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APPRENTICESHIP ISSUES AND CHALLENGES FACING CANADIAN MANUFACTURING INDUSTRIES

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Apprenticeship Issues and Challenges Facing Canadian Manufacturing Industries

Abstract

The apprenticeship system is generally associated with the construction industry. However, the manufacturing industry actually employs a greater amount of persons in apprenticeable occupations than construction. With the rise in value of the Canadian dollar and increased international competition from developing countries, manufacturing industries must increasingly invest in the skills of their workers. Apprenticeship training is often viewed as a possible solution to this challenge.

The objective of this report is to discuss issues related to skilled labour shortages and to apprenticeship in manufacturing. The report finds that in recent years the manufacturing sector has suffered from low output and employment growth. In contrast with these findings, the manufacturing sector is reporting increasing shortages of skilled labour. These conflicting indicators suggest that skills shortages in the manufacturing sector are a result of a strong overall labour market rather than dependent on sector specific developments. Growing skills shortages underline the importance for the manufacturing to train and retain employees despite the poor market conditions prevailing in the sector.

In this context, apprenticeship programs are highly relevant to the manufacturing sector as 14 per cent of its workforce is in apprenticeable occupations. However, strong growth in the number of apprentices in manufacturing has not been followed by a commensurate increase in the number of completions. Much needs to be done if the apprenticeship system is to significantly foster the international competitiveness of the Canadian manufacturing sector through the development of a highly skilled workforce.

Résumé

Le système des apprentis est généralement associé à l'industrie de la construction. Pourtant, l'industrie manufacturière emploie un plus grand nombre de personnes ayant une occupation dont la formation est liée au système d'apprentis que l'industrie de la construction. Avec l'appréciation du dollar canadien et une compétition internationale accrue de la part des pays en voie de développement, les industries manufacturières doivent investir de plus en plus dans les compétences de leurs travailleurs. La formation d'apprentis est souvent perçue comme une solution possible pour relever ce défi.

L'objectif de ce rapport est de discuter des problèmes et défis liés aux pénuries de compétences et au système d'apprenti pour le secteur manufacturier. Récemment, le secteur manufacturier a souffert d'une faible croissance de la production et de l'emploi. Pourtant, le secteur manufacturier continue de signaler une intensification de la pénurie de main d'oeuvre qualifiée. Ces indicateurs contradictoires suggèrent que la pénurie de compétence dans le secteur manufacturier résulte d'un marché global de l'emploi

dynamique plutôt que de développements spécifiques au secteur manufacturier. La croissance de la pénurie de compétence souligne l'importance pour le secteur manufacturier de former et préserver leur main d'œuvre malgré les conditions de marché défavorables auxquelles fait face le secteur.

Dans un tel contexte, les programmes de formation pour les apprentis sont très pertinents pour le secteur manufacturier, notamment parce que 14 pour cent de sa main d'œuvre travaille dans une occupation dont la formation est liée au système d'apprentis. La croissance rapide des inscriptions pour les programmes d'apprentis, par contre, n'a pas été suivi d'une croissance semblable du nombre de gradués. Des efforts considérables restent à déployer afin que le système d'apprentis puisse contribuer de façon significative à raffermir la compétitivité internationale du secteur manufacturier au Canada par le développement d'une main d'œuvre hautement qualifiée.

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Apprenticeship Issues and Challenges Facing Canadian Manufacturing Industries

Executive Summary

The apprenticeship system is generally associated with the construction industry. However, the manufacturing industry actually employs a greater amount of persons in apprenticeable occupations than construction. With the rise in value of the Canadian dollar and increased international competition from developing countries, manufacturing industries must increasingly invest in the skills of their workers. Apprenticeship training is often viewed as a possible solution to this challenge.

The objective of this report is to discuss issues related to skilled labour shortages and to apprenticeship in manufacturing. The report finds that in recent years the manufacturing sector experienced negative output and employment growth. In contrast with these findings, the manufacturing sector is reporting increasing shortages of skilled labour. These conflicting indicators suggest that skills shortages in the manufacturing sector are a result of a strong overall labour market rather than dependent on sector specific developments. Growing skills shortages underline the importance for the manufacturing to train and retain employees despite the poor market conditions prevailing in the sector.

In 2000, there were about 208,000 workers in apprenticeable occupations in manufacturing, representing 28 per cent of all workers in apprenticeable occupations in all sectors. There were more workers in apprenticeable occupations in manufacturing than in construction (25 per cent).

Workers in apprenticeable trades accounted for 14 per cent of total manufacturing employment, compared to 43 per cent in construction. This likely explains why the construction industry is much more associated with apprenticeship in the public's minds than the manufacturing sector, even though manufacturing employs more persons in apprenticeable occupations. But this large number of apprentices in manufacturing means that apprenticeship issues are indeed very relevant for the sector, even though other issues such as international competitiveness, innovation, commercialization, and trade barriers may be given higher profile.

The report is divided into eight sections or parts. To provide context for the discussion of the apprenticeship system in the manufacturing sector, the first section provides an overview of economic developments in Canadian manufacturing, with a focus in the post-2000 period. Trends in manufacturing output, employment, and productivity are examined, including analysis at the detailed industry level and by region and province. The second section sheds light on the importance of the apprenticeship system for manufacturing by reviewing data on the distribution and concentration of employment in apprenticeable occupations within manufacturing.

The issue of skilled labour shortages has had, and will undoubtedly continue to have, a very high media profile. The third section, the longest in the report, examines this issue in the context of manufacturing. A number of measures of labour market shortages are used to assess current labour market imbalances in manufacturing.

It is well known that the overall completion rate for apprentices is low. The fourth section analyzes the apprenticeship registrations and completions trends for trades of particular relevance to manufacturing. It also discusses possible reasons for the low completion rates.

The fifth section looks at the issue of emerging skills sets needed in manufacturing and looks at how the apprenticeship system could deal with this issue. Greater collaboration with other types of post-secondary education institutions is discussed. The sixth section discusses the system of Labour Market Information (LMI) for apprentices. The seventh section looks at possible policy responses to the challenges facing the apprenticeship system in manufacturing industries. The three measures related to apprenticeships in the 2006 Federal Budget and their expected effects are the main focus of the discussion. The eighth and final section concludes.

The key findings of the report are highlighted below:

- Since 2000, and particularly since 2004, output growth in manufacturing has been weak in Canada. The rise in the value of the Canadian dollar accounts for much of the recent weakness. Manufacturing employment growth has also been weak, and fell significantly in 2005, 2006 and 2007. This situation lies in stark contrast to that of the construction and natural resource industries, which have since 2000 enjoyed very strong output and employment growth, due largely to high commodity prices.

- Workers in apprenticeable occupations in manufacturing are concentrated in a small number of industries. The three most important are fabricated metal products, transportation equipment, and machinery, which employ nearly one half of the workers in apprenticeable trades in manufacturing. Primary metal, paper, and food also employ large numbers of tradespersons.

- The manufacturing industries which employ large numbers of workers in apprenticeable occupations are also the industries with a high proportion of their workforce in these occupations. The industry with the highest proportion of workers in apprenticeable occupations is machinery (29 per cent), followed by fabricated metals (28 per cent) and primary metal (24 per cent).

- In terms of specific trades, the most important in absolute terms in manufacturing are welders and related machine operators, machinists, construction millwrights and industrial mechanics, tool and die makers, industrial electricians, and cabinetmakers.

- Manufacturing accounts for 93 per cent of tool and die makers, 85 per cent of machinists, 75 per cent of cabinetmakers, 69 per cent of construction millwrights and industrial mechanics, 62 per cent of welders and related machine operators, and 55 per cent of industrial electricians.

- There has been little difference in the economic performance of the apprenticeship-intensive and non-apprenticeship intensive manufacturing industries in recent years.

- Among the apprenticeship-intensive manufacturing industries, transportation and equipment and machinery have performed the best in terms of output and employment growth while paper manufacturing has performed the worst.

- Employer surveys point to mounting skilled labour shortages in manufacturing. In 2007, 12.5 per cent of surveyed manufacturers identified skilled labour shortages as one of their main production issue, the highest proportion since 1981 and up from only 6.0 per cent in 2004.

- Economic indicators such as capacity utilization, wage increases, and unemployment rates provide no conclusive evidence pointing to significant skill shortages in manufacturing in general or in the apprentice-intensive industries in particular. Indeed, these indicators suggest that the labour market in manufacturing in 2007 was less tight than it had been in a number of years in the 1990s and early 2000s.

- Employer surveys and economic indicators can be reconciled if we consider that the manufacturing sector is competing with other sectors for skilled labour, and that these other sectors are rapidly expanding. Healthy growth in sectors which are key competitors for skilled labour is putting pressure not only on the quantity of skilled workers available, but also insuring that wages for workers with skills transferable to other industries do not adjust downward. At the same time, manufacturers are facing tougher product market conditions which minimize their capacity to attract and retain skilled workers by offering higher wages and more secure jobs.

- Skills shortages do have negative effects on the competitiveness of the manufacturing industry. From this perspective, while the need for more apprentices in manufacturing industries is arguably much less crucial than in the construction and natural resource industries, it still is an important ingredient for the survival and potential revival of the manufacturing sector.

- The completion rate in apprenticeship programs is low compared to other types of post-secondary education. Factors responsible for the low completion rate include unstable employment patterns, inadequate basic skills, and limited compulsory certification for manufacturing trades.

- Apprenticeship programs for trades important to manufacturing also suffer from low completion rates, even though on average they are slightly above the average completion rates for all trades.

- With the development of modern manufacturing technologies, new skill sets are emerging and apprenticeship programs must integrate these new skills sets into their curriculum. Closer collaboration between apprenticeship programs and community colleges is the recommended way to achieve this goal.

- Labour market information for apprenticeships is inadequate, particularly at the high school level. Measures need to be taken to provide students with accurate and relevant information on career prospects in the trades.

The recent interest shown by the federal government in the apprenticeship system, as manifested by the measures related to apprenticeships contained in the May 2006 budget, indicates that there currently exists in this country the political will to take additional steps to reform the apprenticeship system to make it more responsive to the needs of both employers and current and potential apprentices. It is hoped that the material in this report will be used in the development of specific policies and measures to effectuate this needed change.

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Apprenticeship Issues and Challenges Facing Canadian Manufacturing Industries

Introduction: Background and Motivation

There were about 208,000 workers in apprenticeable occupations in manufacturing in 2000 (most recent year for which census data are available), representing 28 per cent of all workers in apprenticeable occupations in all sectors.[1] Indeed, in absolute terms, there were more persons working in apprenticeable trades in manufacturing than in construction (25 per cent of total), although as a share of employment, apprenticeable trades were much more important in construction than manufacturing (43 per cent versus 14 per cent of total employment in the sector). The fact that the proportion of apprenticeable occupations is three times higher in construction than in manufacturing undoubtedly explains why the construction industry is much more associated with apprenticeship in the public's minds than the manufacturing sector, even though manufacturing employs more persons in apprenticeable occupations. But, this large number of apprentices in manufacturing means that apprenticeship issues are indeed very relevant for the sector, even though other issues such as international competitiveness, innovation, commercialization, and trade barriers may be given higher profile.

This report will identify a number of issues and challenges related to the experience of apprentices in the manufacturing industries in Canada. Potential issues and challenges that will be discussed include the following:

- Are Canadian manufacturing industries currently experiencing labour shortages? Are these shortages generally felt across the nation or are they localized in certain regions/provinces? What are the causes of these shortages, that is are shortages cyclical in nature and linked to the booming economy or structural and linked to an aging workforce and technological developments? Are manufacturing industries expected to experience shortages in the future? To what degree can inter-provincial mobility of journeypersons and apprentices mitigate skills shortages in provinces experiencing significant shortages such as Alberta?

- While the apprenticeship completion rates in manufacturing are on average slightly higher than in other sectors, they are still low compared to other post-secondary education programs. What explains these low completion rates?

[1] In 2006, the Centre for the Study of Living Standards (CSLS) prepared two reports for the Industrial Analysis and Sector Services Branch (IASSB) of Industry Canada as part of a project on apprenticeship issues in manufacturing. One report presented a detailed analysis of trends in apprenticeship as it pertains to manufacturing, while the second examined the key issues and challenges related to apprenticeship in manufacturing industries in Canada. This document is a synthesis of the two reports. We would like to thank Susan Francolini and her colleagues at the IASSB at Industry Canada for providing useful comments on the two reports.

Does the problem lie with the employer (e.g. unstable jobs), the apprentice (e.g. lack of basic skills, limited incentive to complete), or both employer and apprentice? What policies and programs could raise completion rates (e.g. greater income support or higher wages for apprentices, apprentice tax credits for employers)? Why do other forms of post-secondary education have higher completion rates than the apprenticeship system?

- Are there emerging skill sets within manufacturing where new apprenticeship programs would be appropriate, or are these skill sets better supplied by other forms of training such as community college programs leading to certificates and diplomas? Is there potential for greater collaboration between community colleges and provincial Directors of Apprenticeship in the design of apprenticeship programs? Is co-op education a substitute or complement to apprenticeship, or both?

- Is the labour market information system for persons considering apprenticeship programs in manufacturing industries currently adequate, as defined by its comprehensiveness, usefulness, reliability, and accuracy? If not, what improvements are needed?

- Given the low level of compulsory certification of trades in manufacturing industries compared to other sectors, should more trades important for manufacturing industries require compulsory certification of workers?

- The May 2006 federal budget proposed three measures to promote trades in general, and the apprenticeship system in particular, in Canada: an Apprenticeship Job Creation Tax Credit of up to $2,000 per year for employers; an Apprenticeship Incentive Grant of $1,000 per year to apprentices in the first two years of their program; and an employment credit of up to $500 for the cost of tradesperson's tools. What is the likely potential impact of these proposed measures on apprentices in manufacturing? Are such measures made more effective when provinces build similar and complementary programs, such as the Ontario Youth Apprenticeship Program (OYAP)?

The report is divided into seven sections or parts. To provide context for the discussion of the apprenticeship system in the manufacturing sector, the first section provides an overview of economic developments in Canadian manufacturing, with a focus on the post-2000 period. Trends in manufacturing output, employment, and productivity are examined, including analysis at the detailed industry level and by region and province.

The second section sheds light on the importance of the apprenticeship system for manufacturing by reviewing data on the distribution and concentration of employment in

apprenticeable occupations within manufacturing. Unfortunately, data are not currently available on the actual number of apprentices in manufacturing.

The issue of skilled labour shortages has had, and will undoubtedly continue to have a very high media profile (e.g. Ibbitson, 2006). The third section, the longest in the report, examines this issue in the context of manufacturing. A number of measures of labour market shortages are used to assess current labour market imbalances in manufacturing.

It is well known that the overall completion rate for apprentices is low. The fourth section analyzes apprenticeship registrations and completions trends for trades of particular relevance to manufacturing. It also discusses possible reasons for the low completion rates.

The fifth section looks at the issue of emerging skills sets in manufacturing and at how the apprenticeship system could respond to this issue. The possibility of greater collaboration with other types of post-secondary education establishments is discussed.

The system of Labour Market Information (LMI) in Canada is considered to be among the best in the world by the OECD. The sixth section looks at the LMI in Canada, and how adequate it is for the apprenticeship system.

The seventh section looks at possible policy responses to the challenges facing the apprenticeship system in manufacturing industries. The three measures related to apprenticeships in the 2006 Federal Budget and their expected effects are the mmaion focus of the discussion.

The eighth and final section concludes.

I. Developments in Manufacturing in Canada

The Canadian manufacturing industry has been experiencing difficult times in recent years. Real output dropped sharply in 2001 and since then has advanced at a slow pace. Employment growth has been very weak and fell significantly in 2005, 2006 and 2007. Increased international competition, particularly from low wage countries, a rising Canadian dollar, and slower US growth are factors that are often pointed to as responsible for the malaise in the manufacturing sector.

This section reviews trends in manufacturing output, employment, and productivity over the 1987-2007 period,[2] with a particular emphasis on post-2000 developments. In addition to an analysis of overall manufacturing trends, developments at the detailed three-digit North American Industry Classification System (NAICS) industry level are discussed, as are developments by region and province.

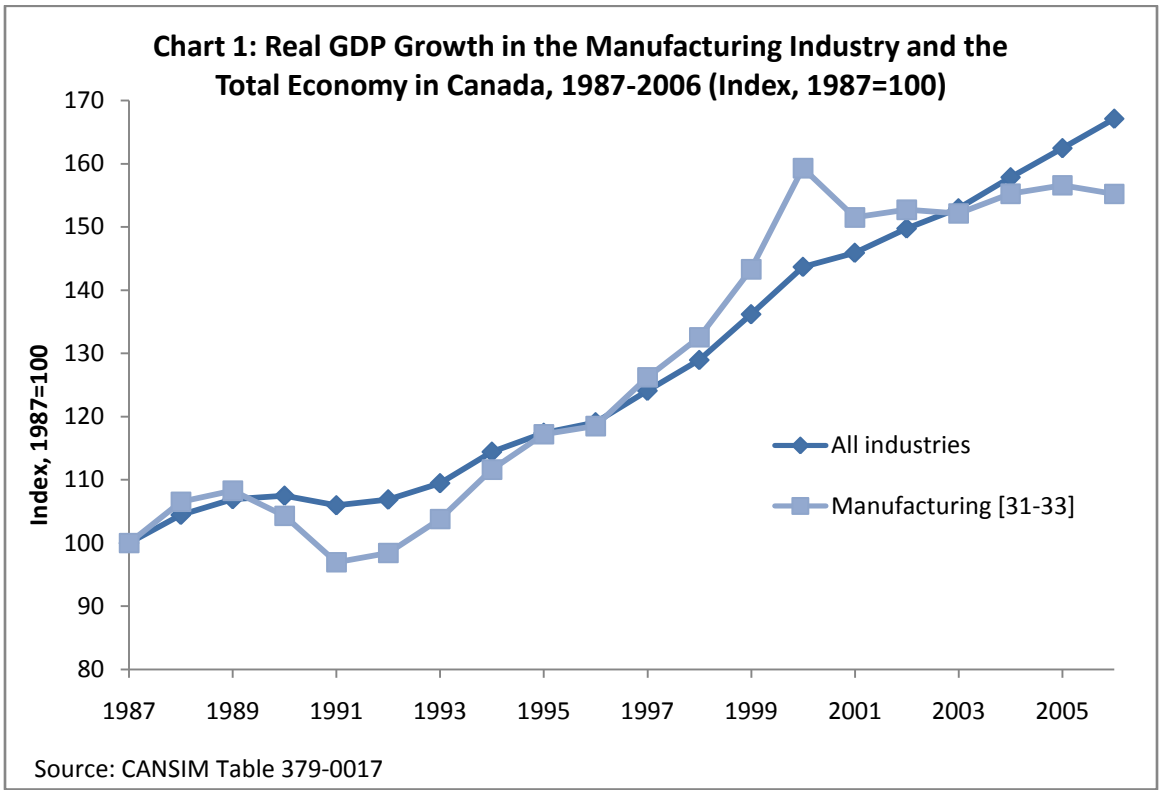
A. Output

In 2006, the Canadian manufacturing industry's output was $175.0 billion (1997 dollars), up 55.3 per cent from $112.7 billion in 1987 (Table 1).[3] By comparison, overall real Canadian GDP, over the same period, has risen by 67.1 per cent from $658.4 billion to $1,100.4 billion. On an average annual basis, this represented a growth rate of 2.3 per cent over 19 years for manufacturing (Chart 1) and a slightly higher rate of 2.7 per cent for the total economy, resulting in the share of real manufacturing output in GDP falling from 17.1 per cent to 15.9 per cent.

More recently, the manufacturing output growth slowed down relative to total economy output growth, and relative to its performance in the second half of the 1990s. Between 2000 and 2006, output in the manufacturing sector actually decreased at an average annual rate of 0.4 per cent, mainly due to a 4.9 per cent fall in output in 2001 (Chart 1). In contrast, total GDP grew at a pace of 2.6 per cent between 2000 and 2006 and manufacturing output advanced at a very strong rate of 6.3 per cent per year in the 1995-2000 period.

In general, this weakness in manufacturing since 2000 can be attributed to cyclical factors such as the slower demand growth from both domestic and foreign sources in the early years of the decade, and structural factors such as the growing international competitiveness of emerging market economies such as China. Since 2003, the appreciation in the value of the Canadian dollar, particularly against the US dollar, has also had an important overall negative effect on manufacturing output growth.

[2] Data for the 1987-2006 period are used where data for 2007 is not yet fully available.
[3] All tables are found at the end of the document.



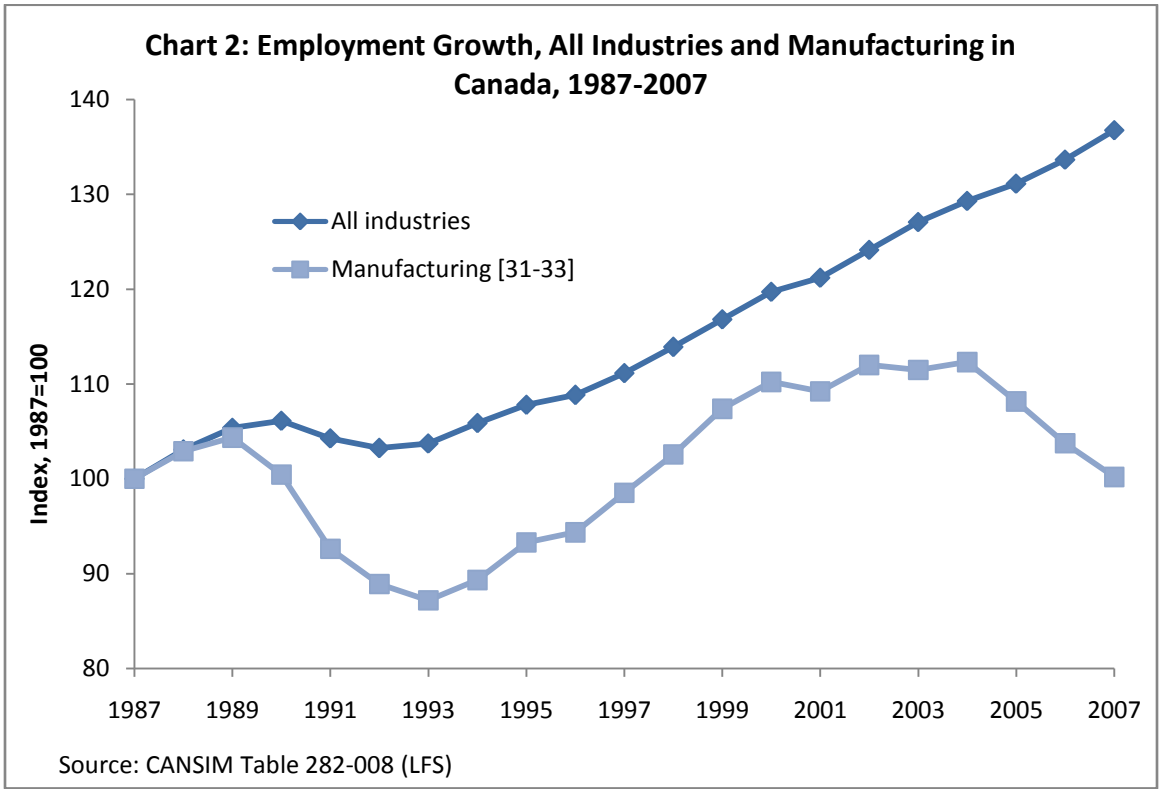
The weakness in the manufacturing sector in Canada since 2000 has been concentrated in a relatively small number of industries, which should be no surprise to anyone regularly reading the news (Table 1). High tech manufacturing and clothing-related industries were hard hit. Between 2000 and 2006, large drops in output were experienced by leather and allied products (-60.9 per cent), textile mills (-41.9 per cent), clothing (-30.6 per cent), computer and electronic products (-30.6 per cent with a 42.1 per cent fall in 2001 alone), electrical equipment (-30.1 per cent) and textile product mills (-24.8 per cent). In contrast, certain manufacturing industries such as food (10.4 per cent), wood products (11.2 per cent), chemicals (18.5 per cent), petroleum and coal products (17.6 per cent) and non-metallic mineral products (17.2 per cent) have experienced robust growth since 2000.

In terms of provincial trends in manufacturing output growth, all provinces experienced positive growth over the period of 1987-2006, but there were significant variations (Table 2). Prince Edward Island recorded the strongest growth at 6.8 per cent per year, followed by Alberta (5.5 per cent). All other provinces experienced average annual growth rates between 1 per cent and 3 per cent, except for Newfoundland (0.6 per cent), and Saskatchewan (3.2 per cent). Grouped by region, the western provinces (British Columbia, Alberta, Saskatchewan and Manitoba) experienced the fastest growth rate at 3.0 per cent, higher than the traditional manufacturing provinces, Quebec and Ontario (2.1 per cent). The Atlantic Provinces followed with 1.8 per cent annual growth.

Between 2000 and 2006, manufacturing output in the western provinces advanced at a growth rate of 0.9 per cent per year, compared to a decline of 1.0 per cent in central Canada. The Atlantic Provinces grew slightly faster than the western provinces, at a rate of 1.1 per cent per year. Nova Scotia, Quebec and Ontario were the three provinces that experienced negative growth during this period, with manufacturing output declining an average of 0.2, 0.9 and 1.0 per cent per year, respectively.

B. Employment

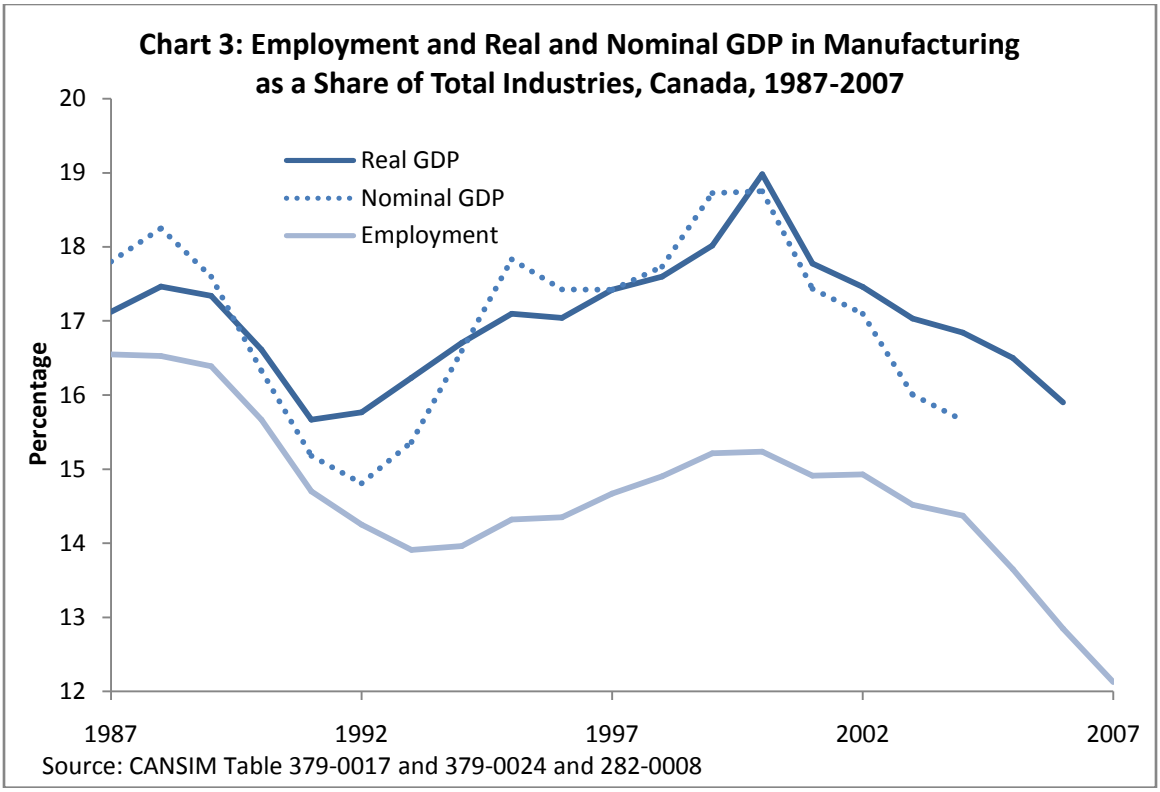
Employment in the manufacturing industry in Canada in 2007 was virtually at the same level as in 1987, with 2,041 thousand workers in 1987 compared to 2,045 thousand in 2007 (Chart 2 and Table 3). In contrast, total employment rose from 12.3 million to 16.9 million, an average annual rate of growth of 1.6 per cent. This resulted in a decline in the share of manufacturing employment in total employment from 16.6 per cent in 1987 to 12.1 per cent in 2007 (Chart 3 and Table 3a).



Since 2000, despite a strong overall rate of increase in total employment in the Canadian economy (1.9 per cent per year), manufacturing employment fell (-1.4 per cent per year). Most of the decline occurred since 2004 with manufacturing employment falling 3.7 per cent, 4.1 per cent and 3.4 per cent respectively in 2005, 2006 and 2007.

The manufacturing industries that experienced the largest falls in employment over 1987-2007 were: leather and allied products (-6.1 per cent per year), textile product mills (-3.9 per cent), clothing (-3.6 per cent) and electrical equipment (-2.3 per cent).

Eleven out of the twenty-one sub-industries experienced positive growth (Table 3). The best employment performance was in miscellaneous manufacturing with a 2.3 per cent average annual growth rate, followed by plastics and rubber (1.3 per cent) and machinery (1.2 per cent), furniture (1.00 per cent) and wood products (1.00 per cent).



Between 2000 and 2007, only four manufacturing industries experienced positive employment growth. The highest growth was in the food manufacturing industry, 1.9 per cent per year. The miscellaneous manufacturing industry (1.6 per cent), the fabricated metals industry (0.5 per cent) and the machinery industry (0.3 per cent) were the other three industries who reported positive employment growth. Seventeen manufacturing industries experienced falls in employment over this period, with the largest declines recorded in clothing (-7.9 per cent), textile mills (-5.5 per cent), textile product mills (-5.4 per cent), leather and allied products (-5.2 per cent per year), primary metals (-4.3 per cent), computer and electronic products (-4.2 per cent), and paper (-4.0 per cent).

Over the 1987-2007 period, employment growth in manufacturing has been strongest in the western provinces at 1.5 per cent per year, with this region offsetting declines in both Central and Atlantic Canada (Table 4). Manufacturing employment in Atlantic Canada virtually stayed the same, declining at an average rate of 0.1 per cent per year, and fell by 0.4 per cent per year in Central Canada. The province with the strongest manufacturing employment growth was Prince Edward Island at 2.6 per cent per year, but the small size of the province meant that this development had minimal effect on the overall picture for Atlantic Canada. Alberta saw strong manufacturing employment growth at 2.2 per cent per year, followed closely by Saskatchewan (1.7 per cent). Quebec

and Ontario had manufacturing employment growth rates of -0.3 per cent and -0.4 per cent respectively.

Regional shares of employment in the manufacturing sector changed over the 1987-2007 period due to these growth patterns. The western provinces' share grew by 5.7 percentage points from 16.3 per cent to 22.0 per cent, while Quebec and Ontario declined from 78.6 per cent of total employment in this sector to 73.1 per cent, a 5.5 percentage points decrease (Table 4a).

In the recent period of 2000-2007, manufacturing employment growth was historically low in all regions: western provinces (0.4 per cent per year), Quebec-Ontario (-1.9 per cent) and Atlantic provinces (-0.3 per cent).[4] Four of the ten provinces experienced negative manufacturing employment growth: Quebec (-2.2 per cent per year), Ontario (-1.7 per cent), New Brunswick (-0.9 per cent) and Nova Scotia (-0.2 per cent). Both Manitoba and British Columbia had relative stability, with manufacturing employment growth of only 0.2 per cent per year over the 2000-2007 period. All other provinces saw manufacturing employment increase at rates between 0.5 per cent (Alberta) and 1.4 per cent per year (Saskatchewan).

C. Productivity

Labour productivity growth in manufacturing has been rising at a much faster rate than in the business sector since 1987. Official Statistics Canada productivity estimates show that between 1987 and 2006 output per hour worked in the manufacturing sector advanced at an average annual growth rate of 2.4 per cent, compared to 1.4 per cent for the business sector (Chart 4 and Table 1e).

From 2000 to 2006, manufacturing labour productivity growth slowed down compared to that of earlier period and increased slower than that of the business sector (0.8 per cent per year versus 1.0 per cent). In 2007, figures from the first three quarters indicate a pick-up in labour productivity growth in manufacturing to 2.0 per cent compared to only 0.8 per cent in the business sector.

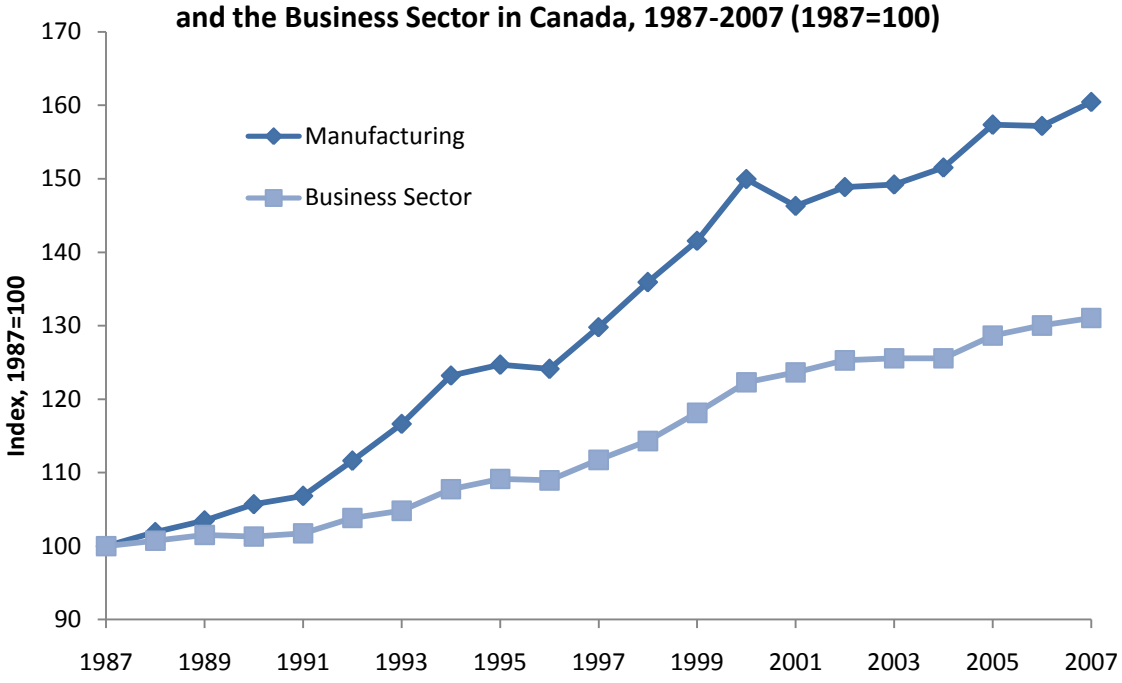
Labour productivity growth varied greatly among manufacturing industries (Table 1c). The industry which experienced the fastest output per worker growth for the whole period (1987 to 2006) was computer and electronics at 5.7 per cent per year, followed by petroleum and coal products (4.4 per cent), primary metal (3.9 per cent), chemical manufacturing (2.9 per cent), fabricated metal products (2.4 per cent), transportation equipment (2.4 per cent) and machinery manufacturing (2.3 per cent). Printing and

[4] This weakness in manufacturing employment in western Canada since 2000 is surprising and appears inconsistent with a recent Statistics Canada study that concluded "There was a definite shift in momentum of shipment activity to the resource-rich West, which counterbalanced more muted growth in the manufacturing-heavy central provinces" (Kowaluk, 2006). The reason for this shift is suspected to be that "In central Canada, [...] the export-dependent sector was hit hard by the strengthened Canadian dollar against the US dollar and soaring energy costs, as well as increased global competition" (Kowaluk, 2006). The western provinces were not hit as hard, mainly because of their rich natural resources.

related activities and leather and allied products were the only industry to experience negative productivity growth (-0.1 per cent and -0.2 per cent respectively).

Over the 2000-2006 period strong productivity growth was recorded in petroleum and coal (5.6 per cent per year), chemicals (5.0 per cent), primary metals (3.9 per cent), and textile product mills (2.4 per cent). Leather and allied products had the worst performance, with productivity falling 5.5 per cent per year. Seven other industries also experienced negative growth during this period.

Chart 4: Labour Productivity (Output per Hour) in Manufacturing and the Business Sector in Canada, 1987-2007 (1987=100)



Source: Table 1e. Note: Data for 2007 is only for the first three quarters

Only three provinces had manufacturing productivity, as measured by real GDP per worker, greater than the national average of $81,589 (1997 dollars) in 2006 (Table 2b): New Brunswick ($83,206), Ontario ($84,157) and Alberta ($103,290).

Manufacturing labour productivity growth between 1987 and 2006 was highest in Prince Edward Island (4.0 per cent per year) and Alberta (3.3 per cent). These two provinces also experienced the fastest growth in manufacturing output and employment during the same period. No province experienced negative labour productivity growth in manufacturing, with British Columbia experiencing the weakest growth at 0.6 per cent. Considering the aggregate regions of Quebec-Ontario and the western provinces (where most of the manufacturing industry is concentrated), Quebec-Ontario had a higher growth rate of productivity between 1987 and 2006 (2.1 per cent versus 1.6 per cent).

Between 2000 and 2006, labour productivity growth in manufacturing was fastest in New Brunswick at 3.5 per cent per year, followed by Alberta (1.8 per cent). Ontario

experienced the lowest productivity growth in that period, at only 0.1 per cent per year. Since 2000, labour productivity growth in manufacturing in Western Canada has significantly outpaced that of the central provinces (1.2 per cent per cent versus 0.2 per cent).

II. The Importance of Apprenticeable Occupations in Manufacturing Industries

Before examining the issues affecting apprenticeships in manufacturing, it is important to identify which manufacturing industries employed persons in apprenticeable occupations and which apprenticeable occupations are concentrated in manufacturing. As noted in the introduction, while the construction sector is more associated in the public's mind with apprenticeship, the manufacturing sector actually employs more persons in apprenticeable trades or occupations in absolute terms.

There are three main sources of data in Canada on apprentices: the Registered Apprenticeship Information Survey (RAIS), the National Apprenticeship Survey (NAS), and the Canadian Census (2001 and 1996). The RAIS is a collection of provincial administrative data on registrations, completions and withdrawals maintained by Statistics Canada.[5] A major weakness of this database, from the point of view of this report, is the lack of an industry breakdown of apprenticeship registrations and completions.

The NAS directly asks apprentices about their experience in the program and is an excellent source of information on the apprenticeship system. The survey was conducted in 1990 and 1995 and is being conducted again in 2006-2007. Unfortunately, the data from the 1995 survey are not publicly available and therefore could not be used in this report to produce a breakdown of apprentices by industry.

Because of the lack of an industry breakdown of apprentices in either the RAIS or NAS, the census has been used. It provides a detailed breakdown of persons in apprenticeable occupations by industry. This information can be used to estimates the number of apprentices on an industry basis. Detailed estimates of apprentices in manufacturing industries are included in the Appendix to this report.

It is also important to note that apprenticeable occupations or trades (the two terms will be used interchangeably) are defined in this report as the 45 Red Seal trades[6] plus the plasterer and heavy duty equipment operator trades. Together, these 47 trades accounted for 92.8 per cent of all registrations for apprenticeships in Canada in 2000. Each of these trades is associated with a corresponding National Occupation Classification – Statistics code (NOC-S).

A. The Importance of Apprenticeable Trades for Manufacturing Industries

In 2000, census data reveal that 14.2 per cent of the workers in manufacturing in Canada were employed in apprenticeable trades (Table 6). This is considerably lower than the construction sector, where 43.3 per cent of workers were in apprenticeable

[5] See Sharpe and Gibson (2005) for a more detailed overview of this database.
[6] See Sharpe and Gibson (2005) for more information on the Red Seal program.

trades, but still well above the average for all industries (9.6 per cent). In addition to construction, three other industries employed a higher percentage of their workers in apprenticeable trades than manufacturing: other services (36.8 per cent), mining and oil and gas extraction (19.0 per cent) and utilities (16.1 per cent). Thus, manufacturing ranked fifth out of the ten NAICS industries in the proportion of employment in apprenticeable trades, a proxy for the proportion of apprentices in total employment.[7]

Using three-digit NAICS census data on employment by occupation for the 21 manufacturing industries, one can identify in which industries employment in apprenticeable occupations is concentrated (Tables 7 and 8). This information is summarized in Summary Table 1.

Six manufacturing industries employed over 70 per cent of the persons employed in apprenticeable trades in manufacturing. In descending order of the absolute number of workers in apprenticeable occupations employed in the industries, the industries were: fabricated metal products (36,315); transportation equipment (29,190); machinery (29,190); primary metals (17,950); paper (13,585); and food (13,800). These six industries employed 147 thousand (70.8 per cent) of the 209 thousand persons employed in apprenticeable occupations in manufacturing in Canada in 2000. The first three industries alone employed 50 per cent of workers in apprenticeable occupations, even though these industries accounted for only 27 per cent of total manufacturing employment in 2000.

Another perspective on the importance of apprenticeable occupations can be obtained by identifying the proportion of workers in an industry who are in apprenticeable occupations. The higher the proportion, the more the industry relies on the apprenticeship system to train its workforce. The manufacturing industry with the highest proportion of workers in apprenticeable occupations in 2000 was machinery, with 29.0 per cent of its workforce in apprenticeable trades. It was followed closely by fabricated metal products (28.1 per cent), primary metal (24.0 per cent), transportation equipment (17.9 per cent), furniture and related products (17.9 per cent) and paper (16.8 per cent).

It is interesting to note that the six industries with the highest proportion of workers in apprenticeable trades correspond almost one for one with the top six industries in terms of the number of workers in apprenticeable trades employed. The exception is the furniture industry, which ranks fifth in terms of the proportion of workers in apprenticeable trades, but because of its small size does not rank in the top six in terms of the absolute number of workers in apprenticeable trades employed. Conversely, the food

[7] The Appendix of this report links apprenticeship registrations levels with the share of employment in corresponding apprenticeable trades for each industry to estimate the number of apprentices by industry. It found that the manufacturing sector employs the largest estimated number of apprentices – 46,225 apprentices, more than construction (Table 10). This calculation makes a number of assumptions. It assumes that the ratio of apprentices to persons employed in an apprenticeable occupation is the same across industries (i.e. that all industries train their fair share of apprentices) and that the duration of apprenticeship programs is the same across apprenticeable occupations. These assumptions may not be valid. For this reason, data of apprentices by industry are badly needed.

industry ranks sixth in the absolute number of workers in apprenticeable trades, but because of its large size does not rank among the top six industries in terms of the proportion of the workers in the industry in apprenticeable trades.

Summary Table 1: Perspectives on the Importance of Apprenticeable Occupations in Manufacturing in Canada, 2000

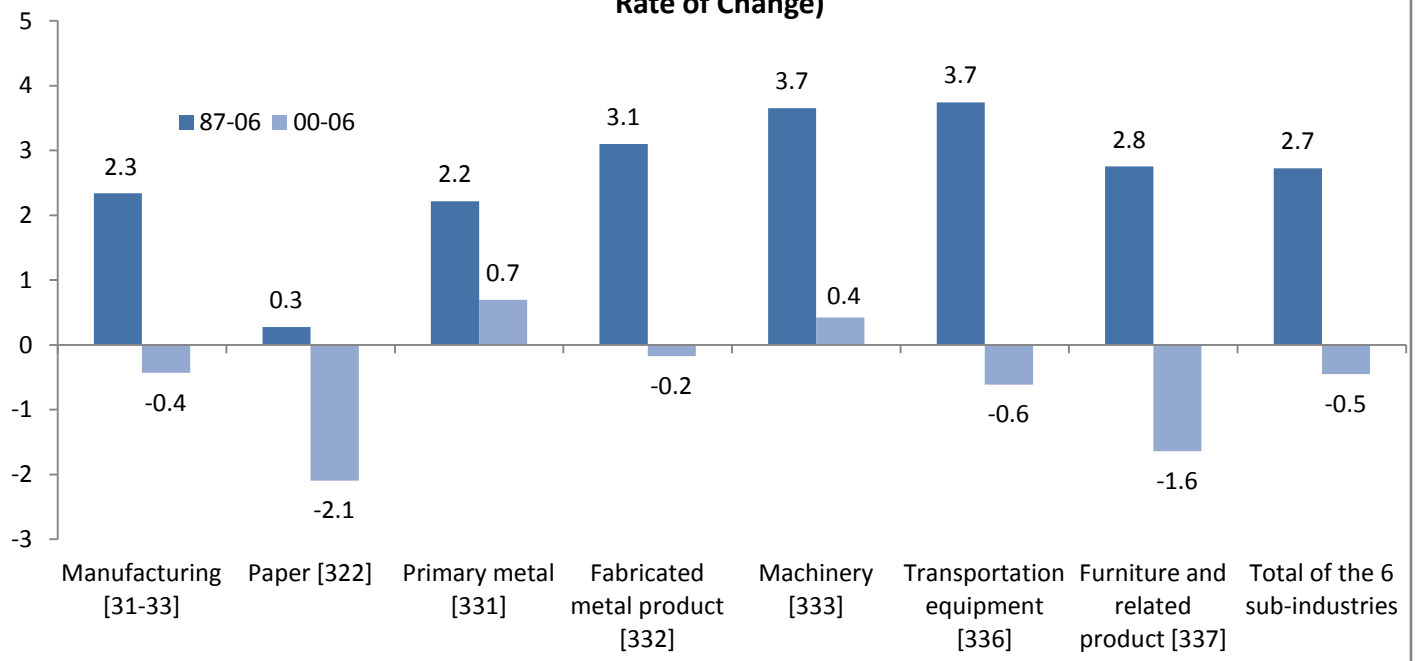
	By Industry		By Occupation	
Ranking by Importance	Percentage of Employment in Apprenticeable Occupations by Sub-Industry	Number of Workers in Apprenticeable Occupations by Sub-Industry	Share of Trade Employment in Manufacturing	Number of Workers by Apprenticeable Occupation in Manufacturing
1	Machinery (29.0%)	Fabricated metal products (36,315)	H312 Tool and die makers (93.4%)	H326 Welders and related machine operators (38,510)
2	Fabricated metal products (28.1%)	Transportation equipment (36,200)	H311 Machinists and machining and tooling inspectors (85.2%)	H311 Machinists and machining and tooling inspectors (34,465)
3	Primary metal (24.0%)	Machinery (29,190)	H122 Cabinetmakers (74.7%)	H411 Construction millwrights and industrial mechanics (except textile) (34,220)
4	Transportation equipment (17.9%)	Primary metal (17,950)	H411 Construction millwrights and industrial mechanics (except textile) (68.7%)	H312 Tool and die makers (13,060)
5	Furniture and related products (17.9%)	Paper (13,585)	H326 Welders and related machine operators (61.6%)	H212 Industrial electricians (11,635)
6	Paper (16.8%)	Food (13,800)	H212 Industrial electricians (54.8%)	H122 Cabinetmakers (9,990)
Six Most Important Combined	22.2 %	147,040	70.5 %	141,880
Total of Manufacturing	14.2 %	207,825	16.9 %	207,825

Source: Tables 9, 10

B. Relative Economic Performance of the Apprenticeship-intensive Manufacturing Industries

The previous section of the report examined trends in the economic performance of the manufacturing sector and manufacturing industries. In this section, we assess the relative economic performance of apprenticeship-intensive manufacturing industries, both as a group relative to the overall performance of the manufacturing sector, and individually. Apprenticeship-intensive manufacturing industries are defined as the six manufacturing industries with the highest proportion of workers in apprenticeable occupations.[8] This analysis allows one to ascertain whether output growth of apprenticeship-intensive industries has outpaced that of the overall manufacturing sector and to identify apprenticeship-intensive industries with high output growth.

Chart 5: Real GDP Growth in Apprenticeship Intensive Industries (Average Annual Rate of Change)

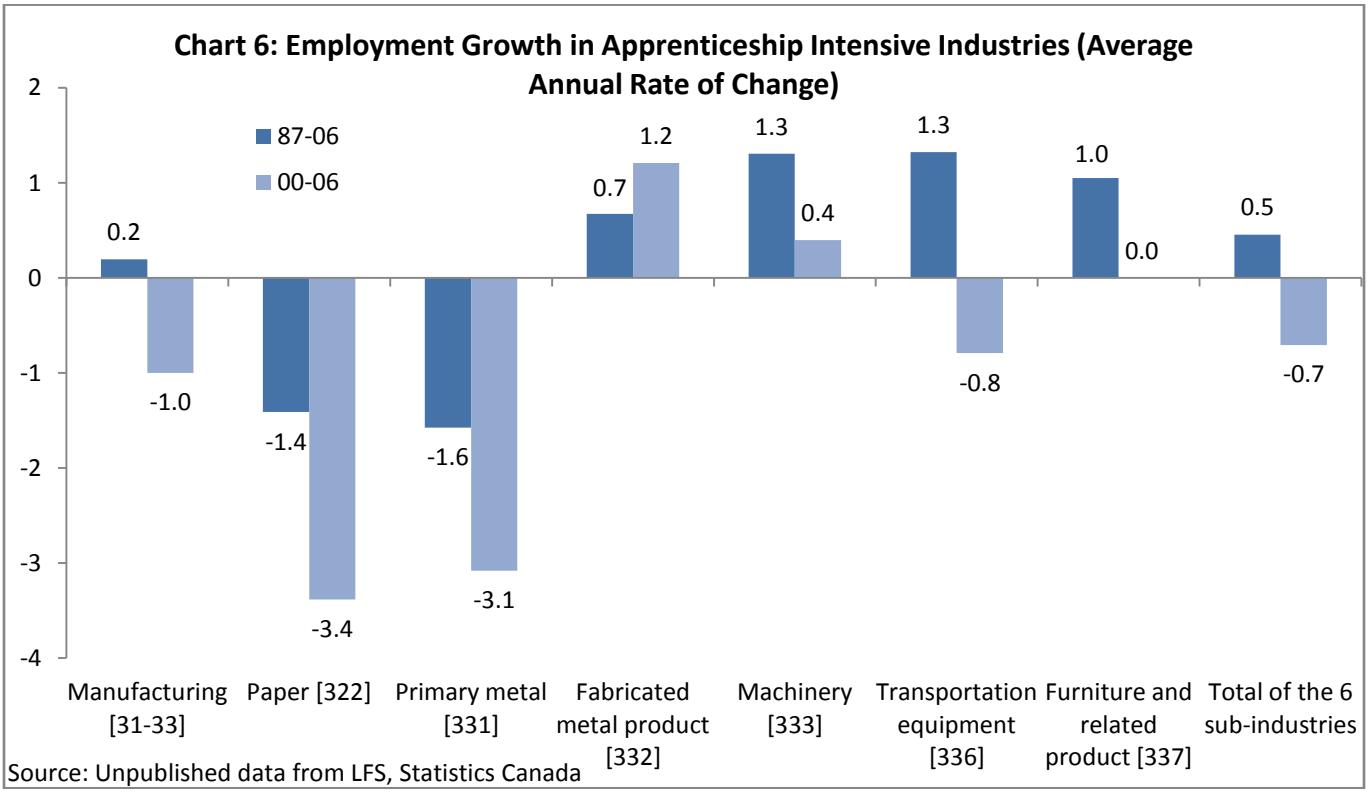


Source: CANSIM Table 379-0017, Statistics Canada unpublished data

In the overall 1987-2006 period, output growth in apprenticeship-intensive manufacturing industries averaged 2.7 per cent per year, somewhat above the 2.3 per cent rate for the overall manufacturing sector (Chart 5 and Table 1). Four industries accounted for this superior performance: machinery (3.7 per cent per year), transportation equipment (3.7 per cent), furniture (2.8 per cent), and fabricated metal products (3.1 per cent). On the other hand, primary metal (2.2 per cent) and paper (0.3 per cent) experienced output growth below the manufacturing average.

[8] Given the overlap between the six industries with the highest proportion of employment in apprenticeable occupations and the six industries with the largest absolute levels of employment in apprenticeable occupations, a definition of apprenticeship-intensive industries based on the second definition would give very similar results. As noted earlier, furniture is included in the first definition and not the second while food is included in the second and not the first.

In the 2000-2006 period, output in apprenticeship-intensive manufacturing industries and overall manufacturing both declined (0.5 per cent per year and 0.4 per cent, respectively). Two apprenticeship-intensive industries enjoyed growth in output over the period: Primary metals (0.7 per cent) and machinery (0.4 per cent). Paper manufacturing suffered the worst decline at 2.1 per cent per year.

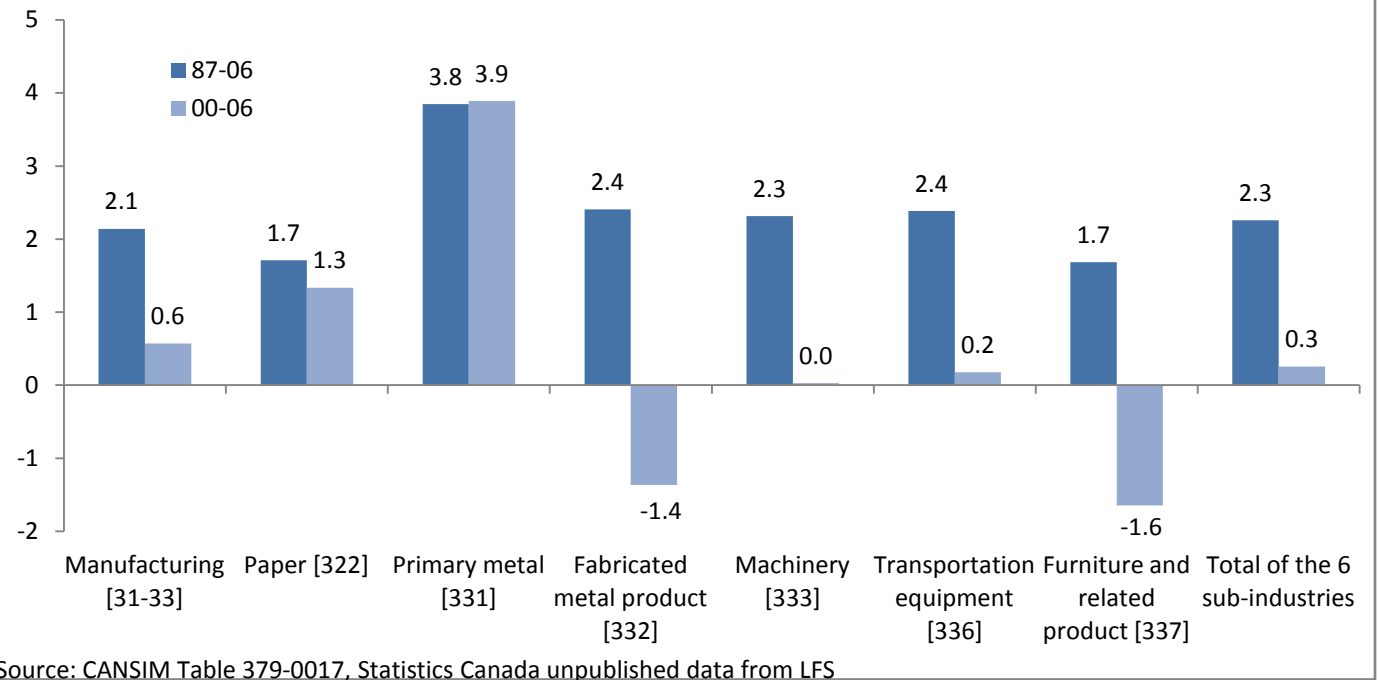


The relative growth pattern observed for employment in apprenticeship-intensive manufacturing industries over the 1987-2006 period was similar to the pattern of output growth (Chart 6). The six apprenticeship-intensive industries recorded slightly faster employment growth than the overall manufacturing sector: 0.5 per cent per year versus 0.2 per cent. Machinery (1.3 per cent per year), transportation equipment (1.3 per cent), furniture (1.0 per cent), and fabricated metals (0.7 per cent) experienced above average employment growth. In contrast, paper and primary metals recorded significant declines in employment over the period, at 1.4 per cent and 1.6 per cent per year, respectively.

In the 2000-2006 period the decline in employment in apprenticeship-intensive manufacturing industries was slightly less than the decline in overall manufacturing (-0.7 per cent versus -1.0 per cent per year). This fall in employment in apprenticeship-intensive industries was driven by paper (-3.4 per cent per year), primary metal (- 3.1 per cent) and, to a lesser degree, transportation equipment (-0.8 per cent). Employment growth was positive in fabricated metals (1.2 per cent per year) and machinery (0.4 per cent).

Labour productivity growth was slightly higher in the apprenticeship-intensive manufacturing industries than in the overall manufacturing sector in the 1987-2006 period: 2.3 per cent per year versus 2.1 per cent (Chart 7). This situation was reversed in the 2000-2006 period when labour productivity advanced at 0.3 per cent per year in apprenticeship-intensive industries compared to 0.6 per cent in overall manufacturing.

Chart 7: Labour Productivity Growth in Apprenticeship Intensive Industries (Average Annual Rate of Change)



Source: CANSIM Table 379-0017, Statistics Canada unpublished data from LFS

C. Employment in Manufacturing by Apprenticeable Occupations

In addition to identifying which industries employ trades persons, it is useful to identify which trades are found in manufacturing. Again, there are two approaches to this question: the absolute number of workers in a particular trade employed in manufacturing and the proportion of workers in a trade employed in manufacturing. In terms of the first approach, Summary Table 1 identifies the six most important trades for manufacturing in terms of number of workers. Welders and related operators are the most important, followed by machinists and machining and tooling inspectors, construction millwrights and industrial mechanics, tool and die makers, industrial electricians, and cabinetmakers. These six trades account for 142 thousand workers, 68 per cent of total trades employment in manufacturing.

In terms of the second approach, the trades enumerated above are also the trades with the greater share of their employment in manufacturing, although the ranking

differs.[9] Tool and die making is the apprenticeable occupation where the largest share of workers in the trade work in manufacturing – 93 per cent in 2000 (though it only accounts for 6 per cent of total trades workers in manufacturing). It was followed by machinists and tooling inspectors (85 per cent), cabinetmakers (75 per cent), construction millwrights and industrial mechanics (69 per cent), welders and related machine occupations (62 per cent), and industrial electricians (55 per cent).

[9] Tool and die makers rank fourth in terms of the number of tradespersons working in manufacturing, but rank first in the share of persons in the trade who work in manufacturing (93 per cent).

III. Are Manufacturing Industries in Canada Experiencing Skilled Labour Shortages?

With an unemployment rate of 6.3 per cent in 2006 and 6.1 per cent in 2007, the Canadian economy enjoyed the lowest unemployment rate in over 30 years. With low unemployment come fewer applicants for job vacancies. Complaints of labour shortages are heard with increasing frequency from employers.[10]

The objective of this section of the report is to assess the imbalances in the Canadian labour market, with particular attention to manufacturing. A number of indicators of labour market pressures, including surveys of employers on the severity of labour shortages, unemployment rates, output gaps and capacity utilization rates, and wage increases are examined to ascertain if manufacturing industries in Canada are currently experiencing skilled labour shortages. The existence of serious labour shortages may have implications for the urgency of policies meant to foster apprenticeships in the manufacturing sector.

Unfortunately, there is much confusion in public discussion of labour shortages, particularly in the context of manufacturing. Perrin Beatty, until recently President of the Canadian Manufacturers and Exporters, expresses this confusion in the following quotation (Beatty, 2006):

> "A rapidly appreciating dollar, skyrocketing energy and commodity prices, intense competition from around the world and increasing labour shortages, which are particularly acute in Western Canada, are forcing the entire manufacturing sector to reassess whether or not to keep products lines open [...] Nearly 700 manufacturing companies across Canada went bankrupt last year. Manufacturing employment has fallen by 200,000 over the past two years."

There appears to be a contradiction in this statement. A sector in decline laying off workers and experiencing mass bankruptcy would normally not be expected to suffer from labour shortages.[11] As this report mentioned earlier, employment in the manufacturing industry fell by 9.1 per cent between 2000 and 2007. Yet a number of reports from the sector talk of a current labour shortage that is expected to be even more significant in the future. This section analyzes the situation of the labour market in the

[10] It is useful to point out the difference in perspectives on the issue of labour shortages between economists and business persons. The former tend to believe that shortages can not exist for any significant period of time, as in competitive labour markets, wages adjust labour supply and demand to equilibrate the market, eliminating shortages. The latter feel this is a simplistic view of the labour market as it ignores barriers to the adjustment process as well as the costs imposed on firms by this adjustment process (paying higher wages to attract workers, training current employees to fill vacancies, and spending resources on recruiting). Building on the economist's perspective, Wilkins (2006) argues that the required labour resources are already in place, but they are not being effectively used; current employees could be trained and developed to accomplish much more than is commonly believed.

[11] Of course, one could argue that manufacturing is not a homogeneous sector but many heterogeneous industries where skills are not transferable. In such a situation, certain industries, or firms within an industry in a particular region, could be in distress while others are booming so labour market imbalances could exist.

manufacturing sector and tries to determine if the situation is as critical as Perrin Beatty believes.

A. Factors Affecting Labour Shortages

The ageing of the baby-boom cohorts will lead to increased retirements from the labour force over the next 20 years. Some see this as an inevitable development that will result in shortages of workers and a possible decline in output. Others have a more positive perspective and believe that the economy will adapt to this structural change. For example, incentives for early retirement are not as common now as they were in the past and there is a recent trend towards an older retirement age (CPRN, 2004). Also, increasing productivity can help the Canadian economy produce more with fewer workers. Mérette (2002) argues that increased labour scarcity will lead to higher wages, which will in turn produce incentives for higher investment in human capital and for the substitution of capital for labour (and thus higher future productivity). The movement towards a knowledge-based economy would have implications for the trades occupations. The tasks associated with certain trades may be amenable to mechanization, which would reduce demand for journeypersons (Masse, Roy and Gingras, 1998). Other economists, including Kuhn (2003), have argued that shortages are likely to be experienced only in specific regions, depending on the region's industrial structure and world demand conditions.

Before assessing the degree to which the Canadian economy is suffering from labour shortages, a definition of skill shortages is needed. In economics, a shortage is defined as a situation where the supply of a good or service does not meet the demand at the prevailing price. In the case of the labour market, there are several definitions and measures used, but none directly observes the condition of the market. When talking about a shortage, some authors will refer to a shortage of *skills* obtained by workers, and others to a shortage of *workers*. In this report, we are interested in whether or not the supply of skilled workers (workers who possess a certain level of specialized human capital, acquired through post-secondary education and/or experience) is sufficient to meet the demand of employers in the manufacturing industry. If a gap is found between the supply and demand of skilled labour, we are also interested in knowing the cause. Is it due to structural factors, such as population ageing, or is it only a consequence of the business cycle?

B. Data Sources on Labour Market Conditions and Shortages

Measuring the gap between labour demand and labour supply is a difficult task. There are two principal types of data sources used in the assessment of labour shortages: surveys and economic indicators.

Surveys are conducted directly with businesses, asking managers and employers questions about current employment conditions. A well-known example of this type of survey is the one conducted by the Canadian Federation of Independent Business. Statistics Canada also conducts a survey of this type, the Business Conditions Survey.

An inherent problem with data from this type of survey is the subjectivity of the employers' answers. Businesses fail to see the big picture of the labour market, and overestimate their shortages during periods of increased sales. When answering the survey, employers may define a shortage of skilled labour in relation to the level of skills they ideally want from workers, which can be unrealistically high. If a firm can not hire enough skilled workers at the prevailing wage level, it will report a shortage, but it could instead raise wages to attract better employees or train its current workforce for the vacancy. In a survey conducted in Quebec in 1995, 75 per cent of employers reported difficulties in hiring skilled labour, but only 10 per cent considered this problem serious enough to increase wages and overtime hours, or to limit production (CPRN, 2004).

In addition to direct surveys of labour market conditions, a number of economic indicators can be used to identify labour shortages. Indicators include output, employment and unemployment trends, productivity, wage rates and wage trends, and the characteristics of the workforce (average age, retirements, etc). However, the interpretation of these economic indicators in the context of labour shortages are often based on assumptions which may be misleading, so economic indicators must also be used with caution in the assessment of labour shortages.

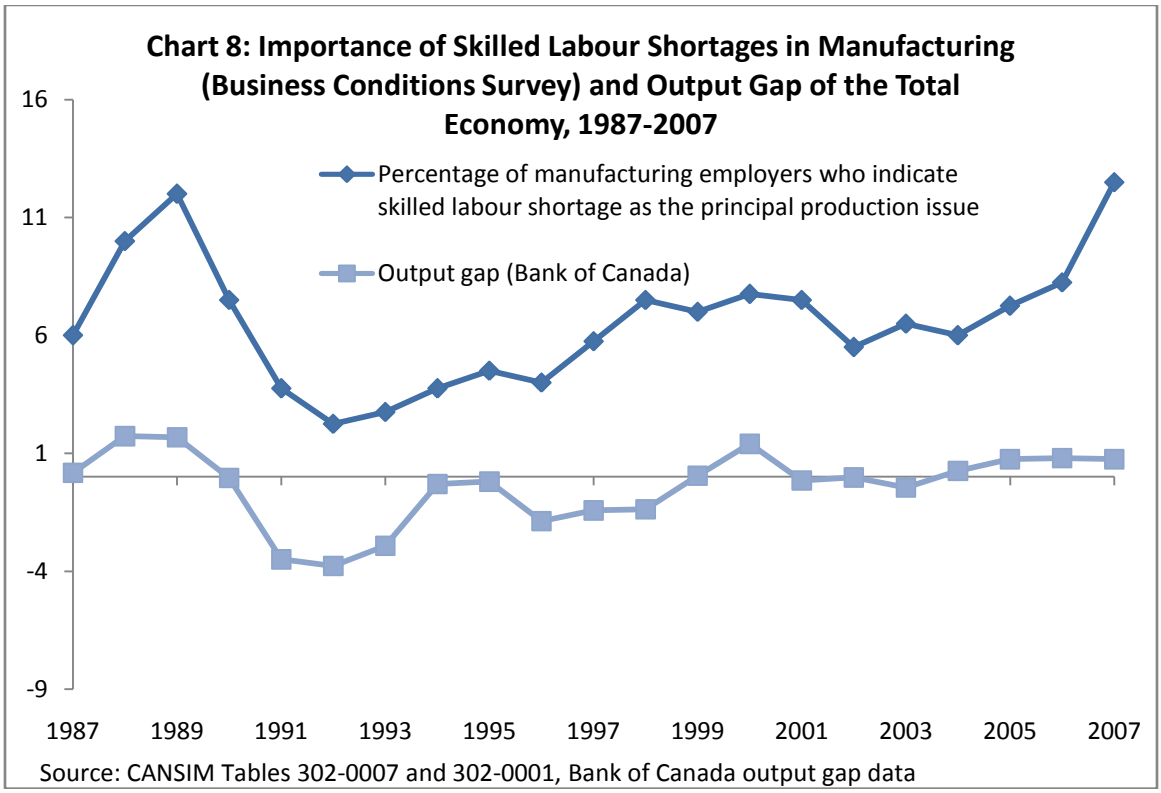
Human Resources and Social Development Canada publishes a database on employment prospects in different industries and occupations called the Canadian Occupational Projection System (COPS). A number of reports and online resources from the government are based on this database, such as Job Futures, one of the main online resource to help youth decide on future careers. COPS uses a number of indicators to determine current and future labour demand and supply conditions for a number of occupations and industries, and gives a rating for each regarding the conditions of the labour market. Ratings are either "limited", "fair" or "good". A "limited" rating indicates that individuals entering this market will have difficulty finding stable employment and "good" means it will be very easy to find a stable job. A "fair" rating is given to industries or occupations that fall between these two extremes.

C. Results from Surveys of Labour Market Conditions

As noted earlier, the Canadian Federation of Independent Business (CFIB) conducts a semi-annual survey of labour shortages. Data are collected directly from questionnaires distributed to members. The number of participants is around 20,000, and responses come from all industries, although no industry de-aggregation is publicly available. In 2006, 52.5 per cent of CFIB members surveyed cited shortages of qualified labour as one of the most important issues to the business (Table 12). This is a large increase from the 31.4 per cent recorded in 1998. No data are publicly available before 1998, which prevents comparisons of current labour market conditions with the pre-1998 period. Another limitation of the survey as a measure of the severity of labour market shortages is that participants may indicate more than one response to the question of which factors are important issues for business. Even though one half of respondents identified shortages of qualified labour as one of the issues most important to the

business, this factor was actually only fifth in importance, behind the total tax burden, government regulation and paper burden, government debt/deficit, and employment insurance.

CFIB survey results are reported for Canada and the provinces. As one might expect, results vary greatly among provinces. In 2006, 76.5 per cent of employers in Alberta indicated that a shortage of qualified labour was one of the main issues they faced, followed by 65.3 in British Columbia, 64.3 per cent in Saskatchewan and 63.6 per cent in Manitoba (Table 12a). Nova Scotia had the lowest response at 31.3 per cent. Over the period of 1998-2006, the western provinces have always been the provinces where employers found labour shortages a more important issue. Also, in contrast to the national level where labour shortages ranked as the fifth most important issue facing business, employers in Alberta in 2006 ranked this issue as the most important. This illustrates the regional labour market differences across Canada.

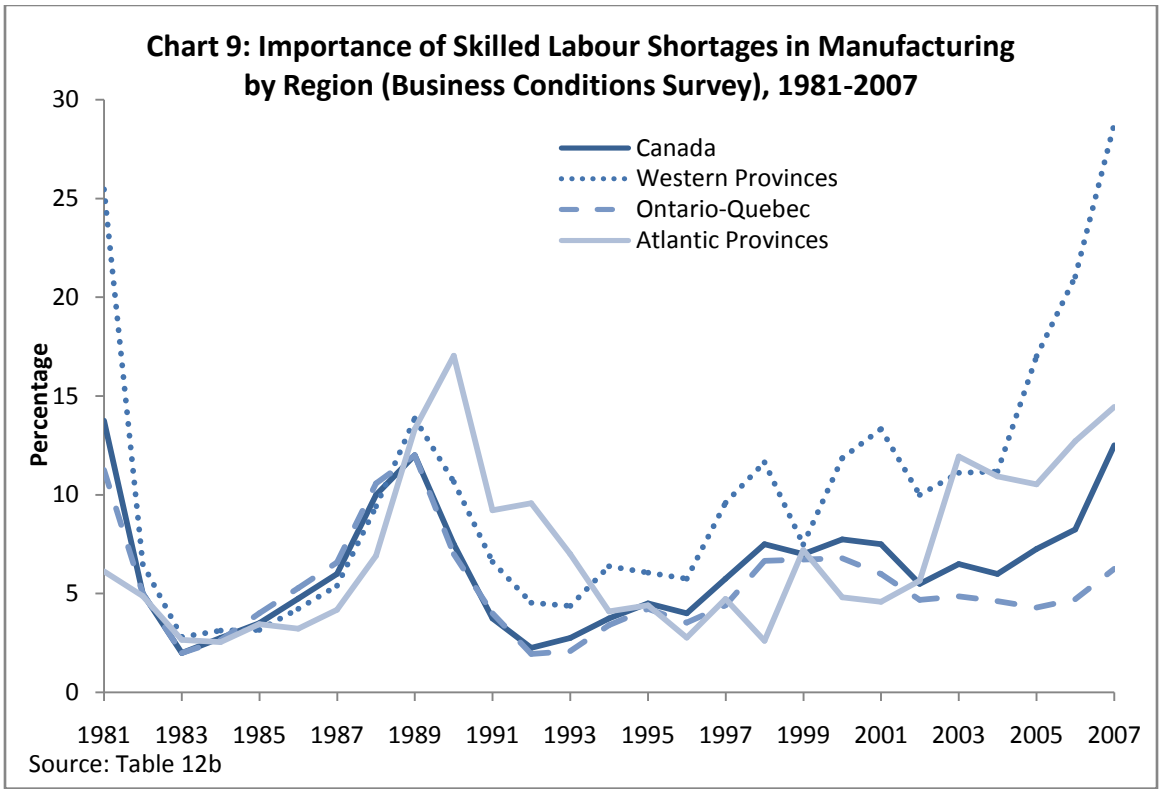


The second survey on labour shortages is the quarterly Business Conditions Survey conducted by Statistics Canada. The great strength of this survey, from the point of view of this report, is that it is confined to manufacturing.[12] The survey identifies what

[12] Because of the change from SIC classification to NAICS, there are in fact two sets of time series, a SIC-based set from 1981 to 2002, and a NAICS-based set from 1992 to 2007. In the over-lapping data range (1992-2002), the two datasets never differ by more than 0.5 percentage point at the national level. For this reason, we simply linked the two series with the NAICS-based data covering the 1992-2007 period and the SIC-based data covering the 1981-1991 period.

proportion of employers rate labour shortages (both skilled and unskilled) as one of their main production issue.[13]

In 2007, 12.5 per cent of employers in manufacturing saw skilled labour shortages as one of their main production issue (Table 12 and Chart 8), compared to only 4.5 per cent for unskilled labour shortages. The current skilled labour shortages are significantly higher than those experienced during the 1998-2001 period (7.0-7.75 per cent), and even slightly higher that in 1988 and 1989 (10-12 per cent). Indeed, only in 1981 did a larger share of businesses considered labour shortages as one of their main production issue (13.75 per cent). Thus, at the national level, the skilled labour shortages currently being experienced in manufacturing are significant and, should they intensified, could well represent an unprecedented crisis. It is also interesting to note that since 2004, and as employment in manufacturing was falling, reported skills shortages more than doubled from 6.0 per cent in 2004 to 12.5 per cent in 2007



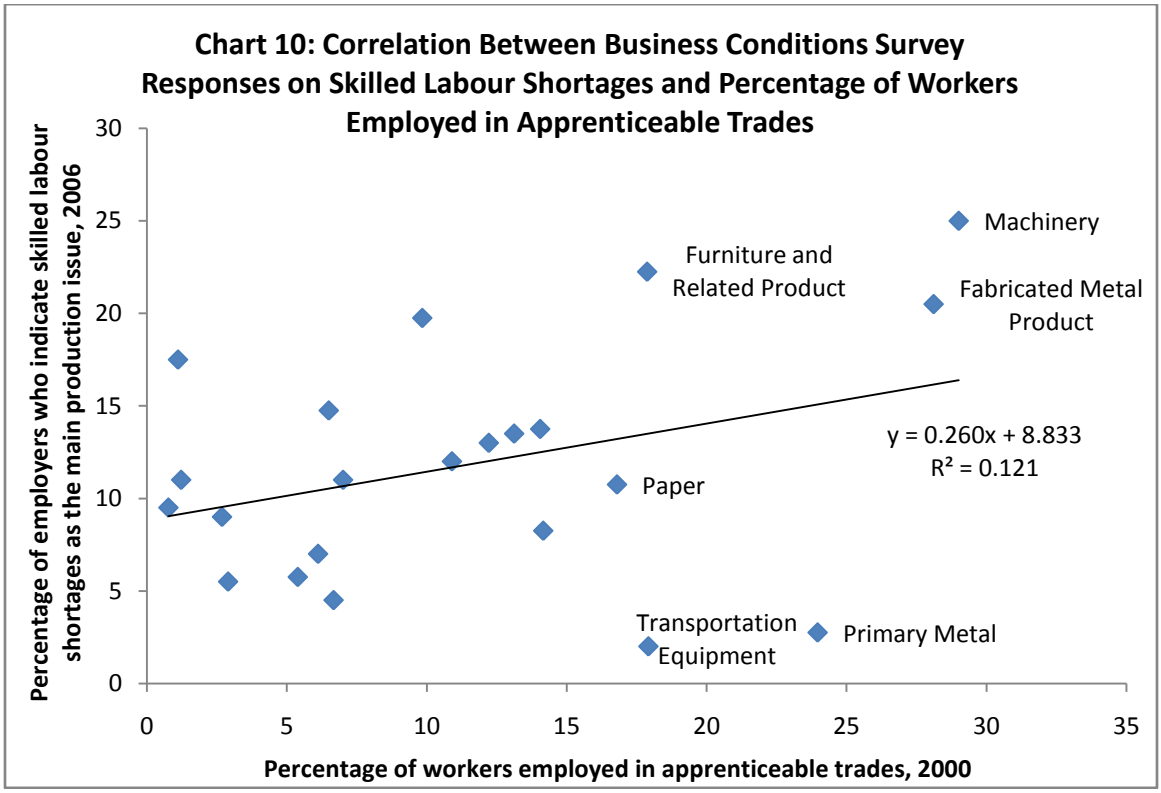
The Business Conditions Survey is also available by province (Table 12b). In 2007, the Western provinces had the highest proportion of manufacturers who reported skilled labour shortages as one of their main production issue (28.8 per cent) (Chart 9).

[13] Statistics Canada does interpret these estimates as the proportion of firms reporting skills shortages as one of their main production difficulty. However, the survey methodology does suggest otherwise. First, answers are weighted by the value of respondent's annual shipments, so that large manufacturers are given more weight. More importantly, the percentage given represents the percentage of weighted responses as a percentage of all responses. As respondents are allowed to provide more than one response to the question on the sources of production difficulties, the number of responses is not necessarily the same as the number of firms. Nonetheless, this report will adopt the official interpretation.

The Atlantic provinces followed (14.5 per cent), but high percentages in Prince Edward Island may cause a slight upward bias in this region (data for Prince Edward Island are much more volatile than for other provinces). Central Canada trailed well behind at 6.3 per cent. In 2007, this indicator in the Western provinces was higher than at any other moment during the 1981-2007 period.

The upward trend in the percentage of manufacturing firms reporting skills shortages at the national level since 2004, and especially the sharp increase in 2007, is due to significant increases across most provinces (Table 12b). For example, reported skills shortages in Ontario increase by almost 50 per cent in 2007 only, from 4.3 per cent in 2006 to 6.3 per cent in 2007. In Alberta, the proportion increased 9.5 percentage points (from 28.0 in 2006 to 37.5 per cent in 2007) and in Saskatchewan it almost doubled to reach 46.8 per cent in 2007 (from 23.5 per cent in 2006). Only Newfoundland and Labrador experienced a slight decline in the percentage of firms reporting skills shortages as one of their main production issue in 2007 (13.0 per cent in 2006 and 12.5 per cent in 2007). While the increase at the national level is in large part driven by increasing reports of skills shortages in Western provinces, Central Canada and particularly Ontario are also reporting a significant rise in skills shortages in 2007.

Chart 10: Correlation Between Business Conditions Survey Responses on Skilled Labour Shortages and Percentage of Workers Employed in Apprenticeable Trades



In 2007 in Canada, the manufacturing industries reporting the greatest extent of skilled labour shortages were chemicals (25.0 per cent), fabricated metals (23.8 per cent), furniture (23.3 per cent), and machinery (23.0 per cent) (Table 12d). Three of these four industries were among the six most-apprentice-intensive manufacturing industries. The extent of skilled labour shortages in each of these three industries in 2007 was the highest

ever recorded in the history of the series, which runs from 1992 to 2006, to the exception of machinery which reported more intense labour shortages in 2004 and 2005 (24.8 and 25.0 per cent respectively).

Chart 10 presents a scatter diagram on the proportion of employment in apprenticeable occupations (in 2000, latest year available) and responses from the Business Conditions Survey in 2006. It shows a positive relation between the two, but it is not significant, and the correlation coefficient is only of 0.348 (Table 13a). Therefore, there is no clear indication that industries which rely more heavily on apprentices suffer more from skilled labour shortages. Indeed, if we repeat the same exercise using responses in 2007, the correlation vanishes (0.06).

D. Economic indicators

In addition to employer surveys of labour market conditions, economic indicators such as capacity utilization rates and wage rates can also shed light on labour market imbalances. This section explores these economic indicators in more detail.

1. Output Gap and Capacity Utilization Rates

One very broad measure of capacity utilization is the output gap series produced by the Bank of Canada. This indicator measures the degree to which the actual output of the economy tracks potential output. The latter is determined by potential labour supply growth and potential labour productivity growth. A positive gap indicates that actual output exceeds potential output and that product markets, and indirectly labour markets, are tight. A negative gap indicates that potential output exceeds actual output and that there is slack in product and labour markets.

In 2007, according to the Bank of Canada, the output gap in Canada was 0.75 per cent (Table 12 and Chart 8). The output gap was higher in 1988-89 and 2000, indicating that product markets were tighter (and inflationary pressures greater) in those years than in 2007.

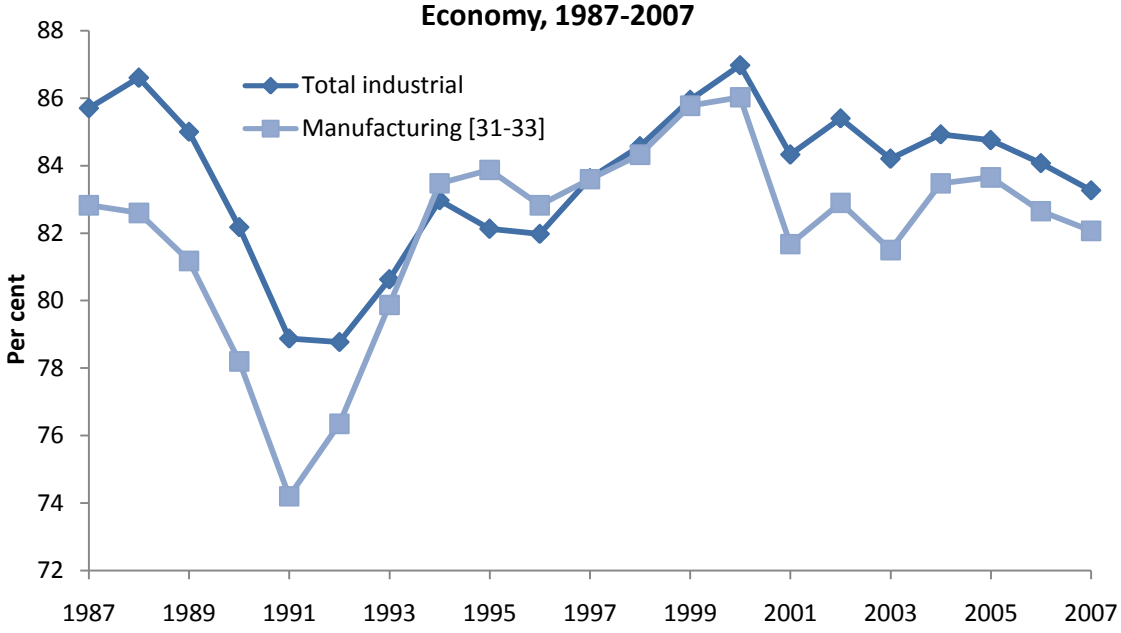
While the output gap tracks the tightness of product markets, there is a close relation between trends in product markets and labour markets, with the former driving the latter (Chart 8). The correlation coefficient between the percentage point change in output gap and the percentage point change in the proportion of employers identifying skilled labour shortages as their main production problem was 0.548 over the 1985-2007 period (Table 12).

In addition to the Bank of Canada output gap measure, Statistics Canada produces estimates of capacity utilization for the industrial aggregate[14] and for goods-producing industries including the manufacturing sector and detailed manufacturing industries

[14] The industrial aggregate combines the following North American Industry Classification System (NAICS) industries: forestry and logging (113), mining and oil and gas extraction (21), electric power generation, transmission and distribution (2211), Construction (23) and manufacturing (31-33).

(Table 13 and Chart 11). No provincial breakdown is available. The measure shows the proportion of the capital stock that is in operation. Given the close relationship between product and labour markets, high rates of capacity utilization indicate that the industry may also, but not necessarily, suffer from labour shortages.

Chart 11: Capacity Utilization in Manufacturing and Total Economy, 1987-2007



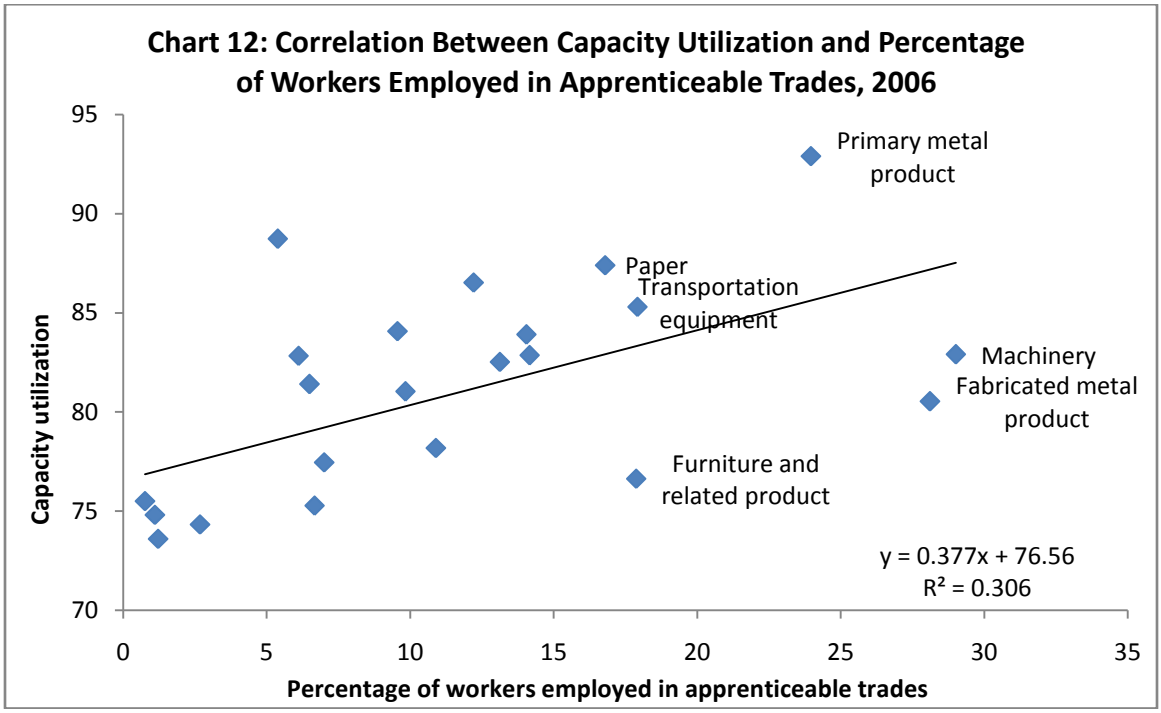
Source: CANSIM Table 028-0002
Notes: Data for 2007 are for the first three quarters only.
The industrial aggregate includes NAICS industries 113, 21 , 2211, 23 and 31-33.

In 2006, the rate of capacity utilization in Canada for the industrial aggregate was 84.1 per cent. From an historical perspective, this is a high rate, but it is declining in recent years and continued to fall in the first three quarters of 2007 (83.3 per cent). Capacity utilization in manufacturing in 2006 was slightly lower than the industrial aggregate at 82.9 per cent. This was also a historically high rate and in decline (82.1 per cent for the first three quarters of 2007). As Chart 11 shows, capacity utilization rates for the industrial aggregate and for manufacturing followed very similar trends over the 1987-2007 period.

Given the implications of product market tightness for labour shortages, it is instructive to identify manufacturing industries that are currently experiencing high rates of capacity utilization (Table 13). In 2006, the manufacturing industries with above average capacity utilization rates were, in descending order: primary metals (92.9 per cent), computer and electronic products (88.7 per cent), paper (87.4 per cent), petroleum and coal products (86.5 per cent) and transportation equipment (85.3 per cent).

Chart 12 presents a scatter diagram of the proportion of employment in apprenticeable occupations (in 2000, the latest year available) and capacity utilization in 2006. The correlation coefficient was 0.554 (Table 13a), which suggests that industries

with high concentrations of apprentices have above average capacity utilization. If we use capacity utilization rates for the first three quarters of 2007, however, the correlation fall to 0.331.



Earlier, we saw that there existed a close relation between trends in product markets and labour markets while analyzing the output gap. Chart 13 illustrates the relation between capacity utilization and skilled labour shortages as measured by the Business Conditions Survey. This chart seems to reinforce the previous conclusion, with trends in capacity utilization closely following those of the Business Conditions Survey.

2. Wage Rates

When a shortage occurs in a perfectly competitive market, it is expected that the price of the good or service should rise. In the labour market, when there is a shortage of workers, the wage paid by employers is expected to rise. Consequently, an above average increase in wages in a sector may point to a tight labour market and a possible labour shortage. Of course, in the real world, markets are not all perfectly competitive and wages are not as flexible as economic theory might suggest. Unions, long term wage contracts, and the reluctance of workers to accept nominal wage cuts all contribute to a certain rigidity in wages, at least in the short-term.

The two sources of data on wages are the Survey of Employment, Payroll and Hours (SEPH) and the Labour Force Survey (LFS). SEPH wage estimates for manufacturing and the total economy have been constructed for the period 1983-2006 for Canada and the provinces, but are available only for 1991-2006 at the sub-industry level.

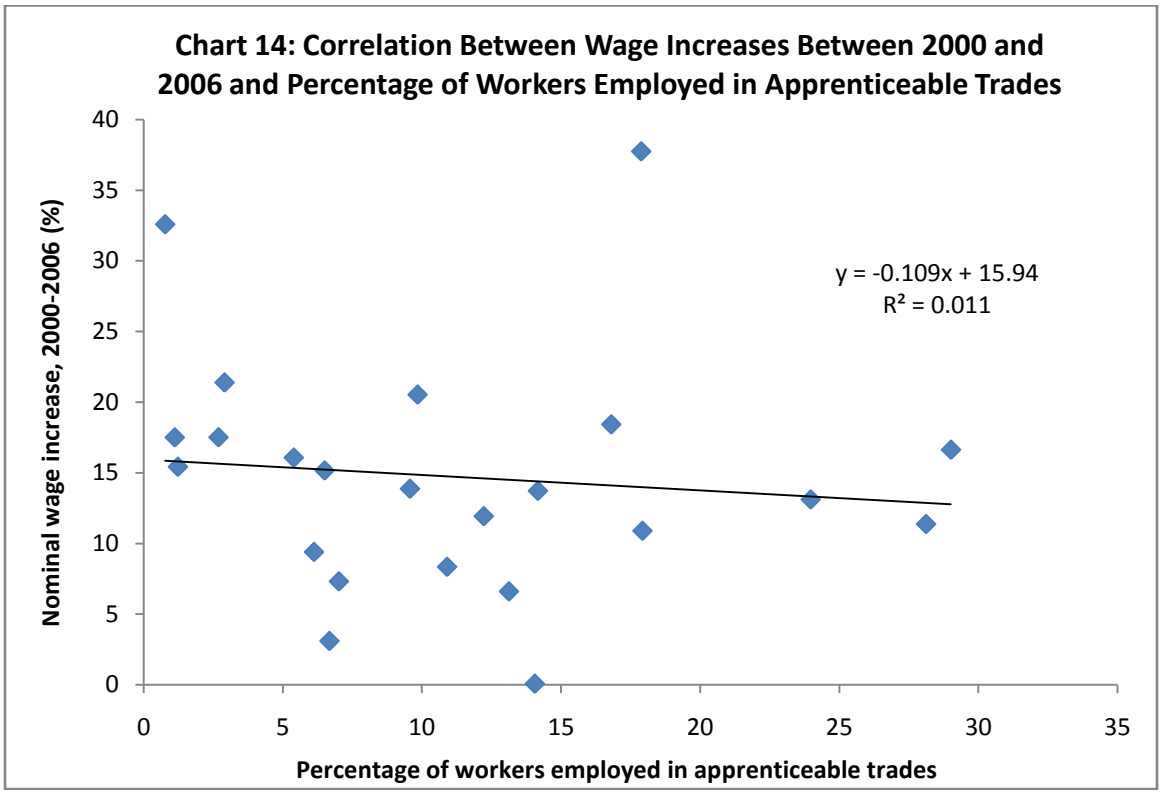
The LFS wage estimates are available only for the 1997-2006 period, but are available for occupations as well as for industries and provinces.

Source: CANSIM Tables 302-0008, 302-0002 and 028-0002
Note: Data for 2007 is for the first three quarters only

In 2006, according to SEPH, average weekly wages in manufacturing advanced 2.1 per cent in nominal terms (0.1 per cent in real terms given the 2.0 per cent increase in the CPI). This was slower than the average of all industries (2.7 per cent) and ranked manufacturing fourteenth out of 20 industries (Table 23), just higher than utilities, mining and oil and gas, arts and entertainment, professional services, transportation and construction. To the degree that wage increases are an accurate reflection of the tightness of labour markets and of potential or emerging labour shortages, one would conclude that labour shortages are more acute in the thirteen industries which experienced larger wage increases than manufacturing.

Perhaps surprisingly, given the relative if not absolute decline in manufacturing employment, wages in manufacturing have followed trends similar to the economy-wide average over longer periods. However, many other sectors had larger wage increases. In the 2000-2006 period, nominal wages advanced at a 2.16 per cent average annual rate in manufacturing compared to 2.19 per cent for all industries. Again, thirteen industries had larger wage increases than manufacturing. In the 1991-2006 period, manufacturing wages increased 2.23 per cent per year on average, compared to 1.97 per cent for all industries. Seven industries registered larger increases. Given these wage developments, there is little evidence that manufacturing as a whole is currently experiencing, or has

experienced in recent years, labour shortages. Yet, it remains surprising that wages in manufacturing have held up despite the large decrease in employment.



Manufacturing is a large sector and overall wage trends may not reflect those at the sub-industry level. Table 16 provides data on nominal wage trends for 22 manufacturing industries for the 1991-2006 period. Industries with above average wage increases may have tight labour markets and possible labour shortages. In 2006, the following manufacturing industries experienced above average wage increases: printing and related activities (6.0 per cent), machinery manufacturing (6.0 per cent), primary metals (5.9 per cent), petroleum and coal (5.3 per cent), furniture (4.3 per cent), electrical equipment (4.1 per cent), food manufacturing (3.3 per cent), beverage and tobacco (3.2 per cent), chemicals (2.8 per cent), computer and electronic products (2.4 per cent) and clothing (2.2 per cent). In the 1991-2006 and 2000-2006 periods it was these same industries that largely experienced above average wage increases.

From the point of view of identifying shortages of labour in apprenticeable occupations, it is useful to compare the rate of wage increases in industries with high proportions of workers in these occupations to industries with low proportions. In 2006, of the 11 industries experiencing above average wage increases, only three (furniture, machinery and primary metal fabricating) were among the top six industries in terms of the proportion of employment in apprenticeable occupations. This may suggest that skilled labour shortages are not particularly pressing in apprenticeship intensive industries.

Chart 14 plots the nominal wage increases over the 2000-2006 period against the proportion of employment in apprenticeable occupations for 22 manufacturing industries. Again, no pattern emerges and one cannot conclude that there is any significant difference in wage trends between apprenticeship-intensive and non-intensive manufacturing industries. Chart 15 plots the nominal wage increases in 2006 against the proportion of employment in apprenticeable occupations for 22 manufacturing industries and supports the same conclusion.

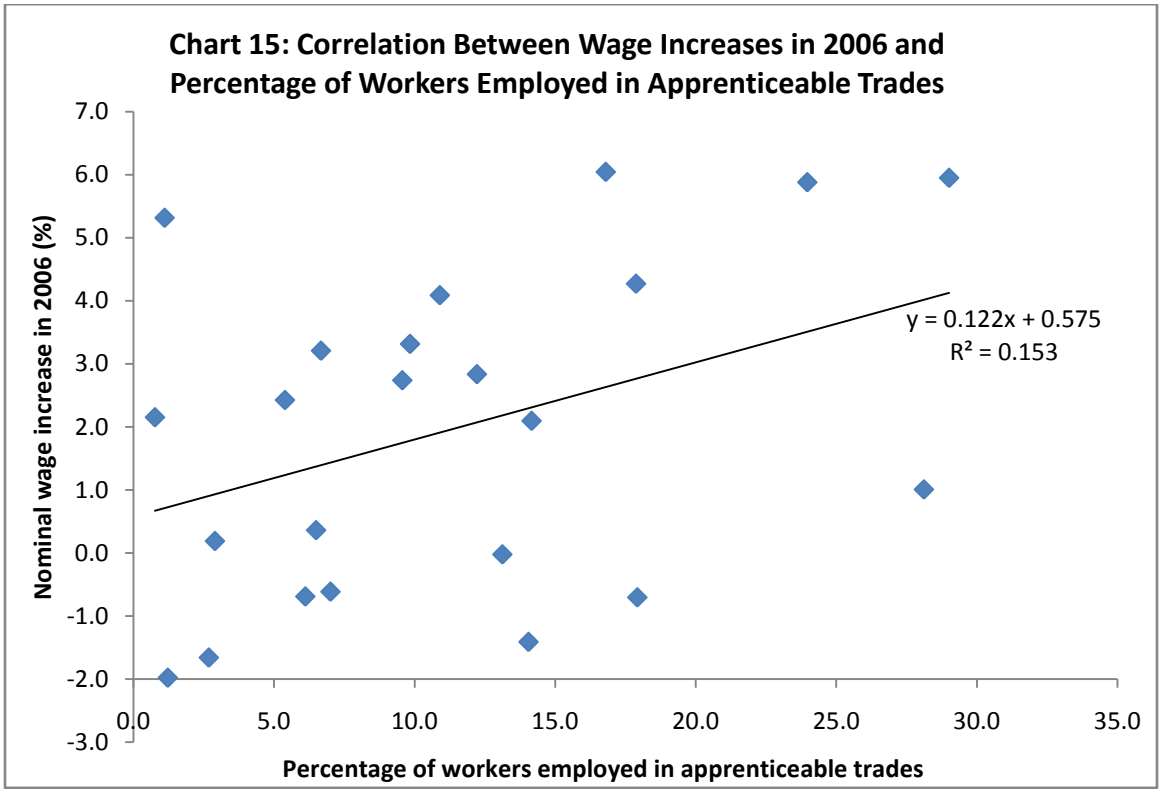
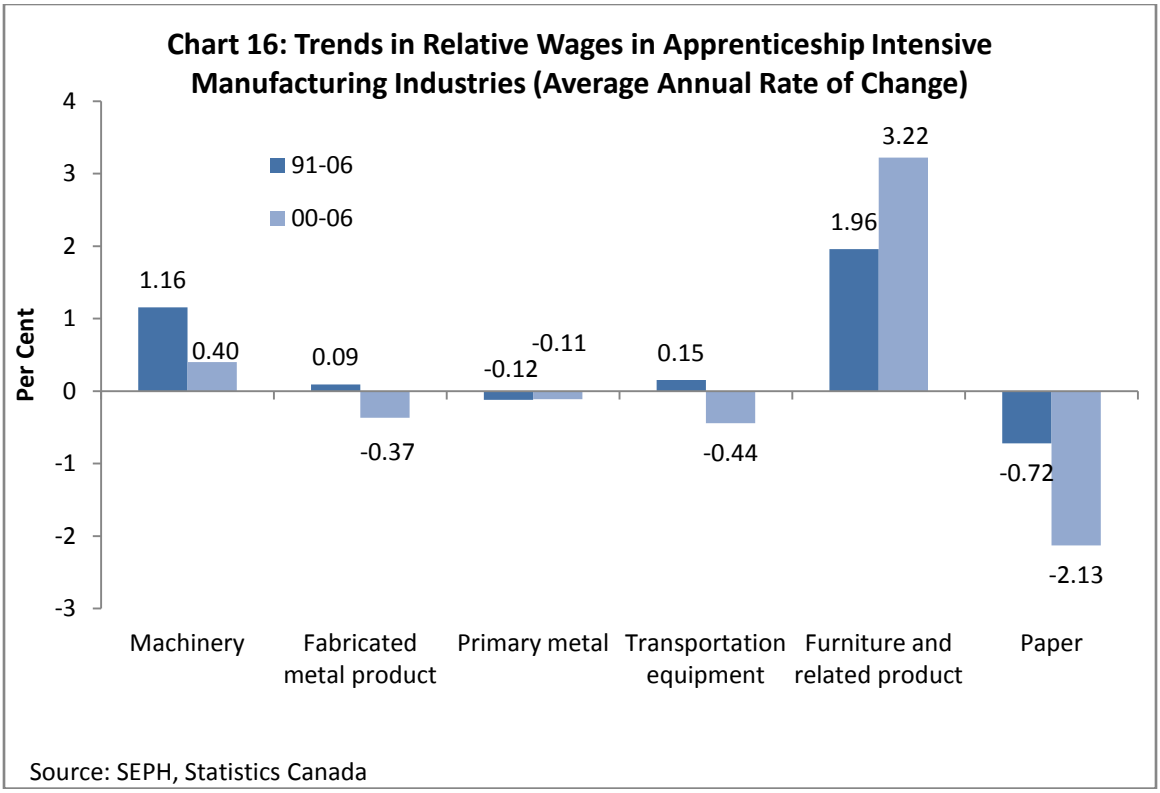


Chart 16 examines trends in wages in the six apprenticeship intensive manufacturing industries relative to the all industries average for the 1991-2006 and 2000-2006 periods. Employees in furniture and transportation equipment industries experienced relative wage increases in both periods, while workers in the primary metal and paper industries experienced relative wage declines. Again no clear wage pattern for apprentice-intensive manufacturing industries emerges.

In addition to an industry perspective on wage developments in manufacturing, one can examine wage trends from an occupational lens using data from the Labour Force Survey. Data are only available for the 1997-2006 period. The occupational category named *trades, transport and equipment operators and related occupations* (NOC-S group H, the smallest aggregation available) includes almost all the major apprenticeable occupations found in manufacturing. The rate of wage increases for this occupation (which includes workers in all industries, not only manufacturing) has been slightly slower than for all occupations (Table 21). From 1997 to 2006, average weekly

wages in trades grew by 2.4 per cent per year compared to 2.7 per cent for all occupations. This pattern of below average wage increases for the trades occupations characterized both the 1997-2000 and 2000-2006 sub-periods. Again, there is no evidence pointing to tight labour market for workers in apprenticeable occupations.

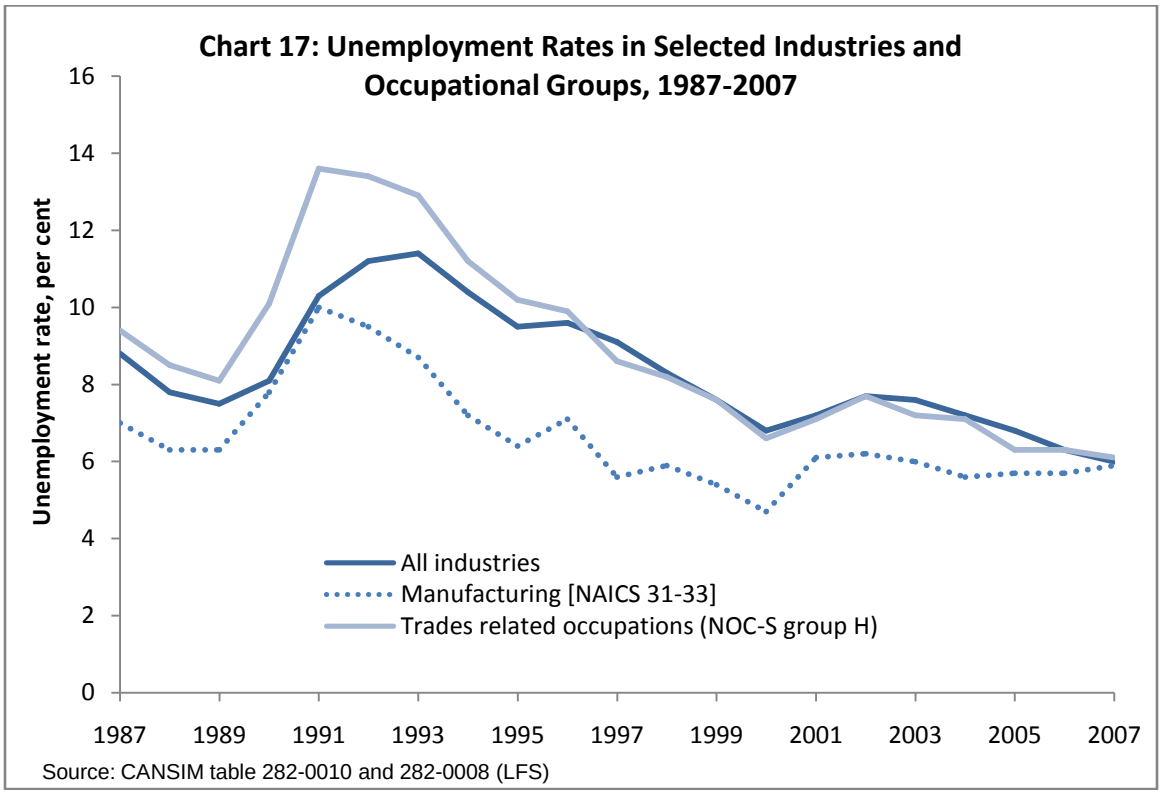


E. Unemployment rates

The unemployment rate, which can be calculated for both industries and occupations, is another important indicator of labour market conditions. In 2007, the unemployment rate in manufacturing was 5.9 per cent in Canada, below the average unemployment rate experienced over the 1987-2007 period, 6.6 per cent (Table 5 and Chart 17). Since 1987, the unemployment rate in manufacturing has been lower than the current rate in six of the 19 years. In 2000, the manufacturing labour market was tighter, with the unemployment rate at a record low of 4.7 per cent. The unemployment rate in manufacturing was also below the 2007 rate in 1997, 1999, and during the 2004-2006 period. This suggests that labour market conditions in manufacturing in 2007 were slightly tighter than that of the overall economy, but not as tight as experienced during a number of recent years.

The unemployment rate in manufacturing in 2007, at 5.9 per cent, was only 0.1 point lower than the rate for all industries (6.0 per cent) or 99 per cent of the all industry rate. This suggests that labour market conditions are very similar in manufacturing than in the overall economy. But the manufacturing unemployment rate over the 1987-2007 period was on average well below the all industry average, averaging 80 per cent of the

latter. Thus the current labour market situation in manufacturing does not represent a tightening relative to other industries and previous periods.



The unemployment rate for workers in the occupational category trades, transport and equipment operators and related occupations (NOC-S group H), which encompasses almost all the major apprenticeable occupations found in manufacturing (NOC-S group H)[15] was 6.1 per cent in 2007. This was the lowest unemployment rate for this occupational category recorded over the 1987-2007 period, suggesting that labour market conditions for workers in this group have never been better during the period. The absolute unemployment rate for this occupational category in 2007 was almost identical to that of both manufacturing and the overall unemployment rate. Two years earlier, in 2005, the unemployment rate for trades (6.3 percent) was well below the overall unemployment rate (6.8 per cent), which was its lowest level relative to the all industries average (93 per cent) for the entire 1987-2007 period.

Data for 2005 supported the view that labour market conditions for this occupational category are at their tightest in years, which suggest that labour shortages may be an issue. However, the situation stabilized in 2006 and 2007. Yet, one cannot infer that this situation applies to the apprenticeable trades in manufacturing. Indeed,

[15] This occupation category, which in 2001 accounted for 14 per cent of total employment, includes 33 of the 47 apprenticeable occupations, including the top six in terms of employment. These 33 apprenticeable trades represented 47 per cent of the total employment in this occupational category. Census data reveal that in 2001 employment in manufacturing accounted for 24 per cent of employment in this occupational category (21 per cent were in construction and 19 per cent in transportation).

manufacturing accounts for only 14 per cent of employment in this occupational category (H category). Therefore, it may be low unemployment rates in construction or other industries that are responsible for the overall tight labour market condition in this occupational category.

Chart 18 illustrates the relationship between the Business Conditions Survey answers which were discussed in an earlier section and the unemployment rate for manufacturing. From 1987 to 2001, the two variables generally evolved in opposite directions. More recently, however, we can observe inconsistencies. Indeed, despite unemployment in the sector remaining stable since 2000, perceived shortages decreased in 2002 and then increased significantly in 2005, 2006 and 2007.

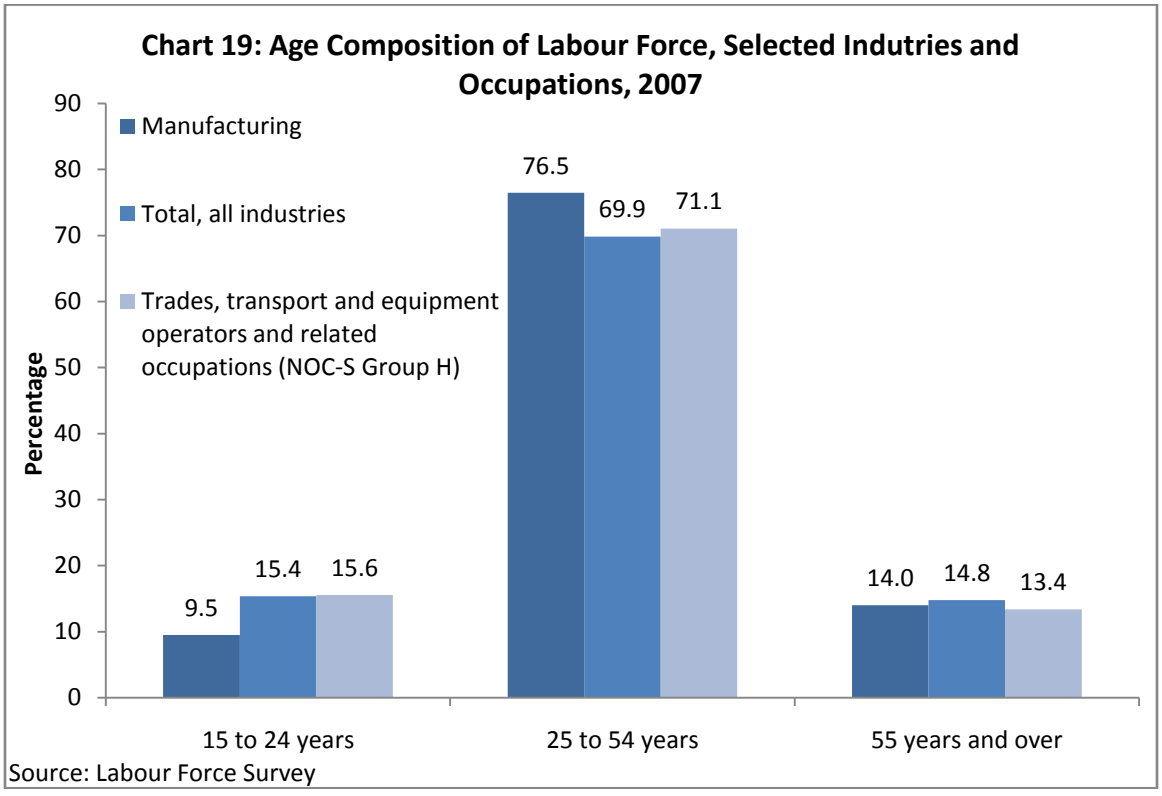
F. Composition of the workforce

Data on the age distribution by industry and occupation are available from the Labour Force Survey. This allows one to compare the demographic situation in specific industries and occupations with the economy-wide situation. Workers in the manufacturing industry are, on average, slightly older than those in other industries. This reflects the much smaller number of new hires in manufacturing than in other industries in recent years. In 2007, 9.5 per cent of the workers in manufacturing were aged between 15 and 24 years old, 76.5 per cent between 25 and 54, and 14.0 over 55 years of age. In the total economy, 15.4 per cent are in the younger group, 69.9 per cent are between 25 and 54 years old and 14.8 per cent aged 55 and over (Table 19 and Chart 19). While the

number of workers in the older group is slightly lower in manufacturing, the lower percentage in the younger group raises the average age in the industry.

By occupation, we compare the age structure of the NOC group "Trades, transport and equipment operators and related occupations" to that of all occupations and to manufacturing, since data are not available at a more detailed level. This occupational group has a relatively similar age structure to that of the overall workforce (Chart 18). However, compared to manufacturing, a greater proportion of this occupation group are in the 15-24 age group.

Wannell (2002) reports that median retirement ages are higher in trades than the average for all occupations (Table 20). CPRN (2004) finds that retirement rates in manufacturing are not high enough to suggest that the sector is particularly at risk of mass retirement in the short term. These two pieces of information suggest that the manufacturing sector is not facing imminent labour shortages due to its demographic structure.



G. Canadian Occupational Projection System

Human Resources and Social Development Canada produces a ten-year labour market outlook by industry and occupation using the Canadian Occupational Projection System (COPS). This section analyzes the last two editions of the report called *Looking-Ahead: A 10-Year Outlook for the Canadian Labour Market*. First, GDP, employment and productivity growth projections from the latest report, produced in 2006, are

examined. Then, projections of labour market conditions are reviewed from the 2004 and 2006 editions of the report. Both publications conclude that no major labour shortages are currently being experienced in Canada, either in the overall economy or in apprenticeable occupations in manufacturing.

In the 2006-2010 period, the report expects that GDP growth will be higher, and employment growth lower in the manufacturing industry than for the total economy, leading to higher labour productivity growth. GDP will grow at 3.4 per cent per year in manufacturing and employment by 0.3 per cent, compared to 2.8 per cent and 1.4 per cent for the overall economy. Labour productivity growth should be higher in the manufacturing industry, at 3.2 per cent, than in the overall economy (1.4 per cent).

In the 2011-2015 period, projections for manufacturing are similar to the previous period. GDP growth is expected to grow at a rate of 3.4 per cent per year, compared to 2.8 per cent in the total economy, and employment should rise at a rate of 0.6 per cent as opposed to 1.1 per cent in the total economy. Productivity growth is expected to be slightly higher again, at 2.8 per cent compared to 1.6 per cent for the overall economy.

This relatively rosy scenario for manufacturing does not apply to every sub-industry. Four manufacturing industries are expected to grow particularly fast: electrical and electronic products; metal fabrication and machinery; rubber, plastics and chemicals; and other transportation equipment, surpassing the average of the industry by a fairly large amount. GDP growth in these four industries is expected to be over 4.0 per cent in both periods. Five industries are expected to experience a decline in employment in both periods: printing and publishing; pulp and paper; wood; motor vehicle, trailers and parts; and other manufacturing (see Table 11 for more details).

Employment growth forecasts are available by occupation and skill level. Employment growth is expected to be the highest from 2006 to 2015 in occupations requiring a university degree, growing 1.6 per cent per year from 2006 to 2015, compared to the total average of 1.1 per cent (Table 11a). Occupations requiring a college degree or apprenticeship training are expected to grow at the same pace as the average, 1.1 per cent.

The two occupation groups (NOC classification) most related to apprenticeships are “Trades, skilled transport and equipment operators (72-73)” and “Intermediate occupations in transport and equipment operators, installation and maintenance (74)”. Employment in the former is expected to grow slower than the total average, at 0.9 per cent for 2006-2015 (Table 11a). Employment in the latter is projected to be average, at 1.1 per cent per year in 2006-2015.

The HRSDC reports project future conditions for different occupations based on the aforementioned employment and output projections and the current state of the labour market. The 2004 and 2006 reports differ by their methodology. First, this paper will analyze the earlier report. In this publication there are three possible ratings: good, fair or limited. The findings are summarized in Table 11b for apprenticeable trades. Occupations requiring a college degree or apprenticeship training receive a “fair” rating, the same as

the current condition. Ten out of the fourteen occupations found in the report that were in the list of main apprenticeable trades receive a "fair" rating, though two of them are facing upwards pressure towards better conditions: electrical trades and telecommunication occupations, and crane operators, drillers and blasters. Four occupations out of the fourteen receive a "limited" rating, and four occupations are facing downwards pressures. Unfortunately, these predictions are for 2-digits level occupations and do not directly correspond to our list of 47 trades. Also, no data is available for occupations only in the manufacturing industry.

The newest report, released in 2006, uses a slightly different methodology. The authors evaluate the future labour demand and supply for each occupation, and then calculate the excess demand. They normalize the number obtained with the base year employment, and use this number to decide if there will be a labour shortage or surplus. A positive number represents excess demand, and therefore labour shortages. On the fifteen occupations relevant to the present report, about half get a positive number. The largest shortage is found in the occupation *crane operators, drillers & blasters*, in which an increase of 140 per cent in the supply of worker is required to alleviate the shortage, and in the occupation *heavy equipment operators*, that needs an increase of 150 per cent. However, in general, the 2006 edition concludes that labour shortages will not be widespread and should affect a minority of workers.

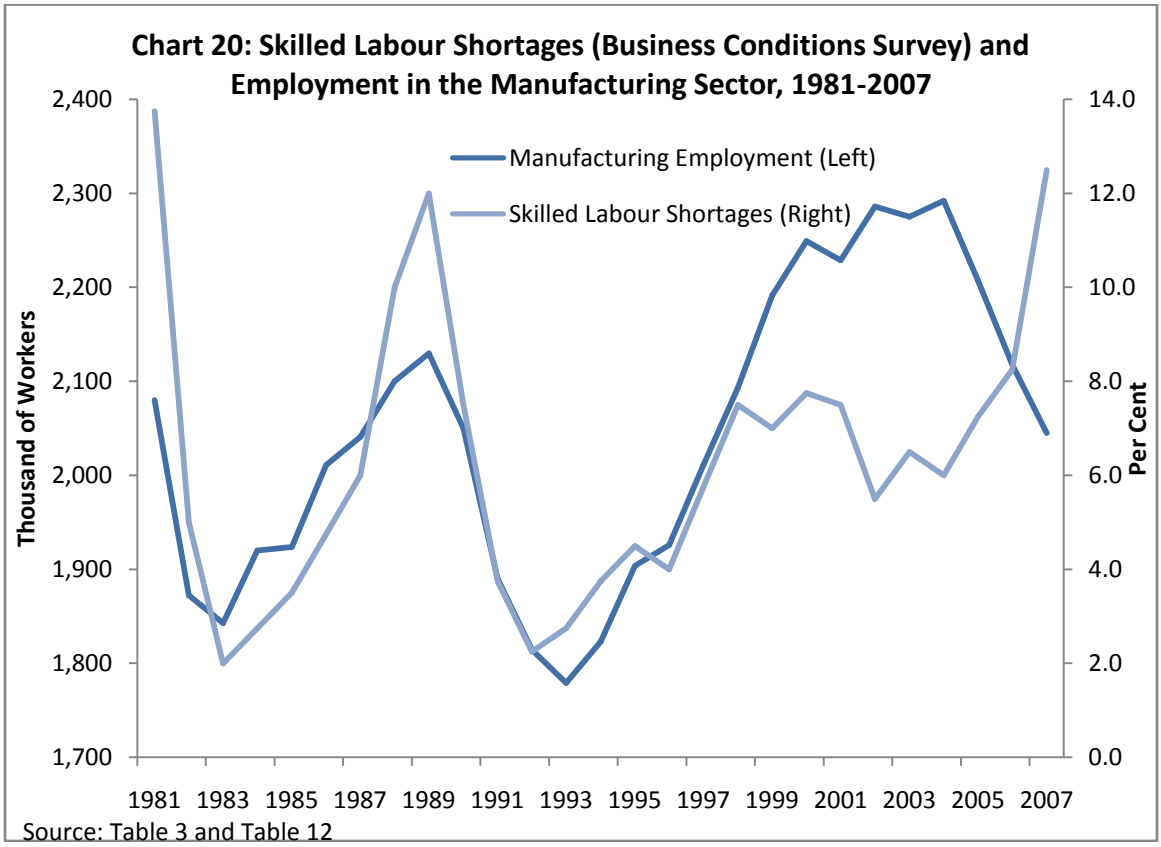
Overall, future conditions in the manufacturing industry are expected to be good, with high GDP and productivity growth over the next ten years. Demand for skilled labour is expected to rise, as shown by above average growth in occupations requiring a university degree. Demand for workers who completed apprenticeship training or a college degree will rise at the same rate as the average, so the future labour market conditions are expected to be fair for this class of workers. It is interesting to note that the demand for workers without high school education will practically stagnate with growth rates greatly below the average. This illustrates the importance of training and skills in the future economy.

H. Explaining Contradictory Findings on Labour Market Shortages

Previous sections have established two facts: (i) the manufacturing sector is reporting increasing labour shortages in 2006 and 2007 and (ii) the manufacturing sector has in recent years suffered from negative output and employment growth. These conflicting indicators suggest that any explanation for labour shortages in the manufacturing sector must lie in developments outside the manufacturing sector. This section explores potential explanations for the apparent contradiction borne out by the data.

Historically, employment and reports of skilled labour shortages in the manufacturing sector have been closely related (Chart 20). Since 2004, however, the two indicators have clearly diverged, with manufacturing employment falling by more than ten per cent and the percentage of employers reporting skilled labour shortages as one of their main production issue more than doubling.

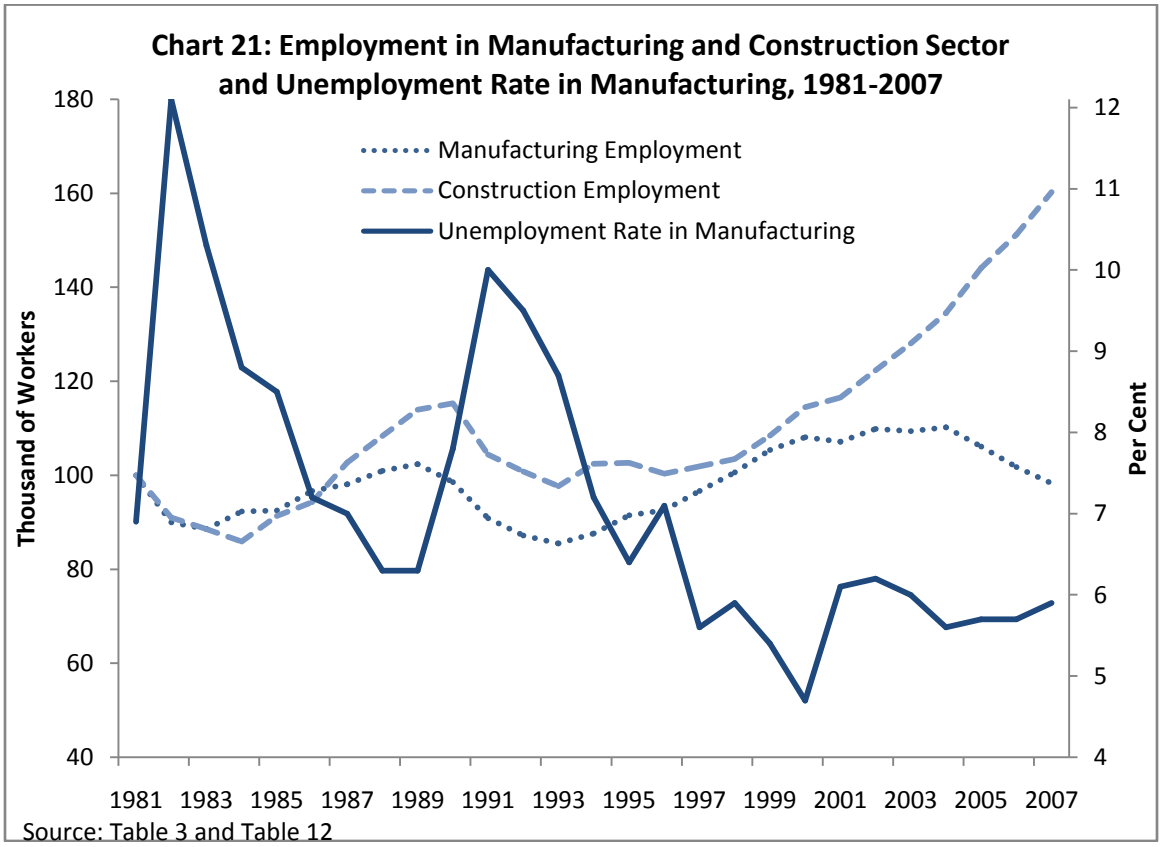
How can an industry be laying off more than ten per cent of its workers and at the same time report increasing skilled labour shortages? Part of the answer lies in the performance of the rest of the Canadian economy. Indeed, since 2004, the overall Canadian labour market has been booming. Total employment increased 5.8 per cent between 2004 and 2007 and employment in the construction sector, one of the sector most likely to compete with manufacturing for skilled labour, is up an astonishing 19.1 per cent over the same period (Chart 21). During previous downturns, such as the early 1980s and early 1990s recessions, employment losses in manufacturing and other sectors occurred concurrently (Table 3). In times of recessions, as manufacturing firms laid off more and more employees, the sector's unemployment rate crept up as these workers proved unable to find employment in other sectors. This story, however, has played out differently in more recent years. In fact, the large employment losses in the manufacturing sector have not lead to any significant increase in the sector's unemployment rate, which has stayed below 6 per cent since 2004 (Chart 21). Clearly, job losers in manufacturing have taken up opportunities in other sectors.



One sector which attracts workers with a skill set similar to that of many manufacturing job is construction. For example, in 2000, about 43 per cent of sheet metal workers worked in manufacturing while another 47 per cent worked in construction (Table 6). Other trades with strong employment in both sectors included boilermakers, ironworkers, heavy equipment and crane operators, steamfitters, pipefitters and

electricians. Between 2001 and 2007, as 184,000 jobs were lost in the manufacturing sector, the construction industry created about 309,000 jobs.

The reason behind the conflicting indicators is, from an economic point of view, simple: the manufacturing sector is competing with other sectors for skilled labour, and these other sectors are rapidly expanding. In this context, healthy growth in sectors which are key competitors is putting pressure not only on the quantity of skilled workers available, but also insuring that wages for workers with skills transferable to other industries do not fall. At the same time, manufacturers are facing tougher product market conditions, with the Canadian dollar rapid appreciation stifling export opportunities and strong competition from Asian countries limiting market shares at home and abroad.



The reported skilled labour shortages in the manufacturing industry probably do not only reflect a lack of skilled workers, but also an increasing inability for manufacturers to attract them at wages they can competitively sustain. With other industries' ability to increase wages on the rise, and with manufacturing firms hard pressed to cut cost to stay competitive, it is no surprise that the latter increasingly report skills shortages as one of their main production issue.

As noted earlier, a shortage is defined as a situation where the supply of a good or service does not meet the demand at the prevailing price. If manufacturing did not compete with other sectors for skilled labour, it would dictate the wage level, pushing wages downward and operating without unfilled positions. Yet, because this is not the

case, wages are higher and positions in manufacturing remained unfilled because firms can not pay the market wage. Moreover, it is possible that workers perceive employment in the manufacturing sector as more precarious given the current market conditions and thus prefer to take up employment in different sectors when possible. In this context, reported skilled labour shortages in manufacturing are no mirage; they do constitute a real challenge for manufacturers and affect their potential to survive. Thus, from the point of view of manufacturers, an increase in the amount of skilled workers would be beneficial as it would relieve wage pressures and allow firms to hire skilled labour at rates they can competitively sustain.

It must be noted, however, that the current labour market situation is very advantageous for workers. The effects on workers of the structural shock currently affecting manufacturing firms have been considerably eased by favorable employment conditions in other sectors. Unlike previous manufacturing employment downturns, the current situation has not translated in higher unemployment rates. While that has meant mounting skilled labour shortages in manufacturing and other sectors, it has also meant shorter unemployment spells and smoother transitions for workers who have been laid off. These welfare gains must not be ignored when considering the effect of the current tightness in the labour market.

I. Summary of Findings on Labour Market Shortages

The challenges facing manufacturing industries, which have translated into negative output and employment growth, have been made worst by mounting skilled labour shortages. There is also no doubt that the ageing population will have an effect on the economy, including the manufacturing sector, but this effect will not be felt for some years. Increased productivity will, however, offset some of the fall in output resulting from a decline in labour force.

Economic indicators focusing on the manufacturing sector suggest that skilled labour shortages are minimal. Yet, manufacturers report increasing skilled labour shortages, with the percentage of firm pin-pointing skills shortages as one of their main production issue doubling between 2004 and 2007. In effect, these shortages are driven by a combination of poor product market conditions in the sector, which lower the manufacturing's sector capacity to compete for skilled labour, and strong employment growth in competing sectors, which lower the pool of qualified candidates available for manufacturing firms. These developments stand in stark contrast with previous episodes of declining manufacturing employment when the sector was able to minimise wage increases and when laid-off workers remained unemployed and available for future employment. A strong overall labour market and strong inter-industry competition for skilled labour can thus reconcile the apparent contradiction between poor economic indicators and mounting skilled shortages. On balance, it appears that the manufacturing sector is indeed facing skills shortages.

Evidence from most data sources suggests that skilled labour shortages in manufacturing differ in intensity between regions and sub-industries. Considering the

large regional differences in the level of reported skills shortages, increased mobility between provinces could help alleviate shortages. Indeed, increased mobility would help reduce temporary shortages in some regions and offer additional employment opportunities to workers in provinces where a particular industry is experiencing a slowdown and skills shortages are not as severe. Moreover, the potential gains in economic activity from increased interprovincial mobility are significant (Sharpe, Arsenault and Ershov, 2007). Later in this report we will also analyze the advantage of a broader skill base, but at this point we can say that workers who possess broader skills could more easily move from one industry to another and thus better balance the shortages of skilled workers across industries.

Finally, it is important to remember that even if there were no signs of generalized labour shortages due to population ageing or other factors, it would still be important to effectively train the labour force. A report from Statistics Canada (Sabourin, 2001) on skills shortages and technology reminds us that the technological developments recently experienced in all industries have also affected manufacturing industries. New machines and computers that are used to produce more output with fewer inputs require new skills from workers. This report found that firms who invested more in new technology acquisitions are more likely to suffer from skills shortages. Moreover, 15.2 per cent of employees in trades report using computer-assisted technology, more than any other group except marketing and sales workers (22.0 per cent).

In an era where manufacturing firms in Canada compete with firms in less developed countries with relatively low labour standards, Canadian firms must find ways to stay competitive on the world market. One way to achieve this is with new, more productive technology. Training the workers to work on these new machines is crucial.

IV. Issues Related to Apprenticeship Registrations and Completions in Manufacturing

While registrations in apprenticeships program have been increasing rapidly in the past few years, the number of completions failed to see a commensurate increase. This section will first examine trends in apprenticeship registrations and completions in manufacturing and all industries. Then, it will determine what caused these trends and examine possible solutions to low completion rates.

A. Summary of Trends

In this section, data on apprenticeship registrations, completions and completion rates will be reviewed. The data and methodology used will built on Sharpe and Gibson (2005), but will extend the analysis to 2005 (the year for which the most recent data from the Registered Apprenticeship Information Survey is available) and will mostly focus on the six trades most relevant for manufacturing, which were determined using the estimated number of apprentices in these trades in 2000.

1. Apprenticeship Registrations

All data regarding apprenticeship trends have been acquired from the Registered Apprenticeship Information System (RAIS) maintained by Statistics Canada. The source of these data, however, is provincial and contains inconsistencies mainly due to differences in the administration of provincial programs.[16] Moreover, it does not provide any data by industry. Therefore, these data limitations must not be forgotten when doing empirical work related to apprenticeships.

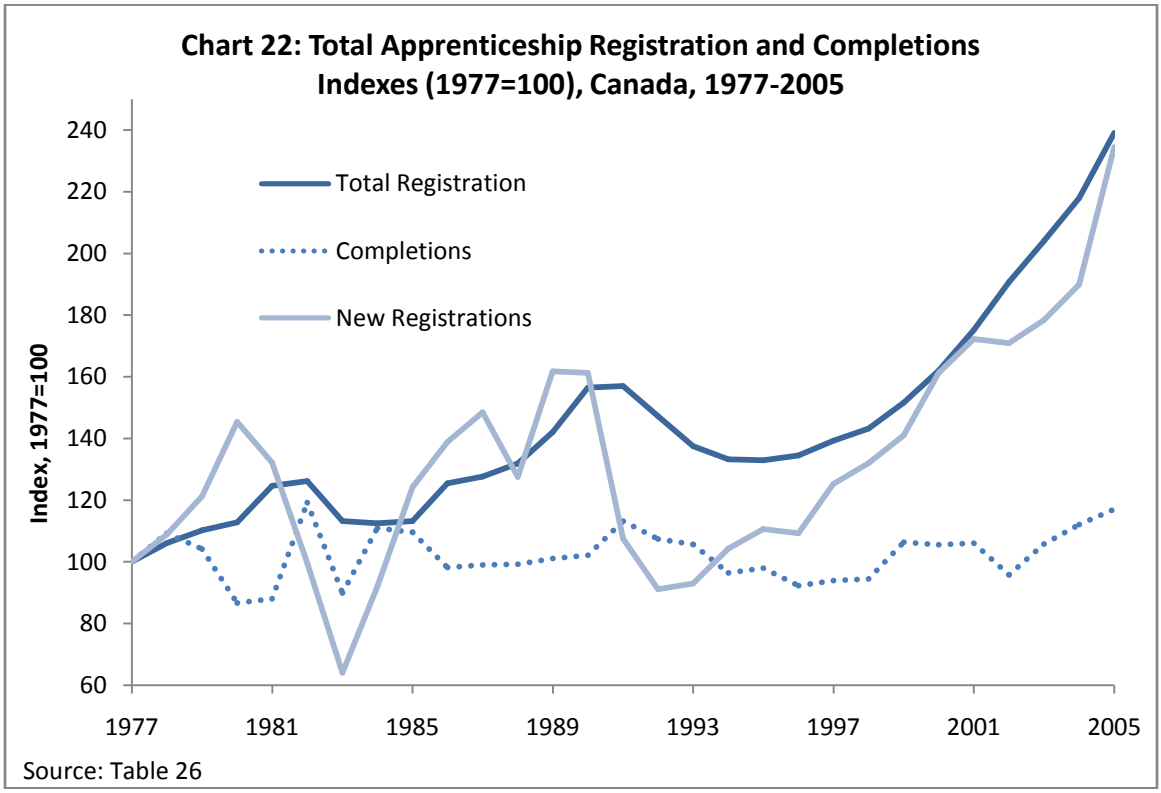
Total registration in the apprenticeship system shows that apprenticeship clearly occupies a subordinate position in the post-secondary education system in Canada. In 2005, total registration in apprenticeship programs was 293.8 thousand, or 2.69 per cent of the labour force aged 15-44 (Table 25). In contrast, university enrolment in 2005 was 1,047.7 thousand, more than three times greater than apprenticeship registration. Community college enrolment in 2004 (the last year for which data are available) was 514.3 thousand. If we consider the post-secondary education system as a whole, apprenticeship registration comprised only 14.9 per cent of post-secondary students in 2004.

However, since 1995, apprenticeship registrations have grown steadily from 163,370 to 293,835 apprentices. As a share of the labour force aged 15 to 44 years old, registrations climbed from 1.56 per cent in 1995 to 2.69 per cent in 2005. Similarly, while the share of apprenticeship registration in total post-secondary enrolment was only 11.7 per cent in 1995, it was up to 14.9 per cent in 2004, indicating that apprenticeships are growing faster than both the labour force and post-secondary enrolments. Total registrations in the apprenticeship programs grew 3.2 per cent per year from 1977 to

[16] For a quick review of the issues with the RAIS data, see Gibson and Sharpe (2005, p.42)

2005, exceeding the labour force's (aged 15-44) annual growth of 1.2 per cent during that period. Total registration growth was cyclical, with periods of expansion in 1977-1981, 1985-1991, and 1997-2005. Total registration contracted severely from 1991 to 1996, declining 3.0 per cent per year, but grew very rapidly between 1996 and 2005, at 6.6 per cent per year (Chart 22).

Trends in total registrations are, of course, driven by new registrations which are a measure of the number of apprentices starting a new apprenticeship program in a given year. New registrations are a useful estimate as they can be interpreted as an annual cohort and then used to compute completion rates. Chart 19 shows that while more volatile, trends in new registrations follow a similar trend as that of total registrations.



2. Apprenticeship Completions

Although the number of apprentices in the apprenticeship system is important, the efficacy of the system at producing certified journeypersons is of even greater importance. One way to estimate this efficacy is to examine the apprentices who succeed in their apprenticeship certification, which are referred to as completions. Total apprenticeship registrations grew 3.2 per cent per year from 1977 to 2005 for a total increase of 139.1 per cent, and the number of completions only increased by 0.6 per cent per year during the same period for a total change of only 17.9 per cent (Table 26 and Chart 22). Thus, while registration in apprenticeship programs has grown considerably in

the past twenty-five years and especially in the middle of the 1990s, the number of apprentices actually receiving their apprenticeship certificates has not followed suit.[17]

Summary Table 2: Completion/Registration Rate and Completion Rates, Canadian Apprenticeship System, 1982-2005, Selected Years

	Completion Rate 1	Completion Rate 2
1982	63.6	62.9
1986	57.2	57.7
1991	44.2	47.5
1996	58.7	55.0
2003	43.5	42.4
2005	39.4	40.4
Absolute Change		
1982-2005	-26.2	-25.0
1982-1986	-6.4	-5.2
1986-1991	-13.0	-10.2
1991-1996	11.4	5.1
1996-2005	-18.2	-14.6

Source: Table 11
Note: Changes expressed above indicate percentage point changes, not annual growth rates

Unfortunately, data at the national level do not exist to allow calculation of true completion rates by tracking a cohort that enters the apprenticeship system in a given year. Thus, completion rates are constructed based on the aggregate data available in order to estimate the share of registered apprentices who receive their certification. This methodology is certainly not as accurate as a true cohort-based analysis and it does suffers from a number of deficiencies, but it does provide an approximate indication of completion rates and of trends in these rates (see Sharpe and Gibson (2005) for more details).

Exhibit 1: Formulas used for computing completion rates

Completion/Registration Rate and Completion Rate Formula:

Completion/Registration Rate: $CR1_t = 100(C_t / R_t)$
Completion Rate 1: $CR2_t = 100(C_t / NR_{t-4})$
Completion Rate 2: $CR3_t = 100(C_t / \{ [NR_{t-3} + NR_{t-4} + NR_{t-5}] / 3 \})$

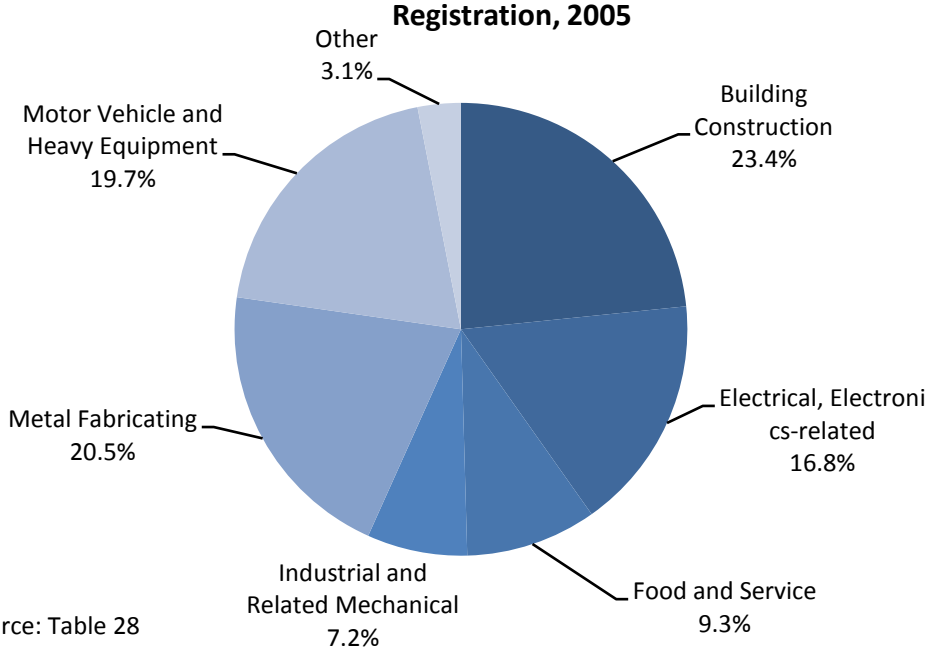
Where C = completions
CR = completion rate
R = total registrations
NR = new registrations

[17] Underreporting of completions and over reporting of new registrations could, in theory, account for these divergent trends in completions and registrations. But due to the administrative nature of the apprenticeship data, it seems unlikely that such underreporting and over reporting is taking place at any significant degree. An increased duration of apprenticeship programs could also have contributed somewhat to these trends

Based on Sharpe and Gibson (2005), we define three ratios or rates that relate completions to registrations in different ways. The formulas used are outlined in Exhibit 1. Regardless of the completion rate estimate used, it is clear that the share of apprentices completing their programs has greatly decreased over the past twenty-five years. Summary table 2 shows the decline of each completion rate from 1982 to 2005.

While each of the rate estimates has its advantages, completion rate 2 is perhaps the most appropriate, since it adjusts for longer program durations. Completion rate 2 decreased 25.0 percentage points, from 62.9 per cent in 1982 to 37.9 per cent in 2005. The completion/registration rate shows a comparable decline of 6.4 percentage points, from 13.4 per cent in 1982 to 7.0 per cent in 2005. These rates are far lower than the rates calculated for other forms of post-secondary education.[18]

Chart 23: Trade Group Shares of Total Apprenticeship Registration, 2005



Source: Table 28

3. Apprenticeships by Trade Groups

RAIS apprenticeship statistics are organized based on specific apprenticeship programs for RAIS occupations and on seven major trade groups. These groups are, in descending order of occupational shares of total registrations in 2005: building and construction trades (23.4 per cent of total registration), metal fabricating trades (20.5 per cent), motor vehicle and heavy equipment trades (19.7 per cent), electrical and electronics trades (16.8 per cent), food and services trades (9.3 per cent), industrial and mechanical trades (7.2 per cent), and other trades (3.1 per cent) (Table 28 and Chart 23).

[18] Based on calculation in Gibson and Sharpe (2005), the completion/registration rate in 1998 for community college and universities was 22.8 per cent and 24.1 respectively.

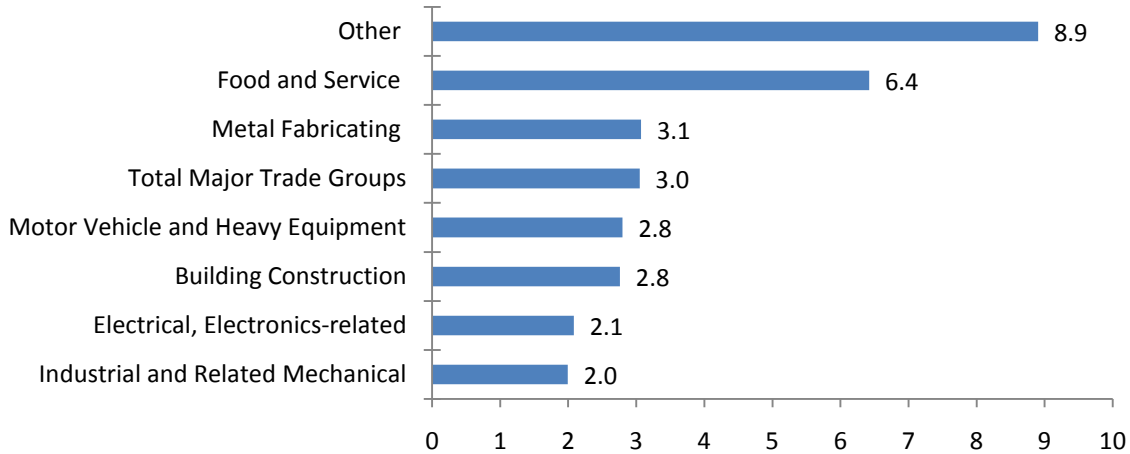
Summary Table 3: Completion Rates by Trade, 1996 and 2005

	Completion Rate 1			Completion Rate 2		
	1996	2005	96-05*	1996	2005	96-05*
Industrial & Mechanical Trades	69.1	48.2	-20.8	65.2	49.7	-15.5
Electrical & Electronics Trades	62.5	47.8	-14.6	60.9	49.2	-11.7
Metal Fabricating Trades	70.8	41.3	-29.4	65.3	44.0	-21.3
Motor Vehicle & Heavy Equipment Trades	52.1	40.6	-11.5	49.4	41.6	-7.9
All Trades	58.7	39.4	-19.3	55.0	40.4	-14.7
Food & Services Trades	86.7	34.0	-52.7	74.5	36.8	-37.7
Building & Construction Trades	38.3	31.4	-6.8	36.3	29.5	-6.8
Other Trades	36.9	23.3	-13.6	34.5	24.5	-10.0

Source: Table 17a
* - Indicates percentage point changes rather than growth rates

Summary Table 3 shows two estimates of completion rates by trade. Electrical and electronics trades and Industrial and mechanical trades had the highest completion rates in 2005 according to both measures, around 50 per cent in each case. Building construction trades and miscellaneous trades had the lowest completion rates, between 25 and 30 per cent in 2005 for both estimates. Both methodologies for estimating completion rates show that for all trades the completion rate has declined since 1996. The decline has been particularly severe in food and service trades and metal fabricating trades.

Chart 24: Growth in Total Apprenticeship Registration, 1991-2005, by Trade Group (Average Annual Rate of Change)



Source: Table 28

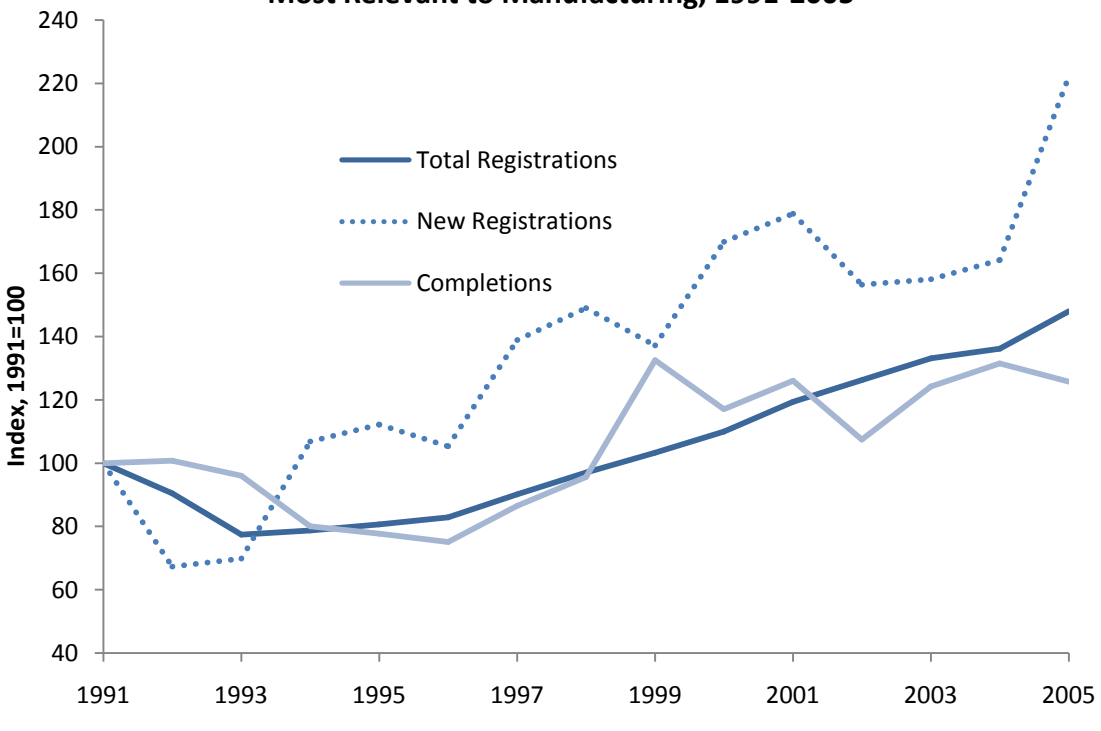
From 1991 to 2005, apprenticeship registration grew at significantly different rates across these major trade groups. Registrations in miscellaneous trades and in food and service trades more than doubled in this period, exceeding by a wide margin growth in the other trade groups (Table 28 and Chart 24). The only other trade group to have an above average growth rate in registrations was metal fabricating with 3.1 per cent compared to the average growth rate of 3.0 per cent per year for all trade groups.

Registration in building and construction trades increased by 2.8 per cent per year over this period. Finally, registration growth in industrial and related mechanical trades, in electrical and electronics trades and in motor vehicle and heavy equipment trades was slightly below average, at 2.0, 2.1 and 2.8 per cent per year respectively.

4. Trades most relevant to manufacturing

As noted earlier in this report, in 2000, the six trades estimated to have the largest number of apprentices in manufacturing were, in order, industrial mechanic and millwright, welder, machinist, industrial electrician, tool and die maker and steamfitter/pipefitter. These six trades accounted for 59.7 per cent of all apprentices in the manufacturing sector in 2000. In this section, we will focus on trends specific to these six trades.

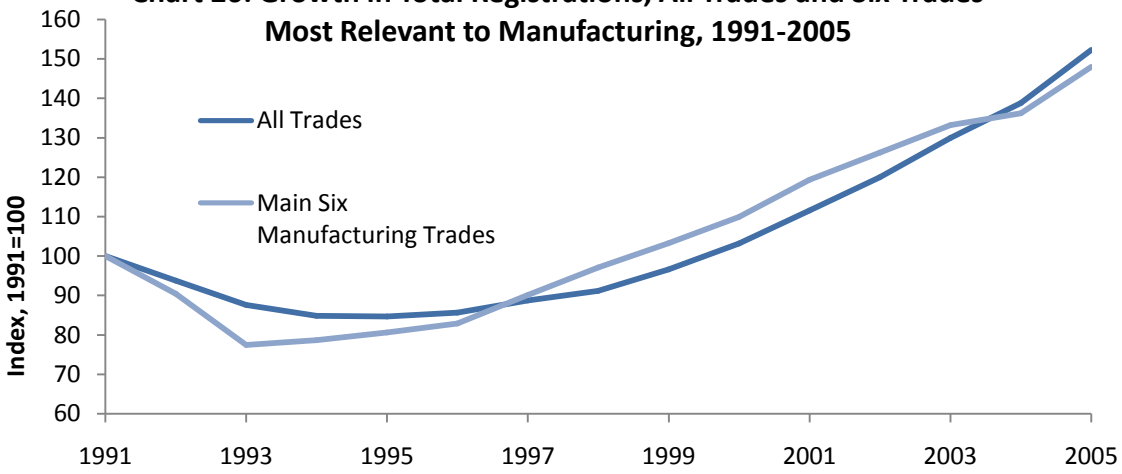
Chart 25: Growth in Registrations and Completions for the Six Trades Most Relevant to Manufacturing, 1991-2005



Source: Table 29g

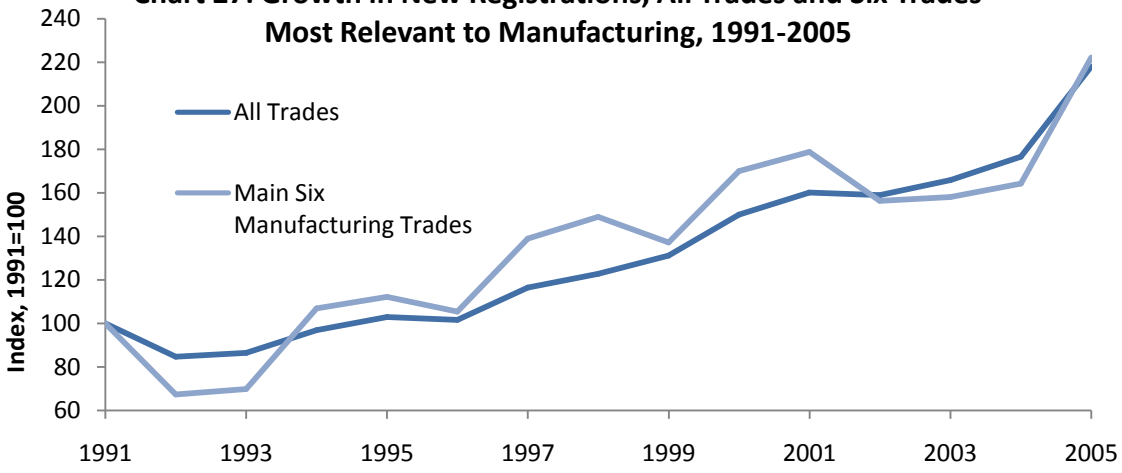
In 2005, registration in the six trades with the largest significance for manufacturing stood at 53,300, representing 18.8 per cent of all registrations. Between 1991 and 2005, registrations for these six trades grew slightly slower than that of the average for all trades, increasing 2.8 per cent annually compared to 3.0 per cent (Chart 25 and Chart 26). There was even more similarity in growth of new registrations between all trades and the six trades most significant to manufacturing (Chart 27). All six trades reported positive growth in registrations and new registrations over the 1991-2005 period.

Chart 26: Growth in Total Registrations, All Trades and Six Trades Most Relevant to Manufacturing, 1991-2005



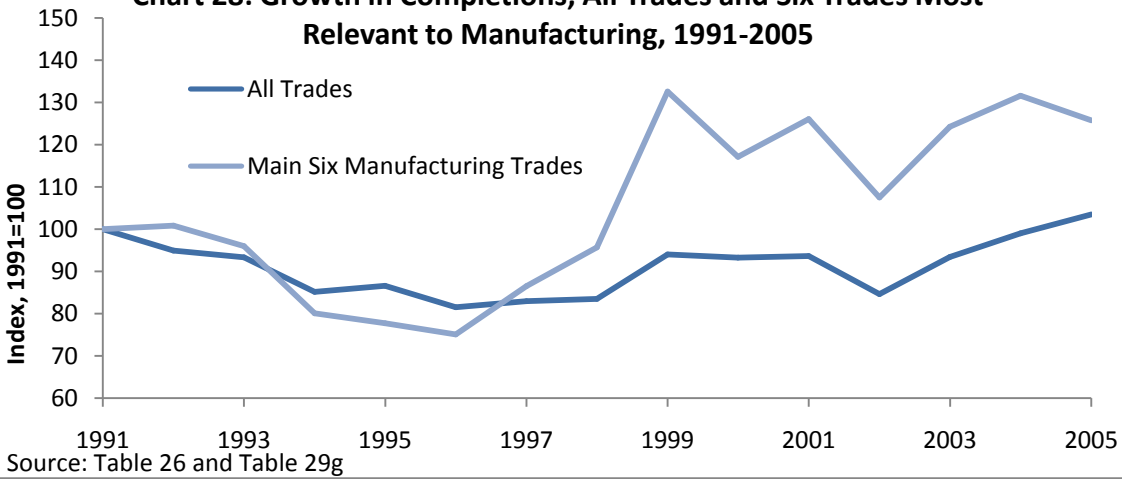
Source: Table 26 and Table 29g

Chart 27: Growth in New Registrations, All Trades and Six Trades Most Relevant to Manufacturing, 1991-2005



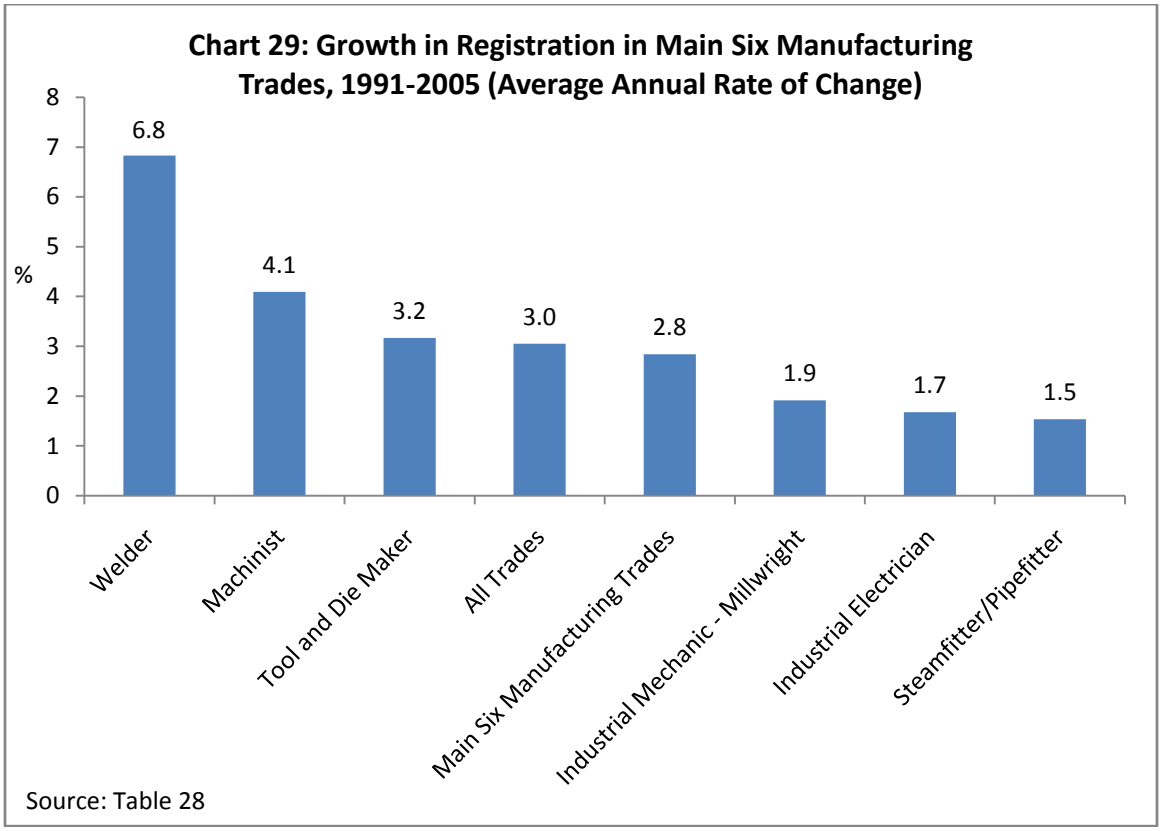
Source: Table 26 and Table 29g

Chart 28: Growth in Completions, All Trades and Six Trades Most Relevant to Manufacturing, 1991-2005



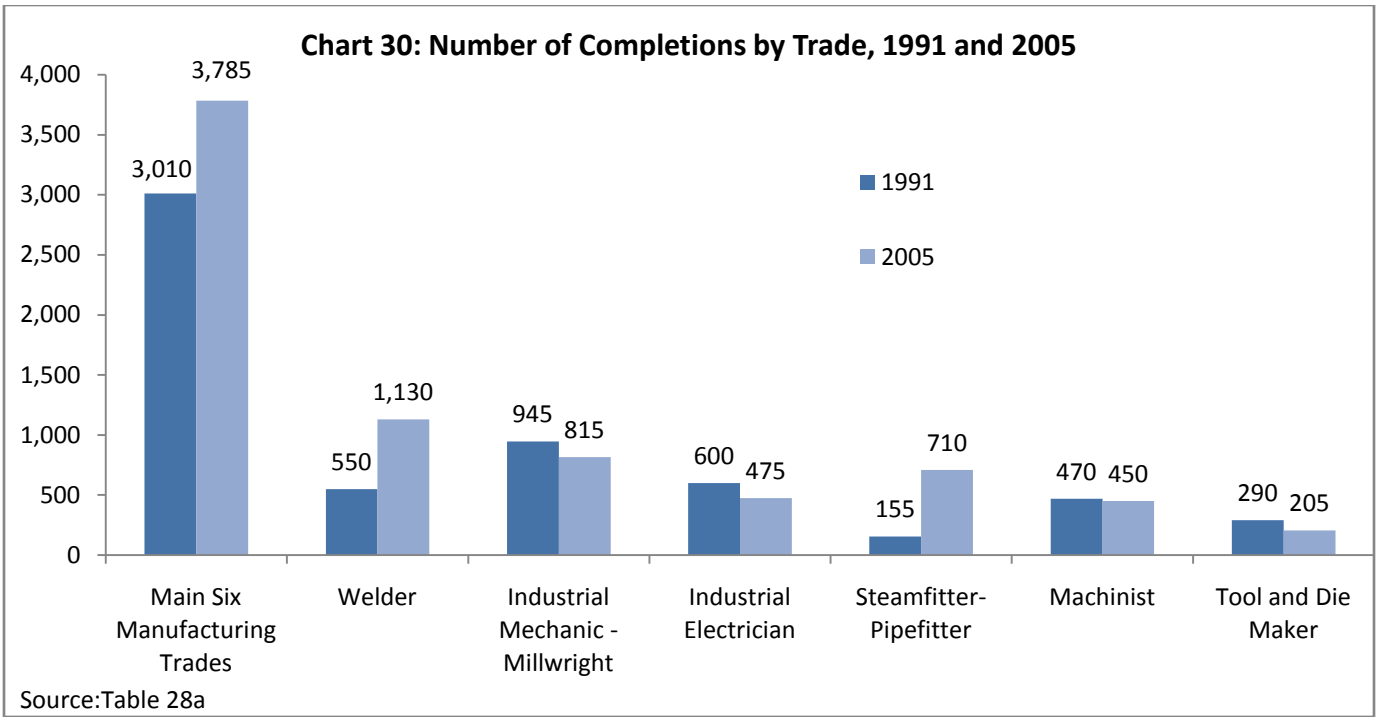
Source: Table 26 and Table 29g

Welder, with an average annual growth of 6.8 per cent (Chart 29), was by far the fastest growing trade. Registrations increased steadily from only 4,335 in 1991 to 10,935 in 2005, more than doubling over the period. Tool and die maker and machinist also grew faster than average, increasing at 3.2 per cent and 4.1 per cent each year, respectively. Registration growth in the industrial mechanic trade was slightly slower than average at 1.9 per cent per year. Moreover, growth for industrial mechanic fluctuated considerably during the period, with 7,360 registrations in 1991, a trough of 5,605 registrations in 1994 and a peak of 9,595 registrations in 2005. The pattern was similar for the industrial electrician trade, which reported an average annual growth in registrations of 1.7 per cent. The slowest growing trade was steamfitter/pipefitter, with 9,850 registrations in 1991, and increasing only to 12,190 registrations in 2005, which translates into a 1.5 per cent average annual growth.



Trends in the level of completions for the six trades most relevant to manufacturing were quite different than the average completion trend for all trades. As Chart 25 shows, completions in those trades followed a trend relatively similar to the level of registrations. While the average trade reported an average annual growth of only 0.2 per cent in its level of completions between 1991 and 2005, the six manufacturing trades reported an average annual increase of 1.6 per cent during the 1991-2005 period (Chart 28). Two of the six trades reported stronger growth than the all trades average of 0.2 per cent per year.

Steamfitter/pipefitter was the fastest growing trade, with completions increasing from 155 in 1991 to 710 in 2005, a 11.5 per cent average annual increase (Chart 30). Completions for welder (5.3 per cent average annual growth) more than doubled over the period. The level of completions for the machinist trade (-0.3 per cent annually), the industrial mechanic trade (-1.1 per cent annually), the industrial electrician trade (-1.7 per cent annually) and the tool and die maker trade (-2.4 per cent annually) all decreased. In absolute terms, welder reported the largest increase in completions, from 550 in 1991 to 1,130 in 2003 (+580) while industrial mechanic suffered the largest decline, from 945 in 1991 to 815 in 2005 (-130).



Source:Table 28a

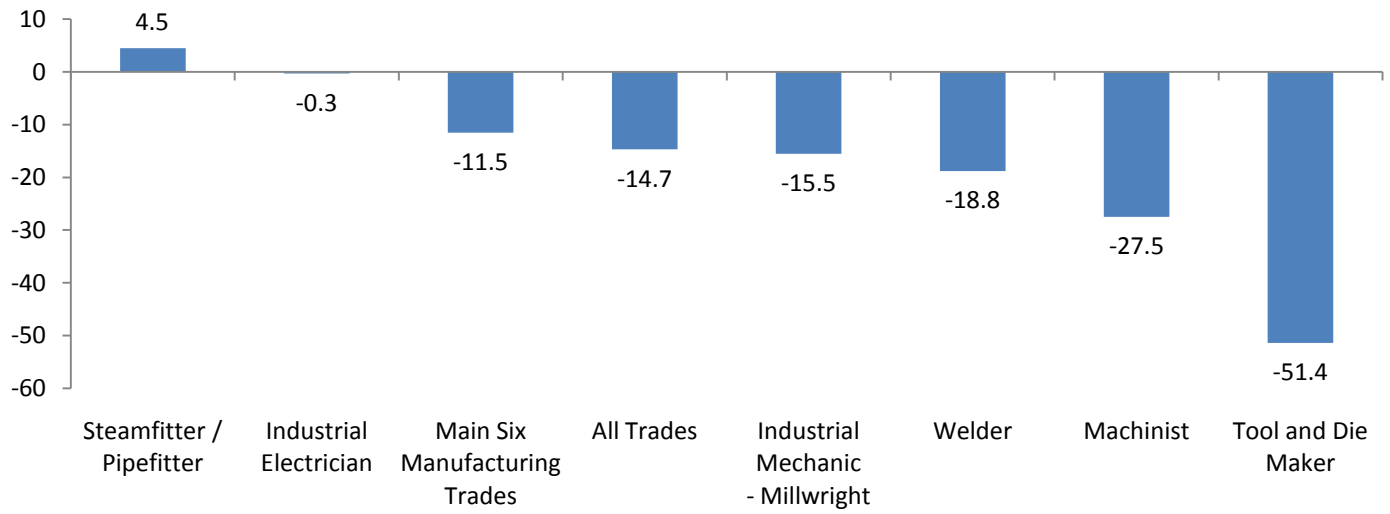
Positive growth for registrations in most trades, coupled with low or negative growth for completions, translated into falling completion rates.[19] Between 1996 and 2005, the completion rate for all trades fell 14.7 percentage points, from 55.0 per cent in 1996 to 40.4 per cent in 2005 (Chart 31). The aggregate completion rate for the six manufacturing trades also decreased 11.5 percentage points, from 53.9 per cent in 1996 to 42.4 per cent in 2005. However, the aggregate completion rate for these 6 manufacturing trades was higher than the all trades average for most years of the period.

The decline in completion rates was much worse in trades with high completion rates in 1996. For example, tool and die maker, which had the highest completion rate in 1996 at 84.4 per cent, suffered the sharpest decline over the period (51.4 percentage point) (Chart 31 and Chart 32). Similarly, the machinist trade, which had the second highest completion rate in 1996 at 66.9 per cent, decreased 27.5 percentage points during the 1996-2005 period. Conversely, the steamfitter/pipefitter trade increased 4.5

[19] We are using completion rate 2. Therefore, data are available only starting in 1996 for specific trades because the formula used requires 5 previous periods of data to compute a completion rate.

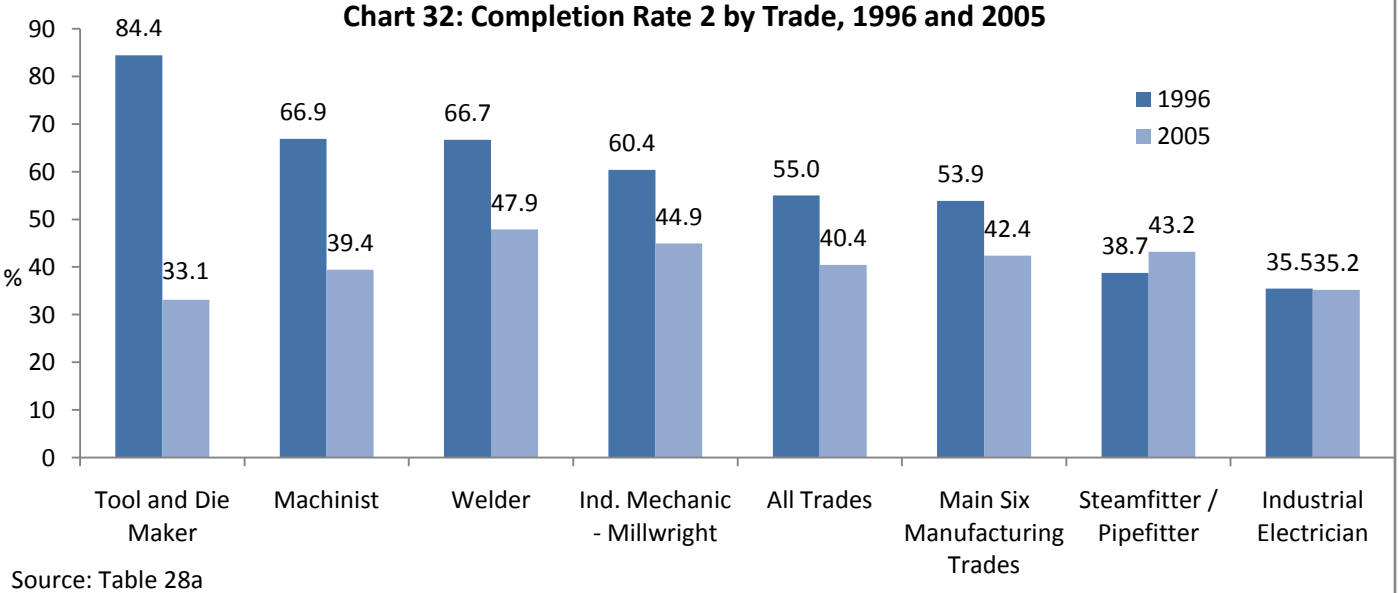
percentage points to 43.2 per cent in 2005, albeit from a low base of 38.7 per cent in 1996. Industrial electrician decreased only 0.3 percentage point, from 35.5 per cent in 1996 to 35.2 in 2005, while industrial mechanic and welder decreased respectively 15.5 percentage points and 18.8 percentage points over the period.

Chart 31: Percentage Point Differences for Completion Rate 2, by Trade, 1996-2005



Source: Table 28a

Chart 32: Completion Rate 2 by Trade, 1996 and 2005



Source: Table 28a

To compare the efficiency of the apprenticeship system across different trades, it is useful to compute "long-term" completion rates. Summary Table 4 presents the completion rates for the 6 manufacturing trades using this long-term completion rate: the sum of completions over the sum of new registrations over the 1996-2005 period with a

four years lag for the latter.[20] This table shows that the average completion rate for the six manufacturing trades, at 51.0 per cent, is 2.5 percentage points higher than the average of all trades completion rate of 48.5 per cent.

Industrial mechanic, with a completion rate of 62.2 per cent, is 13.7 percentage points above average and ranks 1st among the six manufacturing trades. Welder (58.4 per cent) and tool and die maker (56.7 per cent) also have better completion rates than the average apprenticeship program. It is interesting to remember that these three trades were, respectively, the 1st, 2nd and 5th trade with the most potential apprentices in the manufacturing sector. In other words, manufacturing apprentices seem to complete their program more consistently than other apprentices.

Summary Table 4: Completion Rates by Trade, Based on a 4 Years Completion Time, Total Period, 1991-2005

	Total Completion, 1995-2005	Total registration, 1991-2001	Completion Rates
	A	B	C=A/B*100
Industrial Mechanic - Millwright	9,095	14,630	62.2
Welder	9,980	17,075	58.4
Tool and Die Maker	3,120	5,505	56.7
Main Six Manufacturing Trades	36,115	70,850	51.0
All Trades	196,460	404,871	48.5
Machinist	4,585	9,960	46.0
Steamfitter/Pipefitter	5,020	12,125	41.4
Industrial Electrician	4,315	11,555	37.3

Source: Tables 29a-29g

However, machinist, the 3rd trade with the most potential apprentices, only reported a completion rate of 46.0 per cent in 2005, only slightly higher than average. Steamfitter/pipefitter (6th most relevant trade to the manufacturing sector) does even worse, with a completion rate of 41.4 per cent. Finally, the industrial electrician trade (4th most relevant), with a completion rate of 37.3 per cent, is 11.2 percentage points below the all trades average. Overall, trades most relevant to the manufacturing sector do seem to fare better than the average trade (Chart 33), but the trend is not observed for every trade with a high number of apprentices in manufacturing.

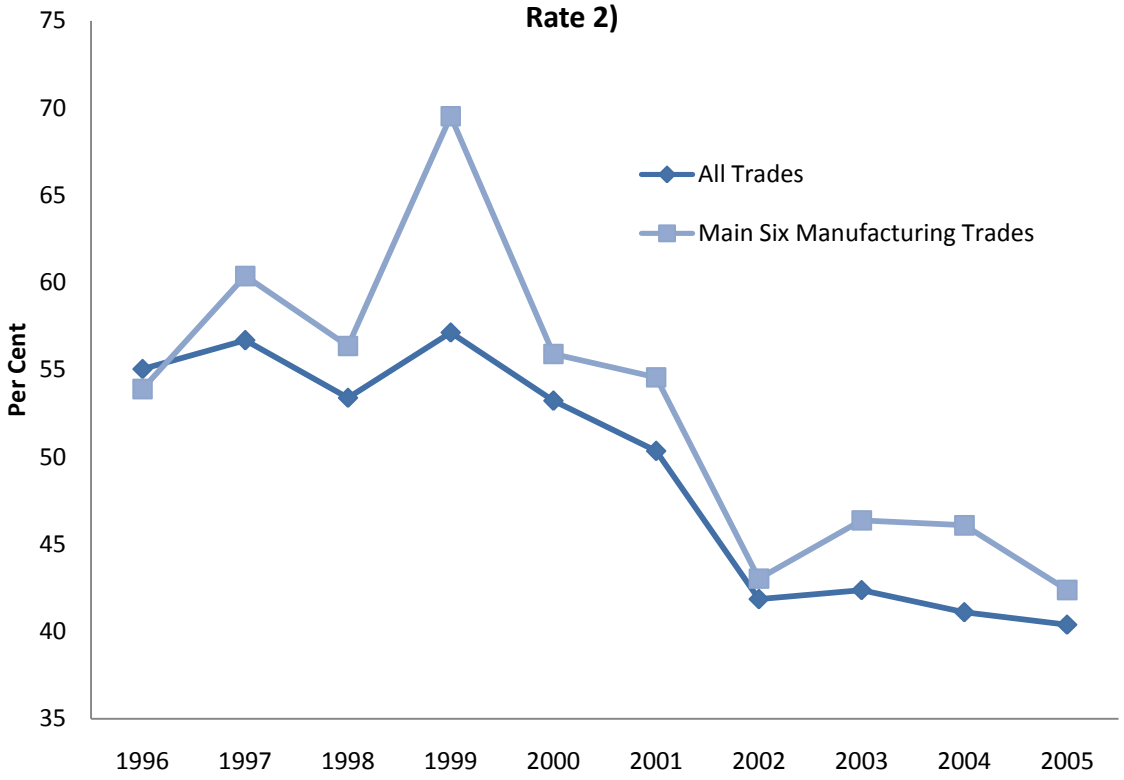
B. Issues Related to Low Completion Rates

Apprenticeship registrations show that this form of education still occupies a subordinate position in the post-secondary education system in Canada, with only about a quarter the number of university students in 2005 and about half the number of community college student in 2004. However, registrations in apprenticeships have been

[20] The lag is introduced to simulate a cohort, so that the sum of completions and the sum of registrations relate to the same cohort of apprentices. In the case of a "long-term" completion rate, the issue of a longer completion period creates less distortion because it only affects the tail of the period. Moreover, it avoids the issue of choosing a base year for comparison, which can create major problems if certain apprenticeship programs suffered or benefited from exceptional circumstances.

increasing faster than both the labour force and university enrolment over the 1995-2005 period (Table 25). Registrations are highly cyclical, generally following the business cycle. The strong output and employment growth since the mid-1990s have thus been favourable to apprenticeship registrations as employers have been in a position to take on more apprentices. But we have yet to see a commensurate increase in the number of completions. With registrations increasing on average by 3.2 per cent per year between 1977 and 2005, completions only increased by 0.6 per cent per year. These two trends contributed to a significant fall in the completion rate from 62.9 per cent in 1982 to 40.4 per cent in 2005.

Chart 33: Trends in the Completion Rates, 1996-2005 (Completion Rate 2)



The previous section found that completion rates have, on average, fallen slower in trades associated with the manufacturing sector and are now at a slightly higher level than for other trades (Chart 33). It is, however, far too optimistic to conclude that the apprenticeship system is flawless in this sector. Completion are falling and remain low in both non-manufacturing and manufacturing trades. For this reason, the report next looks into causes for non-completion of apprenticeship programs in general, and when possible into specific causes for the manufacturing sector.

A recent report from the Canadian Apprenticeship Forum identifies nine barriers to completion of any apprenticeship program (CAF, 2004). The identified factors which will be discussed in the following sections are: unemployment spells experienced by apprentices, which is stated by apprentices as the first reason to leave the program; the

older age of apprentices; the lack of preparation in high school and the negative image of the trades in general; and the limited incentive for apprentices to complete the program.

1. Employer-Supported Costs and Unemployment

For employers, a highly skilled workforce is without doubt an advantage in the market. However, due to poaching externalities, businesses may not invest as much in training and education as they otherwise would to get maximum returns. A firm has to invest much money and time into the training of an employee or apprentice, but the skills taught to the trainee are not always specific to the firm. For this reason, other firms can "steal" fully trained employees from businesses investing in training. In such a situation, the training firm loses its skilled employee and its investment in training at the same time. This free-riding problem causes firms to be more reticent when hiring apprentices (or training employees in a more general way) and thus invest a lower amount in training than they would at social optimum (for more details, see Sharpe and Gibson, 2005). Another problem faced by employers is the cost associated with hiring an apprentice. Wages paid to an apprentice are in general lower than to a journeyperson, because employers do not receive an increase in production as high as they would from a fully-trained employee. It reflects the fact that there is a cost associated with apprenticeships, and it is a potential barrier to the increase in importance of this education system.

These factors have two consequences. First, firms in general think twice before hiring an apprentice, thus increasing the difficulty experienced by apprentices to find an employer. If the search for a job lasts too long, apprentices will not stay in the program. Another consequence of the costs supported by employers is unemployment for apprentices, especially during economic downturns. When a firm is having difficulty and must lower its costs, the first employees to go are often the apprentices. Again, if the unemployment period is too long, the apprentice will leave the program uncompleted. These problems are significant in Canada: reports show that temporary unemployment is one of the main reasons for non-completion of the program (see Sharpe and Gibson, 2005). This conclusion is reinforced by the strong performance of apprenticeship registrations in recent years, as Canada is experiencing low unemployment by historical standards and has a booming economy. The factors explored above are therefore not as relevant, and apprentices do not seem to have difficulty finding employment, as their number doubled in the past ten years.

2. Age of Apprentices

Linked to this problem is the older age of apprentices in Canada compared to apprentices in the rest of the world. The median age of apprentices entering the program was 27 years old in Canada in 1998 (O'Grady, 1998). This high median age suggests that most apprentices are using this system as a path of re-entry in the education system rather than a direct transition between high school and the job market. Apprentices at this age are probably young workers who did not pursue post-secondary education and wish to acquire new skills to raise their employability.

The consequence of the older age of apprentices is indirect. Older apprentices in general already have financial responsibilities such as children and a family. These workers will be affected to a greater extent by unemployment due to pressures to pay for living expenses (house, food, etc). This may force them to drop the program and look for another less skilled job, even knowing they could have higher income in the future would they complete their formation. Younger apprentices that are still living with their parents, or simply do not have children, are able to stay unemployed longer and continue looking for a job.

3. Basic Skills of Apprentices

Employers often report that apprentices they hire do not have enough basic skills or preparation from high school (CAF, 2004). Personal attributes and capacity are judged inadequate to complete an apprenticeship, and this stops employers from hiring additional candidates, thus lowering apprenticeship possibilities and completions. Lack of work ethics and discipline are two problems noted in candidates from high school by employers (CAF, 2004). Other characteristics judged inadequate by employers were literacy and mathematics skills. Indeed, it is believed that some apprentices complete up to the fourth year of the program but are unable to pass the certification exam due to a level of literacy that is too low (CAF, 2004).

The cause of this inadequacy of basic skills of apprentices is clearly due to the lack of preparation in high school and the lack of information about trades available for possible candidates. For example, apprentices in carpentry need more geometric skills than the mainstream mathematics program is able to give them (CAF, 2004). Some specialization or flexibility in the high school curriculum would allow for a better preparation of candidates towards their future studies (OFL, 2005). More information is also needed for students to help them make a clear choice. Another advantage of better information is that potential candidates would be more familiar with the process of finding an employer to train them. It is believed that a good proportion of apprenticeships are given out to personal contacts (CAF, 2004), thus limiting the number of potential apprentices and increasing difficulties to find a new employer should unemployment arise. A further section of this report will analyze more deeply the state of Labour Market Information in Canada.

Another possible cause of the basic skills deficit of apprentices is the self-selection that occurs in high school. Trades have recently been given a negative image in the eyes of youth, parents and educators. A career in this domain is often considered as a "dead-end" or a second choice relative to university. Parents encourage this perception, since a large majority of them would prefer to see their children graduate from university. Guidance counsellors and teachers also contribute, often giving limited or no information about a career in this area. This negative image and the fear of being labelled as a second-class or failed student pushes skilled youth to neglect apprenticeships as a good career option, and those that enter the program are often students who had low skills or grades in basic subjects such as mathematics and English (or French).

4. Compulsory Certification and Incentives to Complete

Another factor limiting the incentives for youth to complete apprenticeship programs is the lack of compulsory certification in many trades. Certifications are compulsory in many occupations, such as doctors and engineers, to protect the public from under-qualified professionals. While this may be of less concern in many trades, compulsory certification forces participants of the program to complete it in order to be able to work in their field. The number of completers that is reported in the official statistics reflects the number of students who write their final certification exam and receive a passing mark. In some trades the certification is compulsory, although this varies by province. In Canada, on average, 30.5 per cent of the 23 main trades were compulsory in 2001 (Table 30), while this average is only 14.5 per cent for the six trades most relevant to manufacturing.

In the trades most relevant to manufacturing, industrial electrician had the highest level of compulsory certification across provinces (37.5 per cent of provinces and territories have compulsory certification). This was the only trade that experienced an increase (12.8 per cent) in the completion rate between 1997 and 2003. Compulsory certification is also expected to reduce fatalities and injuries for workers in the trades, because health and safety issues are included in the curriculum and certification demonstrates that the tradesperson has completed the entire course (OFL, 2005).

In trades where certification is voluntary, apprentices have little or no incentive to write their final exam. Certification as a journeyman often requires employers to pay higher wages, but apprentices who completed the four years of the program possess the same technical skills and can be paid lower wages. If they fear unemployment, apprentices can gain an advantage over their competitors in the job market by not completing the exam (CAF, 2004).

5. Key Issues

In general, the most important problem stems from the employer's side and is the work interruption suffered by apprentices. Since the number of apprenticeships available is mainly restrained by the employers' willingness to hire trainees (because of the cost associated with the training), financial incentives should be aimed towards employers if we want them to be as effective as possible (Sharpe and Gibson, 2005). Helping firms that hire apprentices should help minimize the problem of poaching externalities and encourage businesses to train new tradespeople. This is especially true in times of economic depression. In the past ten years, the Canadian economy has been performing well and the number of apprentices has followed suit, by almost doubling.

Other problems affecting completions can be solved with better information and preparation in high school. Students who would be interested in this type of career, after receiving information from the school's counsellors, could be directed to a program that builds up basic skills required to undertake an apprenticeship. This type of policy could also help reduce the negative image of the trades in the public's mind.

V. Emerging skills sets and collaboration with other institutions in the post-secondary education system

Innovations in basic work techniques, such as the increased use of computers, have brought some questions about the integration of emerging skills sets in the curriculum of different educational programs, including apprenticeships. Also, we can ask whether it is better to include the training for those new skills in the apprenticeships program or if training in these new skills would better be provided by other forms of training, such as community college programs.

Emerging skills sets cause a problem in the education system because it is difficult to predict how fast their use will spread in the economy. For this reason, new skills are often taught to students only five or ten years after their introduction (CAF, 2004). In this period, many cohorts can pass through the system without ever gaining knowledge in these particular skills, thus decreasing their ability in their work environment.

Another issue within apprenticeships regarding the development of new skills is the ability of journeypersons to teach these emerging skills. In general, there is some concern about the preparation of journeypersons for their role as trainers, as in most cases they do not receive any additional compensation for their added responsibility (CAF, 2004). Also, older journeypersons may not be familiar with recent technologies or skills related to new equipment and would not be able to train young apprentices in this domain.

This issue raises the question of collaboration between different education systems. Greater collaboration between community colleges and apprenticeship programs could help reduce the lag between skills' emergence and when apprentices start to learn them. While this may mean a more important share of the program devoted to classroom training, the gain in broad and basic skills (such as mathematics) and new skills would increase the satisfaction of employers towards their apprentices, and may help in increasing the number of positions available.

Another issue related to greater apprenticeship collaboration with community colleges is the introduction of new apprenticeship programs for new and emerging manufacturing occupations. The apprenticeship system in Canada has not expanded into new occupations, as it has in a number of European countries and in Australia. Yet such expansion may be desirable, especially in occupations with complex skill sets that require hands-on learning and training. It is likely that a number of these new occupations are in manufacturing. Of course, community colleges could and do develop certificate and diploma programs to train persons in these new occupations. But a case can be made that superior training can be provided by incorporating the best elements of both systems, namely the work experience of apprenticeship programs and the structured learning and formal phased credentialization provided by community colleges. Indeed, there are already some examples in Canada of innovative collaboration between apprenticeship programs and community colleges.

Increased collaboration between community colleges and apprenticeship programs can also mean a post-secondary education system that is more laddered. A laddered system is one in which students can start in one program, such as an apprenticeship program , and then switch to another, such as a community college degree or diploma program, and have their credentials recognized, or vice versa. This type of system provides a greater degree of flexibility for youth, as the work done by a tradesperson is no longer as different from the work done by a technician as it was in the past. This is especially true in the manufacturing industry, but applies to all other sectors as well (O'Grady, 1998). An example of this type of system is the Quebec post-secondary system, which allows for movement between the different programs, such as the special university programs designed for graduates of technical CEGEPs (community colleges).

The programs recently developed by community colleges with the participation of industries are an indicator of the pertinence of the education laddering. Ontario's recent initiative is moving towards COOP programs joining community colleges and apprenticeships.[21] These programs provide individuals the opportunity to gain both a college diploma and a trades certification and give a broader skill-base to students than a single program. For example, the Automotive Manufacturing Skills Initiative, launched in 1998 by DaimlerChrysler, the Canadian Auto Workers and St-Clair College, is a 4 year program where students spend 2 days a week as an apprentice and the remaining 3 days in class. At the end of this program, students receive both a college degree and a tradesperson certification (CAF, 2005). There are a number of similar programs providing opportunities to young persons who do not wish to enter a fully academic program, but still wish to acquire a useful skill set.

Ontario's new initiatives also include a program called Ontario Youth Apprenticeship Program.[22] This program is intended for high school students who wish to enter apprenticeships. It gives them the opportunity to start learning the basics of the trades while finishing their high school diploma. This program should reduce the concerns of employers about the basic skills acquired by apprentices, and again create a system that is more laddered, thus further improving the flexibility of the post-secondary education system.

[21] http://ogov.newswire.ca/ontario/GPOE/2004/08/05/c8728.html?lmatch=&lang=_e.html
[22] http://www.edu.gov.on.ca/eng/training/apprenticeship/skills/oyap.html

VI. Labour Market Information for Apprenticeships

Labour market information (LMI) in Canada is collected and distributed by many sources. For example, Human Resources and Skills Development Canada (HRSDC), Industry Canada, Citizenship and Immigration Canada (CIC), and Statistics Canada publish information about labour market opportunities and job prospects and conduct surveys on employment, wages and workers' conditions.[23] Provinces also gather and distribute LMI related to their province. Moreover, many private firms also develop LMI in Canada either under contract for HRSDC or on their own. Finally, academics in universities across Canada work to provide information related to the labour market.

This information is publicly available in most cases, but it can often be difficult to find specific information given the massive amount of information available. For this reason, much LMI is distributed directly to targeted groups. The main distributors are the primary and secondary school systems. The amount of information and time devoted to LMI in schools differs across provinces. It can be either continuous across the years spent in school or concentrated in a small number of specific years. The information can be distributed by teachers during class or by guidance counsellors. In most schools a counsellor is available to help with students' specific needs. Community colleges and universities also have guidance services, but they are often targeted at students enrolled in COOP programs.

Another distributor of LMI which may be important for apprenticeships is the public employment services run by the federal and provincial governments across Canada. These services are mainly targeted towards youth, the unemployed, persons with disabilities, and poorly skilled immigrants. These centres are targeted at an audience particularly relevant to apprenticeships, namely youth who dropped out of high school and are considering re-entering the educational system in order to find a better job.

The OECD considers Canada's LMI system among the best in the world (CSLS, 2006b). Despite this positive assessment of our overall LMI system, information about apprenticeships and careers in the trades is often not as widely available and accessible as it should be (of course the situation may be worse in other countries). Additional funding to improve this situation would be beneficial.

The trades are affected by a negative image in the public's mind and a career in this domain is often considered as a "second choice" in the event one cannot pursue a university education. The federal government, working with the Canadian Apprenticeship Forum, has undertaken a campaign to improve the public perception of the apprenticeship system. The recent increase in apprenticeship registrations may indicate that the campaign is meeting with some success, although the ample employment opportunities in apprenticeable occupations are likely a more important explanation of the rise in registrations.

[23] For more details, see the recent CSLS report on LMI (CSLS, 2006a).

In any case, the traditional negative public perception of apprenticeship is reinforced by the academic bias of guidance counsellors, who are generally not familiar with the apprenticeship system. Information is widely given about university careers, but apprenticeships information is given primarily to students who would probably not succeed in university education. In 2005, only 25 per cent of youth were aware of all the different options in the trades (CAF, 2005). This lack of general information about apprenticeships can prevent students, who would likely have done well in an apprenticeship program and acceded to journeyman status, from entering apprenticeship programs.

Young persons should be provided with better information about apprenticeship programs so they have the opportunity to start building the required skills early. They would then enter apprenticeship programs with knowledge of what they will be doing, and a variety of soft skills to start on the right foot.

With better information about the possible careers should come resources to find employers and a possible apprenticeship. Potential apprentices often need to seek their personal contacts, but without that possibility, it is very difficult to find an employer. Looking at university COOP programs across the country, we know that this type of resource is available, and it should be extended towards apprenticeship programs. University COOP departments provide students with a list of employers who are hiring and connect students and firms together. Apprenticeships could benefit from a program of this type, such as a database of potential employers and contacts available for students. In England, for example, the Learning and Skills Council provides free information to potential apprentices and advisers are available to set up meeting with local learning providers and employers.

VII. Policy Directions for the Apprenticeship in Manufacturing for Canada

This section briefly discusses options for the policy direction of apprenticeship in manufacturing for Canada. A first point that has been stressed throughout the report is that issues related to apprenticeship facing employers and apprentices in manufacturing do not differ greatly from the issues facing their counterparts in other sectors. This is because the apprenticeship system is regulated on an occupational, not an industry, basis. Indeed, many apprentices in a given occupation work in a number of industries and move between these industries. Given this reality, an industry-based approach to apprenticeship issues may be less useful than an occupation-based approach.

A. Scenarios for the Evolution of Apprenticeship

Three scenarios can be put forward for future development of the apprenticeship system in this country. The first scenario is one where the apprenticeship system as we know it contracts. The apprenticeship system becomes less important as a training vehicle for the skilled labour force as it fails to adapt to an evolving economic environment and to the changes in the skills sets brought about by technological change and demanded by employers. The number of apprentices declines both as a share of persons enrolled of post-secondary education and in absolute terms. Other types of training programs and credentials emerge to replace formal apprenticeship programs and journeyperson status. The United States appears to be following this path.

A second scenario is one of expansion, the opposite of the first scenario. The apprenticeship system becomes more important as a training vehicle for the skilled labour force as it adapts to an evolving economic environment and to the changes in the skills sets brought about by technological change and demanded by employers. The number of apprentices increases both as a share of persons enrolled of post-secondary education and in absolute terms, as the number of apprentices in existing programs increases and as new apprenticeship programs are created for emerging occupations, particularly in service occupations. Apprenticeship programs may even replace other types of training programs and the value of journeyperson status is enhanced. Australia and a number of European countries appear to be following this path (Sharpe and Gibson, 2005).

The relative costs of the two scenarios depend on the costs of training a person for a trade through the community college system compared to the apprenticeship system. As an apprenticeship involves less class time than a community college program, it is likely that scenario one where the apprenticeship becomes less important is a more costly scenario than scenario two where the apprenticeship system becomes more important. However, the costs differences between the scenarios are not likely great and should not be a major consideration in government's attitude toward the two scenarios. What is more important is which scenario would result in a better trained workforce.

The third scenario lies between the extremes of contraction and expansion. The apprenticeship system continues to function as a training system, but it experiences no

major or fundamental contraction or expansion. Within the context of this scenario, however, the apprenticeship system still evolves, growing in certain existing trades where there is strong labour demand, certifying some new apprenticeship programs for emerging occupations, forging partnerships with other types of education programs, and addressing problems such as low completion rates. This scenario, which could be characterized as the "status quo plus" scenario, appears the one most likely to take place in Canada in coming years given current trends. A number of specific measures can be taken to enhance the apprenticeship system within the context of this status quo plus scenario.

B. Perspectives on the future of the apprenticeship system in manufacturing

In Canada, apprenticeships have traditionally been associated with the trades. In some countries, apprenticeships have covered a much broader range of occupations. For example, in the UK many manufacturing-specific occupations have developed apprenticeship programs. There are also apprenticeships specific for manufacturing sub-industries, such as chemicals or textile. Other non-traditional occupations, such as management, retail and accounting have registered apprenticeships programs.

An expanded system of apprenticeships holds both advantages and disadvantages. Competition with community colleges would likely be increased, as similar programs may be created as apprenticeships, but increased collaboration could resolve this problem. On the other hand, more apprenticeship options could increase public interest and boost registrations in this type of education. It would also help create a more laddered post-secondary education system, as integration of new occupations would require collaboration with community colleges and possibly universities.

Apprenticeship is an effective way of learning in the trades occupations, but its intrinsic benefits could be applied to other types of occupations with success. It has historically been more adapted for youth who do not respond well to an academic environment, and to give them more options will help them gain valuable skills that increase their employability. This is an important issue, as pointed out in a report by HRDC (Masse, Roy and Gingras, 1998). According to this report, workers with lower educational attainment are more deeply affected by the increasing level of skills needed to work in the Canadian economy.

C. Recent Apprenticeship Measures

There is currently much interest among policy makers in Canada in enhancing the apprenticeship system in response to perceived labour shortages in trades occupations. On May 2nd, 2006, the Conservative government included in its first budget three measures directed towards apprentices and employers who hire them. The budget included a tax credit for employers who hire apprentices, a $1,000 grant for new apprentices, and a tax credit to help tradespeople and apprentices pay for their tools.

The tax credit for employers consist of a non-refundable tax credit equal to 10 per cent of the wages paid to qualifying apprentices in the first two years of their contract (Department of Finance, 2006), up to a maximum of $2,000 per apprentice per year. To qualify, the employer must be a business which incurs salaries and wages related to qualifying apprentices. Qualifying apprentices must be in the first two years of their program in one of the prescribed trades, which include the Red Seal[24] trades and possibly a few more, after consultation with the provinces. Unused credits may be carried back 3 years and forward 20 years, to reduce federal income tax in those years.

The new apprenticeship incentive grant will consist of a $1,000 per year cash grant provided to apprentices in the first 2 years of their program. Apprentices who will be eligible for this grant are those who work in one of the Red Seal trades, or another trade that will be judged important by the federal government and provinces.

The last measure is a personal tax credit for tradespeople to help them pay for their tools. A deduction of up to $500 will be provided to tradespeople for the cost of tools in excess of $1,000. To claim this amount, the employer will have to certify that the concerned tools are required for employment. This tax credit applies to the lowest income bracket.

As discussed earlier, unemployment and difficulty in finding work are limiting factors for new apprentices. For this reason, financial incentives directed towards employers are considered an effective strategy to expand the apprenticeship system. The new tax credit given to firms who employ apprentices may increase the number of openings available for apprentices by reducing the costs for employers, thus increasing registrations and possibly lowering the number of lay-offs, a problem to which apprentices are particularly exposed. As employers now face lower costs, some of those who were interested in apprenticeships in the past but were not ready to pay the full cost may now decide to support new apprentices. Also, during economic downturns, firms may keep apprentices on their payroll since the costs associated with them are lower than before.

The employer tax credit is more effective when provinces build similar programs. Ontario, for example, recently introduced a tax credit that employers can use to lower their tax charges when employing apprentices. The refund varies between 25 and 30 per cent of labour costs, depending on total wages paid, and can be claimed with regards to salaries, wages and other compensation paid to qualifying apprentices. There are 117 trades covered by this program, and combined with the credit from the federal government, the incentives for employers to hire apprentices are greatly increased.

Non-fiscal measure can also play an important role in enhancing the efficiency of the apprenticeship system. Ontario has recently adopted a multipronged strategy by complementing its employer tax credit with a number of other initiatives. The Ontario

[24] The Red Seal Program is a inter-provincial mobility program administrated by the Canadian Council of Directors of Apprenticeships in each province. It is promoting mobility across Canadian provinces and standardizing in order for tradespeople to work in all provinces. For more information, go to http://www.red-seal.ca.

Youth Apprenticeship Program (OYAP), as previously noted, aims to facilitate the school-to-work transition for senior high school students by providing them with opportunities to gain apprenticeship experience. This program is targeted at young students rather than at young workers who have been in the workforce for several years. In this context, such a program, while achieving a necessary function, fails to integrate a large portion of potential apprentices. Other programs, such as the pre-apprenticeship program, somewhat address the needs of these individuals. The pre-apprenticeship program targets youth, aboriginal peoples and women and offers them the opportunity to upgrade their trade-related skills so they can be eligible for an apprenticeship. Ontario has also developed a coop diploma apprenticeship program that allows individuals to combine a college diploma with apprenticeship training. These programs are part of a more extended effort to increase the appeal of apprenticeship programs and better integrate them into the educational system. It appears, however, that these programs fail to fully take advantage of the potential of slightly older workers which could use apprenticeship as a stepping stone to go from unskilled to skilled employment.

Apprentices have a significant advantage over other students in the post-secondary system: they are paid to study. Apprentices still have a number of hours to attend in a classroom, in general 20 per cent of the program's duration. During these periods, apprentices receive no wages, but since the duration is relatively short, most apprentices can live without income for a while, and most even qualify for Employment Insurance benefits. But, there may be a problem for older apprentices who have financial responsibilities and cannot live without labour income for a prolonged period of time. The apprenticeship incentive grants are designed for those individuals. These grants help apprentices pay for living expenses, especially during periods of classroom learning, when they receive no income. This program is a popular and welcome measure, since additional income is never a bad thing for any individual. For most apprentices, this may come as a bonus, since they would never have problems paying for living expenses with only the employment earnings, thus creating windfall gains. For those with more financial responsibilities or worse financial situations, it may provide significant help. As an incentive, this grant should not have a major effect, since apprentices are already being paid during 80 per cent of their program's duration.

Tools expenses can be high for tradespeople, and many workers need to provide their own tools as a condition for employment (Budget 2006, CAF 2004). The new tax credit in recognition of tools expenses of tradespeople was introduced to alleviate the financial barriers to acquire new tools. It adds to an existing credit that was specifically designed for vehicle mechanics, and works with another measure in the same budget, the Employment Credit. This credit is a general credit applicable to work expenses, similar to the tools' credit but for every worker. Together, these measures should alleviate the financial burden on tradespeople and gives older workers an incentive to acquire new, more productive tools.

The 2006 budget recognizes that the apprenticeship system needs attention. These measures, especially the employer tax credit, should affect the apprenticeships in a positive way, but more needs to be done. Moreover, provinces need to develop

complementary policies if they are to improve their respective apprenticeship system significantly. Other specific suggestions already were made in this report, including better information concerning apprenticeships in high schools.

VIII. Conclusion

The intense interest of public policy makers in this country in the apprenticeship issue is being largely driven by perceived or actual skill shortages in construction trades. These shortages, associated with massive investments in resource projects such as the oil sands fuelled by high commodity prices, are largely in Western Canada.

In contrast to the boom in the construction sector and the increased demand for journeypersons, the manufacturing sector, largely based in central Canada, has seen weak output growth, with employment in manufacturing actually falling significantly in 2005, 2006 and 2007. Yet, recent data support the idea of skill shortages in the manufacturing industries, including those industries that employ high proportions of workers in apprenticeable occupations. The shortages, however, are mostly the result of thriving employment growth in other sectors competing for skilled labour. Nonetheless, these shortages do have negative effects on the competitiveness of the manufacturing industry. From this perspective, while the need for more apprentices in manufacturing industries is arguably much less crucial than in the construction and natural resource industries, it still is an important ingredient for the survival and potential revival of the manufacturing sector.

For this reason, apprenticeship issues related to manufacturing are potentially important and should not be ignored. But the importance of apprenticeship for the manufacturing sector does not rely solely on the existence of labour shortages. Indeed, the macro-economic context could change rapidly. A fall in commodity prices and a depreciation of the Canadian dollar could reverse the current situation, alleviating skill shortages in construction and natural resources industries and increasing them in manufacturing. Moreover, the necessary shift towards more technologically advanced production process manufacturing will increase the need for a skilled labour force. It is thus important that apprenticeship issues affecting manufacturing (and other sectors) be addressed at this time. As discussed in the report, these issues include: the low apprenticeship completion rates (although they are slightly higher for trades concentrated in manufacturing than for other trades); inadequate labour market information for potential apprentices, particularly at the high school level; the lack of development of apprenticeship programs for emerging occupations in manufacturing; and the need for closer integration of apprenticeship programs and community colleges programs.

The recent interest shown by the federal government in the apprenticeship system, as manifested by the measures related to apprenticeships contained in the May 2006 budget, indicates that there currently exists in this country the political will to take additional steps to reform the apprenticeship system to make it more responsive to the needs of both employers and current and potential apprentices. It is hoped that the material in this report will be used in the development of specific policies and measures to effectuate this needed change.

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Appendix 1: Apprenticeable Occupations in Manufacturing in 2000

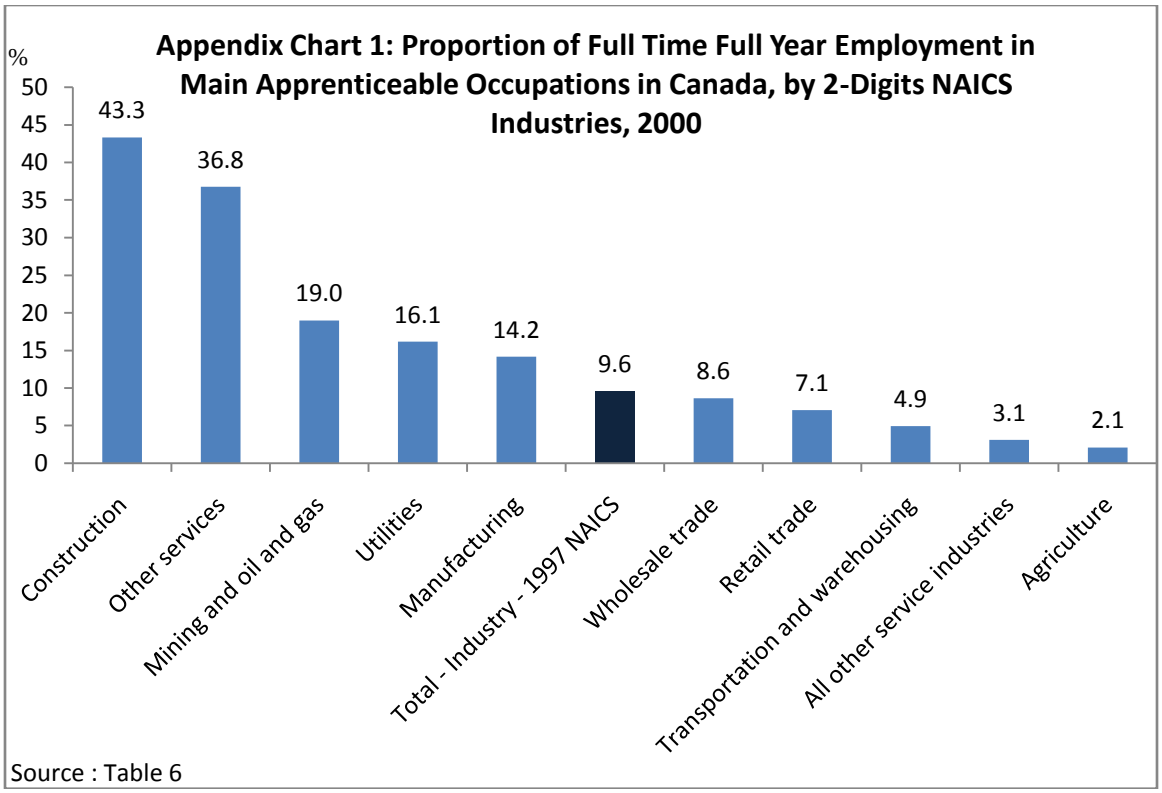
The Statistics Canada 2001 Census provides very detailed data on both occupations and industries. We used data on the number of full-year, full-time workers for 120 North American Industry Classification System (NAICS) industries and 718 National Occupational Classification – Statistics (NOC-S) occupations for Canada. Using detailed NAICS two- and three-digit level data, it is possible to identify which occupations are most relevant to the manufacturing industry. Moreover, by restricting the analysis to apprenticeable occupations,[25] one can infer the relative importance of apprenticeship for manufacturing industries. Finally, using Statistics Canada unpublished registration data by trade, it is possible to compute an approximate number of apprentices in the manufacturing industry for each trade assuming the share of employment and the share of apprentices are similar.

A. Importance of Apprenticeable Trades for the Manufacturing Industry in 2000

Among two-digits NAICS industries, about 14.2 per cent of workers in the manufacturing industry were employed in one of the main apprenticeable occupations in 2000 (Appendix Chart 1). Predictably, this is considerably lower than in construction, where the share of workers in apprenticeable occupations reached 43.3 per cent in 2000. Other industries, such as mining, oil and gas extraction (19.0 per cent) and utilities (16.1 per cent) also employed a higher than average share of workers in apprenticeable occupations. Still, manufacturing ranked 5th of 20 two-digit NAICS industries and was well above the 9.6 per cent average for all industries. Thus, it appears that while apprenticeship might not play as big a role in the manufacturing sector as it does in the construction sector, it is still relevant to a large portion of the manufacturing sector's labour force.

Among the 41 occupations analyzed, some are much more relevant to the manufacturing sector than others. For example, while 93.4 per cent of all tool and die makers work in the manufacturing industry, only 0.06 per cent of hairstylists and barbers worked in that industry (Table 6 and Appendix Chart 2). The machinists and tooling inspectors (85.2 per cent), cabinetmakers (74.7 per cent) and construction millwrights (68.7 per cent) are also concentrated in the manufacturing sector.

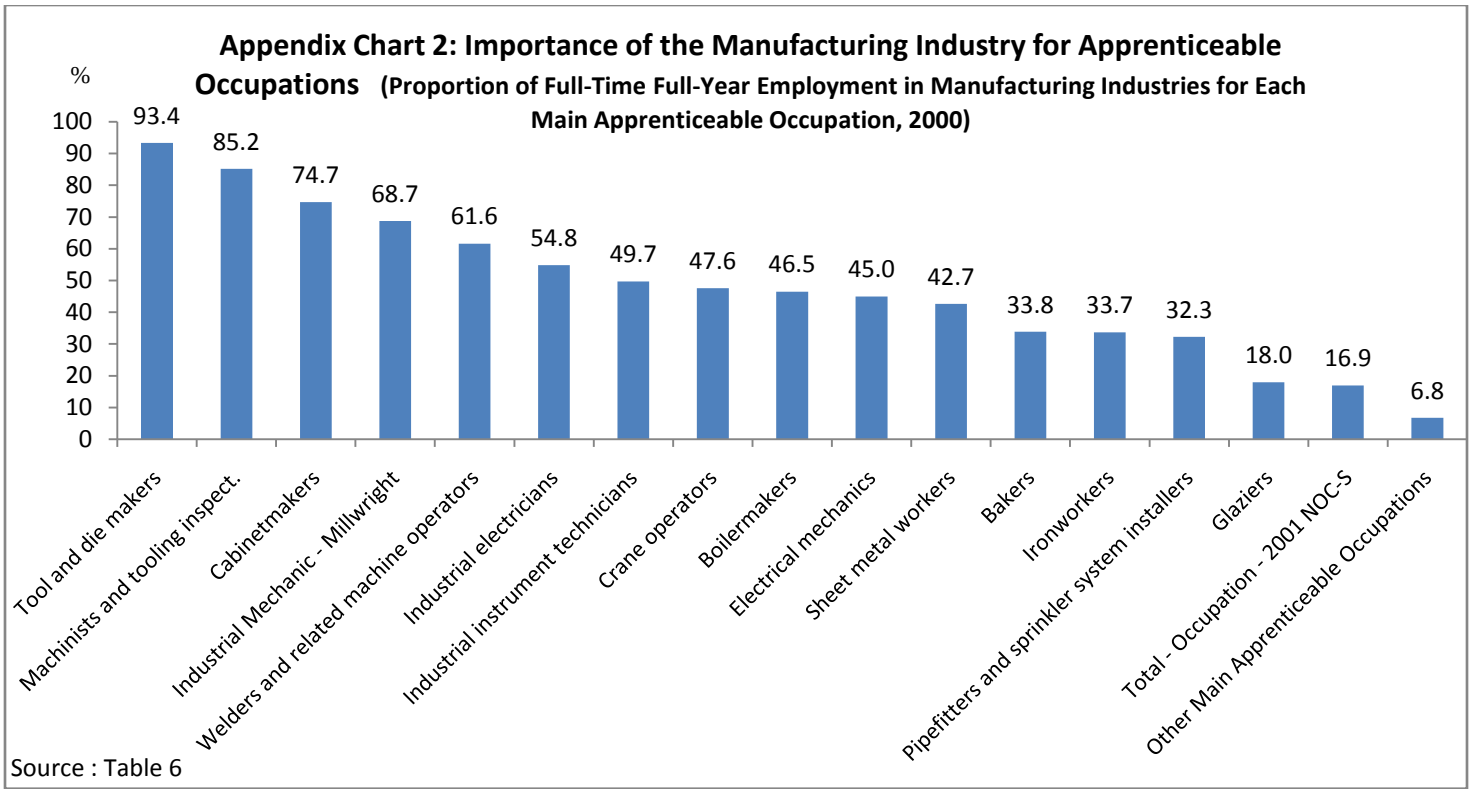
[25] We define apprenticeable occupations as the 45 Red Seal trades plus the plasterer and the heavy duty equipment operator trades, which, while not Red Seal Trades, were included because they were part of the top 25 apprenticeships for registration in 2000. These 47 trades accounted for 92.8 per cent of all apprenticeship registrations in 2000. Trades were then associated to an occupation code based on the National Occupational Classification – Statistics (NOC-S). Of course, apprenticeships represent only a subset of all employment in those occupations, but these numbers were used to establish an approximate share of apprenticeships trades in manufacturing industries. Because some trades are associated to the same occupation (for example, truck and transport mechanic and truck-trailer repairer are both associated to code H421) there are only 41 apprenticeable occupations for 47 trades.

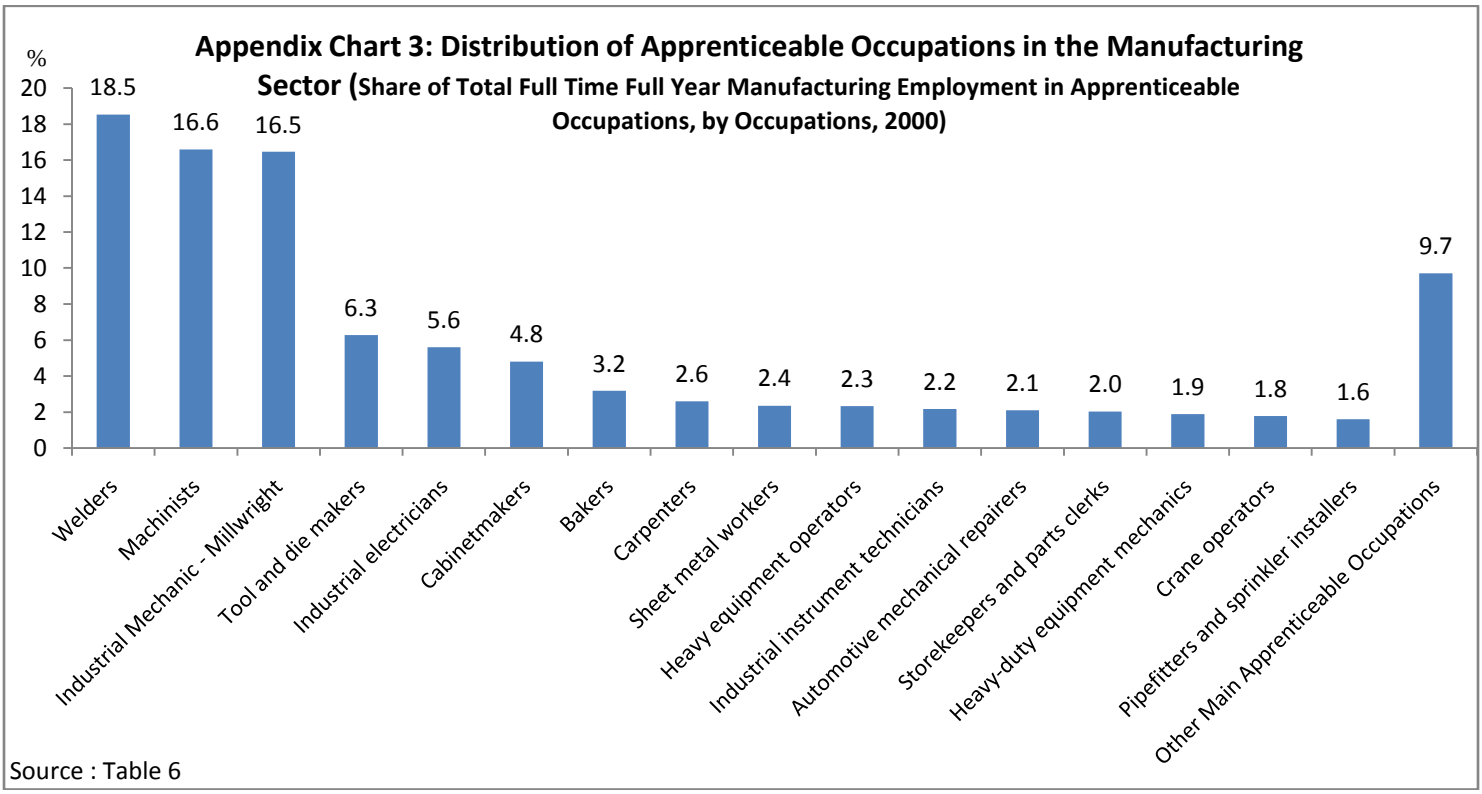


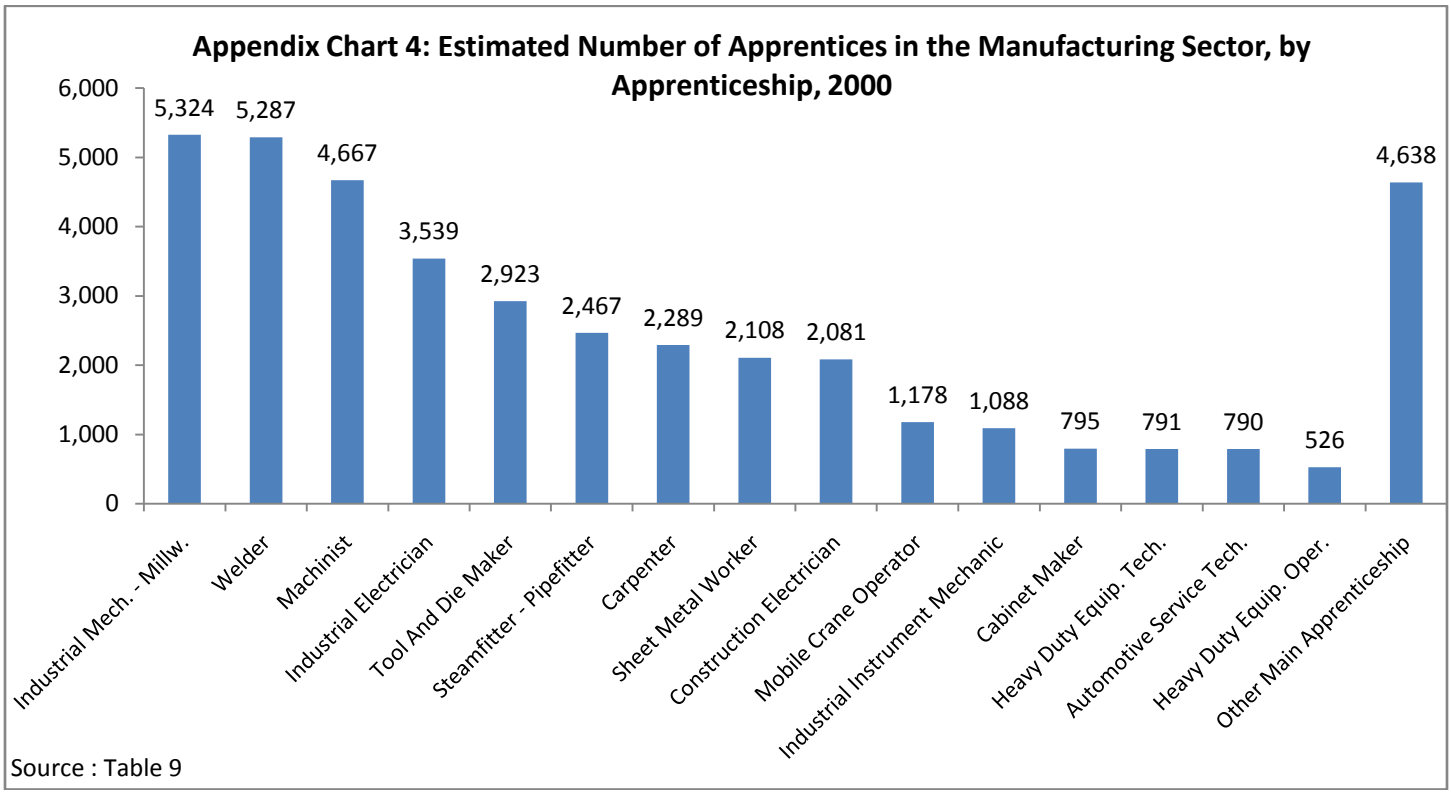
However, in absolute terms, the picture is slightly different. In 2000, there were 207,825 workers in the main apprenticeable occupations working in the manufacturing sector (Appendix Chart 3). Of those, 18.5 per cent (38,510 workers) were welders, 16.6 per cent were machinists (34,465 workers) and 16.5 per cent were construction millwrights (34,220 workers). Some occupations, despite a high concentration in manufacturing, were not very significant in absolute terms. For example, while 47.6 per cent of crane operators worked in the manufacturing sector, they accounted for only 1.8 per cent of workers (3,690) in apprenticeable occupations in manufacturing. Tool and die makers were similar, albeit to a lesser extent, accounting for 6.3 per cent of apprenticeable workers despite having the highest concentration of workers in manufacturing at 93.4 per cent.

To estimate the numbers of apprentices in the manufacturing sector for each trade, we used the registration data for each trade in 2000 provided by Statistics Canada. While some trades had very high registrations, such as construction electrician (23,205), carpenter (21,775) and automotive service technician (16,990), others had much lower registration levels, for instance, electronic technician (105) and electric motor system technician (185) (Table 9).

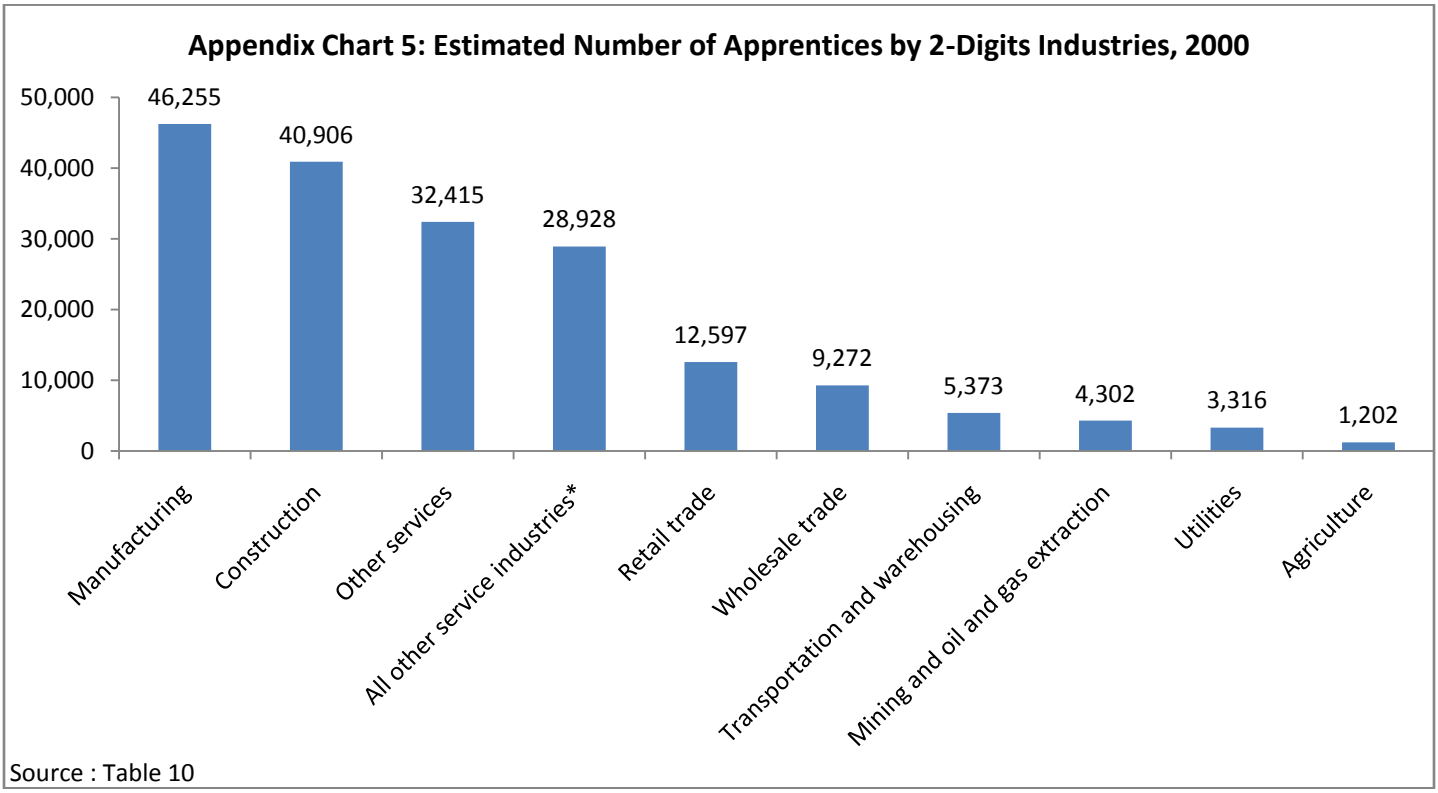
By coupling registration levels and the share of manufacturing in the corresponding occupation, the number of apprentices likely to be employed in the manufacturing sector was computed for each trade (Appendix Chart 4).


Appendix Chart 2: Importance of the Manufacturing Industry for Apprenticeable Occupations (Proportion of Full-Time Full-Year Employment in Manufacturing Industries for Each Main Apprenticeable Occupation, 2000)
%
100
90
80
70
60
50
40
30
20
10
0
93.4
85.2
74.7
68.7
61.6
54.8
49.7
47.6
46.5
45.0
42.7
33.8
33.7
32.3
18.0
16.9
6.8
Tool and die makers
Machinists and tooling inspect.
Cabinetmakers
Industrial Mechanic - Millwright
Welders and related machine operators
Industrial electricians
Industrial instrument technicians
Crane operators
Boilermakers
Electrical mechanics
Sheet metal workers
Bakers
Ironworkers
Pipefitters and sprinkler system installers
Glaziers
Total - Occupation - 2001 NOC-S
Other Main Apprenticeable Occupations
Source : Table 6


Appendix Chart 3: Distribution of Apprenticeable Occupations in the Manufacturing Sector (Share of Total Full Time Full Year Manufacturing Employment in Apprenticeable Occupations, by Occupations, 2000)
%
20
18
16
14
12
10
8
6
4
2
0
18.5
16.6
16.5
6.3
5.6
4.8
3.2
2.6
2.4
2.3
2.2
2.1
2.0
1.9
1.8
1.6
9.7
Welders
Machinists
Industrial Mechanic - Millwright
Tool and die makers
Industrial electricians
Cabinetmakers
Bakers
Carpenters
Sheet metal workers
Heavy equipment operators
Industrial instrument technicians
Automotive mechanical repairers
Storekeepers and parts clerks
Heavy-duty equipment mechanics
Crane operators
Pipefitters and sprinkler installers
Other Main Apprenticeable Occupations
Source : Table 6



Source : Table 9



Source : Table 10

These estimates rest on the strong assumption that the share of employment in manufacturing for each occupation is matched by an identical share of apprentices for the corresponding occupation. While this assumption may seem reasonable, a weak apprenticeship training tradition in manufacturing may mean that employers in this sector train fewer apprenticeships relative to the journeypersons they employ than employers in non-manufacturing industries. When data from the 2007 National Apprenticeship Survey will become available, it will be possible to investigate and determine the actual number of apprentices in the manufacturing sector.

Our estimates indicate that there were 5,324 industrial mechanics and millwright apprentices in the manufacturing sector, 5,287 welders, 4,667 machinists, 3,539 industrial electricians and 2,923 tool and die makers (Appendix Chart 4). Cabinetmakers ranked only 12th, reflecting the relatively low level of registration for that trade in 2000. Conversely, because of high registration levels, steamfitters and pipefitters apprentices went up the ranks with 2,467 apprentices and the 6th rank.

Using the same method to estimate the number of apprentices in two-digit industries, we can see the full potential of apprenticeship for the manufacturing sector. In fact, manufacturing could eventually represent the largest employer for apprentices, with an estimated number of apprentices in 2000 of 46,255.[26] Construction is just behind, with an estimated 40,906 apprentices with most other industries having much lower estimates for their number of apprentices (Appendix Chart 5). Of course, the computed number of apprentices may not be a realistic estimate, but it does reflect the scale to which manufacturing industries could benefit from a close association with an efficient apprenticeship system.

B. Apprenticeable Trades in the 3-Digits Manufacturing Industries in 2000

Among manufacturing industries, most workers in apprenticeable occupations are employed in the durables manufacturing industries. In fact, the durables manufacturing industries account for 78.5 per cent of all manufacturing workers in apprenticeable occupations compared with only 21.5 per cent in the non-durables manufacturing industries. Similarly, the proportion of workers in apprenticeable occupations in the durables manufacturing industries, at 18.3 per cent, is more than twice the proportion in the non-durables sector which stood at 7.4 per cent in 2000.[27]

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[26] The number of apprentices in the construction sector relative to manufacturing is likely to be under-estimated because the data is only for full-time full-year workers. In effect, there is a larger proportion of seasonal and part-time workers in the construction industry than in manufacturing. Thus, these estimates must not be taken as a definite indication that the number of apprentices is larger in the manufacturing sector than in construction.

[27] NAICS durables manufacturing industries (60 per cent of manufacturing employment in 2000) are: Wood product (321), Non-metallic mineral product (327), Primary metal (331), Fabricated metal product (332), Machinery (333), Computer and electronic product (334), Electrical equipment, appliance and component (335), Transportation equipment (336), Furniture and related product (337), Miscellaneous (339) and can be found on Table 3. NAICS non-durables manufacturing industries (40 per cent of manufacturing employment in 2000) are: Food (311), Beverage and tobacco product (312), Textile mills (313), Textile product mills (314), Clothing (315), Leather and allied product

In the non-durables sector, the food manufacturing industry and the paper industry were the most prominent employers of workers in apprenticeable occupations, with respectively 13,800 and 13,585 workers (or 6.64 and 6.54 per cent of all workers in apprenticeable occupations in manufacturing) (Table 7 and Appendix Chart 6). In the food manufacturing industry more than half these workers (6,350 workers) were bakers. Conversely, the distribution in the paper industry was much more diverse, with four different occupations reporting more than a 1,000 workers. Interestingly, while occupations such as bakers are of interest to only a small subset of manufacturing industries (namely the food manufacturing industry, which employs 98.7 per cent of bakers in the manufacturing industry), other occupations seem to be of interest for most manufacturing sub-industries. For example, every three-digits manufacturing industry employed workers in the construction millwrights and industrial mechanics occupations. In fact, apprenticeable occupations can generally be classified in two categories; those demanding general skills, which mostly include occupations related to maintenance, and those requiring specialized skills such as bakers for the food industry or cabinetmakers for the furniture manufacturing industry.

In the durables sector, fabricated metal products manufacturing (17.5 per cent) and transportation equipment manufacturing (17.4 per cent) were the industries that accounted for most of the workers in apprenticeable occupations in the manufacturing sector (Table 8 and Appendix Chart 6). In other words, more than a third of all workers in apprenticeable occupations in the wider manufacturing industry were concentrated in these two sub-industries.

Machinery manufacturing, with 29.0 per cent of its labour force working in apprenticeable occupations, was the leader in this respect (Appendix Chart 7). Fabricated metal product manufacturing (28.1 per cent) and primary metal manufacturing (24.0 per cent) also had about a quarter of their labour forces in apprenticeable occupations. At the other end of the spectrum, the clothing industry, with only 0.8 per cent of its labour force in apprenticeable occupations, was the manufacturing industry with the least concentration of workers in apprenticeable occupations.

The distribution of occupations in the durable goods manufacturing industries was much more diverse than for non-durables industries, with most three-digit industries employing workers in many different occupations (Table 8). However, there were some exceptions, such as the furniture and related products industry in which cabinetmakers accounted for about 67 per cent of all workers in apprenticeable occupations.

Estimates of the number of apprentices for the three-digits manufacturing industries illustrate the potential importance of apprenticeship in each respective

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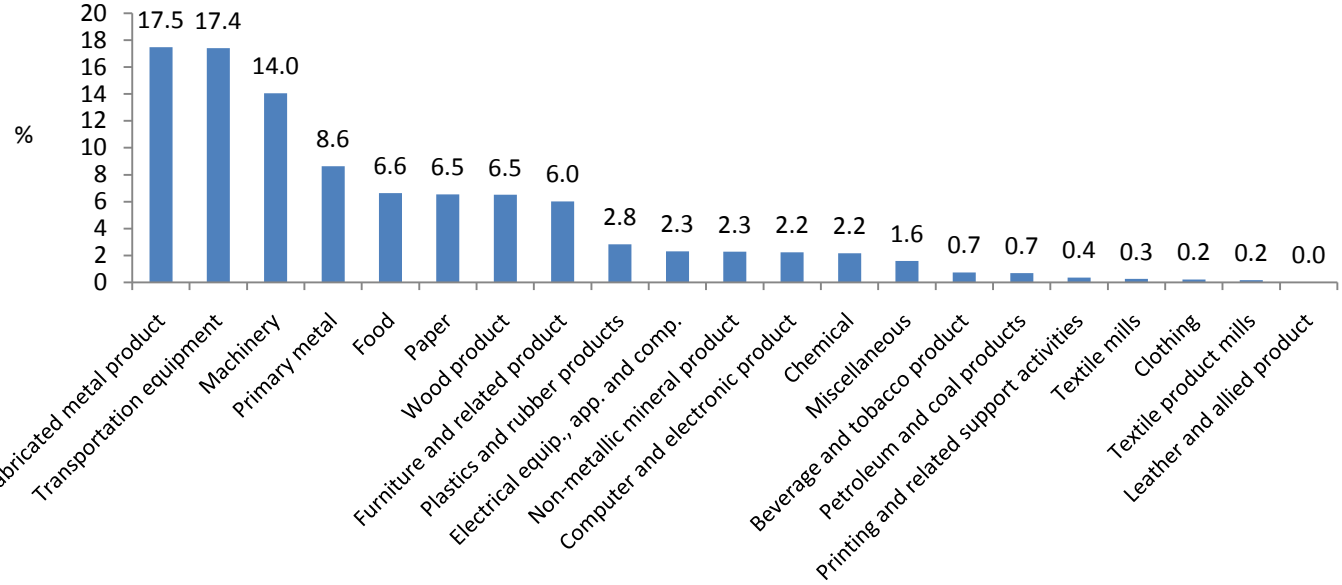
(316), Paper (322), Printing and related support activities (323), Petroleum and coal products (324), Chemical (325), Plastics and rubber products (326) and can be found on Table 2.

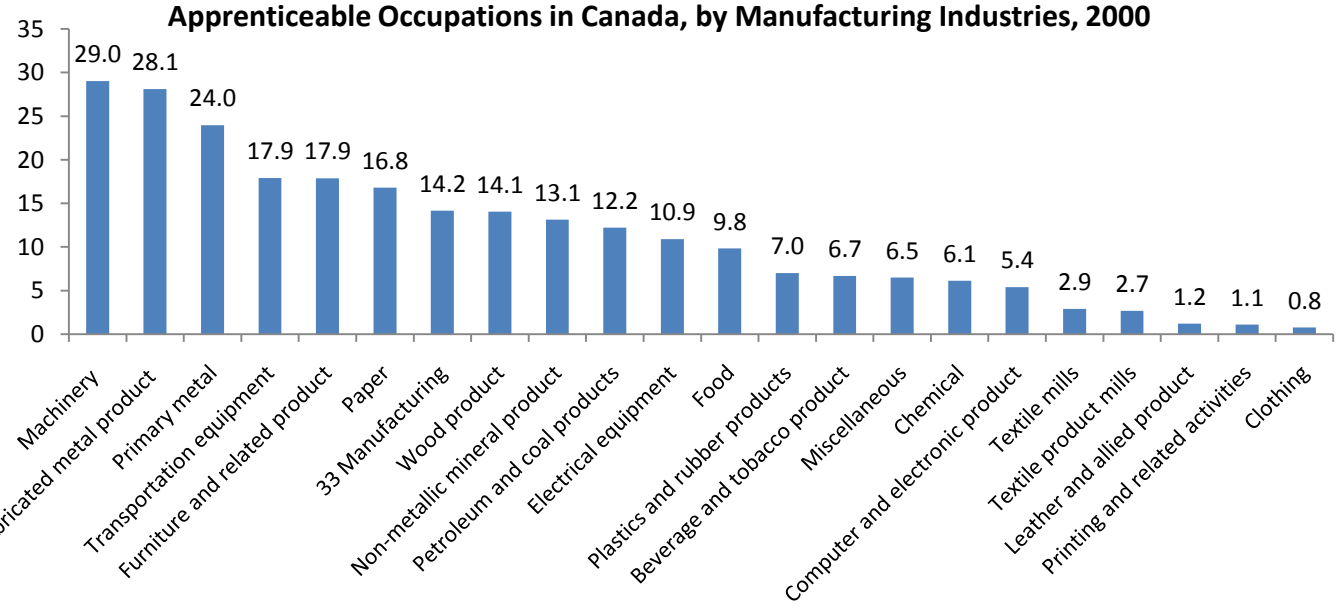
industry (Table 10, Appendix Chart 8). While only three industries have an estimated number of apprentices larger than 5,000, more than half the three-digits industries (12 out of 22) have more than 1,000 apprentices. Thus, apprenticeships if well managed, could have a definite impact on the future of the manufacturing sector.

Appendix Chart 6: Importance of Apprenticeable Occupations in Manufacturing Industries (Full Time Full Year Employment in Main Apprenticeable Occupations in Canada, 3-Digits Manufacturing Industries as a Proportion of Total Manufacturing, 2000)



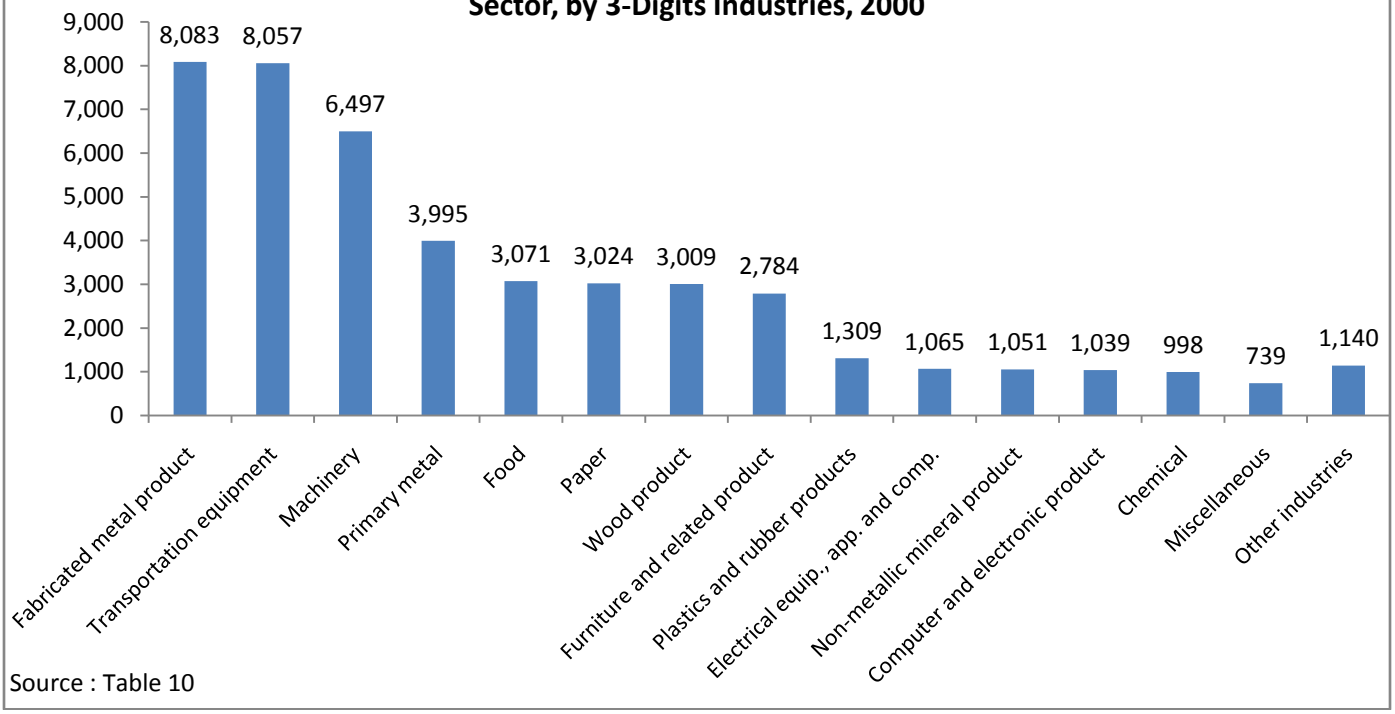
Source : Table 7 and Table 8

Appendix Chart 7: Percentage of Full Time Full Year Employment in Main Apprenticeable Occupations in Canada, by Manufacturing Industries, 2000



Source : Table 7 and Table 8

Appendix Chart 8: Estimated Number of Apprentices in the Manufacturing Sector, by 3-Digits Industries, 2000



Source : Table 10

C. Main Findings Related to Apprenticeable Occupations in Manufacturing

On an industry basis, the durables industries seem to have the largest potential for using apprentices in the existing apprenticeship system. Fabricated metal product manufacturing, machinery manufacturing, transportation and equipment and primary metal manufacturing all use a large number of machinists, tool and die makers, welders, and industrial electricians. These are not only existing Red Seal trades, they are also four categories of skills for which manufacturing companies indicated they had difficulty finding qualified personnel in a survey by the CME. Thus, a closer interaction between these industries and the existing apprenticeship system could definitely contribute to a more thriving manufacturing industry.

The low number of workers in other manufacturing industries working in apprenticeable occupations does not necessarily mean that these industries cannot benefit from the apprenticeship system. It may simply indicate that these industries never participated in the apprenticeship system. In certain cases, the development of new trade certifications could well be a way to ensure a steady flow of skilled labour in the future.

In any case, manufacturing still employs the largest number of workers in apprenticeable occupations, which means it is one of the industries which stands to gain the most from the development of an efficient and personalized apprenticeship system.

However, if manufacturers wish to have an apprenticeship system that answers their specific needs, they will have to be involved in every step of the process to ensure the system is adapted to their changing reality.

Appendix 2: List of Tables

Table 1: Real GDP in Manufacturing by Sub-Industry, 1987-2006 (Millions of 1997 Constant Dollars)

	All industries	Index, 1987=100	Manufacturing [31-33]	Index, 1981=100	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]
1987	658,425	100.0	112,727	100.0	12,967	4,770	n.a.	n.a.	3,456	764	8,267	**10,029**	4,967	1,236
1988	687,559	104.4	120,082	106.5	12,950	5,116	n.a.	n.a.	3,386	724	8,544	**10,118**	5,260	1,366
1989	703,946	106.9	122,046	108.3	12,555	4,918	n.a.	n.a.	3,364	695	8,338	**9,859**	5,394	1,459
1990	707,670	107.5	117,566	104.3	12,816	4,708	n.a.	n.a.	3,171	592	7,759	**9,692**	5,847	1,517
1991	697,540	105.9	109,282	96.9	13,109	4,608	n.a.	n.a.	2,826	468	6,876	**9,193**	4,954	1,443
1992	703,485	106.8	110,926	98.4	13,320	4,679	n.a.	n.a.	2,745	466	7,240	**9,447**	4,841	1,490
1993	720,700	109.5	117,004	103.8	13,330	4,685	n.a.	n.a.	2,782	471	7,598	**10,140**	4,430	1,496
1994	753,118	114.4	125,812	111.6	13,685	4,916	n.a.	n.a.	2,861	500	7,729	**10,659**	4,388	1,543
1995	772,843	117.4	132,123	117.2	13,866	4,908	n.a.	n.a.	3,066	454	7,671	**10,550**	4,265	1,538
1996	783,810	119.0	133,569	118.5	13,809	4,798	n.a.	n.a.	3,025	390	7,903	**10,731**	4,274	1,571
1997	816,763	124.0	142,282	126.2	13,861	4,920	1,414	790	3,267	421	9,199	**10,836**	4,325	1,657
1998	848,963	128.9	149,390	132.5	14,581	5,179	1,609	825	3,266	387	9,616	**10,537**	4,304	1,780
1999	896,577	136.2	161,526	143.3	14,944	4,742	1,531	925	3,135	373	10,234	**11,525**	4,384	1,710
2000	946,025	143.7	179,564	159.3	15,534	4,934	1,605	1,097	3,743	437	11,351	**11,996**	5,002	1,629
2001	960,658	145.9	170,761	151.5	16,751	4,761	1,478	1,086	3,634	374	10,780	**11,279**	5,562	1,873
2002	985,873	149.7	172,130	152.7	16,657	4,778	1,560	1,046	3,371	361	11,981	**11,861**	5,196	1,856
2003	1,006,985	152.9	171,499	152.1	16,502	4,629	1,338	934	3,271	310	12,037	**11,801**	5,069	1,860
2004	1,039,166	157.8	174,992	155.2	16,805	4,747	1,270	933	3,031	246	12,807	**11,763**	4,988	1,909
2005	1,069,661	162.5	176,497	156.6	17,022	4,882	1,140	904	2,739	176	12,910	**11,362**	4,938	1,875
2006	1,100,363	167.1	174,946	155.2	17,155	4,467	933	825	2,600	171	12,620	**10,564**	4,832	1,916
87-06	2.74	2.74	2.34	2.34	1.48	-0.34	n.a.	n.a.	-1.49	-7.58	2.25	**0.27**	-0.14	2.33
89-00	2.72	2.72	3.57	3.57	1.95	0.03	n.a.	n.a.	0.98	-4.13	2.84	**1.80**	-0.68	1.01
89-95	1.57	1.57	1.33	1.33	1.67	-0.03	n.a.	n.a.	-1.53	-6.85	-1.38	**1.14**	-3.84	0.88
95-00	4.13	4.13	6.33	6.33	2.30	0.11	n.a.	n.a.	4.07	-0.76	8.15	**2.60**	3.24	1.16
00-06	2.55	2.55	-0.43	-0.43	1.67	-1.64	-8.64	-4.64	-5.89	-14.48	1.78	**-2.10**	-0.57	2.74

Source: CANSIM Table 379-0017, Statistics Canada unpublished data
Note: Growth rates refer to Annual Average Growth Rates
Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1 (Continued): Real GDP in Manufacturing by Sub-Industry, 1987-2006 (Millions of 1997 Constant Dollars)

	Chemicals [325]	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
1987	10,325	4,346	4,217	**8,021**	**7,320**	**5,949**	3,739	3,700	**13,474**	**2,803**	1,843	**47,596**
1988	10,818	4,741	4,311	**8,471**	**7,600**	**6,778**	4,286	3,735	**16,154**	**2,830**	2,131	**51,951**
1989	11,301	4,636	4,154	**8,425**	**7,920**	**7,144**	4,680	3,787	**17,173**	**2,966**	2,127	**53,487**
1990	11,367	4,448	3,826	**7,905**	**7,531**	**6,612**	4,503	3,655	**16,048**	**2,744**	1,934	**50,532**
1991	10,638	4,181	3,154	**7,842**	**6,657**	**5,905**	4,602	3,108	**14,471**	**2,266**	1,861	**46,334**
1992	10,884	4,518	3,053	**8,164**	**6,161**	**5,857**	5,018	2,913	**14,922**	**2,280**	1,769	**46,831**
1993	11,452	5,193	3,057	**8,682**	**6,231**	**6,870**	5,064	2,984	**17,064**	**2,435**	1,813	**51,422**
1994	12,135	5,869	3,114	**8,699**	**6,997**	**7,889**	5,910	3,164	**19,248**	**2,708**	1,987	**56,200**
1995	12,743	6,141	3,172	**8,941**	**7,638**	**9,050**	6,952	3,051	**20,808**	**2,888**	2,031	**59,875**
1996	12,808	6,628	3,401	**9,084**	**7,788**	**9,102**	6,635	3,238	**20,914**	**3,086**	2,159	**60,705**
1997	12,837	7,067	3,789	**9,586**	**9,327**	**9,831**	7,631	3,330	**22,168**	**3,466**	2,560	**65,215**
1998	12,951	7,342	4,152	**10,400**	**9,832**	**10,130**	8,905	3,636	**23,107**	**4,088**	2,763	**68,141**
1999	13,495	7,973	4,181	**10,776**	**10,641**	**9,983**	12,447	3,836	**27,497**	**4,465**	2,729	**75,099**
2000	14,998	9,107	4,617	**11,667**	**13,208**	**11,463**	16,070	4,674	**28,104**	**5,187**	3,141	**81,514**
2001	15,346	9,141	4,854	**11,431**	**12,788**	**11,376**	9,306	4,663	**25,724**	**5,406**	3,148	**77,504**
2002	16,002	9,821	4,948	**11,953**	**13,085**	**11,148**	8,318	3,964	**25,416**	**5,325**	3,483	**78,280**
2003	16,619	9,753	5,240	**11,583**	**12,872**	**10,805**	9,676	3,441	**25,389**	**4,864**	3,506	**77,926**
2004	17,380	9,647	5,338	**11,755**	**12,826**	**10,919**	10,107	3,404	**26,772**	**4,861**	3,484	**81,785**
2005	17,539	9,373	5,393	**12,090**	**12,981**	**11,246**	10,823	3,347	**27,382**	**4,923**	3,452	**84,241**
2006	17,768	8,849	5,409	**12,160**	**13,071**	**11,758**	11,159	3,266	**27,082**	**4,696**	3,645	**79,331**
87-06	2.90	3.81	1.32	**2.21**	**3.10**	**3.65**	5.92	-0.65	**3.74**	**2.75**	3.65	**2.73**
89-00	2.61	6.33	0.97	**3.00**	**4.76**	**4.39**	11.87	1.93	**4.58**	**5.21**	3.61	**3.90**
89-95	2.02	4.80	-4.40	**1.00**	**-0.60**	**4.02**	6.82	-3.54	**3.25**	**-0.44**	-0.77	**1.90**
95-00	3.31	8.20	7.80	**5.47**	**11.58**	**4.84**	18.24	8.91	**6.20**	**12.43**	9.11	**6.36**
00-06	2.86	-0.48	2.67	**0.69**	**-0.17**	**0.42**	-5.90	-5.80	**-0.62**	**-1.64**	2.51	**-0.45**

Source: CANSIM Table 379-0017, Statistics Canada unpublished data

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1a: Real GDP by Sub-Industry as a Share of Manufacturing Industry, 1987-2006

	Manufacturing as a share of total industry	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]	Chemicals [325]
1987	17.12	11.50	4.23	n.a.	n.a.	3.07	0.68	7.33	**8.90**	4.41	1.10	9.16
1988	17.46	10.78	4.26	n.a.	n.a.	2.82	0.60	7.12	**8.43**	4.38	1.14	9.01
1989	17.34	10.29	4.03	n.a.	n.a.	2.76	0.57	6.83	**8.08**	4.42	1.20	9.26
1990	16.61	10.90	4.00	n.a.	n.a.	2.70	0.50	6.60	**8.24**	4.97	1.29	9.67
1991	15.67	12.00	4.22	n.a.	n.a.	2.59	0.43	6.29	**8.41**	4.53	1.32	9.73
1992	15.77	12.01	4.22	n.a.	n.a.	2.47	0.42	6.53	**8.52**	4.36	1.34	9.81
1993	16.23	11.39	4.00	n.a.	n.a.	2.38	0.40	6.49	**8.67**	3.79	1.28	9.79
1994	16.71	10.88	3.91	n.a.	n.a.	2.27	0.40	6.14	**8.47**	3.49	1.23	9.65
1995	17.10	10.49	3.71	n.a.	n.a.	2.32	0.34	5.81	**7.98**	3.23	1.16	9.64
1996	17.04	10.34	3.59	n.a.	n.a.	2.26	0.29	5.92	**8.03**	3.20	1.18	9.59
1997	17.42	9.74	3.46	0.99	0.56	2.30	0.30	6.47	**7.62**	3.04	1.16	9.02
1998	17.60	9.76	3.47	1.08	0.55	2.19	0.26	6.44	**7.05**	2.88	1.19	8.67
1999	18.02	9.25	2.94	0.95	0.57	1.94	0.23	6.34	**7.14**	2.71	1.06	8.35
2000	18.98	8.65	2.75	0.89	0.61	2.08	0.24	6.32	**6.68**	2.79	0.91	8.35
2001	17.78	9.81	2.79	0.87	0.64	2.13	0.22	6.31	**6.61**	3.26	1.10	8.99
2002	17.46	9.68	2.78	0.91	0.61	1.96	0.21	6.96	**6.89**	3.02	1.08	9.30
2003	17.03	9.62	2.70	0.78	0.54	1.91	0.18	7.02	**6.88**	2.96	1.08	9.69
2004	16.84	9.60	2.71	0.73	0.53	1.73	0.14	7.32	**6.72**	2.85	1.09	9.93
2005	16.50	9.64	2.77	0.65	0.51	1.55	0.10	7.31	**6.44**	2.80	1.06	9.94
2006	15.90	9.81	2.55	0.53	0.47	1.49	0.10	7.21	**6.04**	2.76	1.10	10.16
87-06	-0.39	-0.84	-2.62	n.a.	n.a.	-3.74	-9.69	-0.09	**-2.02**	-2.43	-0.01	0.55
89-00	0.83	-1.56	-3.42	n.a.	n.a.	-2.51	-7.44	-0.70	**-1.71**	-4.11	-2.48	-0.93
89-95	-0.23	0.33	-1.35	n.a.	n.a.	-2.83	-8.07	-2.68	**-0.19**	-5.10	-0.44	0.68
95-00	2.11	-3.79	-5.85	n.a.	n.a.	-2.12	-6.67	1.72	**-3.50**	-2.91	-4.86	-2.84
00-06	-2.91	2.11	-1.22	-8.25	-4.22	-5.48	-14.10	2.22	**-1.67**	-0.14	3.19	3.31

Source: Calculated from Table 1

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1a (Continued): Real GDP by Sub-Industry as a Share of Manufacturing Industry, 1987-2006

	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
1987	3.86	3.74	**7.12**	**6.49**	**5.28**	3.32	3.28	**11.95**	**2.49**	1.63	**42.22**
1988	3.95	3.59	**7.05**	**6.33**	**5.64**	3.57	3.11	**13.45**	**2.36**	1.77	**43.26**
1989	3.80	3.40	**6.90**	**6.49**	**5.85**	3.83	3.10	**14.07**	**2.43**	1.74	**43.83**
1990	3.78	3.25	**6.72**	**6.41**	**5.62**	3.83	3.11	**13.65**	**2.33**	1.65	**42.98**
1991	3.83	2.89	**7.18**	**6.09**	**5.40**	4.21	2.84	**13.24**	**2.07**	1.70	**42.40**
1992	4.07	2.75	**7.36**	**5.55**	**5.28**	4.52	2.63	**13.45**	**2.06**	1.59	**42.22**
1993	4.44	2.61	**7.42**	**5.33**	**5.87**	4.33	2.55	**14.58**	**2.08**	1.55	**43.95**
1994	4.66	2.48	**6.91**	**5.56**	**6.27**	4.70	2.51	**15.30**	**2.15**	1.58	**44.67**
1995	4.65	2.40	**6.77**	**5.78**	**6.85**	5.26	2.31	**15.75**	**2.19**	1.54	**45.32**
1996	4.96	2.55	**6.80**	**5.83**	**6.81**	4.97	2.42	**15.66**	**2.31**	1.62	**45.45**
1997	4.97	2.66	**6.74**	**6.56**	**6.91**	5.36	2.34	**15.58**	**2.44**	1.80	**45.84**
1998	4.91	2.78	**6.96**	**6.58**	**6.78**	5.96	2.43	**15.47**	**2.74**	1.85	**45.61**
1999	4.94	2.59	**6.67**	**6.59**	**6.18**	7.71	2.37	**17.02**	**2.76**	1.69	**46.49**
2000	5.07	2.57	**6.50**	**7.36**	**6.38**	8.95	2.60	**15.65**	**2.89**	1.75	**45.40**
2001	5.35	2.84	**6.69**	**7.49**	**6.66**	5.45	2.73	**15.06**	**3.17**	1.84	**45.39**
2002	5.71	2.87	**6.94**	**7.60**	**6.48**	4.83	2.30	**14.77**	**3.09**	2.02	**45.48**
2003	5.69	3.06	**6.75**	**7.51**	**6.30**	5.64	2.01	**14.80**	**2.84**	2.04	**45.44**
2004	5.51	3.05	**6.72**	**7.33**	**6.24**	5.78	1.95	**15.30**	**2.78**	1.99	**46.74**
2005	5.31	3.06	**6.85**	**7.35**	**6.37**	6.13	1.90	**15.51**	**2.79**	1.96	**47.73**
2006	5.06	3.09	**6.95**	**7.47**	**6.72**	6.38	1.87	**15.48**	**2.68**	2.08	**45.35**
87-06	1.44	-1.00	**-0.12**	**0.74**	**1.28**	3.50	-2.93	**1.37**	**0.40**	1.28	**0.38**
89-00	2.66	-2.52	**-0.55**	**1.15**	**0.79**	8.01	-1.58	**0.97**	**1.58**	0.03	**0.32**
89-95	3.42	-5.65	**-0.33**	**-1.91**	**2.65**	5.41	-4.80	**1.90**	**-1.75**	-2.07	**0.56**
95-00	1.76	1.38	**-0.81**	**4.94**	**-1.40**	11.21	2.42	**-0.12**	**5.73**	2.62	**0.03**
00-06	-0.04	3.12	**1.13**	**0.26**	**0.86**	-5.49	-5.39	**-0.18**	**-1.22**	2.96	**-0.02**

Source: Calculated from Table 1

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1b: Nominal GDP in Manufacturing Industry in Canada, 1987-2003

	All industries (millions of current dollars)	Manufacturing (millions of current dollars)	All industries, index, 1987=100	Manufacturing, index, 1987=100	Manufacturing nominal GDP as a share of total industries	Implicit price index, total industries, 1987=100	Implicit price index, manufacturing, 1987=100
1987	520,897	92,732	100.0	100.0	17.8	100.0	100.0
1988	568,887	103,819	109.2	112.0	18.2	104.6	105.1
1989	607,671	106,945	116.7	115.3	17.6	109.1	106.5
1990	631,401	103,090	121.2	111.2	16.3	112.8	106.6
1991	636,082	96,558	122.1	104.1	15.2	115.3	107.4
1992	649,098	96,106	124.6	103.6	14.8	116.6	105.3
1993	672,837	103,373	129.2	111.5	15.4	118.0	107.4
1994	714,150	118,523	137.1	127.8	16.6	119.9	114.5
1995	750,665	133,846	144.1	144.3	17.8	122.8	123.1
1996	775,816	135,187	148.9	145.8	17.4	125.1	123.0
1997	816,756	142,274	156.8	153.4	17.4	126.4	121.6
1998	846,534	150,086	162.5	161.8	17.7	126.0	122.1
1999	909,694	170,317	174.6	183.7	18.7	128.3	128.2
2000	999,930	187,473	192.0	202.2	18.7	133.6	126.9
2001	1,032,172	179,952	198.2	194.1	17.4	135.8	128.1
2002	1,068,765	182,736	205.2	197.1	17.1	137.0	129.1
2003	1,128,796	180,653	216.7	194.8	16.0	141.7	128.1
2004	1,200,990	188,067	230.6	202.8	15.7	146.1	130.6
87-04	5.04	4.25	4.95	4.26	-0.66	2.20	1.56
00-04	4.69	0.08	4.12	-1.23	-5.14	1.98	0.30

Source: CANSIM Table 379-0024 and Table 1

Table 1c: Labour Productivity (Value Added per Worker in 1997 Dollars) in Canadian Manufacturing, by Sub-Industry, 1987-2006

	All industries	Index, 1987=100	Manufacturing [31-33]	Index, 1981=100	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]	Chemicals [325]
1987	53,387	100.0	55,231	100.0	57,325	97,546	n.a.	n.a.	29,793	31,057	68,663	**81,338**	55,746	51,286	99,088
1988	54,098	101.3	57,174	103.5	56,526	106,583	n.a.	n.a.	27,754	32,760	67,756	**76,536**	61,810	55,081	104,826
1989	54,166	101.5	57,307	103.8	54,587	109,289	n.a.	n.a.	26,281	33,413	64,938	**68,228**	59,471	50,484	101,536
1990	54,077	101.3	57,346	103.8	56,809	115,392	n.a.	n.a.	28,414	31,323	63,030	**69,179**	68,386	59,960	107,034
1991	54,252	101.6	57,815	104.7	59,559	107,664	n.a.	n.a.	28,807	31,622	63,315	**71,820**	60,341	74,381	107,781
1992	55,258	103.5	61,133	110.7	59,121	124,441	n.a.	n.a.	28,096	33,050	66,179	**81,299**	59,399	108,759	104,453
1993	56,337	105.5	65,762	119.1	62,907	117,125	n.a.	n.a.	27,988	38,293	64,940	**83,594**	51,572	92,346	111,836
1994	57,672	108.0	69,006	124.9	62,574	148,520	n.a.	n.a.	27,404	40,323	60,954	**85,821**	55,334	93,515	131,902
1995	58,129	108.9	69,400	125.7	63,958	135,580	n.a.	n.a.	29,312	35,748	58,202	**86,903**	48,576	86,404	128,587
1996	58,400	109.4	69,361	125.6	61,401	135,155	n.a.	n.a.	31,380	31,452	57,855	**90,633**	47,331	85,847	134,963
1997	59,592	111.6	70,755	128.1	61,550	163,455	93,026	24,308	30,763	29,648	65,801	**93,414**	46,505	79,282	129,275
1998	60,441	113.2	71,359	129.2	64,008	136,649	98,110	20,833	28,425	27,842	64,798	**86,582**	45,787	95,699	119,584
1999	62,233	116.6	73,706	133.4	65,717	124,789	70,553	39,530	26,234	32,435	66,411	**98,252**	40,781	103,012	119,956
2000	64,076	120.0	79,828	144.5	68,371	127,494	74,651	41,086	37,505	42,843	68,669	**103,682**	51,674	84,404	127,317
2001	64,274	120.4	76,609	138.7	71,220	140,858	71,058	47,217	33,278	30,909	66,749	**103,954**	58,795	112,156	129,066
2002	64,392	120.6	75,301	136.3	65,916	126,402	76,098	43,223	35,672	39,239	68,346	**111,476**	50,693	112,485	128,016
2003	64,253	120.4	75,378	136.5	63,250	116,599	69,326	38,595	34,395	53,448	64,960	**109,067**	44,117	114,815	137,234
2004	65,164	122.1	76,346	138.2	61,467	127,265	64,141	37,470	36,918	31,948	68,744	**113,324**	44,142	108,466	147,789
2005	66,152	123.9	79,957	144.8	63,539	139,885	74,510	40,721	40,698	18,723	76,300	**112,273**	49,728	101,902	151,459
2006	66,752	125.0	82,611	149.6	67,090	138,297	63,469	47,414	40,000	30,536	75,796	**112,264**	53,333	116,829	171,011
87-06	1.18	1.18	2.14	2.14	0.83	1.85	n.a.	n.a.	1.56	-0.09	0.52	**1.71**	-0.23	4.43	2.91
89-00	1.54	1.54	3.06	3.06	2.07	1.41	n.a.	n.a.	3.29	2.29	0.51	**3.88**	-1.27	4.78	2.08
89-95	1.18	1.18	3.24	3.24	2.68	3.66	n.a.	n.a.	1.84	1.13	-1.81	**4.11**	-3.32	9.37	4.02
95-00	1.97	1.97	2.84	2.84	1.34	-1.22	n.a.	n.a.	5.05	3.69	3.36	**3.59**	1.24	-0.47	-0.20
00-06	0.68	0.68	0.57	0.57	-0.31	1.36	-2.67	2.42	1.08	-5.49	1.66	**1.33**	0.53	5.57	5.04

Source: CANSIM Table 379-0017, Statistics Canada unpublished data from LFS

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1c (Continued): Labour Productivity (Value Added per Worker in 1997 Dollars) in Canadian Manufacturing, by Sub-Industry, 1987-2006

	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
1987	46,432	69,131	**65,854**	**45,157**	**61,648**	35,987	48,684	**57,117**	**31,214**	29,069	**57,386**
1988	43,257	72,698	**60,550**	**47,980**	**69,518**	40,282	56,591	**63,573**	**31,514**	30,399	**59,584**
1989	44,922	73,392	**61,767**	**51,295**	**73,802**	47,321	50,225	**67,030**	**34,171**	32,130	**61,121**
1990	44,303	61,511	**58,730**	**48,214**	**70,641**	43,340	50,623	**64,658**	**31,796**	31,143	**58,827**
1991	46,872	55,431	**61,506**	**50,166**	**69,064**	51,247	44,464	**61,605**	**34,178**	26,624	**59,794**
1992	54,108	59,980	**79,571**	**49,566**	**74,517**	51,520	53,254	**63,552**	**33,382**	26,246	**64,612**
1993	63,718	73,134	**83,722**	**53,669**	**97,447**	58,543	67,359	**74,450**	**31,747**	24,401	**71,668**
1994	64,353	60,702	**88,675**	**57,259**	**95,393**	70,357	58,920	**80,637**	**36,595**	25,672	**75,956**
1995	60,029	59,736	**81,504**	**55,956**	**98,799**	79,451	56,816	**86,809**	**39,454**	26,445	**77,548**
1996	63,547	69,979	**80,106**	**61,957**	**94,517**	71,807	59,852	**84,604**	**39,212**	25,251	**77,857**
1997	65,924	72,865	**87,784**	**64,324**	**92,745**	71,991	62,127	**82,226**	**43,109**	28,540	**78,934**
1998	65,612	82,381	**96,744**	**62,032**	**97,969**	84,568	71,858	**82,732**	**43,214**	30,530	**78,776**
1999	63,631	73,869	**102,824**	**66,882**	**88,502**	98,629	61,971	**89,363**	**41,729**	33,901	**82,644**
2000	71,204	81,429	**107,332**	**77,060**	**95,050**	107,636	80,172	**88,461**	**47,370**	34,746	**86,386**
2001	75,608	85,308	**115,816**	**73,368**	**87,981**	66,094	78,107	**84,120**	**47,841**	33,067	**83,373**
2002	75,604	93,712	**118,581**	**74,052**	**86,620**	65,445	65,957	**77,323**	**44,975**	35,432	**81,567**
2003	73,386	99,810	**119,167**	**76,076**	**81,980**	81,792	62,907	**79,564**	**41,573**	38,192	**82,680**
2004	69,653	81,871	**127,219**	**72,916**	**78,838**	99,185	69,897	**84,348**	**38,366**	33,694	**85,666**
2005	65,181	86,150	**133,150**	**68,106**	**86,044**	101,911	75,045	**88,529**	**43,566**	36,452	**90,040**
2006	67,808	84,384	**134,961**	**70,961**	**95,206**	103,324	67,479	**89,409**	**42,886**	38,612	**87,726**
87-06	2.01	1.05	**3.85**	**2.41**	**2.31**	5.71	1.73	**2.39**	**1.69**	1.51	**2.26**
89-00	4.28	0.95	**5.15**	**3.77**	**2.33**	7.76	4.34	**2.55**	**3.01**	0.71	**3.20**
89-95	4.95	-3.37	**4.73**	**1.46**	**4.98**	9.02	2.08	**4.40**	**2.42**	-3.19	**4.05**
95-00	3.47	6.39	**5.66**	**6.61**	**-0.77**	6.26	7.13	**0.38**	**3.72**	5.61	**2.18**
00-06	-0.81	0.60	**3.89**	**-1.36**	**0.03**	-0.68	-2.83	**0.18**	**-1.64**	1.77	**0.26**

Source: CANSIM Table 379-0017, Statistics Canada unpublished data from LFS

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1d: Labour Productivity by Sub-Industry as a Proportion of Manufacturing Average, 1987-2006

	Manufacturing as a share of all industries	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]
1987	103.5	103.8	176.6	n.a.	n.a.	53.9	56.2	124.3	**147.3**	100.9	92.9
1988	105.7	98.9	186.4	n.a.	n.a.	48.5	57.3	118.5	**133.9**	108.1	96.3
1989	105.8	95.3	190.7	n.a.	n.a.	45.9	58.3	113.3	**119.1**	103.8	88.1
1990	106.0	99.1	201.2	n.a.	n.a.	49.5	54.6	109.9	**120.6**	119.3	104.6
1991	106.6	103.0	186.2	n.a.	n.a.	49.8	54.7	109.5	**124.2**	104.4	128.7
1992	110.6	96.7	203.6	n.a.	n.a.	46.0	54.1	108.3	**133.0**	97.2	177.9
1993	116.7	95.7	178.1	n.a.	n.a.	42.6	58.2	98.8	**127.1**	78.4	140.4
1994	119.7	90.7	215.2	n.a.	n.a.	39.7	58.4	88.3	**124.4**	80.2	135.5
1995	119.4	92.2	195.4	n.a.	n.a.	42.2	51.5	83.9	**125.2**	70.0	124.5
1996	118.8	88.5	194.9	n.a.	n.a.	45.2	45.3	83.4	**130.7**	68.2	123.8
1997	118.7	87.0	231.0	131.5	34.4	43.5	41.9	93.0	**132.0**	65.7	112.1
1998	118.1	89.7	191.5	137.5	29.2	39.8	39.0	90.8	**121.3**	64.2	134.1
1999	118.4	89.2	169.3	95.7	53.6	35.6	44.0	90.1	**133.3**	55.3	139.8
2000	124.6	85.6	159.7	93.5	51.5	47.0	53.7	86.0	**129.9**	64.7	105.7
2001	119.2	93.0	183.9	92.8	61.6	43.4	40.3	87.1	**135.7**	76.7	146.4
2002	116.9	87.5	167.9	101.1	57.4	47.4	52.1	90.8	**148.0**	67.3	149.4
2003	117.3	83.9	154.7	92.0	51.2	45.6	70.9	86.2	**144.7**	58.5	152.3
2004	117.2	80.5	166.7	84.0	49.1	48.4	41.8	90.0	**148.4**	57.8	142.1
2005	120.9	79.5	175.0	93.2	50.9	50.9	23.4	95.4	**140.4**	62.2	127.4
2006	123.8	81.2	167.4	76.8	57.4	48.4	37.0	91.7	**135.9**	64.6	141.4
87-06	0.95	-1.28	-0.28	n.a.	n.a.	-0.57	-2.18	-1.59	**-0.42**	-2.32	2.24
89-00	1.50	-0.96	-1.60	n.a.	n.a.	0.22	-0.75	-2.47	**0.79**	-4.20	1.67
89-95	2.03	-0.55	0.40	n.a.	n.a.	-1.36	-2.04	-4.89	**0.84**	-6.35	5.93
95-00	0.86	-1.45	-3.95	n.a.	n.a.	2.15	0.82	0.51	**0.73**	-1.55	-3.22
00-06	-0.11	-0.88	0.79	-3.22	1.83	0.50	-6.03	1.08	**0.76**	-0.04	4.97

Source: Calculated from Table 1c

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1d (Continued): Labour Productivity by Sub-Industry as a Proportion of Manufacturing Average, 1987-2006

Chemicals [325]	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
179.4	84.1	125.2	**119.2**	**81.8**	**111.6**	65.2	88.1	**103.4**	**56.5**	52.6	**103.9**
183.3	75.7	127.2	**105.9**	**83.9**	**121.6**	70.5	99.0	**111.2**	**55.1**	53.2	**104.2**
177.2	78.4	128.1	**107.8**	**89.5**	**128.8**	82.6	87.6	**117.0**	**59.6**	56.1	**106.7**
186.6	77.3	107.3	**102.4**	**84.1**	**123.2**	75.6	88.3	**112.7**	**55.4**	54.3	**102.6**
186.4	81.1	95.9	**106.4**	**86.8**	**119.5**	88.6	76.9	**106.6**	**59.1**	46.0	**103.4**
170.9	88.5	98.1	**130.2**	**81.1**	**121.9**	84.3	87.1	**104.0**	**54.6**	42.9	**105.7**
170.1	96.9	111.2	**127.3**	**81.6**	**148.2**	89.0	102.4	**113.2**	**48.3**	37.1	**109.0**
191.1	93.3	88.0	**128.5**	**83.0**	**138.2**	102.0	85.4	**116.9**	**53.0**	37.2	**110.1**
185.3	86.5	86.1	**117.4**	**80.6**	**142.4**	114.5	81.9	**125.1**	**56.8**	38.1	**111.7**
194.6	91.6	100.9	**115.5**	**89.3**	**136.3**	103.5	86.3	**122.0**	**56.5**	36.4	**112.2**
182.7	93.2	103.0	**124.1**	**90.9**	**131.1**	101.7	87.8	**116.2**	**60.9**	40.3	**111.6**
167.6	91.9	115.4	**135.6**	**86.9**	**137.3**	118.5	100.7	**115.9**	**60.6**	42.8	**110.4**
162.7	86.3	100.2	**139.5**	**90.7**	**120.1**	133.8	84.1	**121.2**	**56.6**	46.0	**112.1**
159.5	89.2	102.0	**134.5**	**96.5**	**119.1**	134.8	100.4	**110.8**	**59.3**	43.5	**108.2**
168.5	98.7	111.4	**151.2**	**95.8**	**114.8**	86.3	102.0	**109.8**	**62.4**	43.2	**108.8**
170.0	100.4	124.5	**157.5**	**98.3**	**115.0**	86.9	87.6	**102.7**	**59.7**	47.1	**108.3**
182.1	97.4	132.4	**158.1**	**100.9**	**108.8**	108.5	83.5	**105.6**	**55.2**	50.7	**109.7**
193.6	91.2	107.2	**166.6**	**95.5**	**103.3**	129.9	91.6	**110.5**	**50.3**	44.1	**112.2**
189.4	81.5	107.7	**166.5**	**85.2**	**107.6**	127.5	93.9	**110.7**	**54.5**	45.6	**112.6**
207.0	82.1	102.1	**163.4**	**85.9**	**115.2**	125.1	81.7	**108.2**	**51.9**	46.7	**106.2**
0.76	-0.13	-1.06	**1.67**	**0.26**	**0.17**	3.49	-0.40	**0.24**	**-0.45**	-0.62	**0.11**
-0.95	1.18	-2.05	**2.03**	**0.69**	**-0.71**	4.56	1.25	**-0.49**	**-0.04**	-2.28	**0.13**
0.75	1.65	-6.41	**1.44**	**-1.73**	**1.68**	5.60	-1.13	**1.12**	**-0.79**	-6.23	**0.78**
-2.95	0.62	3.45	**2.74**	**3.67**	**-3.51**	3.33	4.17	**-2.39**	**0.86**	2.70	**-0.64**
4.44	-1.38	0.02	**3.30**	**-1.93**	**-0.54**	-1.24	-3.39	**-0.39**	**-2.20**	1.19	**-0.31**

Source: Calculated from Table 1

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 1e: Labour Productivity Indexes, Manufacturing and Business Sector in Canada, 1987-2007

	Manufacturing (1997 = 100)	Annual Rate of Growth in Manufacturing (per cent)	Business Sector (1997 = 100)	Annual Rate of Growth in the Business Sector (per cent)
1987	77.0	-	89.5	-
1988	78.5	1.9	90.2	0.7
1989	79.7	1.5	90.9	0.8
1990	81.4	2.2	90.7	-0.2
1991	82.3	1.1	91.1	0.4
1992	86.0	4.5	92.9	2.1
1993	89.9	4.5	93.8	0.9
1994	94.9	5.6	96.4	2.8
1995	96.0	1.2	97.7	1.3
1996	95.6	-0.4	97.5	-0.2
1997	100.0	4.6	100.0	2.6
1998	104.7	4.7	102.3	2.3
1999	109.1	4.2	105.7	3.3
2000	115.5	5.9	109.5	3.5
2001	112.7	-2.5	110.7	1.1
2002	114.7	1.8	112.1	1.3
2003	115.0	0.2	112.4	0.2
2004	116.7	1.5	112.4	0.0
2005	121.2	3.8	115.2	2.5
2006	121.1	-0.1	116.4	1.1
2007	123.6	2.1	117.3	0.8
Average Annual Rate of Growth				
87-06	2.41	-	1.39	-
00-06	0.79	-	1.03	-

Sources:
Manufacturing: BLS serie INU0005CA0 (Foreign labor Statistics tables) for pre-1997 data, CANSIM series v21573740
Business Sector: Aggregate Productivity Measures, CANSIM II v1409153 converted to annual averages.
*Note: Data for 2007 is a simple average of the first three quarters only.

Table 2: Real GDP in Manufacturing, by Province, 1987-2006 (Millions of 1997 Constant Dollars)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	112,727	815	104	1,626	2,011	30,609	57,434	2,972	1,302	5,158	10,975	20,406	88,043	4,556
1988	120,082	945	117	1,562	1,891	32,925	61,613	2,963	1,193	5,668	11,507	21,331	94,537	4,514
1989	122,046	964	117	1,606	1,910	33,911	62,109	2,974	1,244	5,887	11,667	21,772	96,019	4,596
1990	117,566	878	120	1,544	1,762	33,374	58,602	2,961	1,363	6,477	10,834	21,634	91,977	4,304
1991	109,282	815	127	1,683	1,793	30,646	53,752	2,600	1,268	6,563	10,303	20,734	84,399	4,419
1992	110,926	670	136	1,671	1,888	30,687	55,141	2,715	1,282	6,445	10,523	20,965	85,827	4,365
1993	117,004	718	133	1,660	1,908	32,833	58,205	2,664	1,321	7,105	10,697	21,787	91,038	4,419
1994	125,812	708	155	1,648	1,988	35,014	63,172	2,865	1,463	8,212	10,725	23,265	98,186	4,498
1995	132,123	705	185	1,772	2,158	35,171	67,962	3,149	1,472	8,557	10,846	24,024	103,132	4,820
1996	133,569	648	169	1,768	2,160	35,069	68,472	3,237	1,673	9,386	10,854	25,149	103,541	4,746
1997	142,274	653	205	1,905	2,220	37,780	71,648	3,691	1,911	10,772	11,479	27,853	109,428	4,983
1998	149,314	678	281	1,962	2,354	39,450	76,587	3,816	1,985	11,013	11,228	28,041	116,037	5,275
1999	161,634	816	316	2,131	2,558	43,711	82,814	3,553	1,934	10,869	12,809	29,165	126,524	5,821
2000	177,618	852	337	2,130	2,735	48,090	89,873	3,898	2,144	12,762	14,954	33,758	137,963	6,053
2001	170,247	821	320	2,133	2,686	46,784	85,316	3,757	2,166	12,090	13,634	31,647	132,100	5,961
2002	171,800	832	319	2,342	2,980	46,151	86,965	3,910	1,980	11,766	13,654	31,310	133,116	6,471
2003	170,465	992	328	2,268	3,039	45,322	86,432	3,911	1,969	11,654	13,751	31,286	131,754	6,627
2004	173,726	1,000	359	2,282	3,168	45,364	88,018	3,949	2,113	12,406	14,241	32,708	133,382	6,809
2005	174,987	1,057	377	2,232	2,962	45,542	87,808	3,989	2,295	13,193	14,674	34,151	133,350	6,629
2006	172,782	910	366	2,099	3,070	45,442	84,763	3,977	2,377	14,202	15,031	35,588	130,205	6,445
87-06	2.27	0.58	6.83	1.35	2.25	2.10	2.07	1.55	3.22	5.48	1.67	2.97	2.08	1.84
89-00	3.47	-1.12	10.05	2.60	3.32	3.23	3.42	2.49	5.07	7.29	2.28	4.07	3.35	2.53
89-95	1.33	-5.08	7.91	1.65	2.06	0.61	1.51	0.96	2.85	6.43	-1.21	1.65	1.20	0.79
95-00	6.10	3.86	12.69	3.76	4.85	6.46	5.75	4.36	7.81	8.32	6.63	7.04	5.99	4.66
00-06	-0.46	1.11	1.41	-0.24	1.95	-0.94	-0.97	0.34	1.73	1.80	0.09	0.88	-0.96	1.05

Source: CANSIM Table 379-0025, Statistics Canada unpublished data
Note: Growth rates refer to Annual Average Growth Rates

Table 2a: Real GDP in Manufacturing, by Province, as a Share of National Total, 1987-2006, (Millions of 1997 Constant Dollars)

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	0.72	0.09	1.44	1.78	27.15	50.95	2.64	1.15	4.58	9.74	18.10	78.10	4.04
1988	0.79	0.10	1.30	1.57	27.42	51.31	2.47	0.99	4.72	9.58	17.76	78.73	3.76
1989	0.79	0.10	1.32	1.56	27.79	50.89	2.44	1.02	4.82	9.56	17.84	78.67	3.77
1990	0.75	0.10	1.31	1.50	28.39	49.85	2.52	1.16	5.51	9.21	18.40	78.23	3.66
1991	0.75	0.12	1.54	1.64	28.04	49.19	2.38	1.16	6.01	9.43	18.97	77.23	4.04
1992	0.60	0.12	1.51	1.70	27.66	49.71	2.45	1.16	5.81	9.49	18.90	77.37	3.93
1993	0.61	0.11	1.42	1.63	28.06	49.75	2.28	1.13	6.07	9.14	18.62	77.81	3.78
1994	0.56	0.12	1.31	1.58	27.83	50.21	2.28	1.16	6.53	8.52	18.49	78.04	3.58
1995	0.53	0.14	1.34	1.63	26.62	51.44	2.38	1.11	6.48	8.21	18.18	78.06	3.65
1996	0.49	0.13	1.32	1.62	26.26	51.26	2.42	1.25	7.03	8.13	18.83	77.52	3.55
1997	0.46	0.14	1.34	1.56	26.55	50.36	2.59	1.34	7.57	8.07	19.58	76.91	3.50
1998	0.45	0.19	1.31	1.58	26.42	51.29	2.56	1.33	7.38	7.52	18.78	77.71	3.53
1999	0.51	0.20	1.32	1.58	27.04	51.24	2.20	1.20	6.72	7.92	18.04	78.28	3.60
2000	0.48	0.19	1.20	1.54	27.07	50.60	2.19	1.21	7.19	8.42	19.01	77.67	3.41
2001	0.48	0.19	1.25	1.58	27.48	50.11	2.21	1.27	7.10	8.01	18.59	77.59	3.50
2002	0.48	0.19	1.36	1.73	26.86	50.62	2.28	1.15	6.85	7.95	18.22	77.48	3.77
2003	0.58	0.19	1.33	1.78	26.59	50.70	2.29	1.16	6.84	8.07	18.35	77.29	3.89
2004	0.58	0.21	1.31	1.82	26.11	50.66	2.27	1.22	7.14	8.20	18.83	76.78	3.92
2005	0.60	0.22	1.28	1.69	26.03	50.18	2.28	1.31	7.54	8.39	19.52	76.21	3.79
2006	0.53	0.21	1.21	1.78	26.30	49.06	2.30	1.38	8.22	8.70	20.60	75.36	3.73
87-06	-1.65	4.46	-0.90	-0.02	-0.17	-0.20	-0.71	0.92	3.13	-0.59	0.68	-0.19	-0.42
89-00	-4.43	6.36	-0.84	-0.15	-0.24	-0.05	-0.95	1.55	3.69	-1.15	0.58	-0.12	-0.90
89-95	-6.33	6.49	0.32	0.72	-0.71	0.18	-0.37	1.50	5.03	-2.51	0.32	-0.13	-0.53
95-00	-2.11	6.21	-2.21	-1.18	0.34	-0.33	-1.64	1.61	2.10	0.51	0.89	-0.10	-1.35
00-06	1.58	1.88	0.22	2.42	-0.48	-0.51	0.80	2.20	2.27	0.55	1.35	-0.50	1.52

Source: Table 2
Note: Growth rates refer to Annual Average Growth Rates

Table 2b: Labour Productivity (1997 Dollars by Worker) in Canadian Manufacturing, by Province, 1987-2006

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	55,231	40,940	26,075	37,550	55,247	53,540	55,621	52,780	59,720	55,999	67,371	61,260	54,879	43,976
1988	57,174	41,083	26,591	33,441	47,747	56,572	58,545	50,057	46,961	57,605	68,047	60,583	57,842	39,704
1989	57,307	39,983	27,929	34,017	50,785	55,583	59,468	48,749	48,205	60,135	65,767	60,126	58,035	40,637
1990	57,346	41,429	26,065	35,585	46,601	55,960	59,039	52,588	54,747	67,259	61,345	61,097	57,883	40,225
1991	57,815	42,681	30,951	39,696	53,056	55,913	59,467	48,685	52,838	72,205	60,426	61,198	58,126	44,452
1992	61,133	40,823	33,122	42,524	54,097	57,899	64,447	52,823	51,694	70,901	62,977	62,733	61,942	46,088
1993	65,762	44,309	37,028	45,363	52,412	62,874	70,913	54,807	54,346	76,320	60,231	63,407	67,787	47,621
1994	69,006	52,799	37,683	45,654	57,124	65,766	75,169	54,983	56,494	82,204	58,289	64,286	71,522	50,882
1995	69,400	58,733	41,156	43,849	58,167	63,531	77,308	55,631	56,612	80,420	57,662	63,706	71,984	51,271
1996	69,361	49,838	33,216	47,655	60,513	64,739	75,484	55,330	60,394	87,715	56,296	65,153	71,466	52,207
1997	70,751	42,961	38,679	50,803	62,360	65,453	76,596	61,613	66,592	89,914	58,508	68,840	72,344	53,238
1998	71,323	42,905	52,093	47,851	64,128	65,751	78,102	60,666	67,962	87,402	57,315	67,732	73,413	53,333
1999	73,755	46,646	51,721	48,551	65,590	69,130	80,005	54,835	70,309	81,415	66,783	69,839	75,881	54,659
2000	78,962	56,033	54,274	50,596	67,521	75,984	83,634	55,842	76,832	92,614	73,847	77,072	80,798	58,201
2001	76,378	51,975	53,400	50,547	70,876	74,496	79,906	54,375	76,534	87,042	69,951	73,392	77,903	58,498
2002	75,156	51,975	54,914	53,830	79,032	71,099	79,500	56,828	69,975	80,478	69,449	71,174	76,372	62,827
2003	74,923	67,925	52,935	50,404	76,554	72,169	79,056	57,017	72,661	79,769	66,496	69,741	76,543	62,818
2004	75,793	58,134	57,048	52,330	75,609	71,984	80,031	57,311	73,358	85,973	67,428	72,171	77,100	62,467
2005	79,273	62,935	55,456	55,385	82,513	73,968	82,527	58,226	75,756	100,788	74,036	79,811	79,389	66,419
2006	81,589	57,968	55,455	53,683	83,206	78,173	84,157	59,719	81,113	103,290	76,108	82,589	81,967	65,569
87-06	2.07	1.85	4.05	1.90	2.18	2.01	2.20	0.65	1.62	3.27	0.64	1.58	2.13	2.12
89-00	2.96	3.12	6.23	3.68	2.62	2.88	3.15	1.24	4.33	4.00	1.06	2.28	3.05	3.32
89-95	3.24	6.62	6.68	4.32	2.29	2.25	4.47	2.23	2.72	4.96	-2.17	0.97	3.66	3.95
95-00	2.62	-0.94	5.69	2.90	3.03	3.64	1.59	0.08	6.30	2.86	5.07	3.88	2.34	2.57
00-06	0.55	0.57	0.36	0.99	3.54	0.47	0.10	1.12	0.91	1.84	0.50	1.16	0.24	2.01

Source: CANSIM Table 379-0025, Statistics Canada unpublished data from LFS
Note: Growth rates refer to Annual Average Growth Rates

Table 2c: Labour Productivity in Manufacturing, by Province, as a Share of National Total, 1987-2006

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	74.12	47.21	67.99	100.03	96.94	100.71	95.56	108.13	101.39	121.98	110.92	99.36	79.62
1988	71.86	46.51	58.49	83.51	98.95	102.40	87.55	82.14	100.75	119.02	105.96	101.17	69.45
1989	69.77	48.74	59.36	88.62	96.99	103.77	85.07	84.12	104.94	114.76	104.92	101.27	70.91
1990	72.24	45.45	62.05	81.26	97.58	102.95	91.70	95.47	117.28	106.97	106.54	100.94	70.14
1991	73.82	53.53	68.66	91.77	96.71	102.86	84.21	91.39	124.89	104.52	105.85	100.54	76.89
1992	66.78	54.18	69.56	88.49	94.71	105.42	86.41	84.56	115.98	103.02	102.62	101.32	75.39
1993	67.38	56.31	68.98	79.70	95.61	107.83	83.34	82.64	116.05	91.59	96.42	103.08	72.41
1994	76.51	54.61	66.16	82.78	95.30	108.93	79.68	81.87	119.13	84.47	93.16	103.65	73.74
1995	84.63	59.30	63.18	83.81	91.54	111.40	80.16	81.57	115.88	83.09	91.80	103.72	73.88
1996	71.85	47.89	68.71	87.24	93.34	108.83	79.77	87.07	126.46	81.16	93.93	103.04	75.27
1997	60.72	54.67	71.80	88.14	92.51	108.26	87.08	94.12	127.08	82.70	97.30	102.25	75.25
1998	60.16	73.04	67.09	89.91	92.19	109.50	85.06	95.29	122.55	80.36	94.97	102.93	74.78
1999	63.24	70.13	65.83	88.93	93.73	108.47	74.35	95.33	110.39	90.55	94.69	102.88	74.11
2000	70.96	68.73	64.08	85.51	96.23	105.92	70.72	97.30	117.29	93.52	97.61	102.32	73.71
2001	68.05	69.92	66.18	92.80	97.54	104.62	71.19	100.20	113.96	91.59	96.09	102.00	76.59
2002	69.16	73.07	71.62	105.16	94.60	105.78	75.61	93.11	107.08	92.41	94.70	101.62	83.60
2003	90.66	70.65	67.27	102.18	96.32	105.52	76.10	96.98	106.47	88.75	93.08	102.16	83.84
2004	76.70	75.27	69.04	99.76	94.97	105.59	75.61	96.79	113.43	88.96	95.22	101.72	82.42
2005	79.39	69.96	69.87	104.09	93.31	104.10	73.45	95.56	127.14	93.39	100.68	100.15	83.79
2006	71.05	67.97	65.80	101.98	95.81	103.15	73.19	99.42	126.60	93.28	101.23	100.46	80.36
87-06	-0.22	1.94	-0.17	0.10	-0.06	0.13	-1.39	-0.44	1.18	-1.40	-0.48	0.06	0.05
89-00	0.15	3.18	0.70	-0.32	-0.07	0.19	-1.67	1.33	1.02	-1.84	-0.65	0.09	0.35
89-95	3.27	3.32	1.05	-0.92	-0.96	1.19	-0.99	-0.51	1.67	-5.24	-2.20	0.40	0.69
95-00	-3.46	3.00	0.28	0.40	1.00	-1.00	-2.47	3.59	0.24	2.39	1.24	-0.27	-0.05
00-06	0.02	-0.19	0.44	2.98	-0.07	-0.44	0.57	0.36	1.28	-0.04	0.61	-0.31	1.45

Source: Table 2b

Note: Growth rates refer to Annual Average Growth Rates

Table 3: Employment (Thousands) in Manufacturing Industry, by Sub-Industry, NAICS-based, 1987-2006

	All industries	Index, 1987=100	Manufacturing [31-33]	Index, 1981=100	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]
1987	12,333.0	100.0	2,041.0	100.0	226.2	48.9	20.4	39.8	116.0	24.6	120.4	**123.3**	89.1
1988	12,709.6	103.1	2,100.3	102.9	229.1	48.0	19.4	37.3	122.0	22.1	126.1	**132.2**	85.1
1989	12,996.2	105.4	2,129.7	104.3	230.0	45.0	26.5	44.7	128.0	20.8	128.4	**144.5**	90.7
1990	13,086.4	106.1	2,050.1	100.4	225.6	40.8	17.7	35.5	111.6	18.9	123.1	**140.1**	85.5
1991	12,857.4	104.3	1,890.2	92.6	220.1	42.8	18.9	35.8	98.1	14.8	108.6	**128.0**	82.1
1992	12,730.9	103.2	1,814.5	88.9	225.3	37.6	19.4	32.8	97.7	14.1	109.4	**116.2**	81.5
1993	12,792.7	103.7	1,779.2	87.2	211.9	40.0	19.3	28.9	99.4	12.3	117.0	**121.3**	85.9
1994	13,058.7	105.9	1,823.2	89.3	218.7	33.1	14.5	27.9	104.4	12.4	126.8	**124.2**	79.3
1995	13,295.4	107.8	1,903.8	93.3	216.8	36.2	16.0	35.4	104.6	12.7	131.8	**121.4**	87.8
1996	13,421.4	108.8	1,925.7	94.4	224.9	35.5	16.9	34.8	96.4	12.4	136.6	**118.4**	90.3
1997	13,706.0	111.1	2,010.9	98.5	225.2	30.1	15.2	32.5	106.2	14.2	139.8	**116.0**	93.0
1998	14,046.2	113.9	2,093.5	102.6	227.8	37.9	16.4	39.6	114.9	13.9	148.4	**121.7**	94.0
1999	14,406.7	116.8	2,191.5	107.4	227.4	38.0	21.7	23.4	119.5	11.5	154.1	**117.3**	107.5
2000	14,764.2	119.7	2,249.4	110.2	227.2	38.7	21.5	26.7	99.8	10.2	165.3	**115.7**	96.8
2001	14,946.2	121.2	2,229.0	109.2	235.2	33.8	20.8	23.0	109.2	12.1	161.5	**108.5**	94.6
2002	15,310.4	124.1	2,285.9	112.0	252.7	37.8	20.5	24.2	94.5	9.2	175.3	**106.4**	102.5
2003	15,672.3	127.1	2,275.2	111.5	260.9	39.7	19.3	24.2	95.1	5.8	185.3	**108.2**	114.9
2004	15,947.0	129.3	2,292.1	112.3	273.4	37.3	19.8	24.9	82.1	7.7	186.3	**103.8**	113.0
2005	16,169.7	131.1	2,207.4	108.2	267.9	34.9	15.3	22.2	67.3	9.4	169.2	**101.2**	99.3
2006	16,484.3	133.7	2,117.7	103.8	255.7	32.3	14.7	17.4	65.0	5.6	166.5	**94.1**	90.6
2007	16,866.4	136.8	2,044.9	100.2	258.9	35.4	14.5	18.1	56.2	7.0	146.4	**87.1**	91.6
87-06	1.54	1.54	0.19	0.19	0.65	-2.16	-1.71	-4.26	-3.00	-7.49	1.72	**-1.41**	0.09
87-89	2.65	2.65	2.15	2.15	0.84	-4.07	13.97	5.98	5.05	-8.05	3.27	**8.26**	0.89
89-00	1.17	1.17	0.50	0.50	-0.11	-1.36	-1.88	-4.58	-2.24	-6.27	2.32	**-2.00**	0.59
89-95	0.38	0.38	-1.85	-1.85	-0.98	-3.56	-8.07	-3.81	-3.31	-7.89	0.44	**-2.86**	-0.54
95-00	2.12	2.12	3.39	3.39	0.94	1.34	6.09	-5.48	-0.94	-4.29	4.63	**-0.96**	1.97
00-06	1.85	1.85	-1.00	-1.00	1.99	-2.97	-6.14	-6.89	-6.90	-9.51	0.12	**-3.39**	-1.10
87-07	1.58	1.58	0.01	0.01	0.68	-1.60	-1.69	-3.86	-3.56	-6.09	0.98	**-1.72**	0.14
00-07	1.92	1.92	-1.35	-1.35	1.88	-1.27	-5.47	-5.40	-7.88	-5.24	-1.72	**-3.98**	-0.79

Source: Unpublished data from LFS, Statistics Canada

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 3 (continued): Employment (Thousands) by Sub-Industry, Manufacturing Industry, NAICS-based, 1987-2006

	Petroleum and coal products [324]	Chemicals [325]	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
1987	24.1	104.2	93.6	61.0	**121.8**	**162.1**	**96.5**	103.9	76.0	**235.9**	**89.8**	63.4	**829.4**
1988	24.8	103.2	109.6	59.3	**139.9**	**158.4**	**97.5**	106.4	66.0	**254.1**	**89.8**	70.1	**871.9**
1989	28.9	111.3	103.2	56.6	**136.4**	**154.4**	**96.8**	98.9	75.4	**256.2**	**86.8**	66.2	**875.1**
1990	25.3	106.2	100.4	62.2	**134.6**	**156.2**	**93.6**	103.9	72.2	**248.2**	**86.3**	62.1	**859.0**
1991	19.4	98.7	89.2	56.9	**127.5**	**132.7**	**85.5**	89.8	69.9	**234.9**	**66.3**	69.9	**774.9**
1992	13.7	104.2	83.5	50.9	**102.6**	**124.3**	**78.6**	97.4	54.7	**234.8**	**68.3**	67.4	**724.8**
1993	16.2	102.4	81.5	41.8	**103.7**	**116.1**	**70.5**	86.5	44.3	**229.2**	**76.7**	74.3	**717.5**
1994	16.5	92.0	91.2	51.3	**98.1**	**122.2**	**82.7**	84.0	53.7	**238.7**	**74.0**	77.4	**739.9**
1995	17.8	99.1	102.3	53.1	**109.7**	**136.5**	**91.6**	87.5	53.7	**239.7**	**73.2**	76.8	**772.1**
1996	18.3	94.9	104.3	48.6	**113.4**	**125.7**	**96.3**	92.4	54.1	**247.2**	**78.7**	85.5	**779.7**
1997	20.9	99.3	107.2	52.0	**109.2**	**145.0**	**106.0**	106.0	53.6	**269.6**	**80.4**	89.7	**826.2**
1998	18.6	108.3	111.9	50.4	**107.5**	**158.5**	**103.4**	105.3	50.6	**279.3**	**94.6**	90.5	**865.0**
1999	16.6	112.5	125.3	56.6	**104.8**	**159.1**	**112.8**	126.2	61.9	**307.7**	**107.0**	80.5	**908.7**
2000	19.3	117.8	127.9	56.7	**108.7**	**171.4**	**120.6**	149.3	58.3	**317.7**	**109.5**	90.4	**943.6**
2001	16.7	118.9	120.9	56.9	**98.7**	**174.3**	**129.3**	140.8	59.7	**305.8**	**113.0**	95.2	**929.6**
2002	16.5	125.0	129.9	52.8	**100.8**	**176.7**	**128.7**	127.1	60.1	**328.7**	**118.4**	98.3	**959.7**
2003	16.2	121.1	132.9	52.5	**97.2**	**169.2**	**131.8**	118.3	54.7	**319.1**	**117.0**	91.8	**942.5**
2004	17.6	117.6	138.5	65.2	**92.4**	**175.9**	**138.5**	101.9	48.7	**317.4**	**126.7**	103.4	**954.7**
2005	18.4	115.8	143.8	62.6	**90.8**	**190.6**	**130.7**	106.2	44.6	**309.3**	**113.0**	94.7	**935.6**
2006	16.4	103.9	130.5	64.1	**90.1**	**184.2**	**123.5**	108.0	48.4	**302.9**	**109.5**	94.4	**904.3**
2007	18.6	108.4	120.6	56.5	**79.7**	**177.3**	**122.8**	110.6	47.3	**277.6**	**109.3**	100.8	**853.8**
87-06	-2.01	-0.02	1.76	0.26	**-1.57**	**0.67**	**1.31**	0.20	-2.35	**1.32**	**1.05**	2.12	**0.46**
87-89	9.51	3.35	5.00	-3.67	**5.82**	**-2.40**	**0.16**	-2.44	-0.40	**4.21**	**-1.68**	2.18	**2.72**
89-00	-3.60	0.52	1.97	0.02	**-2.04**	**0.95**	**2.02**	3.82	-2.31	**1.98**	**2.13**	2.87	**0.69**
89-95	-7.76	-1.92	-0.15	-1.06	**-3.57**	**-2.03**	**-0.92**	-2.02	-5.50	**-1.10**	**-2.80**	2.51	**-2.07**
95-00	1.63	3.52	4.57	1.32	**-0.18**	**4.66**	**5.66**	11.28	1.66	**5.80**	**8.39**	3.31	**4.09**
00-06	-2.68	-2.07	0.34	2.07	**-3.08**	**1.21**	**0.40**	-5.25	-3.05	**-0.79**	**0.00**	0.72	**-0.71**
87-07	-1.29	0.20	1.28	-0.38	**-2.10**	**0.45**	**1.21**	0.31	-2.34	**0.82**	**0.99**	2.35	**0.15**
00-07	-0.53	-1.18	-0.84	-0.05	**-4.34**	**0.48**	**0.26**	-4.20	-2.94	**-1.91**	**-0.03**	1.57	**-1.42**

Source: Unpublished data from LFS, Statistics Canada

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 3a: Employment by Sub-Industry as a Share of Total Manufacturing Employment, 1987-2006

	Manufact-uring as a share of all industries	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]	Chemicals [325]
1987	16.5	11.1	2.4	1.0	2.0	5.7	1.2	5.9	**6.0**	4.4	1.2	5.1
1988	16.5	10.9	2.3	0.9	1.8	5.8	1.1	6.0	**6.3**	4.1	1.2	4.9
1989	16.4	10.8	2.1	1.2	2.1	6.0	1.0	6.0	**6.8**	4.3	1.4	5.2
1990	15.7	11.0	2.0	0.9	1.7	5.4	0.9	6.0	**6.8**	4.2	1.2	5.2
1991	14.7	11.6	2.3	1.0	1.9	5.2	0.8	5.7	**6.8**	4.3	1.0	5.2
1992	14.3	12.4	2.1	1.1	1.8	5.4	0.8	6.0	**6.4**	4.5	0.8	5.7
1993	13.9	11.9	2.2	1.1	1.6	5.6	0.7	6.6	**6.8**	4.8	0.9	5.8
1994	14.0	12.0	1.8	0.8	1.5	5.7	0.7	7.0	**6.8**	4.3	0.9	5.0
1995	14.3	11.4	1.9	0.8	1.9	5.5	0.7	6.9	**6.4**	4.6	0.9	5.2
1996	14.3	11.7	1.8	0.9	1.8	5.0	0.6	7.1	**6.1**	4.7	1.0	4.9
1997	14.7	11.2	1.5	0.8	1.6	5.3	0.7	7.0	**5.8**	4.6	1.0	4.9
1998	14.9	10.9	1.8	0.8	1.9	5.5	0.7	7.1	**5.8**	4.5	0.9	5.2
1999	15.2	10.4	1.7	1.0	1.1	5.5	0.5	7.0	**5.4**	4.9	0.8	5.1
2000	15.2	10.1	1.7	1.0	1.2	4.4	0.5	7.3	**5.1**	4.3	0.9	5.2
2001	14.9	10.6	1.5	0.9	1.0	4.9	0.5	7.2	**4.9**	4.2	0.7	5.3
2002	14.9	11.1	1.7	0.9	1.1	4.1	0.4	7.7	**4.7**	4.5	0.7	5.5
2003	14.5	11.5	1.7	0.8	1.1	4.2	0.3	8.1	**4.8**	5.1	0.7	5.3
2004	14.4	11.9	1.6	0.9	1.1	3.6	0.3	8.1	**4.5**	4.9	0.8	5.1
2005	13.7	12.1	1.6	0.7	1.0	3.0	0.4	7.7	**4.6**	4.5	0.8	5.2
2006	12.8	12.1	1.5	0.7	0.8	3.1	0.3	7.9	**4.4**	4.3	0.8	4.9
2007	12.1	12.7	1.7	0.7	0.9	2.7	0.3	7.2	**4.3**	4.5	0.9	5.3
87-06	-1.32	0.45	-2.35	-1.90	-4.45	-3.19	-7.67	1.52	**-1.60**	-0.11	-2.20	-0.21
87-89	-0.49	-1.29	-6.09	11.58	3.75	2.83	-9.98	1.10	**5.98**	-1.23	7.20	1.18
89-00	-0.66	-0.61	-1.85	-2.37	-5.05	-2.72	-6.74	1.82	**-2.49**	0.09	-4.08	0.02
89-95	-2.22	0.89	-1.74	-6.33	-2.00	-1.48	-6.16	2.33	**-1.03**	1.34	-6.02	-0.07
95-00	1.25	-2.37	-1.98	2.61	-8.59	-4.19	-7.43	1.20	**-4.21**	-1.37	-1.70	0.12
00-06	-2.80	3.02	-1.99	-5.19	-5.95	-5.96	-8.60	1.13	**-2.41**	-0.10	-1.69	-1.08
87-07	-1.54	0.67	-1.61	-1.70	-3.87	-3.57	-6.10	0.97	-1.73	0.13	-1.30	0.19
00-07	-3.21	3.28	0.09	-4.18	-4.11	-6.61	-3.94	-0.37	-2.66	0.57	0.84	0.17

Source: Calculated from Table 3

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 3a (Continued): Employment by Sub-Industry as a Share of Total Manufacturing Employment, 1987-2006

	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Total of the 6 sub-industries**
1987	4.6	3.0	**6.0**	**7.9**	**4.7**	5.1	3.7	**11.6**	**4.4**	3.1	**40.6**
1988	5.2	2.8	**6.7**	**7.5**	**4.6**	5.1	3.1	**12.1**	**4.3**	3.3	**41.5**
1989	4.8	2.7	**6.4**	**7.2**	**4.5**	4.6	3.5	**12.0**	**4.1**	3.1	**41.1**
1990	4.9	3.0	**6.6**	**7.6**	**4.6**	5.1	3.5	**12.1**	**4.2**	3.0	**41.9**
1991	4.7	3.0	**6.7**	**7.0**	**4.5**	4.8	3.7	**12.4**	**3.5**	3.7	**41.0**
1992	4.6	2.8	**5.7**	**6.9**	**4.3**	5.4	3.0	**12.9**	**3.8**	3.7	**39.9**
1993	4.6	2.3	**5.8**	**6.5**	**4.0**	4.9	2.5	**12.9**	**4.3**	4.2	**40.3**
1994	5.0	2.8	**5.4**	**6.7**	**4.5**	4.6	2.9	**13.1**	**4.1**	4.2	**40.6**
1995	5.4	2.8	**5.8**	**7.2**	**4.8**	4.6	2.8	**12.6**	**3.8**	4.0	**40.6**
1996	5.4	2.5	**5.9**	**6.5**	**5.0**	4.8	2.8	**12.8**	**4.1**	4.4	**40.5**
1997	5.3	2.6	**5.4**	**7.2**	**5.3**	5.3	2.7	**13.4**	**4.0**	4.5	**41.1**
1998	5.3	2.4	**5.1**	**7.6**	**4.9**	5.0	2.4	**13.3**	**4.5**	4.3	**41.3**
1999	5.7	2.6	**4.8**	**7.3**	**5.1**	5.8	2.8	**14.0**	**4.9**	3.7	**41.5**
2000	5.7	2.5	**4.8**	**7.6**	**5.4**	6.6	2.6	**14.1**	**4.9**	4.0	**41.9**
2001	5.4	2.6	**4.4**	**7.8**	**5.8**	6.3	2.7	**13.7**	**5.1**	4.3	**41.7**
2002	5.7	2.3	**4.4**	**7.7**	**5.6**	5.6	2.6	**14.4**	**5.2**	4.3	**42.0**
2003	5.8	2.3	**4.3**	**7.4**	**5.8**	5.2	2.4	**14.0**	**5.1**	4.0	**41.4**
2004	6.0	2.8	**4.0**	**7.7**	**6.0**	4.4	2.1	**13.8**	**5.5**	4.5	**41.7**
2005	6.5	2.8	**4.1**	**8.6**	**5.9**	4.8	2.0	**14.0**	**5.1**	4.3	**42.4**
2006	6.2	3.0	**4.3**	**8.7**	**5.8**	5.1	2.3	**14.3**	**5.2**	4.5	**42.7**
2007	5.9	2.8	**3.9**	**8.7**	**6.0**	5.4	2.3	**13.6**	**5.3**	4.9	**41.8**
87-06	1.57	0.07	**-1.77**	**0.48**	**1.11**	0.01	-2.54	**1.13**	**0.85**	1.92	**0.26**
87-89	2.79	-5.70	**3.60**	**-4.46**	**-1.95**	-4.49	-2.49	**2.02**	**-3.75**	0.03	**0.56**
89-00	1.46	-0.48	**-2.53**	**0.45**	**1.51**	3.30	-2.80	**1.47**	**1.63**	2.36	**0.19**
89-95	1.74	0.81	**-1.75**	**-0.18**	**0.95**	-0.17	-3.72	**0.76**	**-0.97**	4.44	**-0.22**
95-00	1.14	-2.00	**-3.46**	**1.22**	**2.19**	7.63	-1.68	**2.32**	**4.83**	-0.08	**0.68**
00-06	1.35	3.10	**-2.10**	**2.23**	**1.41**	-4.30	-2.07	**0.21**	**1.01**	1.74	**0.30**
87-07	1.27	-0.39	-2.11	0.44	1.20	0.30	-2.35	0.81	0.98	2.34	0.14
00-07	0.52	1.32	-3.02	1.86	1.63	-2.88	-1.61	-0.56	1.34	2.96	-0.07

Source: Calculated from Table 3

Note: Growth rates refer to Annual Average Growth Rates

Note: Industries in bold are the 6 industries who employ the largest percentage of their workforce in apprenticeable trades

Table 3b: Recent Trends in Employment (Thousands) in All Industries and Manufacturing, January 2005 to December 2007

	All industries	Manufacturing
2005		
January	16,053.8	2,278.7
February	16,073.0	2,252.8
March	16,057.8	2,249.9
April	16,105.9	2,227.0
May	16,118.5	2,206.0
June	16,143.2	2,212.8
July	16,185.0	2,199.0
August	16,223.8	2,188.9
September	16,216.1	2,173.6
October	16,272.8	2,168.6
November	16,304.5	2,169.2
December	16,303.8	2,164.0
2006		
January	16,303.7	2,122.2
February	16,345.5	2,144.2
March	16,389.3	2,130.5
April	16,422.8	2,158.5
May	16,516.5	2,135.0
June	16,508.8	2,130.3
July	16,509.8	2,097.2
August	16,502.6	2,086.8
September	16,524.5	2,104.4
October	16,564.3	2,090.8
November	16,582.4	2,101.2
December	16,654.4	2,112.1
2007		
January	16,722.4	2,113.4
February	16,741.2	2,082.0
March	16,791.8	2,080.2
April	16,788.2	2,063.5
May	16,805.9	2,052.6
June	16,849.4	2,020.3
July	16,857.0	2,042.5
August	16,875.2	2,035.8
September	16,929.5	2,030.8
October	16,992.5	2,026.9
November	17,015.4	2,008.7
December	17,012.5	1,982.5
Total Growth, December-to-December		
2006-2005	2.15	-2.40
2007-2006	2.15	-6.14

Source: LFS, CANSIM Table 282-0088 (Seasonally Adjusted)

Table 4: Employment (Thousands) in the Manufacturing Industry, by Province (1987-2006)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	2041.0	19.9	4.0	43.3	36.4	571.7	1032.6	56.3	21.8	92.1	162.9	333.1	1604.3	103.6
1988	2100.3	23.0	4.4	46.7	39.6	582.0	1052.4	59.2	25.4	98.4	169.1	352.1	1634.4	113.7
1989	2129.7	24.1	4.2	47.2	37.6	610.1	1044.4	61.0	25.8	97.9	177.4	362.1	1654.5	113.1
1990	2050.1	21.2	4.6	43.4	37.8	596.4	992.6	56.3	24.9	96.3	176.6	354.1	1589.0	107.0
1991	1890.2	19.1	4.1	42.4	33.8	548.1	903.9	53.4	24.0	90.9	170.5	338.8	1452.0	99.4
1992	1814.5	16.4	4.1	39.3	34.9	530.0	855.6	51.4	24.8	90.9	167.1	334.2	1385.6	94.7
1993	1779.2	16.2	3.6	36.6	36.4	522.2	820.8	48.6	24.3	93.1	177.6	343.6	1343.0	92.8
1994	1823.2	13.4	4.1	36.1	34.8	532.4	840.4	52.1	25.9	99.9	184.0	361.9	1372.8	88.4
1995	1903.8	12.0	4.5	40.4	37.1	553.6	879.1	56.6	26.0	106.4	188.1	377.1	1432.7	94.0
1996	1925.7	13.0	5.1	37.1	35.7	541.7	907.1	58.5	27.7	107.0	192.8	386.0	1448.8	90.9
1997	2010.9	15.2	5.3	37.5	35.6	577.2	935.4	59.9	28.7	119.8	196.2	404.6	1512.6	93.6
1998	2093.5	15.8	5.4	41.0	36.7	600.0	980.6	62.9	29.2	126.0	195.9	414.0	1580.6	98.9
1999	2191.5	17.5	6.1	43.9	39.0	632.3	1035.1	64.8	27.5	133.5	191.8	417.6	1667.4	106.5
2000	2249.4	15.2	6.2	42.1	40.5	632.9	1074.6	69.8	27.9	137.8	202.5	438.0	1707.5	104.0
2001	2229.0	15.8	6.0	42.2	37.9	628.0	1067.7	69.1	28.3	138.9	194.9	431.2	1695.7	101.9
2002	2285.9	16.0	5.8	43.5	37.7	649.1	1093.9	68.8	28.3	146.2	196.6	439.9	1743.0	103.0
2003	2275.2	14.6	6.2	45.0	39.7	628.0	1093.3	68.6	27.1	146.1	206.8	448.6	1721.3	105.5
2004	2292.1	17.2	6.3	43.6	41.9	630.2	1099.8	68.9	28.8	144.3	211.2	453.2	1730.0	109.0
2005	2207.4	16.8	6.8	40.3	35.9	615.7	1064.0	68.5	30.3	130.9	198.2	427.9	1679.7	99.8
2006	2117.7	15.7	6.6	39.1	36.9	581.3	1007.2	66.6	29.3	137.5	197.5	430.9	1588.5	98.3
2007	2044.9	15.9	6.7	41.4	37.9	543.2	950.6	70.6	30.7	142.9	205.1	449.3	1493.8	101.9
87-06	0.19	-1.24	2.67	-0.54	0.07	0.09	-0.13	0.89	1.57	2.13	1.02	1.36	-0.05	-0.28
87-89	2.15	10.05	2.47	4.41	1.63	3.30	0.57	4.09	8.79	3.10	4.36	4.26	1.55	4.48
89-00	0.50	-4.10	3.60	-1.03	0.68	0.33	0.26	1.23	0.71	3.16	1.21	1.75	0.29	-0.76
89-95	-1.85	-10.97	1.16	-2.56	-0.22	-1.61	-2.83	-1.24	0.13	1.40	0.98	0.68	-2.37	-3.04
95-00	3.39	4.84	6.62	0.83	1.77	2.71	4.10	4.28	1.42	5.31	1.49	3.04	3.57	2.04
00-06	-1.00	0.54	1.05	-1.22	-1.54	-1.41	-1.07	-0.78	0.82	-0.04	-0.42	-0.27	-1.20	-0.94
87-07	0.01	-1.12	2.61	-0.22	0.20	-0.26	-0.41	1.14	1.73	2.22	1.16	1.51	-0.36	-0.08
00-07	-1.35	0.65	1.11	-0.24	-0.94	-2.16	-1.74	0.16	1.38	0.52	0.18	0.36	-1.89	-0.29

Source: CANSIM Table 282-0008 (LFS)
Note: Growth rates refer to Annual Average Growth Rates

Table 4a: Employment in the Manufacturing Industry by Province, as a Share of Canadian Manufacturing Employment (1987-2006)

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1981	1.2	0.2	2.1	1.8	28.5	48.6	2.9	1.1	5.2	8.5	17.7	77.0	5.3
1982	1.1	0.2	2.2	1.7	27.5	49.9	2.9	1.2	5.0	8.1	17.3	77.5	5.2
1983	1.1	0.2	2.1	1.7	28.2	50.1	3.1	1.1	4.6	7.7	16.5	78.4	5.1
1984	1.0	0.2	2.1	1.7	28.1	50.8	3.0	1.2	4.3	7.6	16.1	78.9	5.0
1985	1.0	0.2	2.1	1.7	27.1	51.0	3.1	1.3	4.5	7.9	16.8	78.1	5.1
1986	1.0	0.2	2.1	1.7	28.3	50.4	3.0	1.2	4.4	7.7	16.3	78.7	5.1
1987	1.0	0.2	2.1	1.8	28.0	50.6	2.8	1.1	4.5	8.0	16.3	78.6	5.1
1988	1.1	0.2	2.2	1.9	27.7	50.1	2.8	1.2	4.7	8.1	16.8	77.8	5.4
1989	1.1	0.2	2.2	1.8	28.6	49.0	2.9	1.2	4.6	8.3	17.0	77.7	5.3
1990	1.0	0.2	2.1	1.8	29.1	48.4	2.7	1.2	4.7	8.6	17.3	77.5	5.2
1991	1.0	0.2	2.2	1.8	29.0	47.8	2.8	1.3	4.8	9.0	17.9	76.8	5.3
1992	0.9	0.2	2.2	1.9	29.2	47.2	2.8	1.4	5.0	9.2	18.4	76.4	5.2
1993	0.9	0.2	2.1	2.0	29.4	46.1	2.7	1.4	5.2	10.0	19.3	75.5	5.2
1994	0.7	0.2	2.0	1.9	29.2	46.1	2.9	1.4	5.5	10.1	19.8	75.3	4.8
1995	0.6	0.2	2.1	1.9	29.1	46.2	3.0	1.4	5.6	9.9	19.8	75.3	4.9
1996	0.7	0.3	1.9	1.9	28.1	47.1	3.0	1.4	5.6	10.0	20.0	75.2	4.7
1997	0.8	0.3	1.9	1.8	28.7	46.5	3.0	1.4	6.0	9.8	20.1	75.2	4.7
1998	0.8	0.3	2.0	1.8	28.7	46.8	3.0	1.4	6.0	9.4	19.8	75.5	4.7
1999	0.8	0.3	2.0	1.8	28.9	47.2	3.0	1.3	6.1	8.8	19.1	76.1	4.9
2000	0.7	0.3	1.9	1.8	28.1	47.8	3.1	1.2	6.1	9.0	19.5	75.9	4.6
2001	0.7	0.3	1.9	1.7	28.2	47.9	3.1	1.3	6.2	8.7	19.3	76.1	4.6
2002	0.7	0.3	1.9	1.6	28.4	47.9	3.0	1.2	6.4	8.6	19.2	76.3	4.5
2003	0.6	0.3	2.0	1.7	27.6	48.1	3.0	1.2	6.4	9.1	19.7	75.7	4.6
2004	0.8	0.3	1.9	1.8	27.5	48.0	3.0	1.3	6.3	9.2	19.8	75.5	4.8
2005	0.8	0.3	1.8	1.6	27.9	48.2	3.1	1.4	5.9	9.0	19.4	76.1	4.5
2006	0.7	0.3	1.8	1.7	27.4	47.6	3.1	1.4	6.5	9.3	20.3	75.0	4.6
2007	0.8	0.3	2.0	1.9	26.6	46.5	3.5	1.5	7.0	10.0	22.0	73.1	5.0
87-06	-1.43	2.47	-0.73	-0.12	-0.11	-0.32	0.69	1.37	1.93	0.82	1.17	-0.25	-0.47
87-89	7.73	0.31	2.21	-0.50	1.13	-1.55	1.90	6.50	0.93	2.16	2.07	-0.58	2.29
89-00	-4.58	3.09	-1.52	0.18	-0.16	-0.24	0.73	0.21	2.65	0.71	1.24	-0.21	-1.25
89-95	-9.29	3.06	-0.72	1.66	0.25	-1.00	0.62	2.02	3.31	2.89	2.58	-0.53	-1.21
95-00	1.40	3.12	-2.48	-1.57	-0.66	0.68	0.86	-1.91	1.85	-1.84	-0.34	0.17	-1.31
00-06	1.56	2.07	-0.23	-0.54	-0.41	-0.07	0.22	1.84	0.97	0.59	0.74	-0.20	0.07
87-07	-1.13	2.60	-0.23	0.19	-0.26	-0.42	1.13	1.72	2.21	1.15	1.50	-0.37	-0.09
00-07	2.03	2.50	1.13	0.41	-0.82	-0.39	1.54	2.77	1.90	1.56	1.74	-0.55	1.08

Source: Calculated from Table 4
Note: Growth rates refer to Annual Average Growth Rates

Table 4b: Employment (Thousands) in the Construction Industry, by Province (1987-2006)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	West	Quebec-Ontario	Atlantic Provinces
1987	726.6	12.3	3.8	23.4	17.5	166.0	298.0	30.1	26.3	68.8	80.4	205.6	464.0	57.0
1988	766.5	12.4	4.0	26.4	18.8	185.0	301.4	24.3	25.3	77.4	91.6	218.6	486.4	61.6
1989	806.2	12.7	4.0	26.1	20.0	181.2	324.7	23.2	24.7	81.1	108.4	237.4	505.9	62.8
1990	815.8	11.7	4.0	25.6	20.5	177.9	325.5	23.7	23.4	83.9	119.7	250.7	503.4	61.8
1991	738.9	12.6	3.9	22.2	19.3	156.3	287.0	21.5	21.1	81.7	113.2	237.5	443.3	58.0
1992	713.1	11.4	3.5	20.6	18.4	147.7	270.4	23.1	19.9	81.7	116.3	241.0	418.1	53.9
1993	691.2	10.1	3.2	20.1	17.7	140.7	261.0	22.9	18.1	81.2	116.1	238.3	401.7	51.1
1994	724.6	11.7	3.8	20.8	16.9	144.8	268.5	26.3	19.4	86.7	125.7	258.1	413.3	53.2
1995	726.4	12.2	4.3	20.2	18.3	138.1	268.4	23.5	22.1	93.4	126.0	265.0	406.5	55.0
1996	709.7	9.9	4.7	19.7	18.7	134.5	261.0	25.0	20.0	96.8	119.3	261.1	395.5	53.0
1997	721.0	8.9	4.5	21.0	18.6	123.6	280.2	24.2	22.1	94.8	123.1	264.2	403.8	53.0
1998	731.9	9.6	3.9	20.9	19.5	120.4	285.4	27.0	22.5	105.4	117.2	272.1	405.8	53.9
1999	766.9	11.4	3.8	21.5	19.1	129.7	297.8	29.1	23.4	116.9	114.3	283.7	427.5	55.8
2000	810.1	10.9	3.6	23.8	19.0	140.2	322.7	29.3	23.2	126.4	111.1	290.0	462.9	57.3
2001	824.3	10.5	4.5	24.6	18.7	137.6	336.3	27.1	23.1	131.3	110.7	292.2	473.9	58.3
2002	865.2	9.3	4.3	24.0	19.7	153.4	344.5	26.0	24.8	141.4	118.1	310.3	497.9	57.3
2003	906.0	9.5	4.2	24.5	19.2	162.9	369.1	26.9	23.3	146.6	119.8	316.6	532.0	57.4
2004	951.7	11.7	4.1	28.2	19.4	164.5	367.6	27.7	24.0	160.5	144.0	356.2	532.1	63.4
2005	1019.5	12.4	4.7	27.7	18.6	179.2	394.8	28.2	26.3	159.7	168.0	382.2	574.0	63.4
2006	1069.7	12.9	5.7	27.3	21.1	186.1	405.2	29.9	29.6	172.6	179.3	411.4	591.3	67.0
2007	1133.5	13.5	5.0	27.2	24.0	195.5	412.6	33.8	32.1	193.1	196.9	455.9	608.1	69.7
87-06	2.06	0.25	2.16	0.81	0.99	0.60	1.63	-0.04	0.62	4.96	4.31	3.72	1.28	0.85
87-89	5.34	1.61	2.60	5.61	6.90	4.48	4.38	-12.21	-3.09	8.57	16.11	7.46	4.42	4.96
89-00	0.04	-1.38	-0.95	-0.84	-0.47	-2.31	-0.06	2.14	-0.57	4.12	0.22	1.84	-0.80	-0.83
89-95	-1.72	-0.67	1.21	-4.18	-1.47	-4.43	-3.12	0.21	-1.84	2.38	2.54	1.85	-3.58	-2.19
95-00	2.21	-2.23	-3.49	3.33	0.75	0.30	3.75	4.51	0.98	6.24	-2.49	1.82	2.63	0.82
00-06	4.74	2.85	7.96	2.31	1.76	4.83	3.87	0.34	4.14	5.33	8.30	6.00	4.16	2.64

Source: CANSIM Table 282-0008
Note: Growth rates refer to Annual Average Growth Rates

Table 5: Unemployment Rates, Selected Industries and Occupations 1987-2006

	All industries	Manufacturing [NAICS 31-33]	Trades related occupations (NOCS group H)	Manufacturing as a share of total industries	Trades related occupations as a share of total industries
1987	8.8	7.0	9.4	79.5	106.8
1988	7.8	6.3	8.5	80.8	109.0
1989	7.5	6.3	8.1	84.0	108.0
1990	8.1	7.8	10.1	96.3	124.7
1991	10.3	10.0	13.6	97.1	132.0
1992	11.2	9.5	13.4	84.8	119.6
1993	11.4	8.7	12.9	76.3	113.2
1994	10.4	7.2	11.2	69.2	107.7
1995	9.5	6.4	10.2	67.4	107.4
1996	9.6	7.1	9.9	74.0	103.1
1997	9.1	5.6	8.6	61.5	94.5
1998	8.3	5.9	8.2	71.1	98.8
1999	7.6	5.4	7.6	71.1	100.0
2000	6.8	4.7	6.6	69.1	97.1
2001	7.2	6.1	7.1	84.7	98.6
2002	7.7	6.2	7.7	80.5	100.0
2003	7.6	6.0	7.2	78.9	94.7
2004	7.2	5.6	7.1	77.8	98.6
2005	6.8	5.7	6.3	83.8	92.6
2006	6.3	5.7	6.3	90.5	100.0
2007	6.0	5.9	6.1	98.3	101.7
87-06	8.5	6.7	9.0	78.9	105.3
87-89	8.0	6.5	8.7	81.4	107.9
90-00	9.3	7.1	10.2	76.2	108.9
01-06	7.1	5.9	7.0	82.7	97.4
87-07	8.3	6.6	8.9	79.8	105.1
01-07	7.0	5.9	6.8	84.9	98.0

Source: CANSIM table 282-0010 and 282-0008 (LFS)
Note: Periods refer to period averages

Table 5a: Recent Trends in Unemployment Rates, January 2005 to September 2007

	All industries	Manufacturing [NAICS 31-33]	Trades related occupations (NOC-S group H)
2005			
January	6.9	5.5	9.6
February	7.0	5.6	8.9
March	6.9	5.8	8.4
April	6.8	5.7	7.3
May	6.9	5.7	5.6
June	6.9	5.7	4.8
July	6.7	5.4	4.9
August	6.7	5.3	5.1
September	6.7	5.7	4.5
October	6.7	5.8	5.2
November	6.3	5.5	5.2
December	6.5	5.9	6.3
2006			
January	6.6	6.0	8.9
February	6.4	5.3	7.6
March	6.4	5.7	7.5
April	6.3	5.5	7.8
May	6.1	5.7	5.6
June	6.1	5.4	4.8
July	6.4	5.6	5.2
August	6.5	5.7	5.3
September	6.4	5.6	5.0
October	6.2	6.1	5.2
November	6.3	6.2	6.1
December	6.1	5.4	6.5
2007			
January	6.2	5.9	8.5
February	6.1	6.3	8.6
March	6.1	6.1	8.7
April	6.2	6.3	7.8
May	6.0	5.6	5.6
June	6.1	6.2	4.8
July	6.0	5.5	4.8
August	6.0	5.8	4.8
September	5.9	5.7	4.1
October	5.8	5.8	4.5
November	5.9	6.1	5.2
December	6.0	5.9	6.0

Source: CANSIM Tables 282-0009 and 282-0094
Note: Numbers by industry are seasonally adjusted, but not adjusted by occupation.

Table 6: Full-Time Full Year Employment in Two-Digits NAICS Industries in Canada, by Main Apprenticeable Occupation, 2000

	Total - Industry - 1997 NAICS	11 Agriculture, forestry, fishing and hunting	21 Mining and oil and gas extraction	22 Utilities	23 Construction	31-33 Manufacturing	41 Wholesale trade	44-45 Retail trade	48-49 Transportation and warehousing	81 Other services (except public administration)	All other service industries*	Distribution of employment by occupation in total manufacturing apprenticeable occupation employment	Share of manufacturing employment in total employment
All Occupation - 2001 National Occupational Classification for Statistics	8,685,225	259,220	101,825	92,265	424,115	1,467,615	483,040	801,275	488,850	396,040	4,170,990	-	16.90
B572 Storekeepers and parts clerks	25,095	45	270	590	345	4,215	5,805	7,475	1,205	1,335	3,790	2.03	16.80
C121 Biological technologists and technicians	5,775	620	0	35	20	615	250	30	25	110	4,020	0.30	10.65
C142 Electronic service technicians (household and business equipment)	34,930	45	95	220	2,175	2,910	6,760	4,350	500	5,155	12,700	1.40	8.33
C143 Industrial instrument technicians and mechanics	9,055	20	865	1,180	350	4,500	525	40	170	390	995	2.17	49.70
G412 Cooks	69,350	225	150	0	70	840	215	1,370	255	1,160	65,010	0.40	1.21
G911 Hairstylists and barbers	47,550	0	0	0	0	30	30	110	0	46,970	375	0.01	0.06
G942 Bakers	19,550	0	0	0	0	6,615	470	7,640	25	40	4,720	3.18	33.84
H111 Plumbers	22,530	25	140	165	16,975	1,045	790	265	230	260	2,610	0.50	4.64
H112 Steamfitters, pipefitters and sprinkler system installers	10,350	40	810	235	4,175	3,340	370	45	140	325	845	1.61	32.27
H121 Carpenters	51,365	180	215	230	38,735	5,400	380	395	400	390	5,025	2.60	10.51
H122 Cabinetmakers	13,375	0	0	0	2,145	9,990	145	405	0	335	310	4.81	74.69
H131 Bricklayers	5,510	0	55	0	4,480	495	145	65	0	30	215	0.24	8.98
H132 Concrete finishers	3,195	0	0	0	2,640	400	0	0	0	0	75	0.19	12.52
H133 Tilesetters	2,830	0	0	0	2,400	160	70	145	0	0	25	0.08	5.65
H134 Plasterers, drywall installers, finishers and lathers	8,905	0	0	0	8,470	175	30	0	0	0	150	0.08	1.97
H141 Roofers and shinglers	5,150	0	0	0	4,785	170	45	0	20	0	40	0.08	3.30
H142 Glaziers	4,785	0	0	0	2,140	860	240	495	0	920	70	0.41	17.97
H143 Insulators	3,830	0	120	45	2,825	485	100	0	0	85	100	0.23	12.66
H144 Painters and decorators	14,725	30	25	10	10,940	835	95	275	105	120	2,275	0.40	5.67
H145 Floor covering installers	7,540	0	0	0	5,950	90	140	1,225	0	0	80	0.04	1.19
H211 Electricians (except industrial and power system)	36,965	65	515	710	24,725	3,315	590	810	690	815	4,725	1.60	8.97
H212 Industrial electricians	21,220	45	1,850	760	3,870	11,635	465	75	1,220	355	895	5.60	54.83

Table 6 (continued): Full-Time Full Year Employment in Two-Digits NAICS Industries in Canada, by Main Apprenticeable Occupation, 2000

	Total - Industry - 1997 NAICS	11 Agriculture, forestry, fishing and hunting	21 Mining and oil and gas extraction	22 Utilities	23 Construction	31-33 Manufacturing	41 Wholesale trade	44-45 Retail trade	48-49 Transportation and warehousing	81 Other services (except public administration)	All other service industries*	Distribution of employment by occupation in total manufacturing apprenticeable occupation employment	Share of manufacturing employment in total employment
H214 Electrical power line and cable workers	8,800	0	60	6,440	1,180	375	50	0	55	30	570	0.18	4.26
H311 Machinists and machining and tooling inspectors	40,465	55	330	205	400	34,465	1,510	210	635	1,485	1,140	16.58	85.17
H312 Tool and die makers	13,985	0	50	0	60	13,060	285	80	25	155	255	6.28	93.39
H321 Sheet metal workers	11,470	0	45	20	5,410	4,895	435	25	170	185	280	2.36	42.68
H322 Boilermakers	1,645	0	55	35	335	765	55	0	85	140	130	0.37	46.50
H324 Ironworkers	4,200	0	175	40	1,990	1,415	125	0	65	185	165	0.68	33.69
H326 Welders and related machine operators	62,490	400	2,130	445	5,335	38,510	2,600	205	1,430	9,620	1,820	18.53	61.63
H411 Construction millwrights and industrial mechanics (except textile)	49,785	440	2,960	1,715	2,080	34,220	2,655	215	835	2,215	2,465	16.47	68.74
H412 Heavy-duty equipment mechanics	30,160	1,520	3,015	215	2,695	3,910	7,020	480	3,490	5,015	2,780	1.88	12.96
H413 Refrigeration and air conditioning mechanics	10,400	0	20	85	6,115	1,000	895	185	185	780	1,115	0.48	9.62
H421 Automotive service technicians, truck mechanics and mechanical repairers	93,930	200	355	355	855	4,370	4,220	23,630	8,400	46,110	5,425	2.10	4.65
H422 Motor vehicle body repairers	22,660	0	0	0	90	1,180	555	3,470	565	16,430	285	0.57	5.21
H431 Oil and solid fuel heating mechanics	1,970	0	0	50	1,070	140	275	210	20	85	105	0.07	7.11
H432 Electric appliance servicers and repairers	6,165	0	0	20	370	415	570	1,500	90	2,850	295	0.20	6.73
H433 Electrical mechanics	4,945	0	55	430	255	2,225	480	130	230	830	270	1.07	44.99
H434 Motorcycle and other related mechanics	2,425	0	0	0	20	235	565	895	60	465	140	0.11	9.69
H611 Heavy equipment operators (except crane)	33,865	1,415	4,560	535	15,440	4,835	950	150	2,310	180	3,470	2.33	14.28
H621 Crane operators	7,755	30	410	130	1,875	3,690	755	0	505	85	215	1.78	47.58
Total - Main apprenticeable occupations	830,695	5,400	19,330	14,900	183,790	207,825	41,660	56,600	24,140	145,640	129,975	100	25.02
Apprenticeable occupations as a percentage of all occupations employment, per cent	10	2	19	16.15	43.33	14.16	8.62	7.06	4.94	36.77	3.12	-	-

Source : 2001 Canadian Census for population 15 years and over with employment income who worked full time (30 hours or more per week), full year (49-52 weeks) - 20% Sample Data. Product number: 97F0012XCB2001049.

* Includes Information and cultural industries (51), Finance and insurance (52), Real estate and rental and leasing (53), Professional, scientific and technical services (54), Management of companies and enterprises (55), Administrative and support, waste management and remediation services (56), Educational services (61), Health care and social assistance (62), Arts, Entertainment and recreation (71), Accommodation and food services (72) and Public administration (91)

Table 7: Full-Time Full Year Employment in Non-Durables Manufacturing Industries in Canada, by Main Apprenticeable Occupation, 2000

	31-33 Manufacturing	311 Food	312 Beverage and tobacco product	313 Textile mills	314 Textile product mills	315 Clothing	316 Leather and allied product	322 Paper	323 Printing and related support activities	324 Petroleum and coal products	325 Chemical	326 Plastics and rubber products
All Occupations - 2001 National Occupational Classification for Statistics	1,467,615	140,300	22,800	17,955	13,815	59,025	5,745	80,875	67,350	11,830	73,390	83,930
B572 Storekeepers and parts clerks	4,215	235	55	25	25	95	0	295	50	0	95	125
C121 Biological technologists and technicians	615	310	0	0	0	0	0	60	0	0	125	0
C142 Electronic service technicians (household and business equipment)	2,910	15	50	0	0	0	0	120	115	0	160	45
C143 Industrial instrument technicians and mechanics	4,500	275	45	30	0	20	0	1,190	20	185	555	130
G412 Cooks	840	695	0	0	0	0	0	25	0	0	0	0
G911 Hairstylists and barbers	30	0	0	0	0	0	0	0	0	0	0	0
G942 Bakers	6,615	6,530	0	0	0	20	0	0	0	0	0	0
H111 Plumbers	1,045	75	35	0	0	0	0	205	0	20	40	35
H112 Steamfitters, pipefitters and sprinkler system installers	3,340	15	0	0	0	0	0	1,100	0	240	225	80
H121 Carpenters	5,400	50	30	0	0	0	0	175	30	50	60	85
H122 Cabinetmakers	9,990	0	0	0	0	0	0	0	0	0	0	0
H131 Bricklayers	495	0	0	0	0	0	0	40	0	0	0	0
H132 Concrete finishers	400	0	0	0	0	0	0	0	0	0	0	0
H133 Tilesetters	160	0	0	0	0	0	0	0	0	0	0	0
H134 Plasterers, drywall installers, finishers and lathers	175	0	0	0	0	0	0	0	0	0	0	0
H141 Roofers and shinglers	170	0	0	0	0	0	0	0	0	40	0	0
H142 Glaziers	860	0	0	0	0	0	0	0	0	0	0	95
H143 Insulators	485	0	0	0	0	0	0	45	0	35	85	20
H144 Painters and decorators	835	0	0	0	0	0	0	45	0	0	95	25
H145 Floor covering installers	90	0	0	0	20	0	0	0	0	0	0	0
H211 Electricians (except industrial and power system)	3,315	255	65	20	0	0	0	380	25	50	115	110
H212 Industrial electricians	11,635	690	165	90	40	0	0	1,755	25	125	300	420

Table 7 (continued): Full-Time Full Year Employment in Non-Durables Manufacturing Industries in Canada, by Main Apprenticeable Occupation, 2000

	31-33 Manufacturing	311 Food	312 Beverage and tobacco product	313 Textile mills	314 Textile product mills	315 Clothing	316 Leather and allied product	322 Paper	323 Printing and related support activities	324 Petroleum and coal products	325 Chemical	326 Plastics and rubber products
H214 Electrical power line and cable workers	375	0	0	0	0	0	0	0	0	0	0	0
H311 Machinists and machining and tooling inspectors	34,465	255	90	40	50	60	0	690	110	90	280	1,055
H312 Tool and die makers	13,060	0	15	0	0	0	0	130	15	0	50	400
H321 Sheet metal workers	4,895	0	0	0	0	0	0	125	0	0	20	0
H322 Boilermakers	765	0	0	0	0	0	0	0	0	50	0	0
H324 Ironworkers	1,415	0	0	0	0	0	0	0	0	20	0	0
H326 Welders and related machine operators	38,510	210	0	65	85	0	0	825	0	100	230	325
H411 Construction millwrights and industrial mechanics (except textile)	34,220	3,385	700	250	120	230	70	4,725	355	365	1,675	2,580
H412 Heavy-duty equipment mechanics	3,910	150	40	0	0	25	0	380	0	25	85	85
H413 Refrigeration and air conditioning mechanics	1,000	100	80	0	0	0	0	30	0	0	25	0
H421 Automotive service technicians, truck mechanics and mechanical repairers	4,370	155	80	0	0	0	0	90	0	0	45	65
H422 Motor vehicle body repairers	1,180	0	0	0	0	0	0	0	0	0	0	40
H431 Oil and solid fuel heating mechanics	140	0	0	0	0	0	0	0	0	0	0	0
H432 Electric appliance servicers and repairers	415	55	30	0	0	0	0	0	0	0	20	
H433 Electrical mechanics	2,225	200	15	0	0	0	0	100	0	0	55	80
H434 Motorcycle and other related mechanics	235	0	0	0	0	0	0	0	0	0	30	0
H611 Heavy equipment operators (except crane)	4,835	145	25	0	30	0	0	885	0	50	115	80
H621 Crane operators	3,690	0	0	0	0	0	0	170	0	0	0	0
Total - Main apprenticeable occupations	207,825	13,800	1,520	520	370	450	70	13,585	745	1,445	4,485	5,880
Share of apprenticeable occupations employment by industry, in per cent	14	10	7	2.90	2.68	0.76	1.22	16.80	1.11	12.21	6.11	7.01
Distribution of main apprenticeable occupations employment in manufacturing	100	7	1	0.25	0.18	0.22	0.03	6.54	0.36	0.70	2.16	2.83

Source : 2001 Canadian Census for population 15 years and over with employment income who worked full time (30 hours or more per week), full year (49-52 weeks) - 20% Sample Data. Product number: 97F0012XCB2001049

Table 8: Full-Time Full Year Employment in Durable Manufacturing Industries in Canada, by Main Apprenticeable Occupation, 2000

	31-33 Manufacturing	321 Wood product	327 Non-metallic mineral product	331 Primary metal	332 Fabricated metal product	333 Machinery	334 Computer and electronic product	335 Electrical equipment, appliance and component	336 Transportation equipment	337 Furniture and related product	339 Miscellaneous
All Occupation - 2001 National Occupational Classification for Statistics	1,467,615	96,200	35,980	74,895	129,170	100,620	86,705	43,915	202,015	69,990	51,125
B572 Storekeepers and parts clerks	4,215	135	50	345	270	455	260	140	1,340	105	95
C121 Biological technologists and technicians	615	0	0	0	0	0	0	0	0	0	0
C142 Electronic service technicians (household and business equipment)	2,910	50	30	95	75	275	1,380	200	115	35	100
C143 Industrial instrument technicians and mechanics	4,500	45	65	610	165	325	450	110	160	35	65
G412 Cooks	840	0	0	0	0	0	0	0	20	0	0
G911 Hairstylists and barbers	30	0	0	0	0	0	0	0	0	0	0
G942 Bakers	6,615	0	0	0	0	30	0	0	0	0	0
H111 Plumbers	1,045	20	20	195	80	65	0	15	210	0	0
H112 Steamfitters, pipefitters and sprinkler system installers	3,340	70	0	455	195	270	25	25	600	0	0
H121 Carpenters	5,400	2,130	95	175	155	50	20	0	590	1,510	150
H122 Cabinetmakers	9,990	995	0	20	55	20	20	0	245	8,385	200
H131 Bricklayers	495	0	95	250	20	55	0	0	0	0	0
H132 Concrete finishers	400	0	340	0	0	0	0	0	0	0	0
H133 Tilesetters	160	0	130	0	0	0	0	0	0	0	0
H134 Plasterers, drywall installers, finishers and lathers	175	50	65	0	0	0	0	0	0	0	0
H141 Roofers and shinglers	170	35	0	0	40	0	0	0	0	0	0
H142 Glaziers	860	130	420	0	140	0	0	0	20	40	0
H143 Insulators	485	0	70	35	50	40	0	35	0	0	0
H144 Painters and decorators	835	65	20	35	120	75	0	25	105	165	25
H145 Floor covering installers	90	45	0	0	0	0	0	0	0	0	0
H211 Electricians (except industrial and power system)	3,315	250	115	355	115	315	115	280	580	55	105
H212 Industrial electricians	11,635	1,050	345	2,030	560	695	200	500	2,510	30	105

Table 8 (continued): Full-Time Full Year Employment in Durable Manufacturing Industries in Canada, by Main Apprenticeable Occupation, 2000

	31-33 Manufacturing	321 Wood product	327 Non-metallic mineral product	331 Primary metal	332 Fabricated metal product	333 Machinery	334 Computer and electronic product	335 Electrical equipment, appliance and component	336 Transportation equipment	337 Furniture and related product	339 Miscellaneous
H214 Electrical power line and cable workers	375	0	0	35	0	35	35	180	20	0	0
H311 Machinists and machining and tooling inspectors	34,465	375	145	1,680	12,280	7,765	755	600	7,185	380	575
H312 Tool and die makers	13,060	25	20	705	2,605	5,090	135	165	3,460	60	180
H321 Sheet metal workers	4,895	0	0	245	2,200	950	40	70	915	65	210
H322 Boilermakers	765	0	0	65	480	90	0	0	25	0	0
H324 Ironworkers	1,415	0	100	250	860	45	0	0	60	0	0
H326 Welders and related machine operators	38,510	695	510	2,395	11,765	8,530	540	1,035	9,000	1,170	990
H411 Construction millwrights and industrial mechanics (except textile)	34,220	4,400	905	4,360	2,470	1,890	300	475	4,135	420	405
H412 Heavy-duty equipment mechanics	3,910	905	290	490	230	685	0	0	435	0	0
H413 Refrigeration and air conditioning mechanics	1,000	0	0	40	35	505	95	40	40	0	0
H421 Automotive service technicians, truck mechanics and mechanical repairers	4,370	85	125	160	305	235	0	65	2,870	0	30
H422 Motor vehicle body repairers	1,180	0	0	0	135	85	0	0	855	0	0
H431 Oil and solid fuel heating mechanics	140	0	0	20	0	65	0	0	20	0	0
H432 Electric appliance servicers and repairers	415	0	0	0	30	100	0	150	0	0	0
H433 Electrical mechanics	2,225	105	15	105	190	170	270	590	175	55	30
H434 Motorcycle and other related mechanics	235	0	0	0	20	40	0	0	60	0	0
H611 Heavy equipment operators (except crane)	4,835	1,675	575	615	195	95	30	50	220	0	30
H621 Crane operators	3,690	185	175	2,185	475	145	0	35	230	0	25
Total - Main apprenticeable occupations	207,825	13,520	4,720	17,950	36,315	29,190	4,670	4,785	36,200	12,510	3,320
Share of apprenticeable occupations employment by industry, in per cent	14	14	13	23.97	28.11	29.01	5.39	10.90	17.92	17.87	6.49
Distribution of main apprenticeable occupations employment in manufacturing	100	7	2	8.64	17.47	14.05	2.25	2.30	17.42	6.02	1.60

Source : 2001 Canadian Census for population 15 years and over with employment income who worked full time (30 hours or more per week), full year (49-52 weeks) - 20% Sample Data. Product number: 97F0012XCB2001049

Table 9: Estimated Number of Apprentices in the Manufacturing Industry for 47 Trades, 2000

	Total registered apprenticeship in all industries in 2000, persons	Share of employment in the corresponding occupation that is in manufacturing	Estimated number of apprentices
	A	B	A*B/100
H432 Appliance Service Technician	185	7	12
H422 Automotive Painter	495	5	26
H421 Automotive Service Technician	16,990	5	790
G942 Baker	665	34	225
H322 Boilermaker	790	47	367
H131 Bricklayer	2,190	9	197
H122 Cabinet Maker	1,065	75	795
H121 Carpenter	21,775	11	2,289
H132 Concrete Finisher	995	13	125
H211 Construction Electrician	23,205	9	2,081
G412 Cook	7,270	1	88
H433 Electric Motor System Technician	135	45	61
C142 Electronics Technician (Consumer Products)	105	8	9
C121 Farm Equipement Mechanic	800	11	85
H145 Floorcovering Installer	515	1	6
H142 Glazier	1,310	18	235
G911 Hairstylist	10,950	0	7
H611 Heavy Duty Equipment Operator	3,685	14	526
H412 Heavy Duty Equipment Technician	6,100	13	791
H212 Industrial Electrician	6,455	55	3,539
C143 Industrial Instrument Mechanic	2,190	50	1,088
H411 Industrial Mechanic (Millwright)	7,745	69	5,324
H143 Insulator (Heat And Frost)	1,070	13	135
H324 Ironworker (Generalist)	1,435	34	483
H134 Lather (Interior Systems Mechanic)	1,250	2	25
H311 Machinist	5,480	85	4,667
H321 Metal Fabricator (Fitter)	920	43	393
H621 Mobile Crane Operator	2,475	48	1,178
H422 Motor Vehicule Body Repairer	3,255	5	170
H434 Motorcycle Mechanic	350	10	34
H431 Oil Burner Mechanic	285	7	20
H144 Painter And Decorator	2,975	6	169
B572 Partsperson	1,285	17	216
H134 Plasterer	2,400	2	47
H111 Plumber	7,670	5	356
H214 Powerline Technician	1,025	4	44
H421 Recreation Vehicle Service Technician	225	5	10
H413 Refrigeration And Air Conditioning Mechanic	3,740	10	360
H141 Roofer	2,795	3	92
H321 Sheet Metal Worker	4,940	43	2,108
H112 Sprinkler System Installer	1,225	32	395
H112 Steamfitter - Pipefitter	7,645	32	2,467
H133 Tile Setter	780	6	44
H312 Tool And Die Maker	3,130	93	2,923
H421 Truck And Transport Mechanic	4,010	5	187
H421 Truck-Trailer Repairer	325	5	15
H326 Welder	8,580	62	5,287
Apprenticeable Occupations	184,885	17	40,493

Source : Statistics Canada unpublished data on apprenticeship registration. See Table 6 for the share of employment in the manufacturing industries by occupation.

Table 9a: Importance of Apprenticeship Trades in Manufacturing Industries in Canada, 2000

	Percentage of total employment in apprenticeable occupations	Number of workers in apprenticeable occupations
All Industries	9.56	830,695
31-33 Manufacturing	14.16	207,825
332 Fabricated metal products	28.11	36,315
336 Transportation equipment	17.92	36,200
333 Machinery	29.01	29,190
331 Primary metal	23.97	17,950
311 Food	9.84	13,800
322 Paper	16.80	13,585
321 Wood products	14.05	13,520
337 Furniture and related products	17.87	12,510
326 Plastics and rubber products	7.01	5,880
335 Electrical equipment, appliance and component	10.90	4,785
327 Non-metallic mineral products	13.12	4,720
334 Computer and electronic products	5.39	4,670
325 Chemical	6.11	4,485
339 Miscellaneous	6.49	3,320
312 Beverage and tobacco products	6.67	1,520
324 Petroleum and coal products	12.21	1,445
323 Printing and related support activities	1.11	745
313 Textile mills	2.90	520
315 Clothing	0.76	450
314 Textile product mills	2.68	370
316 Leather and allied products	1.22	70

Source : 2001 Canadian Census for population 15 years and over with employment income who worked full time (30 hours or more per week), full year (49-52 weeks) - 20% Sample Data. Product number: 97F0012XCB2001049

Table 9b: Importance of Employment in Manufacturing in Apprenticeable Occupations, Canada, 2000

	Number of workers in manufacturing	Manufacturing employment in occupation as a share of total employment in apprenticeable occupations in manufacturing	Manufacturing employment as a share of total employment in the trade
H326 Welders and related machine operators	38,510	18.53	61.63
H311 Machinists and machining and tooling inspectors	34,465	16.58	85.17
H411 Construction millwrights and industrial mechanics (except textile)	34,220	16.47	68.74
H312 Tool and die makers	13,060	6.28	93.39
H212 Industrial electricians	11,635	5.60	54.83
H122 Cabinetmakers	9,990	4.81	74.69
G942 Bakers	6,615	3.18	33.84
H121 Carpenters	5,400	2.60	10.51
H321 Sheet metal workers	4,895	2.36	42.68
H611 Heavy equipment operators (except crane)	4,835	2.33	14.28
C143 Industrial instrument technicians and mechanics	4,500	2.17	49.70
H421 Automotive service technicians, truck mechanics and mechanical repairers	4,370	2.10	4.65
B572 Storekeepers and parts clerks	4,215	2.03	16.80
H412 Heavy-duty equipment mechanics	3,910	1.88	12.96
H621 Crane operators	3,690	1.78	47.58
H112 Steamfitters, pipefitters and sprinkler system installers	3,340	1.61	32.27
H211 Electricians (except industrial and power system)	3,315	1.60	8.97
C142 Electronic service technicians (household and business equipment)	2,910	1.40	8.33
H433 Electrical mechanics	2,225	1.07	44.99
H324 Ironworkers	1,415	0.68	33.69
H422 Motor vehicle body repairers	1,180	0.57	5.21
H111 Plumbers	1,045	0.50	4.64
H413 Refrigeration and air conditioning mechanics	1,000	0.48	9.62
H142 Glaziers	860	0.41	17.97
G412 Cooks	840	0.40	1.21
H144 Painters and decorators	835	0.40	5.67
H322 Boilermakers	765	0.37	46.50
C121 Biological technologists and technicians	615	0.30	10.65
H131 Bricklayers	495	0.24	8.98
H143 Insulators	485	0.23	12.66
H432 Electric appliance servicers and repairers	415	0.20	6.73
H132 Concrete finishers	400	0.19	12.52
H214 Electrical power line and cable workers	375	0.18	4.26
H434 Motorcycle and other related mechanics	235	0.11	9.69
H134 Plasterers, drywall installers, finishers and lathers	175	0.08	1.97
H141 Roofers and shinglers	170	0.08	3.30
H133 Tilesetters	160	0.08	5.65
H431 Oil and solid fuel heating mechanics	140	0.07	7.11
H145 Floor covering installers	90	0.04	1.19
G911 Hairstylists and barbers	30	0.01	0.06
TOTAL	207,825	100.00	25.02

Source : 2001 Canadian Census for population 15 years and over with employment income who worked full time (30 hours or more per week), full year (49-52 weeks) - 20% Sample Data. Product number: 97F0012XCB2001049.

Table 10: Estimated Number of Apprentices by Industry, 2000

	Distribution of employment in apprenticeable occupations	Estimated number of apprentices
	B	A*B/100
Two-Digits Industries		
Total - Industry - 1997 NAICS	100.0	184,885
11 Agriculture, forestry, fishing and hunting	0.7	1,202
21 Mining and oil and gas extraction	2.3	4,302
22 Utilities	1.8	3,316
23 Construction	22.1	40,906
31-33 Manufacturing	**25.0**	**46,255**
41 Wholesale trade	5.0	9,272
44-45 Retail trade	6.8	12,597
48-49 Transportation and warehousing	2.9	5,373
81 Other services (except public administration)	17.5	32,415
All other service industries*	15.6	28,928
Three-Digits Manufacturing Industries**		
31-33 Manufacturing	100.0	46,255
311 Food	6.6	3,071
312 Beverage and tobacco product	0.7	338
313 Textile mills	0.3	116
314 Textile product mills	0.2	82
315 Clothing	0.2	100
316 Leather and allied product	0.0	16
322 Paper	**6.5**	**3,024**
323 Printing and related support activities	0.4	166
324 Petroleum and coal products	0.7	322
325 Chemical	2.2	998
326 Plastics and rubber products	2.8	1,309
321 Wood product	6.5	3,009
327 Non-metallic mineral product	2.3	1,051
331 Primary metal	**8.6**	**3,995**
332 Fabricated metal product	**17.5**	**8,083**
333 Machinery	**14.0**	**6,497**
334 Computer and electronic product	2.2	1,039
335 Electrical equipment, appliance and component	2.3	1,065
336 Transportation equipment	**17.4**	**8,057**
337 Furniture and related product	**6.0**	**2,784**
339 Miscellaneous	1.6	739

Source : Statistics Canada unpublished data on apprenticeship registration. Ratio of employment in the two-digits industries calculated from Table 6 and for two-digits manufacturing industries calculated from Table 7 and Table 8. Based on total registrations of 184,885 in 2000 for all industries and 46,255 in manufacturing.

* Includes Information and cultural industries (51), Finance and insurance (52), Real estate and rental and leasing (53), Professional, scientific and technical services (54), Management of companies and enterprises (55), Administrative and support, waste management and remediation services (56), Educational services (61), Health care and social assistance (62), Arts, Entertainment and recreation (71), Accommodation and food services (72) and Public administration (91)

**Manufacturing is used as the base for calculation for the three-digits manufacturing industries.

Table 10a: Ratio of Apprentices to Total Employment, by Occupation, 2000

	Total registered apprenticeship in all industries in 2000, persons	Total employment, persons	Ratio of apprentices to total employment
B572 Partsperson	1,285	25,095	5
C121 Farm Equipement Mechanic	800	5,775	14
C142 Electronics Technician (Consumer Products)	105	34,930	0
C143 Industrial Instrument Mechanic	2,190	9,055	24
G412 Cook	7,270	69,350	10
G911 Hairstylist	10,950	47,550	23
G942 Baker	665	19,550	3
H111 Plumber	7,670	22,530	34
H112 Sprinkler System Installer	1,225	10,350	86
H112 Steamfitter - Pipefitter	7,645		
H121 Carpenter	21,775	51,365	42
H122 Cabinet Maker	1,065	13,375	8
H131 Bricklayer	2,190	5,510	40
H132 Concrete Finisher	995	3,195	31
H133 Tile Setter	780	2,830	28
H134 Lather (Interior Systems Mechanic)	1,250	8,905	41
H134 Plasterer	2,400		
H141 Roofer	2,795	5,150	54
H142 Glazier	1,310	4,785	27
H143 Insulator (Heat And Frost)	1,070	3,830	28
H144 Painter And Decorator	2,975	14,725	20
H145 Floorcovering Installer	515	7,540	7
H211 Construction Electrician	23,205	36,965	63
H212 Industrial Electrician	6,455	21,220	30
H214 Powerline Technician	1,025	8,800	12
H311 Machinist	5,480	40,465	14
H312 Tool And Die Maker	3,130	13,985	22
H321 Metal Fabricator (Fitter)	920	11,470	51
H321 Sheet Metal Worker	4,940		
H322 Boilermaker	790	1,645	48
H324 Ironworker (Generalist)	1,435	4,200	34
H326 Welder	8,580	62,490	14
H411 Industrial Mechanic (Millwright)	7,745	49,785	16
H412 Heavy Duty Equipment Technician	6,100	30,160	20
H413 Refrigeration And Air Conditioning Mechanic	3,740	10,400	36
H421 Automotive Service Technician	16,990	93,930	23
H421 Recreation Vehicle Service Technician	225		
H421 Truck And Transport Mechanic	4,010		
H421 Truck-Trailer Repairer	325		
H422 Automotive Painter	495	22,660	17
H422 Motor Vehicule Body Repairer	3,255		
H431 Oil Burner Mechanic	285	1,970	14
H432 Appliance Service Technician	185	6,165	3
H433 Electric Motor System Technician	135	4,945	3
H434 Motorcycle Mechanic	350	2,425	14
H611 Heavy Duty Equipment Operator	3,685	33,865	11
H621 Mobile Crane Operator	2,475	7,755	32
Apprenticeable Occupations	184,885	830,695	22

Table 11: Projections for Employment, GDP and Productivity Growth by Industry, 2006-2015 (Average Annual Growth Rates)

	2006-2010			2011-2015		
	GDP	Employment	Productivity	GDP	Employment	Productivity
Total economy	2.8	1.4	1.4	2.8	1.1	1.6
Manufacturing	3.4	0.3	3.2	3.4	0.6	2.8
Food products and beverages	2.4	0.3	2.1	2.5	0.4	2.1
Wood	1.0	-1.2	2.3	1.5	-0.6	2.1
Pulp and paper	1.1	-1.4	2.6	1.1	-0.9	2.0
Printing and publishing	2.1	-0.9	2.8	1.6	-0.5	2.1
Manufactured and mineral products	4.2	0.8	3.3	3.9	0.6	3.2
Rubber, plastics and chemicals	4.2	0.9	3.3	4.2	1.3	2.8
Metal fabrication and machinery	5.0	1.2	3.8	4.4	1.1	3.2
Electrical and electronic products	5.8	2.0	3.6	6.7	2.9	3.5
Motor vehicles, trailers and parts	1.7	-0.3	2.1	1.9	-0.1	2.0
Other transportation equipment	5.1	2.8	2.0	4.4	2.4	1.8
Other manufacturing	2.5	-1.0	3.5	2.7	-0.2	3.0

Source: *Looking Ahead: A 10-Year Outlook for the Canadian Labour Market 2006-2015* , HRSDC, 2006

Table 11a: Non-student Employment Growth by Selected Occupation and Skills (NOC Classification), 2006-2015

	Employment		Employment share		AAGR
	2005	2015	2005	2015	2006-2015
Total	14,566,800	16,263,800			1.1
By Education					
Less than High School	2,126,753	1,919,128	14.6	11.8	-1.0
High School	4,370,040	4,683,974	30.0	28.8	0.7
College	4,894,445	5,692,330	33.6	35.0	1.5
University	3,175,562	3,968,367	21.8	24.4	2.3
By skill level					
Management Occupations	1,376,700	1,547,000	9.5	9.5	1.2
Occupations usually requiring:					
University education	2,525,800	2,971,200	17.3	18.3	1.6
College or apprenticeships	4,843,200	5,402,600	33.2	33.2	1.1
High school education	4,353,300	4,778,200	29.9	29.4	0.9
Only on-the-job training	1,467,500	1,564,800	10.1	9.6	0.6
By occupation					
22 Technical Occupations related to natural and applied science	477,300	563,600	3.3	3.5	1.7
72-73 Trades, skilled transport and equipment operators	1,378,300	1,507,700	9.5	9.3	0.9
74 Intermediate occupations in transport, equipment operation, installation and maintenance	782,900	876,300	5.4	5.4	1.1

Source: *Looking Ahead: A 10-Year Outlook for the Canadian Labour Market 2006-2015* , HRSDC, 2006
Note: Employment by education level was estimated from the shares given in the HRSDC report.
Note: Average annual growth rates for 2006-2015 are calculated with 2005 as the base year.

Table 11b: Labour Market Conditions by Selected Occupations and Skills (NOC classification), 2004-2013

	NOC-S equivalent	Current conditions	Expansion demand	Retirements	Demand	Supply	Potential pressures	Future conditions
Total		Fair	A	A	A	A	--	Fair
By skill level								
Management		Good	A	AA	AA	BA	Up	Good
Requiring:								
University education		Fair	AA	AA	AA	A	Up	Fair*
College or apprenticeships		Fair	A	A	A	A	--	Fair
High school education		Fair	A	A	A	A	--	Fair
Only on-the-job training		Limited	BA	A	BA	BA	Down	Limited
By occupation								
Technical occupations related to electronics and electrical engineering	C-14	Fair	AA	BA	A	A	--	Fair
Butchers and Bakers	G-94	Limited	A	BA	A	AA	Down	Limited
Plumbers, Pipefitters and Gas Fitters	H-11	Fair	BA	A	BA	BA	--	Fair
Carpenters and Cabinetmakers	H-12	Fair	BA	A	BA	A	Down	Fair*
Masonry and Plastering Trades	H-13	Fair	BA	BA	BA	BA	--	Fair
Other Construction Trades	H-14	Limited	A	A	A	A	--	Limited
Electrical Trades and Telecommunication Occupations	H-21	Fair	BA	AA	AA	A	Up	Fair*
Machinists and Related Occupations	H-31	Fair	A	BA	A	A	--	Fair
Metal Forming, Shaping and Erecting Trades	H-32	Limited	A	A	A	AA	Down	Limited
Machinery and Transportation Equipment Mechanics	H-41	Fair	BA	AA	A	A	--	Fair
Motor vehicle mechanics	H-42	Fair	A	BA	A	A	--	Fair
Other mechanics	H-43	Limited	A	A	A	AA	Down	Limited
Heavy Equipment Operators	H-61	Fair	BA	A	BA	BA	--	Fair
Crane operators, drillers and blasters	H-62	Fair	BA	AA	A	BA	Up	Fair*

Source: *Looking Ahead: A 10-Year Outlook for the Canadian Labour Market 2004-2013* , HRSDC, 2004
Notes: AA=above average, BA=below average, A=average, -- = no change, *=pressures insufficient to change future conditions.

Table 12: Results of Employer Surveys on Labour Shortages (1981-2007)

Year	Percentage of firms who indicate skilled labour shortages were the main or important production issue		Percentage of firms who indicate unskilled labour shortages were the main or important production issue	Output Gap, all industries[3]
	CFIB members' survey (all industries)[1]	Business Conditions Survey (manufacturing)[2]	Business Conditions Survey (manufacturing)[2]	
1981	n.a.	13.75	1.25	n.a.
1982	n.a.	5.00	0.00	n.a.
1983	n.a.	2.00	0.00	n.a.
1984	n.a.	2.75	0.25	n.a.
1985	n.a.	3.50	0.25	0.58
1986	n.a.	4.75	0.25	-0.45
1987	n.a.	6.00	1.25	0.18
1988	n.a.	10.00	2.50	1.73
1989	n.a.	12.00	2.75	1.68
1990	n.a.	7.50	1.00	-0.05
1991	n.a.	3.75	0.00	-3.50
1992	n.a.	2.25	0.00	-3.78
1993	n.a.	2.75	0.00	-2.93
1994	n.a.	3.75	0.00	-0.30
1995	n.a.	4.50	0.00	-0.20
1996	n.a.	4.00	0.25	-1.88
1997	n.a.	5.75	0.75	-1.43
1998	31.40	7.50	1.00	-1.38
1999	45.85	7.00	1.50	0.05
2000	42.70	7.75	2.25	1.40
2001	45.50	7.50	2.50	-0.15
2002	45.80	5.50	2.00	-0.03
2003	48.05	6.50	2.00	-0.45
2004	45.90	6.00	2.25	0.25
2005	50.30	7.25	2.50	0.75
2006	52.50	8.25	4.75	0.80
2007	n.a.	12.50	4.50	0.75

Source: (1) CFIB Our Members' Opinion (1998 to 2006) from http://www.cfib.ca/research/surveys/ , (2) Cansim Table 302-0007 and 302-0001 and (3) Bank of Canada output gap data

Note: All data converted to annual averages. Data from Business Conditions Survey is available from 1981-2002 for SIC industries, and 1992-2007 for NAICS. Data for 1981-1991 are SIC data while data for 1992-2007 are NAICS data.

Note: CFIB survey is the percentage of CFIB members who indicated skilled labour shortage as an important production issue (possibility of multiple answers). The exact question is "1. Which of the following issues are the most important to your business? (Select as many as apply)". The Business Conditions Survey from Statistics Canada is the percentage of employers surveyed who indicated labour shortages (skilled or unskilled) as their main production issue.

Correlation between percentage point change in BCS and Output gap: 0.548
Correlation between percentage point change in BCS and Manufacturing Unemployment Rate: -0.529

Table 12a: Results of the CFIB Firm Survey by Province, 1998-2006 (Percentage of Member Firms who Indicate Skilled Labour Shortages as an Important Production Issue)

	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec	New Brunswick	Nova Scotia	Prince Edward Island	Newfoundland and Labrador	Canada	Western provinces	Ontario-Quebec	Atlantic provinces
1998	28.0	39.1	39.0	50.0	30.4	29.6	24.8	20.9	19.0	32.0	31.4	37.7	30.1	24.0
1999	38.0	50.9	46.4	61.9	48.1	39.0	49.3	34.4	32.3	66.5	45.9	48.2	45.2	45.0
2000	32.2	49.5	37.0	56.6	47.3	39.0	34.0	33.1	33.1	36.7	42.7	42.5	44.7	33.9
2001	40.4	59.7	44.3	53.2	48.4	39.7	43.2	33.2	37.8	43.5	45.5	48.5	45.4	38.7
2002	41.8	54.8	48.9	54.4	46.4	42.3	48.6	39.4	43.1	32.0	45.8	49.1	45.0	42.1
2003	46.6	55.8	50.3	55.6	46.9	50.3	43.5	38.3	39.9	38.2	48.1	51.4	48.1	40.2
2004	47.3	58.1	48.2	48.4	43.9	51.7	33.6	31.1	30.1	35.2	45.9	50.9	46.7	32.4
2005	55.8	67.9	60.0	57.7	46.9	51.7	44.2	31.7	29.9	43.8	50.3	61.2	48.7	37.5
2006	65.3	76.5	64.3	63.6	43.8	55.2	42.7	31.3	47.5	45.9	51.3	69.0	48.2	39.5

Source: CFIB, Our Members' opinion from 1998 to 2006 (earlier data not available)
Note: Regional aggregations are weighted averages of provincial data, using number of survey answers in each province as weights

Table 12b: Results of the Business Conditions Survey by Province, 1981-2007 (Percentage of Manufacturing Employers who Answer Skilled Labour Shortages is one of their Main Production Issue)

	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec	New Brunswick	Nova Scotia	Prince Edward Island	Newfoundland and Labrador	Canada	Western provinces	Ontario-Quebec	Atlantic provinces
1981	28.0	21.6	30.0	23.2	12.0	10.0	4.0	8.0	x	x	13.8	25.5	11.3	6.1
1982	6.7	6.4	6.0	6.4	5.0	5.0	6.0	4.0	x	x	5.0	6.5	5.0	4.9
1983	2.7	3.2	1.0	3.2	2.0	2.0	1.0	4.0	x	x	2.0	2.8	2.0	2.7
1984	1.3	1.6	2.0	10.4	3.0	2.0	2.0	3.0	x	x	2.8	3.1	2.6	2.5
1985	2.7	1.6	4.0	6.4	4.0	4.0	4.0	3.0	x	x	3.5	3.2	4.0	3.4
1986	4.0	1.6	2.0	9.6	6.0	4.0	1.0	5.0	x	x	4.8	4.2	5.3	3.2
1987	5.3	4.0	1.0	9.6	8.0	4.0	2.0	6.0	x	x	6.0	5.4	6.6	4.2
1988	8.0	8.8	4.0	16.8	12.0	8.0	8.0	6.0	x	x	10.0	9.4	10.6	6.9
1989	16.0	7.2	8.0	20.8	12.0	12.0	15.0	12.0	x	x	12.0	13.9	12.0	13.3
1990	10.7	7.2	10.0	16.8	7.0	7.0	32.0	4.0	x	x	7.5	10.7	7.0	17.0
1991	8.0	4.8	4.0	6.4	4.0	4.0	17.0	3.0	x	x	3.8	6.6	4.0	9.2
1992	3.8	4.3	3.8	8.0	1.8	2.3	20.5	4.3	4.0	0.5	2.3	4.5	1.9	9.6
1993	4.8	2.0	4.5	7.5	2.0	2.3	10.0	6.8	5.3	1.3	2.8	4.4	2.1	7.0
1994	7.8	3.5	5.0	7.8	3.5	3.3	3.3	3.5	22.0	2.5	3.8	6.4	3.4	4.1
1995	5.5	5.8	5.5	8.8	5.0	3.0	2.5	7.0	4.5	1.5	4.5	6.1	4.2	4.4
1996	4.3	7.3	6.3	7.8	3.3	4.0	1.5	4.5	6.3	0.0	4.0	5.8	3.5	2.8
1997	4.5	16.8	9.0	12.3	5.8	2.3	6.5	4.0	5.8	2.0	5.8	9.6	4.4	4.7
1998	4.0	20.5	20.3	13.8	6.0	7.8	1.5	3.8	2.5	2.3	7.5	11.6	6.7	2.6
1999	5.0	6.8	14.8	13.3	7.0	6.3	6.0	5.5	39.3	3.0	7.0	7.5	6.7	7.2
2000	6.8	15.5	12.5	19.3	7.3	6.0	6.5	1.8	17.3	3.8	7.8	11.9	6.8	4.8
2001	6.5	24.0	12.5	11.5	6.0	6.0	3.3	5.5	7.5	4.3	7.5	13.3	6.0	4.6
2002	6.3	13.5	19.0	9.5	4.5	5.0	4.5	7.0	1.5	6.3	5.5	10.0	4.7	5.7
2003	9.3	7.8	22.8	19.3	4.5	5.5	13.8	8.3	25.3	12.8	6.5	11.1	4.9	11.9
2004	9.3	12.0	15.0	13.8	4.3	5.3	11.3	8.5	29.5	9.5	6.0	11.2	4.6	10.9
2005	12.8	24.5	14.3	16.3	3.8	5.3	8.0	12.3	22.5	7.0	7.3	17.0	4.3	10.5
2006	16.3	28.0	23.5	19.8	4.3	5.5	9.0	15.5	16.3	13.0	8.3	21.0	4.7	12.7
2007	19.5	37.5	46.8	30.3	6.3	6.3	11.5	16.5	23.5	12.5	12.5	28.8	6.3	14.5

Source: CANSIM Tables 302-0008 and 302-0003. Cansim Table 302-0007 and 302-0001 for Canada.

Note: Regional aggregations are weighted averages of provincial data, using share of total manufacturing employment in each province as weights.
Atlantic provinces before 1992 do not include P.E.I and Newfoundland.

Table 12c: Results of Business Conditions Survey by Provinces, 1981-2007 (Percentage of Manufacturing Employers who Answer Unskilled Labour Shortages is one of their Main Production Issue)

	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec	New Brunswick	Nova Scotia	Prince Edward Island	Newfoundland and Labrador	Canada	Western provinces	Ontario-Quebec	Atlantic provinces
1981	0.5	7.8	1.5	1.8	1.0	0.5	0.0	0.3	x	x	1.3	2.9	0.8	0.1
1982	0.0	1.0	0.0	0.5	0.0	0.0	1.8	0.3	x	x	0.0	0.4	0.0	0.9
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	x	x	0.0	0.0	0.0	0.0
1984	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	x	x	0.3	0.0	0.2	0.0
1985	0.0	0.0	0.3	0.3	0.3	0.3	0.0	0.0	x	x	0.3	0.1	0.3	0.0
1986	0.0	0.0	0.0	0.3	0.8	0.3	0.0	0.3	x	x	0.3	0.0	0.6	0.1
1987	0.3	2.5	0.0	0.5	2.8	0.8	0.0	1.5	x	x	1.3	0.9	2.0	0.8
1988	0.5	0.5	0.0	1.3	4.0	1.3	0.5	2.5	x	x	2.5	0.6	3.0	1.6
1989	2.0	2.8	0.0	1.3	4.3	1.0	1.5	0.8	x	x	2.8	1.9	3.1	1.1
1990	0.5	2.0	0.0	0.0	1.5	1.5	0.5	0.5	x	x	1.0	0.8	1.5	0.5
1991	0.5	0.0	0.5	0.0	0.3	0.3	0.0	0.0	x	x	0.0	0.3	0.3	0.0
1992	0.3	1.3	0.3	2.0	0.0	0.0	0.0	0.3	1.0	0.0	0.0	0.8	0.0	0.1
1993	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.1
1994	0.5	0.3	0.3	0.5	0.0	0.0	0.3	0.5	0.8	0.0	0.0	0.4	0.0	0.3
1995	0.0	0.3	0.5	1.5	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.2
1996	0.0	2.0	0.5	0.0	0.0	0.0	0.0	0.3	0.8	0.0	0.3	0.6	0.0	0.1
1997	0.8	7.3	2.3	2.3	0.0	0.0	0.0	0.0	3.5	0.5	0.8	3.0	0.0	0.3
1998	0.3	6.0	2.0	3.3	0.5	0.5	0.5	0.5	3.3	0.0	1.0	2.6	0.5	0.6
1999	0.5	2.3	3.5	2.5	1.5	1.0	0.8	0.5	10.0	0.3	1.5	1.6	1.3	1.1
2000	1.0	8.5	2.5	6.5	1.8	1.8	1.5	0.3	19.3	0.0	2.3	4.3	1.8	1.8
2001	0.3	13.5	8.5	7.0	1.5	2.5	2.0	1.5	7.0	2.5	2.5	6.1	1.9	2.2
2002	0.8	6.3	5.3	4.3	1.3	2.3	3.3	1.5	4.0	0.0	2.0	3.4	1.6	2.0
2003	1.0	2.8	3.0	7.0	1.5	2.8	5.5	2.3	4.0	2.0	2.0	2.6	2.0	3.5
2004	1.5	6.3	3.5	5.8	1.0	2.8	2.3	2.3	5.8	4.5	2.3	3.8	1.6	2.8
2005	4.8	12.0	6.3	7.5	1.3	2.5	3.8	2.5	3.3	3.8	2.5	7.5	1.7	3.2
2006	8.3	21.3	8.8	11.3	1.8	3.0	8.5	9.5	6.3	11.0	4.8	12.9	2.2	9.1
2007	11.8	15.3	9.5	12.8	1.8	2.3	4.8	15.5	7.5	8.8	4.5	12.9	1.9	9.8

Source: CANSIM Tables 302-0008 and 302-0002. Cansim Table 302-0007 and 302-0001 for Canada.

Note: Regional aggregations are weighted averages of provincial data, using share of total manufacturing employment in each province as weights.
Atlantic provinces before 1992 do not include P.E.I and Newfoundland.

Table 12d: Results of Business Conditions Survey in Manufacturing by Sub-Industry, 1992-2007 (Percentage of Manufacturing Employers who Answer Skilled Labour Shortages is one of their Main Production Issue)

	Manufacturing [31-33]	**Six Main Apprenticeship Intensive Industries (Unweighted Average)**	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]	Chemicals [325]
1992	2.8	**3.2**	4.8	0.5	3.3	9.3	8.5	3.3	3.5	**2.3**	2.0	0.0	2.0
1993	2.8	**3.5**	3.3	0.0	2.5	7.0	10.3	6.8	6.3	**1.3**	1.5	0.0	0.8
1994	3.8	**5.6**	2.5	4.0	4.5	8.8	13.0	12.0	5.0	**1.5**	2.8	2.0	2.3
1995	4.5	**5.9**	5.3	7.0	4.3	7.3	13.5	22.0	5.3	**2.5**	1.5	0.0	2.5
1996	4.0	**5.1**	3.8	0.0	4.3	8.5	6.3	5.8	3.5	**2.5**	3.0	0.0	1.3
1997	5.8	**7.3**	6.5	6.8	3.5	5.5	10.0	21.0	3.8	**5.5**	4.3	8.5	5.0
1998	7.5	**7.0**	12.3	7.8	4.8	12.3	13.0	8.8	10.0	**4.0**	3.0	10.0	3.3
1999	7.0	**8.2**	12.8	2.3	6.0	12.0	15.0	5.3	9.0	**4.3**	8.8	4.0	2.3
2000	7.8	**9.4**	18.0	3.8	5.3	12.5	15.5	3.5	12.0	**5.5**	4.0	2.0	3.5
2001	7.5	**7.3**	17.8	6.8	4.8	16.5	11.5	15.5	6.0	**5.5**	4.5	23.5	6.5
2002	5.5	**5.7**	11.3	2.3	3.8	21.8	8.3	5.3	7.0	**5.0**	4.8	8.0	6.8
2003	6.5	**9.8**	12.5	4.8	6.3	9.8	14.0	24.0	10.0	**8.5**	10.3	5.8	6.0
2004	6.0	**9.6**	10.5	2.3	7.8	8.3	12.5	25.8	11.0	**5.8**	9.3	6.8	6.0
2005	7.3	**12.5**	12.0	3.0	2.0	9.0	10.0	23.8	13.8	**7.3**	9.3	12.3	5.5
2006	8.3	**13.9**	19.8	4.5	5.5	9.0	9.5	11.0	13.8	**10.8**	17.5	13.0	7.0
2007	12.5	**15.3**	21.0	10.3	1.0	12.3	10.8	33.3	15.8	**13.0**	16.0	18.5	25.0

Source: CANSIM Table 302-0007

Table 12d (continued): Results of Business Conditions Survey in Manufacturing by Sub-Industry, 1992-2007 (Percentage of Manufacturing Employers who Answer Skilled Labour Shortages is one of their Main Production Issue)

	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]
1992	3.0	2.0	**0.3**	**4.0**	**5.3**	4.3	1.8	**1.5**	**5.8**	2.8
1993	3.5	1.8	**0.5**	**3.8**	**6.3**	2.8	5.8	**2.0**	**7.3**	1.3
1994	6.0	4.0	**2.0**	**8.0**	**12.0**	3.8	2.3	**1.8**	**8.3**	4.5
1995	7.5	3.5	**0.8**	**8.8**	**15.0**	4.5	6.0	**2.5**	**5.8**	4.8
1996	7.0	3.3	**0.8**	**10.0**	**8.8**	14.5	1.3	**1.3**	**7.3**	4.8
1997	9.3	6.0	**1.3**	**8.0**	**14.3**	14.8	4.8	**1.8**	**13.3**	2.5
1998	9.0	10.0	**2.0**	**10.5**	**11.5**	23.5	11.8	**3.0**	**11.3**	5.0
1999	7.5	6.8	**2.0**	**9.8**	**14.0**	17.8	5.5	**4.0**	**15.0**	6.8
2000	11.0	10.3	**2.3**	**11.3**	**18.3**	17.3	5.8	**3.0**	**16.0**	13.8
2001	8.3	13.0	**1.3**	**9.0**	**13.3**	9.5	5.5	**1.8**	**12.8**	12.8
2002	11.8	7.5	**1.3**	**6.5**	**8.5**	3.8	7.8	**3.0**	**9.8**	9.3
2003	6.5	6.8	**2.3**	**14.0**	**13.8**	2.5	7.3	**2.5**	**18.0**	17.0
2004	6.0	6.8	**2.5**	**14.5**	**15.5**	2.0	12.5	**2.0**	**17.3**	8.5
2005	7.0	8.8	**3.3**	**17.5**	**24.8**	2.0	13.8	**2.3**	**20.0**	14.0
2006	11.0	13.5	**2.8**	**20.5**	**25.0**	5.8	12.0	**2.0**	**22.3**	14.8
2007	14.5	15.3	**4.5**	**23.8**	**23.0**	16.0	19.0	**4.3**	**23.3**	15.3

Source: CANSIM Table 302-0007

Table 12e: Results of Business Conditions Survey in Manufacturing by Sub-Industry, 1992-2007 (Percentage of Manufacturing Employers who Answer Unskilled Labour Shortages is one of their Main Production Issue)

	Manufacturing [31-33]	**Six Main Apprenticeship Intensive Industries (Unweighted Average)**	Food [311]	Beverage and tobacco products [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]	Chemicals [325]
1992	0.0	**0.2**	0.5	0.3	0.3	0.5	1.5	0.3	0.3	**0.0**	0.3	0.0	0.0
1993	0.0	**0.1**	0.3	0.0	0.5	0.3	1.0	0.0	0.0	**0.0**	0.0	0.0	0.0
1994	0.0	**0.2**	0.0	0.0	0.0	1.0	1.8	0.0	2.8	**0.0**	0.3	0.0	0.0
1995	0.0	**0.2**	0.8	0.0	0.8	0.5	2.8	0.8	2.0	**0.0**	0.3	0.0	0.0
1996	0.3	**0.2**	1.3	0.0	0.3	1.3	0.8	0.0	0.3	**0.0**	1.0	0.0	0.0
1997	0.8	**0.5**	6.0	0.0	0.3	0.5	1.0	0.3	0.3	**0.0**	0.0	0.0	0.5
1998	1.0	**0.9**	4.8	1.3	0.8	2.0	2.3	1.5	3.3	**0.3**	0.5	0.0	0.8
1999	1.5	**1.5**	6.5	0.8	3.3	1.8	1.5	0.8	3.3	**0.8**	1.0	0.0	0.5
2000	2.3	**2.0**	10.0	1.5	1.8	3.0	6.5	0.8	5.3	**1.0**	1.5	1.3	1.5
2001	2.5	**1.3**	14.3	1.0	2.3	9.5	1.8	1.5	2.8	**1.0**	2.3	0.0	2.0
2002	2.0	**1.5**	7.0	0.8	2.8	11.0	5.8	0.8	5.0	**0.8**	3.5	0.0	0.8
2003	2.0	**2.5**	6.3	0.0	5.3	3.8	1.5	12.0	2.8	**1.5**	6.3	0.0	1.8
2004	2.3	**2.9**	9.0	0.0	3.5	1.5	1.3	5.5	3.5	**0.3**	2.5	0.0	2.3
2005	2.5	**3.4**	9.5	2.8	0.3	4.0	3.0	10.5	7.3	**1.3**	6.0	0.0	1.3
2006	4.8	**4.9**	19.8	1.0	4.5	2.8	4.8	7.8	11.0	**2.8**	13.5	1.0	1.3
2007	4.5	**4.8**	20.3	3.0	9.3	7.0	8.8	16.0	13.0	**2.8**	10.3	0.0	2.8

Source: CANSIM Table 302-0007

Table 12e (continued): Results of Business Conditions Survey in Manufacturing by Sub-Industry, 1992-2007 (Percentage of Manufacturing Employers who Answer Unskilled Labour Shortages is one of their Main Production Issue)

	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]
1992	0.0	0.0	**0.0**	**0.3**	**0.0**	0.8	0.0	**0.0**	**0.8**	0.0
1993	0.3	0.0	**0.0**	**0.0**	**0.3**	1.0	1.8	**0.0**	**0.5**	0.0
1994	0.5	0.0	**0.0**	**0.3**	**0.3**	0.0	0.0	**0.0**	**0.8**	0.3
1995	0.3	1.0	**0.0**	**0.8**	**0.0**	0.0	0.3	**0.0**	**0.3**	0.5
1996	0.5	0.0	**0.0**	**0.0**	**0.3**	0.3	1.3	**0.0**	**0.8**	0.3
1997	1.3	0.8	**0.0**	**0.8**	**0.5**	0.3	0.0	**0.0**	**1.5**	1.8
1998	1.5	0.8	**0.0**	**0.8**	**0.8**	0.0	0.5	**0.0**	**3.5**	0.8
1999	4.0	0.3	**0.5**	**2.3**	**0.3**	1.0	1.5	**0.0**	**5.3**	2.0
2000	5.8	4.8	**0.0**	**2.8**	**1.0**	1.0	0.8	**0.5**	**7.0**	4.8
2001	3.5	6.3	**0.0**	**1.5**	**1.0**	0.0	0.5	**0.0**	**4.5**	4.3
2002	4.3	4.5	**0.3**	**2.5**	**1.0**	0.0	0.3	**0.8**	**3.5**	1.5
2003	2.8	3.8	**0.3**	**4.3**	**1.3**	0.5	0.8	**1.3**	**6.3**	8.0
2004	2.3	5.0	**0.5**	**5.3**	**1.8**	0.3	1.0	**0.8**	**9.0**	6.5
2005	4.3	6.3	**1.5**	**5.0**	**2.8**	0.8	4.0	**0.8**	**9.0**	5.0
2006	6.5	7.0	**0.8**	**6.3**	**7.3**	2.3	6.0	**1.0**	**11.3**	16.3
2007	11.8	10.3	**0.8**	**6.3**	**6.3**	1.5	4.8	**1.0**	**11.8**	9.3

Source: CANSIM Table 302-0007

Table 13: Capacity Utilization in the Manufacturing Industries, by Sub-Industry, 1987-2007

	Total industrial[1]	Manufacturing [31-33]	Food [311]	Beverage and tobacco products [312]	Textile [313+314]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied products [316]	Wood products [321]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]
1987	85.7	82.8	79.6	70.8	87.6	n.a	n.a	87.9	81.8	85.8	**95.5**	78.6	86.2
1988	86.6	82.6	80.2	73.6	84.6	n.a	n.a	83.6	76.6	82.4	**93.6**	79.5	90.5
1989	85.0	81.2	79.1	73.5	82.8	n.a	n.a	82.3	77.0	77.9	**87.9**	81.0	85.2
1990	82.2	78.2	78.1	70.4	77.7	n.a	n.a	78.1	70.4	74.0	**83.7**	87.2	87.5
1991	78.9	74.2	79.1	66.9	74.1	n.a	n.a	76.1	63.9	70.6	**84.5**	74.4	82.6
1992	78.8	76.4	80.2	74.5	74.9	n.a	n.a	77.0	68.9	81.6	**88.1**	76.4	83.6
1993	80.6	79.9	79.6	79.6	79.5	n.a	n.a	79.7	71.3	90.2	**88.0**	74.2	86.9
1994	83.0	83.5	82.0	79.6	82.1	n.a	n.a	80.4	74.9	91.1	**94.3**	76.5	87.3
1995	82.1	83.9	81.6	82.6	81.1	n.a	n.a	81.0	74.0	86.7	**92.0**	77.8	89.5
1996	82.0	82.8	79.6	81.4	77.3	n.a	n.a	83.0	75.4	86.4	**89.1**	80.1	92.8
1997	83.6	83.6	79.0	81.8	80.2	82.7	76.0	85.1	80.1	84.5	**90.4**	80.0	93.1
1998	84.6	84.3	80.7	83.2	82.7	83.3	81.6	84.1	77.6	86.5	**86.1**	79.8	95.5
1999	86.0	85.8	80.1	81.7	84.5	86.5	81.3	85.6	74.1	83.9	**91.1**	80.6	94.4
2000	87.0	86.0	80.9	79.5	82.7	83.6	81.4	85.0	78.5	85.1	**92.1**	79.8	92.7
2001	84.3	81.7	81.6	80.7	78.1	79.3	76.6	82.0	74.5	82.0	**88.6**	76.8	94.9
2002	85.4	82.9	81.8	77.2	79.4	77.2	83.1	82.8	73.8	87.0	**90.6**	74.0	96.5
2003	84.2	81.5	78.9	72.3	77.5	74.7	81.3	80.1	71.6	88.2	**91.1**	75.6	95.4
2004	84.9	83.5	79.1	75.6	78.5	76.6	80.9	79.5	72.0	92.1	**91.1**	74.4	93.9
2005	84.8	83.7	80.6	75.8	77.6	75.1	80.6	74.4	67.6	90.6	**89.4**	75.2	88.3
2006	84.1	82.7	81.0	74.9	72.1	69.7	74.3	75.5	73.6	83.9	**87.4**	74.8	86.5
2007	83.3	82.1	81.4	80.8	77.9	72.0	83.2	73.5	85.9	72.3	**91.6**	75.1	77.8
87-06	-0.10	-0.01	0.09	0.29	-1.02	n.a.	n.a.	-0.80	-0.55	-0.12	**-0.47**	-0.26	0.02
89-95	-0.57	0.55	0.53	1.97	-0.34	n.a.	n.a.	-0.28	-0.67	1.80	**0.76**	-0.67	0.82
89-00	0.21	0.53	0.20	0.72	-0.02	n.a.	n.a.	0.29	0.18	0.80	**0.42**	-0.14	0.77
95-00	1.15	0.51	-0.18	-0.76	0.37	n.a.	n.a.	0.97	1.19	-0.38	**0.02**	0.51	0.71
00-06	-0.56	-0.66	0.02	-0.99	-2.26	-2.99	-1.51	-1.96	-1.07	-0.23	**-0.87**	-1.08	-1.15
91-95	1.01	3.11	0.80	5.44	2.29	n.a.	n.a.	1.56	3.74	5.27	**2.15**	1.13	2.03

Source: CANSIM Table 028-0002

1) The industrial aggregate combines the following North American Industry Classification System (NAICS) industries: forestry and logging (113), mining and oil and gas extraction (21), electric power generation, transmission and distribution (2211), Construction (23) and manufacturing (31-33).

Note: 2007 numbers are a simple average of the first 3 quarters.

Note: The last column is a weighted average of the six main manufacturing trades, using output as weights. For 2007, output weights from 2006 are used.

Table 13 (continued): Capacity Utilization in the Manufacturing Industries, by Sub-Industry, 1987-2007

	Chemicals [325]	Plastics and rubber products [326]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal products [332]**	**Machinery [333]**	Computer and electronic products [334]	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related products [337]**	Miscellaneous manufacturing [339]	**Main Six Manufacturing Trades**
1987	88.6	89.8	84.6	**92.7**	**79.0**	**70.7**	81.7	79.4	**78.9**	**82.7**	78.7	**83.9**
1988	89.0	89.3	86.1	**93.1**	**79.5**	**76.7**	82.3	82.6	**76.0**	**77.1**	87.0	**82.9**
1989	86.9	87.9	83.3	**88.5**	**81.4**	**74.8**	80.9	87.1	**76.3**	**74.9**	86.9	**80.8**
1990	86.6	81.6	72.4	**85.1**	**76.9**	**70.2**	72.1	85.4	**74.5**	**72.6**	79.5	**77.6**
1991	80.7	77.2	63.3	**81.0**	**69.7**	**63.1**	69.6	74.1	**72.2**	**66.5**	80.2	**74.3**
1992	81.0	79.9	66.5	**83.4**	**69.2**	**65.4**	72.8	71.9	**71.0**	**69.7**	76.6	**75.6**
1993	83.9	82.7	71.0	**90.2**	**72.7**	**74.3**	70.5	76.4	**77.2**	**73.9**	78.6	**80.4**
1994	84.7	85.0	74.4	**93.1**	**80.0**	**81.0**	77.3	82.4	**81.9**	**79.2**	80.4	**85.5**
1995	85.2	81.0	75.5	**88.3**	**78.2**	**85.4**	84.9	79.4	**86.2**	**80.9**	73.6	**86.1**
1996	86.3	81.6	76.7	**88.0**	**79.6**	**80.1**	76.2	83.6	**84.8**	**81.1**	76.3	**84.5**
1997	80.2	83.2	83.4	**89.0**	**80.0**	**84.8**	79.3	85.2	**86.4**	**82.5**	85.2	**86.1**
1998	81.2	84.4	80.1	**93.8**	**80.8**	**80.5**	85.0	91.0	**86.4**	**83.1**	88.5	**85.5**
1999	80.9	86.8	80.4	**91.1**	**85.7**	**80.0**	90.8	93.7	**89.5**	**84.5**	88.2	**87.6**
2000	80.1	84.3	79.8	**90.9**	**84.1**	**83.6**	96.7	92.5	**89.0**	**84.8**	83.5	**88.0**
2001	80.4	84.0	80.1	**86.2**	**79.7**	**78.5**	72.1	76.3	**86.0**	**80.8**	80.3	**84.5**
2002	80.8	88.7	82.1	**87.8**	**80.1**	**78.9**	66.8	74.0	**88.1**	**81.1**	82.5	**85.9**
2003	80.9	88.5	83.8	**88.4**	**75.9**	**78.1**	69.6	73.6	**83.3**	**79.8**	82.7	**82.4**
2004	81.5	89.9	84.2	**91.8**	**79.8**	**80.8**	80.8	77.3	**85.0**	**79.3**	81.2	**82.1**
2005	80.2	82.8	84.4	**91.5**	**80.6**	**83.0**	85.3	76.3	**87.3**	**81.3**	81.1	**81.8**
2006	82.9	77.1	82.5	**92.8**	**80.5**	**82.9**	88.7	78.2	**85.3**	**76.6**	81.4	**85.1**
2007	83.5	71.6	85.5	**90.3**	**82.8**	**85.4**	94.0	82.8	**82.0**	**80.7**	82.6	**85.1**
87-06	-0.35	-0.79	-0.13	**0.00**	**0.10**	**0.84**	0.43	-0.08	**0.41**	**-0.40**	0.18	0.07
89-95	-0.33	-1.34	-1.63	**-0.04**	**-0.67**	**2.22**	0.81	-1.53	**2.05**	**1.30**	-2.74	1.06
89-00	-0.74	-0.37	-0.39	**0.24**	**0.29**	**1.01**	1.63	0.55	**1.41**	**1.14**	-0.36	0.78
95-00	-1.23	0.80	1.11	**0.58**	**1.46**	**-0.42**	2.63	3.11	**0.65**	**0.95**	2.56	0.44
00-06	0.56	-1.48	0.57	**0.35**	**-0.72**	**-0.14**	-1.42	-2.76	**-0.71**	**-1.69**	-0.42	-0.57
91-95	1.37	1.22	4.49	**2.18**	**2.92**	**7.84**	5.08	1.74	**4.54**	**5.01**	-2.12	3.75

Source: CANSIM Table 028-0002

1) The industrial aggregate combines the following North American Industry Classification System (NAICS) industries: forestry and logging (113), mining and oil and gas extraction (21), electric power generation, transmission and distribution (2211), Construction (23) and manufacturing (31-33).

Note: 2007 numbers are a simple average of the first 3 quarters.

Note: The last column is a weighted average of the six main manufacturing trades, using output as weights. For 2007, output weights from 2006 are used.

Table 13a: Selected Labour Shortages Indicators and Correlation with Employment in Apprenticeable Occupations, 2006

	Percentage of employment in apprenticeable occupations	Capacity Utilization in 2006 (Per cent)	Business Conditions Survey, 2006, skilled labour shortages	Nominal wage increase, 2000-2006	Nominal wage increase, 2006
Total industrial1	9.6	84.1	n.a.	13.9	2.7
Manufacturing [31-33]	14.2	82.7	8.3	13.7	2.1
Food manufacturing [311]	9.8	81.0	19.8	20.5	3.3
Beverage and tobacco product manufacturing [312]	6.7	74.9	4.5	3.1	3.2
Textile mills [313]	2.9	69.7	5.5	21.4	0.2
Textile product mills [314]	2.7	74.3	9.0	17.5	-1.7
Clothing manufacturing [315]	0.8	75.5	9.5	32.6	2.2
Leather and allied product manufacturing [316]	1.2	73.6	11.0	15.4	-2.0
Wood product manufacturing [321]	14.1	83.9	13.8	0.1	-1.4
Paper manufacturing [322]	**16.8**	**87.4**	**10.8**	**18.4**	**6.0**
Printing and related support activities [323]	1.1	74.8	17.5	17.5	5.3
Petroleum and coal products manufacturing [324]	12.2	86.5	13.0	11.9	2.8
Chemical manufacturing [325]	6.1	82.9	7.0	9.4	-0.7
Plastics and rubber products manufacturing [326]	7.0	77.1	11.0	7.3	-0.6
Non-metallic mineral product manufacturing [327]	13.1	82.5	13.5	6.6	0.0
Primary metal manufacturing [331]	**24.0**	**92.8**	**2.8**	**13.1**	**5.9**
Fabricated metal product manufacturing [332]	**28.1**	**80.5**	**20.5**	**11.4**	**1.0**
Machinery manufacturing [333]	**29.0**	**82.9**	**25.0**	**16.6**	**6.0**
Computer and electronic product manufacturing [334]	5.4	88.7	5.8	16.1	2.4
Electrical equipment, appliance and component manufacturing [335]	10.9	78.2	12.0	8.3	4.1
Transportation equipment manufacturing [336]	**17.9**	**85.3**	**2.0**	**10.9**	**-0.7**
Furniture and related product manufacturing [337]	**17.9**	**76.6**	**22.3**	**37.7**	**4.3**
Miscellaneous manufacturing [339]	6.5	81.4	14.8	15.2	0.4
Correlation coefficient with percentage of employment in apprenticeable occupations:	1.000	0.554	0.348	-0.108	0.396

Source: Tables 7, 8, 12d, 13 and 16

1) The industrial aggregate combines the following North American Industry Classification System (NAICS) industries: forestry and logging (113), mining and oil and gas extraction (21), electric power generation, transmission and distribution (2211), Construction (23) and manufacturing (31-33).

*Average of first three quarters

Table 14: Average Weekly Nominal Earnings in the Manufacturing Industry, excluding overtime, by Province (SEPH) (1983-2006)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1983	437.70	311.71	301.12	351.63	377.43	410.67	450.64	356.28	487.02	478.88	493.98
1984	456.60	342.61	318.19	375.56	393.65	428.66	471.66	374.54	505.13	492.55	503.91
1985	476.25	342.89	331.91	386.69	406.71	443.04	496.35	386.46	522.91	510.27	520.68
1986	488.95	347.75	345.47	412.64	434.83	452.91	511.60	402.74	532.39	510.75	527.61
1987	504.20	374.52	353.86	432.35	448.08	470.11	527.79	423.67	551.81	506.20	538.19
1988	522.02	410.62	372.58	448.91	460.73	488.39	547.79	438.07	572.82	525.12	542.83
1989	549.32	443.08	396.99	468.83	498.12	513.07	576.79	456.15	578.66	542.30	576.12
1990	580.68	456.91	417.82	485.56	515.99	544.14	612.86	478.92	617.33	567.50	602.87
1991	608.81	492.46	438.41	511.85	542.98	560.84	647.75	504.75	664.15	615.24	626.07
1992	633.26	512.58	433.00	528.23	550.24	587.95	674.24	515.84	652.05	654.23	643.68
1993	644.46	524.75	437.28	556.99	573.03	596.64	685.69	521.43	651.92	658.79	659.48
1994	656.64	543.06	457.28	551.49	607.14	601.65	700.74	530.46	679.91	665.39	667.43
1995	665.78	540.62	456.74	549.34	630.44	606.05	713.46	531.42	644.45	671.49	690.74
1996	686.77	541.65	512.47	571.13	635.99	622.36	737.75	575.08	694.15	685.98	708.12
1997	693.78	565.35	555.00	593.93	642.96	632.05	743.92	582.15	686.18	689.28	713.37
1998	720.42	583.93	551.79	615.70	648.96	650.85	779.92	598.48	698.73	720.19	732.07
1999	734.15	570.02	545.17	617.04	635.71	675.24	792.89	607.66	689.93	723.76	745.39
2000	745.13	570.89	536.14	641.32	650.01	681.05	805.40	624.36	694.35	745.71	754.95
2001	759.63	578.85	526.49	655.16	653.07	689.31	828.83	624.22	703.97	757.11	759.78
2002	777.78	582.84	554.41	664.99	659.13	711.98	844.86	639.71	715.55	776.66	783.26
2003	785.01	619.22	540.65	683.51	676.53	718.61	849.25	646.79	709.04	791.93	793.16
2004	800.80	653.73	534.17	699.30	673.04	733.60	864.86	655.77	728.97	820.89	806.46
2005	829.91	733.91	556.00	725.71	713.81	762.05	891.35	683.27	776.57	866.46	826.27
2006	847.30	763.85	609.41	731.75	733.52	782.30	904.62	701.80	779.71	896.84	841.39
83-06	2.91	3.97	3.11	3.24	2.93	2.84	3.08	2.99	2.07	2.77	2.34
00-06	2.16	4.97	2.16	2.22	2.03	2.34	1.96	1.97	1.95	3.12	1.82

Source: CANSIM Tables 281-0027 and 281-0006 (SEPH). Data were available NAICS-based from 1991, and has been brought back to 1983 using SIC-data growth
Note: Growth rates refer to Annual Average Growth Rates

Table 15: Average Weekly Real Earnings (1992 Dollars) in the Manufacturing Industry, excluding overtime, by Province (SEPH) (1983-2006)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1983	632.83	426.10	421.67	496.81	536.55	601.76	662.42	509.33	685.56	662.06	693.53
1984	632.91	448.23	427.27	508.25	532.67	603.61	660.65	516.35	682.51	663.87	680.44
1985	635.00	430.76	430.06	500.60	525.85	597.62	668.22	511.08	681.47	667.65	681.38
1986	626.09	424.36	438.28	518.13	543.06	582.79	658.90	510.17	675.31	646.26	670.79
1987	618.28	444.31	433.40	524.72	544.28	579.93	647.67	514.99	667.45	615.38	664.31
1988	615.86	476.55	440.46	526.46	540.94	580.97	641.92	511.08	663.10	621.50	646.52
1989	616.88	495.99	452.34	526.17	558.39	585.40	639.00	508.09	641.37	616.50	656.66
1990	622.16	490.24	453.00	518.47	552.70	594.98	647.90	510.35	656.32	609.87	652.08
1991	617.63	497.71	442.05	515.55	546.22	571.40	654.04	511.68	670.79	624.54	642.74
1992	633.26	512.58	433.00	528.23	550.24	587.95	674.24	515.84	652.05	654.23	643.68
1993	632.41	516.28	429.20	550.40	565.65	589.16	673.55	507.68	632.35	652.32	636.95
1994	643.61	527.60	449.87	538.59	595.83	601.65	688.33	509.14	647.84	649.28	632.38
1995	638.42	518.14	442.17	529.68	609.47	595.73	683.87	496.56	602.68	640.50	639.46
1996	648.92	511.09	487.25	540.70	605.81	602.19	695.93	525.86	636.63	639.93	649.88
1997	644.66	522.47	521.27	551.04	601.57	602.81	689.24	521.75	621.56	630.60	649.77
1998	662.82	538.48	520.56	567.45	603.83	611.98	716.22	529.37	624.53	650.75	664.66
1999	663.82	518.37	508.11	559.42	581.87	625.41	713.94	527.16	605.94	638.24	669.59
2000	656.09	504.11	480.21	561.91	576.19	615.65	704.62	528.66	594.32	636.02	666.18
2001	652.44	505.38	459.46	563.40	568.74	609.12	703.66	514.59	585.19	631.06	659.46
2002	653.34	497.16	471.25	555.27	555.65	616.57	702.92	519.44	578.16	625.99	664.20
2003	641.45	513.31	444.01	551.96	551.56	607.14	688.00	515.91	560.02	611.39	658.12
2004	642.48	532.09	429.15	554.53	540.87	607.94	687.92	512.99	563.10	624.78	656.31
2005	651.52	581.81	433.18	560.04	560.28	617.34	693.74	520.46	586.97	646.04	659.15
2006	652.37	595.04	464.16	553.45	566.26	623.25	691.77	524.25	577.46	643.68	660.04
83-06	0.13	1.46	0.42	0.47	0.23	0.15	0.19	0.13	-0.74	-0.12	-0.22
00-06	-0.09	2.80	-0.57	-0.25	-0.29	0.20	-0.31	-0.14	-0.48	0.20	-0.15

Source: Table 14 and CANSIM table 326-0002

Note: The average annual provincial CPI was used to deflate nominal wages

Table 16: Average Weekly Nominal Earnings in the Manufacturing Industry, excl. Overtime, by Sub-Industry (SEPH) (1991-2006)

	All industries	Manufacturing	Food	Beverage and tobacco products	Textile mills	Textile product mills	Clothing	Leather and allied products	**Paper**	Printing and related support activities	Petroleum and coal products	Chemicals	Plastics and rubber products
1991	539.88	608.81	506.86	668.04	489.17	442.54	392.18	393.88	**724.79**	584.64	814.63	724.70	593.11
1992	558.97	633.26	517.81	700.07	518.82	466.47	393.44	386.20	**755.15**	619.95	786.18	769.68	610.58
1993	568.26	644.46	533.98	725.92	526.29	468.65	390.90	400.58	**767.67**	634.78	908.54	783.95	609.24
1994	576.95	656.64	540.76	741.17	539.63	444.49	397.08	413.09	**787.53**	616.35	939.33	806.15	622.09
1995	583.38	665.78	550.26	736.52	562.58	469.78	410.30	421.46	**815.77**	625.79	964.33	799.45	633.66
1996	594.80	686.77	564.52	758.00	561.71	512.33	434.83	453.43	**829.49**	636.48	944.81	806.83	648.94
1997	603.77	693.78	564.83	756.24	558.33	529.25	442.34	446.17	**848.78**	653.94	941.99	828.51	659.63
1998	613.92	720.42	575.82	834.65	554.89	525.00	459.73	463.05	**858.74**	659.48	1004.14	869.03	682.07
1999	621.59	734.15	582.52	851.72	580.76	547.79	468.14	455.85	**872.34**	663.89	1006.00	876.28	666.31
2000	635.44	745.13	600.84	897.14	611.27	567.07	477.15	477.74	**883.65**	696.49	1029.39	898.79	665.89
2001	645.43	759.63	609.72	926.53	609.99	581.43	476.99	489.24	**869.55**	692.58	1052.55	907.24	690.95
2002	658.90	777.78	617.47	938.54	647.08	612.81	506.58	512.34	**886.60**	723.46	1069.94	928.42	717.30
2003	666.96	785.01	640.51	903.82	643.03	619.22	521.70	509.83	**873.97**	733.89	1051.97	927.75	718.86
2004	680.60	800.80	656.46	878.72	693.69	639.49	565.59	512.01	**874.99**	747.52	1091.69	961.97	723.13
2005	704.26	829.91	700.94	896.10	740.59	677.58	619.29	562.53	**896.83**	777.77	1148.46	978.20	733.46
2006	723.55	847.30	724.18	924.85	741.99	666.34	632.62	551.40	**884.18**	824.78	1209.51	1005.94	728.40
91-06	1.97	2.23	2.41	2.19	2.82	2.77	3.24	2.27	**1.33**	2.32	2.67	2.21	1.38
91-00	1.83	2.27	1.91	3.33	2.51	2.79	2.20	2.17	**2.23**	1.96	2.63	2.42	1.29
00-06	2.19	2.16	3.16	0.51	3.28	2.73	4.81	2.42	**0.01**	2.86	2.72	1.89	1.51
2006	2.74	2.10	3.32	3.21	0.19	-1.66	2.15	-1.98	**-1.41**	6.04	5.32	2.84	-0.69

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Average Annual Growth rates

Table 16 (continued): Average Weekly Nominal Earnings in the Manufacturing Industry, excl. Overtime, by Sub-Industry (SEPH) (1991-2006)

	Wood products	Non-metallic mineral products	**Primary metal**	**Fabricated metal products**	**Machinery**	Computer and electronic products	Electrical equipment, appliance and component	**Transportation equipment**	**Furniture and related products**	Miscellaneous manufacturing	**Main Six Manufacturing Trades**
1991	576.17	628.68	**768.47**	**592.66**	**627.17**	666.99	633.63	**710.64**	**467.04**	462.80	**680.44**
1992	591.92	654.19	**800.79**	**613.82**	**653.99**	706.80	667.32	**737.24**	**486.66**	473.42	**708.52**
1993	600.43	657.08	**814.85**	**607.86**	**651.89**	740.11	663.42	**759.86**	**494.96**	500.49	**718.34**
1994	613.24	659.73	**822.42**	**623.89**	**668.54**	739.81	673.32	**790.07**	**512.69**	514.60	**738.91**
1995	629.93	677.60	**848.60**	**632.90**	**674.16**	721.72	679.76	**801.41**	**511.85**	504.53	**757.66**
1996	663.17	708.33	**868.79**	**666.85**	**724.96**	746.28	670.81	**818.68**	**541.45**	533.07	**784.40**
1997	667.91	698.93	**878.07**	**668.76**	**741.34**	764.42	696.48	**834.52**	**533.06**	540.25	**797.88**
1998	692.50	711.69	**880.70**	**702.38**	**774.97**	831.65	762.56	**871.05**	**550.46**	579.70	**820.27**
1999	713.21	701.99	**903.44**	**723.84**	**814.72**	865.23	783.45	**881.41**	**559.41**	576.18	**837.39**
2000	719.47	718.17	**896.42**	**721.95**	**836.81**	862.69	801.48	**876.10**	**584.66**	602.33	**839.99**
2001	733.05	726.02	**903.55**	**729.21**	**844.33**	902.03	797.24	**924.75**	**630.67**	612.98	**856.73**
2002	741.94	749.31	**910.84**	**757.51**	**889.08**	922.15	822.74	**922.94**	**670.79**	645.30	**870.81**
2003	742.27	739.72	**924.46**	**770.58**	**869.71**	932.16	813.52	**953.03**	**689.08**	657.17	**881.49**
2004	775.72	746.48	**932.91**	**762.96**	**893.10**	936.04	814.19	**959.57**	**736.07**	678.07	**889.19**
2005	776.79	765.70	**957.59**	**795.98**	**921.12**	977.58	834.18	**978.36**	**772.37**	691.12	**916.88**
2006	772.02	765.53	**1013.90**	**804.00**	**975.93**	1001.29	868.28	**971.47**	**805.36**	693.62	**932.37**
91-06	1.97	1.32	**1.86**	**2.05**	**2.99**	2.75	2.12	**2.11**	**3.70**	2.73	**2.12**
91-00	2.50	1.49	**1.73**	**2.22**	**3.26**	2.90	2.65	**2.35**	**2.53**	2.97	**2.37**
00-06	1.18	1.07	**2.07**	**1.81**	**2.60**	2.51	1.34	**1.74**	**5.48**	2.38	**1.75**
2006	-0.61	-0.02	**5.88**	**1.01**	**5.95**	2.43	4.09	**-0.70**	**4.27**	0.36	**1.69**

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Average Annual Growth rates

Table 17: Average Weekly Real Earnings (1997 Dollars, CPI Deflated) in the Manufacturing Industry, Excluding Overtime, by Sub-Industry, 1991-2006 (SEPH)

	All industries	Manufacturing	Food	Beverage and tobacco products	Textile mills	Textile product mills	Clothing	Leather and allied products	**Paper**	Printing and related support activities	Petroleum and coal products	Chemicals
1991	589.43	664.69	553.38	729.36	534.07	483.16	428.18	430.03	**791.32**	638.30	889.40	791.22
1992	601.56	681.51	557.26	753.41	558.35	502.01	423.42	415.62	**812.69**	667.18	846.08	828.32
1993	600.13	680.60	563.92	766.63	555.80	494.93	412.82	423.04	**810.72**	670.38	959.49	827.91
1994	608.59	692.65	570.42	781.82	569.22	468.87	418.86	435.74	**830.72**	650.15	990.85	850.36
1995	602.03	687.06	567.85	760.06	580.56	484.80	423.41	434.93	**841.84**	645.79	995.15	825.00
1996	604.84	698.36	574.05	770.79	571.19	520.97	442.17	461.08	**843.49**	647.22	960.75	820.44
1997	603.77	693.78	564.83	756.24	558.33	529.25	442.34	446.17	**848.78**	653.94	941.99	828.51
1998	607.87	713.32	570.14	826.42	549.42	519.82	455.20	458.49	**850.27**	652.98	994.24	860.46
1999	604.86	714.39	566.84	828.80	565.13	533.05	455.54	443.58	**848.86**	646.02	978.93	852.70
2000	602.14	706.08	569.35	850.12	579.23	537.35	452.14	452.70	**837.34**	659.99	975.44	851.68
2001	596.59	702.15	563.59	856.42	563.84	537.44	440.90	452.22	**803.76**	640.18	972.91	838.59
2002	595.65	703.11	558.19	848.44	584.96	553.98	457.95	463.16	**801.49**	654.01	967.23	839.29
2003	586.51	690.32	563.25	794.80	565.47	544.53	458.77	448.33	**768.55**	645.37	925.08	815.84
2004	587.64	691.43	566.80	758.70	598.95	552.15	488.34	442.08	**755.48**	645.42	942.59	830.58
2005	595.00	701.16	592.20	757.08	625.69	572.46	523.21	475.26	**757.70**	657.11	970.29	826.44
2006	599.53	702.07	600.05	766.33	614.81	552.13	524.19	456.89	**732.63**	683.41	1002.20	833.52
91-06	0.11	0.37	0.54	0.33	0.94	0.89	1.36	0.40	**-0.51**	0.46	0.80	0.35
00-06	-0.07	-0.09	0.88	-1.71	1.00	0.45	2.49	0.15	**-2.20**	0.58	0.45	-0.36

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Annual Average Growth Rates

Table 17 (continued): Average Weekly Real Earnings (1997 Dollars, CPI Deflated) in the Manufacturing Industry, Excluding Overtime, by Sub-Industry, 1991-2006 (SEPH)

	Plastics and rubber products	Wood products	Non-metallic mineral products	**Primary metal**	**Fabricated metal products**	**Machinery**	Computer and electronic products	Electrical equipment, appliance and component	**Transportation equipment**	**Furniture and related products**	Miscellaneous manufacturing	**Main Six Manufacturing Trades**
1991	647.55	629.06	686.38	**839.01**	**647.06**	**684.74**	728.21	691.79	**775.87**	**509.91**	505.28	**742.90**
1992	657.10	637.02	704.03	**861.80**	**660.59**	**703.82**	760.65	718.16	**793.41**	**523.74**	509.49	**762.51**
1993	643.40	634.10	693.93	**860.54**	**641.95**	**688.44**	781.61	700.62	**802.47**	**522.71**	528.55	**758.62**
1994	656.21	646.87	695.91	**867.52**	**658.11**	**705.20**	780.38	710.25	**833.40**	**540.81**	542.82	**779.44**
1995	653.91	650.06	699.26	**875.72**	**653.13**	**695.71**	744.79	701.49	**827.03**	**528.21**	520.66	**781.87**
1996	659.89	674.36	720.28	**883.45**	**678.10**	**737.19**	758.87	682.13	**832.49**	**550.59**	542.06	**797.64**
1997	659.63	667.91	698.93	**878.07**	**668.76**	**741.34**	764.42	696.48	**834.52**	**533.06**	540.25	**797.88**
1998	675.35	685.67	704.67	**872.02**	**695.46**	**767.33**	823.45	755.04	**862.46**	**545.03**	573.99	**812.19**
1999	648.38	694.02	683.10	**879.13**	**704.36**	**792.80**	841.95	762.37	**857.69**	**544.36**	560.67	**814.85**
2000	630.99	681.76	680.53	**849.44**	**684.11**	**792.95**	817.48	759.47	**830.18**	**554.02**	570.76	**795.97**
2001	638.67	677.58	671.09	**835.18**	**674.03**	**780.44**	833.78	736.92	**854.78**	**582.95**	566.60	**791.90**
2002	648.44	670.71	677.38	**823.40**	**684.79**	**803.73**	833.62	743.76	**834.34**	**606.39**	583.35	**787.21**
2003	632.15	652.74	650.49	**812.95**	**677.63**	**764.80**	819.72	715.39	**838.07**	**605.96**	577.90	**775.16**
2004	624.36	669.77	644.53	**805.49**	**658.75**	**771.12**	808.19	702.99	**828.51**	**635.54**	585.46	**767.74**
2005	619.67	656.28	646.91	**809.03**	**672.49**	**778.22**	825.92	704.77	**826.58**	**652.54**	583.90	**774.64**
2006	603.55	639.69	634.32	**840.12**	**666.19**	**808.65**	829.67	719.45	**804.96**	**667.32**	574.73	**772.56**
91-06	-0.47	0.11	-0.52	**0.01**	**0.19**	**1.12**	0.87	0.26	**0.25**	**1.81**	0.86	**0.26**
00-06	-0.74	-1.06	-1.17	**-0.18**	**-0.44**	**0.33**	0.25	-0.90	**-0.51**	**3.15**	0.12	**-0.50**

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Annual Average Growth Rates

Table 18: Wages in the Manufacturing Industry as a Proportion of Average Wage in All Industries, by Sub-Industry, 1991-2006

	All Industries	Manufacturing	Food	Beverage and tobacco products	Textile mills	Textile product mills	Clothing	Leather and allied products	**Paper**	Printing and related support activities	Petroleum and coal products	Chemicals
1991	539.88	112.8	93.9	123.7	90.6	82.0	72.6	73.0	**134.3**	108.3	150.9	134.2
1992	558.97	113.3	92.6	125.2	92.8	83.5	70.4	69.1	**135.1**	110.9	140.6	137.7
1993	568.26	113.4	94.0	127.7	92.6	82.5	68.8	70.5	**135.1**	111.7	159.9	138.0
1994	576.95	113.8	93.7	128.5	93.5	77.0	68.8	71.6	**136.5**	106.8	162.8	139.7
1995	583.38	114.1	94.3	126.3	96.4	80.5	70.3	72.2	**139.8**	107.3	165.3	137.0
1996	594.8	115.5	94.9	127.4	94.4	86.1	73.1	76.2	**139.5**	107.0	158.8	135.6
1997	603.77	114.9	93.6	125.3	92.5	87.7	73.3	73.9	**140.6**	108.3	156.0	137.2
1998	613.92	117.3	93.8	136.0	90.4	85.5	74.9	75.4	**139.9**	107.4	163.6	141.6
1999	621.59	118.1	93.7	137.0	93.4	88.1	75.3	73.3	**140.3**	106.8	161.8	141.0
2000	635.44	117.3	94.6	141.2	96.2	89.2	75.1	75.2	**139.1**	109.6	162.0	141.4
2001	645.43	117.7	94.5	143.6	94.5	90.1	73.9	75.8	**134.7**	107.3	163.1	140.6
2002	658.9	118.0	93.7	142.4	98.2	93.0	76.9	77.8	**134.6**	109.8	162.4	140.9
2003	666.96	117.7	96.0	135.5	96.4	92.8	78.2	76.4	**131.0**	110.0	157.7	139.1
2004	680.6	117.7	96.5	129.1	101.9	94.0	83.1	75.2	**128.6**	109.8	160.4	141.3
2005	704.26	117.8	99.5	127.2	105.2	96.2	87.9	79.9	**127.3**	110.4	163.1	138.9
2006	723.55	117.1	100.1	127.8	102.5	92.1	87.4	76.2	**122.2**	114.0	167.2	139.0
91-06	2.28	0.29	0.49	0.25	0.96	0.90	1.44	0.34	**-0.72**	0.40	0.79	0.27
00-06	2.19	-0.02	0.95	-1.64	1.07	0.53	2.57	0.23	**-2.13**	0.66	0.52	-0.29

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Annual Average Growth Rates

Table 18 (continued): Wages in the Manufacturing Industry as a Proportion of Average Wage in All Industries, by Sub-Industry, 1991-2006

	Plastics and rubber products	Wood products	Non-metallic mineral products	**Primary metal**	**Fabricated metal products**	**Machinery**	Computer and electronic products	Electrical equipment, appliance and component	**Transportation equipment**	**Furniture and related products**	Miscellaneous manufacturing	**Main Six Manufacturing Trades**
1991	109.9	106.7	116.4	**142.3**	**109.8**	**116.2**	123.5	117.4	**131.6**	**86.5**	85.7	**126.0**
1992	109.2	105.9	117.0	**143.3**	**109.8**	**117.0**	126.4	119.4	**131.9**	**87.1**	84.7	**126.8**
1993	107.2	105.7	115.6	**143.4**	**107.0**	**114.7**	130.2	116.7	**133.7**	**87.1**	88.1	**126.4**
1994	107.8	106.3	114.3	**142.5**	**108.1**	**115.9**	128.2	116.7	**136.9**	**88.9**	89.2	**128.1**
1995	108.6	108.0	116.2	**145.5**	**108.5**	**115.6**	123.7	116.5	**137.4**	**87.7**	86.5	**129.9**
1996	109.1	111.5	119.1	**146.1**	**112.1**	**121.9**	125.5	112.8	**137.6**	**91.0**	89.6	**131.9**
1997	109.3	110.6	115.8	**145.4**	**110.8**	**122.8**	126.6	115.4	**138.2**	**88.3**	89.5	**132.1**
1998	111.1	112.8	115.9	**143.5**	**114.4**	**126.2**	135.5	124.2	**141.9**	**89.7**	94.4	**133.6**
1999	107.2	114.7	112.9	**145.3**	**116.4**	**131.1**	139.2	126.0	**141.8**	**90.0**	92.7	**134.7**
2000	104.8	113.2	113.0	**141.1**	**113.6**	**131.7**	135.8	126.1	**137.9**	**92.0**	94.8	**132.2**
2001	107.1	113.6	112.5	**140.0**	**113.0**	**130.8**	139.8	123.5	**143.3**	**97.7**	95.0	**132.7**
2002	108.9	112.6	113.7	**138.2**	**115.0**	**134.9**	140.0	124.9	**140.1**	**101.8**	97.9	**132.2**
2003	107.8	111.3	110.9	**138.6**	**115.5**	**130.4**	139.8	122.0	**142.9**	**103.3**	98.5	**132.2**
2004	106.2	114.0	109.7	**137.1**	**112.1**	**131.2**	137.5	119.6	**141.0**	**108.2**	99.6	**130.6**
2005	104.1	110.3	108.7	**136.0**	**113.0**	**130.8**	138.8	118.4	**138.9**	**109.7**	98.1	**130.2**
2006	100.7	106.7	105.8	**140.1**	**111.1**	**134.9**	138.4	120.0	**134.3**	**111.3**	95.9	**128.9**
91-06	-0.67	0.00	-0.73	**-0.12**	**0.09**	**1.16**	0.88	0.17	**0.15**	**1.96**	0.86	**0.17**
00-06	-0.67	-0.98	-1.09	**-0.11**	**-0.37**	**0.40**	0.32	-0.83	**-0.44**	**3.22**	0.19	**-0.42**

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Annual Average Growth Rates

Table 18a: Increases in Nominal and Real Wages from 1997 to 2006, in All Occupations and Trades Relevant to Manufacturing

All occupations

		Nominal (%)	Real (%)
Average hourly wage	Total employees	26.5	4.81
	Full-time employees	26.9	5.15
	Part-time employees	21.2	0.39
Average weekly wage	Total employees	27.0	5.20
	Full-time employees	26.2	4.54
	Part-time employees	24.2	2.94
Median hourly wage	Total employees	23.6	2.45
	Full-time employees	25.2	3.74
	Part-time employees	14.3	-5.30
Median weekly wage	Total employees	24.1	2.86
	Full-time employees	23.2	2.08
	Part-time employees	24.8	3.44

Trades relevant to manufacturing (Other trades occupations)

		Nominal (%)	Real (%)
Average hourly wage	Total employees	22.8	1.74
	Full-time employees	22.7	1.65
	Part-time employees	25.2	3.74
Average weekly wage	Total employees	23.5	2.34
	Full-time employees	23.4	2.25
	Part-time employees	30.8	8.34
Median hourly wage	Total employees	17.6	-2.52
	Full-time employees	18.2	-2.10
	Part-time employees	10.0	-8.85
Median weekly wage	Total employees	20.3	-0.33
	Full-time employees	20.0	-0.57
	Part-time employees	17.6	-2.52

Note: Other trades occupations include occupations H211 to H535 (NOC-S Classification), in which there is 5 of the 6 most important apprenticeable occupations for manufacturing (Tool and die makers, Machinists, Construction millwrights, Welders, Industrial Electricians)

Source: CANSIM Table 282-0070 (LFS)

Table 19: Age composition by Industry (Employment in Thousands), Manufacturing, 1976-2006

	Total, all industries						Manufacturing					
	15 to 24 years	Share of total	25 to 54 years	Share of total	55 years and over	Share of total	15 to 24 years	Share of total	25 to 54 years	Share of total	55 years and over	Share of total
1976	2,533.6	26.0	6,071.8	62.3	1,142.1	11.7	445.6	23.9	1,218.8	65.5	196.6	10.6
1977	2,571.3	25.9	6,207.1	62.6	1,138.7	11.5	428.3	23.2	1,219.4	65.9	201.7	10.9
1978	2,635.8	25.8	6,428.9	62.9	1,155.6	11.3	450.0	23.5	1,261.8	65.9	202.6	10.6
1979	2,774.9	26.0	6,688.0	62.7	1,205.6	11.3	503.5	24.7	1,319.8	64.8	211.9	10.4
1980	2,836.2	25.8	6,929.5	63.1	1,218.3	11.1	498.2	23.9	1,359.4	65.3	222.6	10.7
1981	2,865.0	25.3	7,203.0	63.7	1,237.0	10.9	476.6	22.9	1,372.1	66.0	231.3	11.1
1982	2,578.4	23.6	7,142.4	65.3	1,222.9	11.2	369.6	19.7	1,281.2	68.4	221.7	11.8
1983	2,513.4	22.8	7,292.9	66.2	1,215.8	11.0	333.7	18.1	1,292.2	70.1	216.9	11.8
1984	2,537.0	22.4	7,534.4	66.7	1,230.3	10.9	366.8	19.1	1,344.5	70.0	208.7	10.9
1985	2,542.9	21.9	7,840.8	67.4	1,243.6	10.7	356.4	18.5	1,373.9	71.4	193.6	10.1
1986	2,576.3	21.5	8,179.8	68.2	1,230.5	10.3	339.9	16.9	1,464.2	72.8	206.8	10.3
1987	2,575.1	20.9	8,510.3	69.0	1,247.6	10.1	350.1	17.2	1,484.8	72.7	206.1	10.1
1988	2,559.1	20.1	8,879.9	69.9	1,270.5	10.0	350.3	16.7	1,548.4	73.7	201.7	9.6
1989	2,528.1	19.5	9,192.9	70.7	1,275.2	9.8	330.0	15.5	1,608.4	75.5	191.3	9.0
1990	2,405.3	18.4	9,393.1	71.8	1,288.0	9.8	277.7	13.5	1,576.8	76.9	195.6	9.5
1991	2,235.4	17.4	9,367.4	72.9	1,254.6	9.8	211.6	11.2	1,499.5	79.3	179.2	9.5
1992	2,127.1	16.7	9,366.8	73.6	1,237.0	9.7	195.3	10.8	1,453.2	80.1	166.0	9.1
1993	2,072.3	16.2	9,499.2	74.3	1,221.3	9.5	183.1	10.3	1,441.2	81.0	154.8	8.7
1994	2,090.0	16.0	9,705.6	74.3	1,263.2	9.7	196.2	10.8	1,467.1	80.5	159.8	8.8
1995	2,096.9	15.8	9,941.3	74.8	1,257.1	9.5	204.9	10.8	1,538.7	80.8	160.2	8.4
1996	2,064.0	15.4	10,075.9	75.1	1,281.5	9.5	205.3	10.7	1,552.2	80.6	168.2	8.7
1997	2,031.5	14.8	10,338.3	75.4	1,336.3	9.7	210.2	10.5	1,615.2	80.3	185.5	9.2
1998	2,088.0	14.9	10,562.2	75.2	1,396.0	9.9	218.7	10.4	1,681.9	80.3	192.9	9.2
1999	2,192.9	15.2	10,746.6	74.6	1,467.2	10.2	247.1	11.3	1,743.5	79.6	200.9	9.2
2000	2,289.4	15.5	10,933.8	74.1	1,540.9	10.4	266.3	11.8	1,780.6	79.2	202.6	9.0
2001	2,324.6	15.6	11,022.4	73.7	1,599.2	10.7	246.1	11.0	1,767.2	79.3	215.7	9.7
2002	2,399.1	15.7	11,153.7	72.9	1,757.5	11.5	248.4	10.9	1,796.2	78.6	241.3	10.6
2003	2,449.4	15.6	11,261.5	71.9	1,961.4	12.5	236.1	10.4	1,786.5	78.5	252.6	11.1
2004	2,461.0	15.4	11,400.7	71.5	2,085.3	13.1	232.5	10.1	1,799.9	78.5	259.7	11.3
2005	2,472.5	15.3	11,481.9	71.0	2,215.3	13.7	216.3	9.8	1,711.3	77.5	279.9	12.7
2006	2,535.8	15.4	11,619.6	70.5	2,328.9	14.1	203.1	9.6	1,642.3	77.5	272.4	12.9
2007	2,589.4	15.4	11,782.7	69.9	2,494.3	14.8	194.5	9.5	1,563.9	76.5	286.4	14.0

Source: CANSIM Table 282-0008 (LFS)

Table 19a: Age Composition by Occupation (Employees in Thousands) (NOC-S), 1997-2006

	Total employees, all occupations						Trades, transport and equipment operators and related occupations (NOC-S Group H)					
	15 to 24 years	Share of total	25 to 54 years	Share of total	55 years and over	Share of total	15 to 24 years	Share of total	25 to 54 years	Share of total	55 years and over	Share of total
1997	1,879.2	16.5	8,584.1	75.6	893.3	7.9	235.8	13.5	1,348.9	77.3	159.2	9.1
1998	1,941.2	16.7	8,768.1	75.3	931.3	8.0	230.5	13.2	1,348.8	77.3	164.9	9.5
1999	2,051.0	17.1	8,953.9	74.8	968.9	8.1	241.3	13.8	1,332.7	76.4	170.8	9.8
2000	2,173.6	17.5	9,165.4	74.0	1,051.5	8.5	251.5	14.0	1,375.8	76.4	173.7	9.6
2001	2,231.4	17.6	9,320.0	73.6	1,118.1	8.8	255.9	14.1	1,372.6	75.7	185.9	10.2
2002	2,295.3	17.7	9,467.2	72.8	1,233.4	9.5	259.9	13.9	1,399.7	75.0	206.1	11.0
2003	2,339.3	17.6	9,553.3	72.0	1,377.9	10.4	270.9	14.1	1,425.7	74.0	229.8	11.9
2004	2,360.1	17.5	9,663.7	71.6	1,469.9	10.9	292.8	15.1	1,411.3	72.6	240.0	12.3
2005	2,373.5	17.4	9,708.3	71.1	1,576.4	11.5	298.0	15.0	1,429.5	72.1	255.4	12.9
2006	2,443.4	17.5	9,863.9	70.5	1,679.0	12.0	320.3	15.8	1,445.3	71.1	266.8	13.1
2007	2,500.2	17.5	9,959.1	69.9	1,792.2	12.6	321.7	15.6	1,467.9	71.1	276.3	13.4

Source: CANSIM Table 282-0070 (LFS)
Note: NOC-S group H includes 33 of the 47 trades discussed in this paper.

Table 20: Retirement Age and Worker's Median Age for Selected Occupations, 2001

	Median Retirement Age (Ave. 1997-2001)	Workers' Median Age (2001)
All Occupations	60.9	38
Transportation Equipment Operators & Related Workers, Excluding Labourers	62.5	42
Mechanics	61.0	39
Technical Occupations Related to Natural & Applied Sciences	59.1	37
Heavy Equipment & Crane Operators Including Drillers	63.7	41
Machine Operators in Manufacturing	62.0	39
Construction Trades	62.7	39
Machinists, Metal Forming, Shaping & Erecting Occupations	63.5	39
Assemblers in Manufacturing	62.5	38
Other Trades N.E.C	63.5	39

Source: Source: Wannell, Ted, Retirement "Hot Spots", Labour and Household Analysis Division, Statistics Canada, October 2002. Available online at http://www.sdc.gc.ca/asp/gateway.asp?hr=en/lp/spila/wlb/aw/54affected-stats.shtml&hs=wnc

Table 21: Nominal Wages by Type of Occupation, All Occupations and Trades Related to Manufacturing, 1997-2006

	Average weekly wage rate		Median weekly wage rate	
	Total employees, all occupations	Trades, transport and equipment operators and related occupations (NOC-S group H)	Total employees, all occupations	Trades, transport and equipment operators and related occupations (NOC-S group H)
1997	573.25	642.45	523.60	637.50
1998	581.38	655.61	533.75	647.20
1999	597.08	664.84	549.60	654.00
2000	616.02	688.15	562.50	680.00
2001	635.75	710.30	576.80	693.60
2002	649.94	722.40	594.40	702.00
2003	662.44	736.25	600.00	720.00
2004	679.83	746.85	605.60	723.60
2005	703.35	770.80	634.55	750.00
2006	727.78	796.68	650.00	770.00
97-06	2.69	2.42	2.43	2.12
97-00	2.43	2.32	2.42	2.17
00-06	2.82	2.47	2.44	2.09

Source: Lafour Force Survey, CANSIM Table 282-0070
Note: NOC-S group H includes 33 of the 47 trades discussed in this paper.

Table 22: Real and Nominal Wage Increase Between 1997 and 2006, by Occupational Group

	Nominal increase, percentage	Real increase, percentage
Other management occupations	43.3	18.7
Management occupations	42.4	18.0
Professional occupations in business and finance	41.4	17.1
Professional occupations in health, nurse supervisors and registered nurses	38.1	14.4
Senior management occupations	36.4	13.0
Natural and applied sciences and related occupations	32.7	10.0
Health occupations	29.6	7.4
Occupations unique to primary industry	29.4	7.2
Contractors and supervisors in trades and transportation	28.1	6.1
Business, finance and administrative occupations	27.1	5.3
Total employees, all occupations	***27.0***	***5.2***
Chefs and cooks, and occupations in food and beverage service, including supervisors	26.6	4.9
Transport and equipment operators	25.4	3.9
Occupations in social science, government service and religion	25.1	3.7
Technical, assisting and related occupations in health	24.9	3.5
Financial, secretarial and administrative occupations	24.8	3.4
Construction trades	24.3	3.0
Clerical occupations, including supervisors	24.1	2.8
Trades, transport and equipment operators and related occupations	24.0	2.8
Other trades occupations	***23.5***	***2.3***
Occupations in art, culture, recreation and sport	23.2	2.0
Sales and service occupations;	23.0	1.9
Machine operators and assemblers in manufacturing, including supervisors	23.0	1.9
Retail salespersons, sales clerks, cashiers, including retail trade supervisors	22.5	1.5
Occupations unique to processing, manufacturing and utilities	22.2	1.3
Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers	21.5	0.7
Trades helpers, construction, and transportation labourers and related occupations	20.8	0.1
Occupations in social science, education, government service and religion	20.6	-0.1
Occupation in protective services	20.4	-0.2
Childcare and home support workers	20.0	-0.5
Teachers and professors	19.3	-1.2
Sales and service occupations not elsewhere classified, including occupations in travel and accommodation, attendants in recreation and sport as well as supervisors	18.7	-1.7
Labourer in processing, manufacturing and utilities	14.9	-4.8

Source: LFS CANSIM Table 282-0070, CPI CANSIM Table 326-0020 (rebased to 1997).
Note: Average weekly wages for total employees data was used

Table 23: Average Nominal Weekly Earnings by NAICS 2-digits Industry, 1991-2006

	All Industries	Forestry, logging and support [11]	Mining and oil and gas extraction [21]	Utilities [22]	Construction [23]	**Manufacturing [31-33]**	Wholesale trade [41]	Retail trade [44-45]	Transportation and warehousing [48-49]	Information and cultural industries [51]	Finance and insurance [52]	Real estate and rental and leasing [53]
1991	539.88	626.86	826.65	798.13	680.14	**608.81**	619.32	356.83	598.90	639.00	616.29	449.37
1992	558.97	642.65	853.98	830.98	689.40	**633.26**	642.72	364.47	611.97	674.26	649.87	470.70
1993	568.26	650.14	868.43	856.31	691.05	**644.46**	655.66	372.26	616.07	686.72	687.88	476.04
1994	576.95	669.63	873.33	863.19	701.47	**656.64**	672.32	383.13	625.01	711.05	696.26	504.20
1995	583.38	665.44	910.29	876.90	717.47	**665.78**	691.59	387.28	638.16	722.98	714.30	504.21
1996	594.80	710.24	955.20	888.02	733.96	**686.77**	693.04	390.55	648.06	724.14	764.16	533.93
1997	603.77	744.27	944.08	907.24	755.48	**693.78**	710.32	400.32	661.97	736.87	795.17	566.25
1998	613.92	725.39	994.50	934.71	743.42	**720.42**	740.18	412.40	677.19	733.86	812.86	560.10
1999	621.59	729.40	976.80	964.46	746.38	**734.15**	742.10	418.30	690.82	741.71	817.22	568.76
2000	635.44	765.73	1046.62	974.77	765.00	**745.13**	741.36	420.48	699.36	758.72	837.59	579.82
2001	645.43	792.61	1056.69	954.99	762.96	**759.63**	758.03	426.41	713.64	781.98	843.05	599.47
2002	658.90	813.81	1042.85	975.27	771.23	**777.78**	764.27	430.70	734.82	804.15	844.08	600.95
2003	666.96	816.63	1027.08	982.88	791.31	**785.01**	775.11	440.32	736.78	805.52	871.69	597.24
2004	680.60	828.35	1138.40	991.15	788.77	**800.80**	785.18	450.86	724.68	812.93	887.57	613.41
2005	704.26	874.31	1178.78	988.01	819.29	**829.91**	812.49	467.73	750.42	866.48	928.66	638.02
2006	723.55	915.76	1196.22	1004.27	824.34	**847.30**	856.25	478.37	755.71	916.63	958.58	661.94
91-06	1.97	2.56	2.49	1.54	1.29	**2.23**	2.18	1.97	1.56	2.43	2.99	2.62
00-06	2.19	3.03	2.25	0.50	1.25	**2.16**	2.43	2.17	1.30	3.20	2.27	2.23
2006	2.74	4.74	1.48	1.65	0.62	**2.10**	5.39	2.27	0.70	5.79	3.22	3.75

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Average Annual Growth rates

Table 23 (continued): Average Nominal Weekly Earnings by NAICS 2-digits Industry, 1991-2006

	Professional, scientific and technical services [54]	Management of companies and enterprises [55]	Administrative and support, waste management and remediation services [56]	Educational services [61]	Health care and social assistance [62]	Arts, entertainment and recreation [71]	Accommodation and food services [72]	Other services (except public administration) [81]	Public administration [91]
1991	641.73	741.40	399.63	646.67	489.95	349.27	227.87	423.79	684.89
1992	667.21	846.05	423.21	672.80	508.34	356.87	233.98	428.07	699.35
1993	677.99	882.02	430.39	680.28	523.10	357.16	238.21	442.55	722.23
1994	705.34	803.85	441.85	675.93	527.44	368.70	250.23	442.21	726.38
1995	731.36	862.51	455.54	674.19	524.49	377.85	255.42	450.37	724.06
1996	760.18	918.65	468.02	667.15	532.20	386.22	260.95	464.00	719.15
1997	789.78	905.01	483.13	658.20	541.22	384.34	257.00	469.54	717.35
1998	798.25	850.64	486.48	667.60	538.06	376.65	252.97	477.43	718.83
1999	813.58	845.14	483.81	663.40	537.35	391.68	257.70	485.53	742.38
2000	853.77	819.04	506.27	672.27	552.06	402.59	270.74	497.15	761.55
2001	869.47	817.82	522.55	685.67	569.53	434.39	264.73	513.91	768.20
2002	889.57	830.88	524.15	713.70	593.91	438.53	276.55	522.25	812.08
2003	904.42	839.62	530.74	733.82	600.91	422.04	265.53	519.71	836.63
2004	916.47	850.82	549.18	759.48	627.45	417.62	272.63	538.31	853.36
2005	939.75	890.03	562.67	785.97	643.90	425.54	288.18	556.85	880.60
2006	949.84	925.70	587.73	811.20	665.33	430.73	299.43	571.73	910.77
91-06	2.65	1.49	2.60	1.52	2.06	1.41	1.84	2.02	1.92
00-06	1.79	2.06	2.52	3.18	3.16	1.13	1.69	2.36	3.03
2006	1.07	4.01	4.45	3.21	3.33	1.22	3.90	2.67	3.43

Source: CANSIM Table 281-0027 (SEPH)
Note: Growth rates refer to Average Annual Growth rates

Table 24: Average Hourly Earnings for Hourly-Paid Employees in Manufacturing, by Sub-Industry, 1991-2006

	Industrial aggregate	Manufacturing [31-33]	Food [311]	Beverage and tobacco product [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied product [316]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]
1991	13.72	14.80	12.83	17.37	11.14	9.95	9.28	9.43	**18.07**	14.91	14.30
1992	14.15	15.27	12.91	18.09	11.71	10.38	9.44	9.14	**18.73**	16.11	13.90
1993	14.37	15.51	13.53	19.06	11.65	10.16	9.40	9.51	**19.07**	16.04	16.24
1994	14.54	15.76	13.53	19.78	12.10	10.26	9.60	9.98	**19.41**	15.29	16.77
1995	14.74	16.08	13.49	20.15	12.59	10.81	9.68	10.02	**20.14**	15.53	16.30
1996	15.13	16.59	14.19	19.79	13.21	12.43	10.86	11.21	**20.37**	15.75	16.65
1997	15.19	16.56	14.14	19.95	13.09	12.81	10.97	11.00	**20.77**	15.75	16.39
1998	15.40	16.99	14.18	19.94	12.81	12.36	10.96	11.21	**21.59**	15.87	20.62
1999	15.64	17.23	14.13	19.73	13.02	12.52	10.81	10.89	**21.63**	15.05	20.53
2000	16.07	17.65	14.49	20.56	13.93	13.23	11.27	11.39	**22.38**	15.95	18.91
2001	16.36	18.02	14.89	21.26	13.74	12.86	10.51	11.03	**22.66**	17.37	20.94
2002	16.67	18.48	15.30	21.69	14.30	13.26	11.10	11.41	**22.48**	17.58	21.86
2003	16.77	18.95	16.26	20.57	14.31	13.48	11.28	11.34	**22.51**	17.70	21.90
2004	17.26	19.46	16.88	19.91	15.98	14.76	12.84	11.46	**22.16**	18.39	21.48
2005	17.67	19.92	17.47	20.19	16.51	14.85	12.96	11.69	**22.89**	19.03	22.32
2006	18.02	19.99	16.36	22.77	16.15	15.64	14.11	11.28	**21.58**	19.25	22.59
91-06	1.83	2.02	1.63	1.82	2.51	3.06	2.83	1.20	**1.19**	1.72	3.10
00-06	1.93	2.10	2.04	1.72	2.50	2.83	3.82	-0.16	**-0.60**	3.18	3.01
2006	1.98	0.35	-6.35	12.78	-2.18	5.32	8.87	-3.51	**-5.72**	1.16	1.21

Source: CANSIM Table 281-0030 (SEPH)

Note: Growth rates refer to Average Annual Growth rates

Table 24 (continued): Average Hourly Earnings for Hourly-Paid Employees in Manufacturing, by Sub-Industry, 1991-2006

	Chemicals [325]	Wood products [321]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal product [332]**	**Machinery [333]**	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related product [337]**	Miscellaneous manufacturing [339]
1991	16.40	14.85	15.49	**18.65**	**14.66**	**14.83**	14.06	**17.85**	**10.97**	10.94
1992	16.85	15.02	16.15	**19.51**	**15.23**	**15.36**	14.90	**18.27**	**11.29**	10.84
1993	17.29	15.31	16.19	**19.98**	**14.69**	**15.31**	14.78	**18.71**	**11.67**	11.46
1994	17.55	15.67	16.04	**20.02**	**14.89**	**15.39**	15.38	**19.65**	**11.64**	11.62
1995	17.06	16.20	16.67	**20.64**	**15.50**	**15.92**	15.92	**20.29**	**11.99**	11.59
1996	17.32	16.76	17.14	**20.87**	**15.84**	**16.77**	15.07	**20.23**	**12.73**	12.69
1997	17.08	16.81	16.50	**20.76**	**15.81**	**17.13**	15.38	**20.25**	**12.62**	12.85
1998	18.15	17.11	16.65	**20.92**	**16.47**	**17.76**	16.18	**21.36**	**13.32**	12.94
1999	18.11	17.39	17.01	**21.81**	**17.37**	**18.31**	15.59	**21.53**	**13.89**	12.84
2000	17.79	17.55	17.16	**21.80**	**17.47**	**19.19**	17.20	**21.60**	**14.57**	13.25
2001	18.22	17.52	18.34	**22.19**	**17.45**	**20.44**	17.93	**22.46**	**15.40**	14.04
2002	19.52	18.20	18.56	**22.39**	**18.14**	**21.58**	17.95	**22.64**	**16.38**	14.63
2003	20.05	18.91	17.43	**22.97**	**18.84**	**21.95**	17.83	**23.17**	**16.37**	16.38
2004	19.96	19.26	18.57	**23.65**	**18.96**	**22.23**	17.98	**23.79**	**17.38**	16.73
2005	20.18	19.53	18.49	**24.07**	**19.51**	**22.55**	18.68	**24.08**	**18.43**	17.36
2006	19.85	20.09	18.49	**25.84**	**19.06**	**23.67**	19.93	**24.38**	**18.76**	16.62
91-06	1.28	2.04	1.19	**2.20**	**1.77**	**3.17**	2.35	**2.10**	**3.64**	2.83
00-06	1.84	2.28	1.25	**2.87**	**1.46**	**3.56**	2.49	**2.04**	**4.30**	3.85
2006	-1.64	2.87	0.00	**7.35**	**-2.31**	**4.97**	6.69	**1.25**	**1.79**	-4.26

Source: CANSIM Table 281-0030 (SEPH)

Note: Growth rates refer to Average Annual Growth rates

Table 24a: Average Hourly Earnings for Salaried Employees in Manufacturing, by Sub-Industry, 1991-2006

	Industrial aggregate	Manufacturing [31-33]	Food [311]	Beverage and tobacco product [312]	Textile mills [313]	Textile product mills [314]	Clothing [315]	Leather and allied product [316]	**Paper [322]**	Printing and related support activities [323]	Petroleum and coal products [324]
1991	18.71	20.49	18.53	22.91	18.72	18.36	16.92	15.93	**23.96**	18.05	26.71
1992	19.52	21.28	19.06	24.07	19.62	18.31	16.76	15.34	**24.71**	19.66	25.21
1993	19.93	21.94	19.48	24.50	19.67	18.23	16.59	15.97	**25.25**	20.08	28.00
1994	20.32	22.57	20.31	24.51	20.46	17.69	16.12	16.65	**26.12**	20.49	28.60
1995	20.87	23.29	21.14	25.03	21.73	19.30	17.75	17.64	**27.01**	21.27	29.32
1996	21.19	23.47	21.13	26.62	20.56	18.94	16.56	16.84	**27.48**	21.79	29.15
1997	21.42	24.41	21.64	27.29	20.98	20.26	17.56	17.39	**28.09**	23.65	29.71
1998	21.91	25.51	22.54	29.17	21.62	20.78	18.40	17.94	**28.57**	22.30	31.81
1999	22.29	25.97	23.26	30.51	24.27	23.09	19.44	18.15	**29.03**	23.93	32.15
2000	22.81	26.61	25.21	33.05	23.86	22.11	18.55	19.81	**27.51**	24.55	32.08
2001	23.00	27.00	25.97	33.89	24.28	21.64	18.79	20.94	**26.70**	23.24	31.79
2002	23.40	27.53	26.32	34.14	24.79	22.06	19.32	20.51	**27.35**	22.90	34.15
2003	23.88	27.19	23.10	33.45	24.72	22.50	19.70	20.52	**27.81**	23.86	33.04
2004	24.45	27.77	26.41	36.36	24.04	21.05	19.77	18.25	**28.74**	25.14	35.35
2005	25.28	28.69	28.37	29.62	25.13	21.40	20.18	18.92	**27.58**	28.11	37.25
2006	26.08	30.21	34.22	25.52	27.73	23.99	23.99	20.67	**29.94**	26.34	38.56
91-06	2.24	2.62	4.17	0.72	2.65	1.80	2.35	1.75	**1.50**	2.55	2.48
00-06	2.26	2.14	5.22	-4.22	2.54	1.37	4.38	0.71	**1.42**	1.18	3.11
2006	3.16	5.30	20.62	-13.84	10.35	12.10	18.88	9.25	**8.56**	-6.30	3.52

Source: CANSIM Table 281-0036 (SEPH)

Note: Growth rates refer to Average Annual Growth rates

Table 24a (continued): Average Hourly Earnings for Salaried Employees in Manufacturing, by Sub-Industry, 1991-2006

	Chemicals [325]	Wood products [321]	Non-metallic mineral products [327]	**Primary metal [331]**	**Fabricated metal product [332]**	**Machinery [333]**	Electrical equipment, appliance and component [335]	**Transportation equipment [336]**	**Furniture and related product [337]**	Miscellaneous manufacturing [339]
1991	22.43	19.40	20.26	**24.38**	**18.81**	**19.42**	21.42	**22.16**	**15.73**	15.30
1992	23.45	20.33	20.36	**24.92**	**19.46**	**20.26**	22.82	**22.95**	**16.29**	16.09
1993	24.31	20.69	20.64	**25.56**	**19.73**	**20.82**	22.28	**24.15**	**17.44**	17.14
1994	25.68	20.66	21.54	**26.12**	**20.21**	**21.60**	22.88	**25.21**	**17.25**	17.79
1995	26.20	21.84	22.46	**27.15**	**20.73**	**22.42**	23.57	**25.84**	**18.57**	18.26
1996	26.51	22.76	23.44	**27.83**	**21.89**	**23.55**	23.58	**26.30**	**18.30**	18.14
1997	27.80	23.17	24.29	**28.37**	**22.80**	**24.76**	24.56	**27.54**	**19.42**	18.90
1998	28.56	24.91	23.46	**28.54**	**23.68**	**26.54**	26.56	**29.18**	**19.65**	20.97
1999	28.10	24.15	21.81	**30.85**	**23.43**	**26.32**	25.97	**29.31**	**21.24**	20.62
2000	28.59	23.76	23.34	**30.96**	**24.48**	**28.43**	25.87	**30.62**	**22.31**	22.42
2001	28.29	26.87	24.07	**29.33**	**26.29**	**29.55**	26.85	**30.45**	**22.59**	22.27
2002	29.81	26.00	24.70	**29.85**	**27.27**	**30.00**	27.49	**30.55**	**22.90**	22.92
2003	29.41	26.68	24.06	**29.60**	**27.24**	**29.66**	26.96	**32.75**	**22.33**	21.80
2004	31.43	27.28	27.70	**28.86**	**25.46**	**29.57**	26.15	**33.50**	**23.98**	20.90
2005	32.23	25.02	29.06	**30.91**	**25.66**	**30.53**	25.63	**35.75**	**25.64**	20.97
2006	33.23	24.50	28.93	**32.77**	**27.19**	**33.49**	28.38	**34.82**	**25.39**	21.40
91-06	2.65	1.57	2.40	**1.99**	**2.49**	**3.70**	1.89	**3.06**	**3.24**	2.26
00-06	2.54	0.51	3.64	**0.95**	**1.77**	**2.77**	1.56	**2.17**	**2.18**	-0.77
2006	3.10	-2.08	-0.45	**6.02**	**5.96**	**9.70**	10.73	**-2.60**	**-0.98**	2.05

Source: CANSIM Table 281-0036 (SEPH)

Note: Growth rates refer to Average Annual Growth rates

Table 25: Apprenticeship Total Registration as Share of Labour Force, Post-Secondary Educational Programs, Canada, 1977-2005

YEARS	Labour Force 15-44, thous.	Total Registrations				Apprenticeship Registration as Share of, (%)			
		Community College (full-time)	University	Apprenticeship	Total	Labour Force, 15-44	Community College Enrollment	University Enrollment	Total Enrollment
	A	B	C	D	E = B+C+D	F = 1/10 (D/A)	G = 100(D/B)	H = 100(D/C)	I = 100(D/E)
1977	7,861	241,665	585,845	122,908	950,418	1.56	50.9	21.0	12.9
1978	8,180	249,768	584,060	130,334	964,162	1.59	52.2	22.3	13.5
1979	8,503	252,146	601,225	135,415	988,786	1.59	53.7	22.5	13.7
1980	8,811	260,761	627,750	138,673	1,027,184	1.57	53.2	22.1	13.5
1981	9,118	273,377	653,790	153,140	1,080,307	1.68	56.0	23.4	14.2
1982	9,165	295,575	692,770	155,125	1,143,470	1.69	52.5	22.4	13.6
1983	9,350	316,294	729,215	139,098	1,184,607	1.49	44.0	19.1	11.7
1984	9,551	321,537	738,955	138,235	1,198,727	1.45	43.0	18.7	11.5
1985	9,755	322,212	734,563	139,199	1,195,974	1.43	43.2	18.9	11.6
1986	10,022	321,495	745,056	154,226	1,220,777	1.54	48.0	20.7	12.6
1987	10,179	319,548	762,044	156,857	1,238,449	1.54	49.1	20.6	12.7
1988	10,338	317,583	783,115	162,064	1,262,762	1.57	51.0	20.7	12.8
1989	10,517	316,841	807,703	174,663	1,299,207	1.66	55.1	21.6	13.4
1990	10,614	324,529	834,091	192,332	1,350,952	1.81	59.3	23.1	14.2
1991	10,599	349,207	864,667	192,950	1,406,824	1.82	55.3	22.3	13.7
1992	10,469	364,696	885,645	180,965	1,431,306	1.73	49.6	20.4	12.6
1993	10,442	369,192	874,605	168,985	1,412,782	1.62	45.8	19.3	12.0
1994	10,430	379,961	858,972	163,750	1,402,683	1.57	43.1	19.1	11.7
1995	10,439	391,282	846,408	163,370	1,401,060	1.56	41.8	19.3	11.7
1996	10,485	397,308	829,767	165,325	1,392,400	1.58	41.6	19.9	11.9
1997	10,524	398,643	822,774	171,180	1,392,597	1.63	42.9	20.8	12.3
1998	10,577	403,516	826,362	175,960	1,405,838	1.66	43.6	21.3	12.5
1999	10,651	408,781	847,503	186,385	1,442,669	1.75	45.6	22.0	12.9
2000	10,705	n.a.	850,581	199,075	n.a.	1.86	n.a.	23.4	n.a.
2001	10,768	n.a.	886,605	215,245	n.a.	2.00	n.a.	24.3	n.a.
2002	10,920	n.a.	933,870	231,415	n.a.	2.12	n.a.	24.8	n.a.
2003	10,962	511,483	993,246	250,795	1,755,524	2.29	49.0	25.3	14.3
2004	10,963	514,266	1,017,588	267,775	1,799,629	2.44	52.1	26.3	14.9
2005	10,908	n.a.	1,047,705	293,835	n.a.	2.69	n.a.	n.a.	n.a.
77-05	1.2	2.4*	2.1**	3.2	1.9*	2.0	-0.4*	0.9**	0.0*
77-87	2.6	2.8	2.7	2.5	2.7	-0.1	-0.4	-0.2	-0.2
87-91	1.0	2.2	3.2	5.3	3.2	4.3	3.0	2.0	2.0
91-96	-0.2	2.6	-0.8	-3.0	-0.2	-2.8	-5.5	-2.2	-2.8
96-05	0.4	n.a.	n.a.	6.6	n.a.	6.1	n.a.	n.a.	n.a.

Sources: A - Statistics Canada (SC), 282-0002 (15+ minus 45+), January 4, 2005 (pre-revision)
B - SC, 477-0006; Data for 2003-2004 from the Survey of Colleges and Institutes (SCI - school years 2003-04 and 2004-05)
C - 1992-2003, SC, 477-0013; 1985-1992: Education in Canada, SC cat. no. 81-229;
1977-1984: Unpublished Statistics Canada Data
D - Statistics Canada, HRDC Apprenticeship Database

Notes: Period growth rates refer to compound average annual growth rates
* - Indicates 1977-1999
** - Indicates 1977-2004
Enrollments for community colleges refer to full-time enrollments only, but refer to all enrollments for universities and apprenticeships.
For community colleges and universities, the enrollments in a given year refer to the enrollments as of October 31 of that year, i.e. near the start of the academic year beginning in the autumn of that calendar year.
For apprenticeships, registrations in a given year refer to registrations during the calendar year.

Table 26: Apprenticeship Completion Trends, Canada, All Trades, 1977-2005

YEAR	Levels					*Red Seal Certificate as % of Completions*	Index			
	Reg. Total	*New Reg.*	*Incumbent Reg.*	*Completions*	*Red Seal Certificate**		*Reg. Total*	*New Reg.*	*Completions*	*Red Seal Certificate as % of Completions*
	Number	Number	Number	Number	Number	%	Index, 1977=100	Index, 1977=100	Index, 1977=100	Index, 1977=100
	A	B	C	D	E	F = 100(E/D)	G = Index (A)	H = Index (B)	I = Index (D)	J = Index (F)
1977	122,908	30,043	92,865	17,427	14,328	82.2	100.0	100.0	100.0	100.0
1978	130,334	32,703	97,631	19,034	15,473	81.3	106.0	108.9	109.2	98.9
1979	135,415	36,407	99,008	18,163	14,577	80.3	110.2	121.2	104.2	97.6
1980	138,673	43,676	94,997	15,096	9,075	60.1	112.8	145.4	86.6	73.1
1981	153,140	39,732	113,408	15,340	7,910	51.6	124.6	132.3	88.0	62.7
1982	155,125	29,926	125,199	20,786	9,011	43.4	126.2	99.6	119.3	52.7
1983	139,098	19,236	119,862	15,657	8,118	51.8	113.2	64.0	89.8	63.1
1984	138,235	27,637	110,598	19,335	10,151	52.5	112.5	92.0	110.9	63.9
1985	139,199	37,319	101,880	19,092	9,093	47.6	113.3	124.2	109.6	57.9
1986	154,226	41,701	112,525	17,105	6,303	36.8	125.5	138.8	98.2	44.8
1987	156,857	44,604	112,253	17,258	6,985	40.5	127.6	148.5	99.0	49.2
1988	162,064	38,327	123,737	17,296	7,675	44.4	131.9	127.6	99.2	54.0
1989	174,663	48,615	126,048	17,614	9,414	53.4	142.1	161.8	101.1	65.0
1990	192,332	48,438	143,894	17,804	7,850	44.1	156.5	161.2	102.2	53.6
1991	192,950	32,306	160,640	19,725	8,588	43.5	157.0	107.5	113.2	53.0
1992	180,965	27,375	152,015	18,720	8,400	44.9	147.2	91.1	107.4	54.6
1993	168,985	27,935	138,360	18,410	8,381	45.5	137.5	93.0	105.6	55.4
1994	163,750	31,325	131,215	16,800	7,134	42.5	133.2	104.3	96.4	51.6
1995	163,370	33,245	128,705	17,075	7,858	46.0	132.9	110.7	98.0	56.0
1996	165,325	32,815	131,085	16,075	8,060	50.1	134.5	109.2	92.2	61.0
1997	171,180	37,635	131,930	16,370	8,522	52.1	139.3	125.3	93.9	63.3
1998	175,960	39,655	134,680	16,465	8,481	51.5	143.2	132.0	94.5	62.7
1999	186,385	42,365	142,360	18,545	9,628	51.9	151.6	141.0	106.4	63.1
2000	199,075	48,460	148,775	18,395	9,900	53.8	162.0	161.3	105.6	65.5
2001	215,245	51,755	161,645	18,475	9,855	53.3	175.1	172.3	106.0	64.9
2002	231,415	51,345	177,890	16,690	10,095	60.5	190.8	170.9	95.8	73.6
2003	250,795	53,590	194,580	18,430	10,440	56.6	204.1	178.4	105.8	68.9
2004	267,775	57,040	207,165	19,535	n.a	n.a.	217.9	189.9	112.1	n.a.
2005	293,835	70,465	219,260	20,405	n.a	n.a.	239.1	234.5	117.1	n.a.
77-05	3.2	3.1	3.1	0.6	-1.2	-1.4	3.2	3.1	0.6	-1.4
77-87	2.5	4.0	1.9	-0.1	-6.9	-6.8	2.5	4.0	-0.1	-6.8
87-91	5.3	-7.7	9.4	3.4	5.3	1.8	5.3	-7.7	3.4	1.8
91-96	-3.0	0.3	-4.0	-4.0	-1.3	2.9	-3.0	0.3	-4.0	2.9
96-05	6.6	8.9	5.9	2.7	3.8	1.8	6.6	8.9	2.7	1.8

Sources: A, B, C, D, E - Statistics Canada, HRDC Apprenticeship Database

Notes: * - This refers to the total number of red seal certifications awarded in all trades in a given year

Period growth rates refer to compound average annual growth rates

Table 27: Apprenticeship Completion/Registration Ratio and Completion Rates, Canada, All Trades, 1977-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1977	122,908	30,043	17,427	14.2	n.a.	n.a.
1978	130,334	32,703	19,034	14.6	n.a.	n.a.
1979	135,415	36,407	18,163	13.4	n.a.	n.a.
1980	138,673	43,676	15,096	10.9	n.a.	n.a.
1981	153,140	39,732	15,340	10.0	51.1	n.a.
1982	155,125	29,926	20,786	13.4	63.6	62.9
1983	139,098	19,236	15,657	11.3	43.0	41.6
1984	138,235	27,637	19,335	14.0	44.3	48.4
1985	139,199	37,319	19,092	13.7	48.1	50.5
1986	154,226	41,701	17,105	11.1	57.2	57.7
1987	156,857	44,604	17,258	11.0	89.7	67.4
1988	162,064	38,327	17,296	10.7	62.6	61.6
1989	174,663	48,615	17,614	10.1	47.2	49.5
1990	192,332	48,438	17,804	9.3	42.7	43.2
1991	192,950	32,306	19,724	10.2	44.2	47.5
1992	180,965	27,375	18,720	10.3	48.8	42.7
1993	168,985	27,935	18,410	10.9	37.9	40.8
1994	163,750	31,325	16,800	10.3	34.7	39.0
1995	163,370	33,245	17,075	10.5	52.9	47.4
1996	165,325	32,815	16,075	9.7	58.7	55.0
1997	171,180	37,635	16,370	9.6	58.6	56.7
1998	175,960	39,655	16,465	9.4	52.6	53.4
1999	186,385	42,365	18,545	9.9	55.8	57.1
2000	199,075	48,460	18,395	9.2	56.1	53.2
2001	215,245	51,755	18,475	8.6	49.1	50.3
2002	231,415	51,345	16,690	7.2	42.1	41.8
2003	250,795	53,590	18,430	7.3	43.5	42.4
2004	267,775	57,040	19,535	7.3	40.3	41.1
2005	293,835	70,465	20,405	6.9	39.4	40.4
77-05	3.2	3.1	0.6	-2.5	n.a.	n.a.
77-87	2.5	4.0	-0.1	-3.2	n.a.	n.a.
87-91	5.3	-7.7	3.4	-0.8	-45.5	-19.9
91-96	-3.0	0.3	-4.0	-0.5	14.5	7.6
96-05	6.6	8.9	2.7	-3.7	-4.3	-3.4

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 28: Total Apprenticeship Registration, By Trade Group, Canada, 1991-2005

A - Total Registration, By Trade Group

YEARS	Total Major Trade Groups	Building Construction	Electrical, Electronics-related	Food and Service	Industrial and Related Mechanical	Metal Fabricating	Motor Vehicle and Heavy Equipment	Other
1991	192,950	46,925	37,040	11,495	15,970	39,530	39,250	2,740
1992	180,965	43,705	34,400	11,055	15,050	36,625	37,455	2,670
1993	168,985	40,995	31,425	11,955	13,375	33,600	34,910	2,725
1994	163,750	36,680	30,195	13,870	13,235	32,875	34,215	2,690
1995	163,370	34,785	29,215	15,260	13,550	33,310	34,390	2,860
1996	165,325	33,395	28,270	16,885	14,235	33,840	35,580	3,120
1997	171,180	32,955	28,205	18,035	14,670	35,875	37,950	3,490
1998	175,960	33,395	28,840	18,175	14,905	38,055	38,595	4,000
1999	186,385	36,495	30,475	18,910	16,020	40,390	39,865	4,230
2000	199,075	39,090	32,555	20,120	16,555	44,105	41,975	4,675
2001	215,245	42,110	36,435	22,155	17,725	47,425	43,940	5,460
2002	231,415	47,545	39,645	23,345	18,590	49,905	46,155	6,225
2003	250,795	53,605	42,400	25,175	19,575	52,505	49,655	6,920
2004	267,775	60,610	45,430	26,235	19,890	54,655	52,835	8,120
2005	293,835	68,705	49,435	27,470	21,055	60,370	57,755	9,045
91-05	3.0	2.8	2.1	6.4	2.0	3.1	2.8	8.9
91-96	-3.0	-6.6	-5.3	8.0	-2.3	-3.1	-1.9	2.6
96-05	6.6	8.3	6.4	5.6	4.4	6.6	5.5	12.6

B - Trade Group Share of Total Registration

YEARS	Building Construction	Electrical, Electronics-related	Food and Service	Industrial and Related Mechanical	Metal Fabricating	Motor Vehicle and Heavy Equipment	Other
1991	24.3	19.2	6.0	8.3	20.5	20.3	1.4
1992	24.2	19.0	6.1	8.3	20.2	20.7	1.5
1993	24.3	18.6	7.1	7.9	19.9	20.7	1.6
1994	22.4	18.4	8.5	8.1	20.1	20.9	1.6
1995	21.3	17.9	9.3	8.3	20.4	21.1	1.8
1996	20.2	17.1	10.2	8.6	20.5	21.5	1.9
1997	19.3	16.5	10.5	8.6	21.0	22.2	2.0
1998	19.0	16.4	10.3	8.5	21.6	21.9	2.3
1999	19.6	16.4	10.1	8.6	21.7	21.4	2.3
2000	19.6	16.4	10.1	8.3	22.2	21.1	2.3
2001	19.6	16.9	10.3	8.2	22.0	20.4	2.5
2002	20.5	17.1	10.1	8.0	21.6	19.9	2.7
2003	21.4	16.9	10.0	7.8	20.9	19.8	2.8
2004	22.6	17.0	9.8	7.4	20.4	19.7	3.0
2005	23.4	16.8	9.3	7.2	20.5	19.7	3.1
91-05	-0.9	-2.4	3.4	-1.1	0.1	-0.7	1.7
91-96	-4.1	-2.1	4.3	0.3	0.0	1.2	0.5
96-05	3.2	-0.3	-0.9	-1.4	0.1	-1.9	1.2

C - Total Registration, By Trade Group, Index, 1991=100

YEARS	Total Major Trade Groups	Building Construction	Electrical, Electronics-related	Food and Service	Industrial and Related Mechanical	Metal Fabricating	Motor Vehicle and Heavy Equipment	Other
1991	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1992	93.8	93.1	92.9	96.2	94.2	92.7	95.4	97.4
1993	87.6	87.4	84.8	104.0	83.8	85.0	88.9	99.5
1994	84.9	78.2	81.5	120.7	82.9	83.2	87.2	98.2
1995	84.7	74.1	78.9	132.8	84.8	84.3	87.6	104.4
1996	85.7	71.2	76.3	146.9	89.1	85.6	90.6	113.9
1997	88.7	70.2	76.1	156.9	91.9	90.8	96.7	127.4
1998	91.2	71.2	77.9	158.1	93.3	96.3	98.3	146.0
1999	96.6	77.8	82.3	164.5	100.3	102.2	101.6	154.4
2000	103.2	83.3	87.9	175.0	103.7	111.6	106.9	170.6
2001	111.6	89.7	98.4	192.7	111.0	120.0	111.9	199.3
2002	119.9	101.3	107.0	203.1	116.4	126.2	117.6	227.2
2003	130.0	114.2	114.5	219.0	122.6	132.8	126.5	252.6
2004	138.8	129.2	122.7	228.2	124.5	138.3	134.6	296.4
2005	152.3	146.4	133.5	239.0	131.8	152.7	147.1	330.1

Source: Statistics Canada, 477-0051

Notes: period growth rates in A refer to compound average annual growth rates
period growth rates in B refer to percentage point differences

Table 28a: Completion Rates 1 and 2, by Trade, 1995-2005

Canada, 1991-2005

New Registrations

	All Trades	Building & Construction Trades	Electrical & Electronics Trades	Food & Services Trades	Industrial & Mechanical Trades	Metal Fabricating Trades	Motor Vehicle & Heavy Equipment Trades	Other Trades
1991	32,306	7,063	5,346	3,458	2,461	5,612	7,718	655
1992	27,375	5,985	4,530	2,930	2,085	4,755	6,540	555
1993	27,935	5,875	4,065	3,845	2,085	5,095	6,400	575
1994	31,325	5,330	4,515	4,720	2,305	6,445	7,480	530
1995	33,245	4,940	4,635	5,090	2,835	7,265	7,785	700
1996	32,815	5,215	4,410	5,085	2,890	6,795	7,670	755
1997	37,635	5,650	5,175	5,410	3,005	8,470	9,015	910
1998	39,655	6,550	5,985	5,130	3,055	9,155	8,555	1,225
1999	42,365	8,275	6,125	5,320	3,440	9,155	9,015	1,035
2000	48,460	8,915	7,125	5,990	3,805	11,005	10,280	1,335
2001	51,755	9,365	7,850	6,730	3,970	11,445	10,885	1,500
2002	51,345	11,715	7,920	5,955	3,785	9,780	10,740	1,450
2003	53,590	12,815	7,830	5,815	3,940	10,420	10,985	1,785
2004	57,040	14,435	8,315	5,975	3,690	10,990	11,700	1,930
2005	70,465	16,735	10,125	7,090	4,840	14,855	14,655	2,165
91-05	5.73	6.36	4.67	5.26	4.95	7.20	4.69	8.92

*Completion Rate 1**

	All Trades	Building & Construction Trades	Electrical & Electronics Trades	Food & Services Trades	Industrial & Mechanical Trades	Metal Fabricating Trades	Motor Vehicle & Heavy Equipment Trades	Other Trades
1995	52.9	35.5	57.1	69.6	66.2	61.8	48.7	39.7
1996	58.7	38.3	62.5	86.7	69.1	70.8	52.1	36.9
1997	58.6	34.1	63.1	70.2	74.1	71.2	57.1	46.1
1998	52.6	36.1	55.4	55.6	64.6	60.2	50.1	54.7
1999	55.8	44.1	59.5	50.6	78.3	58.2	54.3	50.7
2000	56.1	38.8	61.2	50.8	57.8	62.3	63.5	42.4
2001	49.1	36.8	60.0	45.2	60.1	49.5	50.4	33.0
2002	42.1	31.2	51.6	35.8	53.4	42.0	46.2	23.7
2003	43.5	30.8	46.3	39.4	56.0	48.2	47.2	34.8
2004	40.3	28.8	49.4	37.1	52.6	43.5	39.8	26.2
2005	39.4	31.4	47.8	34.0	48.2	41.3	40.6	23.3
96-05	-19.3	-6.8	-14.6	-52.7	-20.8	-29.4	-11.5	-13.6

*Completion Rate 2***

	All Trades	Building & Construction Trades	Electrical & Electronics Trades	Food & Services Trades	Industrial & Mechanical Trades	Metal Fabricating Trades	Motor Vehicle & Heavy Equipment Trades	Other Trades
1996	55.0	36.3	60.9	74.5	65.2	65.3	49.4	34.5
1997	56.7	35.0	58.7	70.5	71.6	66.8	53.7	47.9
1998	53.4	35.8	56.8	57.7	61.9	61.9	51.9	48.2
1999	57.1	42.2	61.1	51.9	82.9	61.8	55.3	53.7
2000	53.2	38.4	57.0	49.8	57.4	56.3	59.7	40.6
2001	50.3	35.8	59.8	46.9	60.5	51.5	54.0	31.1
2002	41.8	30.0	53.6	34.7	51.5	43.1	44.6	27.4
2003	42.4	32.2	44.2	38.2	56.1	45.1	45.8	30.0
2004	41.1	29.0	50.0	37.0	53.5	45.4	40.7	27.1
2005	40.4	29.5	49.2	36.8	49.7	44.0	41.6	24.5
96-05	-14.7	-6.8	-11.7	-37.7	-15.5	-21.3	-7.9	-10.0

Source: Registered Apprenticeship Information System (RAIS) unpublished data

Note: Period growth rates refer to percentage point differences

* - $CR1_t = 100(C_t / B_{t-4})$

where C_t = Completions in the present year

B_{t-4} = New Registrations four years before the present

** - $$CR2_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

Table 29a: Industrial Mechanic - Millwright Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	7,360	1,375	945	12.8	-	-
1992	6,695	780	1,140	17.0	-	-
1993	5,360	775	885	16.5	-	-
1994	5,605	1,040	695	12.4	-	-
1995	5,805	1,210	620	10.7	45.1	-
1996	6,245	1,255	590	9.4	75.6	60.4
1997	6,725	1,415	635	9.4	81.9	73.4
1998	7,045	1,485	660	9.4	63.5	65.5
1999	7,605	1,525	1,385	18.2	114.5	118.5
2000	7,710	1,885	835	10.8	66.5	64.6
2001	8,310	1,885	935	11.3	66.1	67.5
2002	8,535	1,680	735	8.6	49.5	49.8
2003	9,105	1,805	925	10.2	60.7	56.7
2004	9,175	1,645	960	10.5	50.9	54.4
2005	9,595	2,205	815	8.5	43.2	44.9
91-05**	1.9	3.4	-1.1	-4.3	-1.9	-15.5
91-97**	-1.5	0.5	-6.4	-3.4	36.8	13.0
97-05	4.5	5.7	3.2	-0.9	-38.7	-28.5

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29b: Welder Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	4,335	1,075	550	12.7	-	-
1992	4,035	585	585	14.5	-	-
1993	3,745	725	570	15.2	-	-
1994	4,165	1,135	550	13.2	-	-
1995	4,720	1,395	560	11.9	52.1	-
1996	5,115	1,190	530	10.4	90.6	66.7
1997	6,380	2,075	695	10.9	95.9	85.3
1998	7,615	2,310	805	10.6	70.9	74.2
1999	7,950	1,510	1,120	14.1	80.3	90.3
2000	8,580	2,230	1,050	12.2	88.2	67.6
2001	9,320	2,845	1,030	11.1	49.6	55.4
2002	9,790	2,005	860	8.8	37.2	43.8
2003	9,680	1,680	1,050	10.8	69.5	52.1
2004	9,520	2,155	1,150	12.1	51.6	52.4
2005	10,935	3,480	1,130	10.3	39.7	47.9
91-05**	6.8	8.8	5.3	-2.4	-12.4	-18.8
91-97**	6.7	11.6	4.0	-1.8	43.8	18.6
97-05	7.0	6.7	6.3	-0.6	-56.1	-37.4

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29c: Machinist Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	3,580	470	470	13.1	-	-
1992	3,240	450	445	13.7	-	-
1993	2,965	425	435	14.7	-	-
1994	2,935	765	330	11.2	-	-
1995	3,270	925	265	8.1	56.4	-
1996	3,675	900	300	8.2	66.7	66.9
1997	4,215	1,145	355	8.4	83.5	64.9
1998	4,740	1,300	450	9.5	58.8	63.8
1999	5,020	1,050	465	9.3	50.3	53.9
2000	5,380	1,290	540	10.0	60.0	54.5
2001	5,590	1,240	500	8.9	43.7	44.8
2002	5,530	895	430	7.8	33.1	36.9
2003	5,635	940	400	7.1	38.1	33.0
2004	5,850	1,110	430	7.4	33.3	36.0
2005	6,275	1,330	450	7.2	36.3	39.4
91-05**	4.1	7.7	-0.3	-6.0	-20.1	-27.5
91-97**	2.8	16.0	-4.6	-4.7	27.1	-2.0
97-05	5.1	1.9	3.0	-1.3	-47.2	-25.5

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29d: Industrial Electrician Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	8,945	1,145	600	6.7	-	-
1992	7,975	690	380	4.8	-	-
1993	6,810	660	465	6.8	-	-
1994	6,875	1,270	340	4.9	-	-
1995	6,625	1,020	310	4.7	27.1	-
1996	6,450	925	295	4.6	42.8	35.5
1997	6,480	1,075	295	4.6	44.7	33.8
1998	6,550	1,095	280	4.3	22.0	28.5
1999	6,900	1,130	330	4.8	32.4	30.8
2000	7,280	1,285	305	4.2	33.0	30.3
2001	8,310	1,260	510	6.1	47.4	49.4
2002	9,400	1,505	535	5.7	48.9	48.6
2003	10,315	1,535	540	5.2	47.8	46.2
2004	10,735	1,450	440	4.1	34.2	35.9
2005	11,295	1,420	475	4.2	37.7	35.2
91-05**	1.7	1.5	-1.7	-2.5	10.6	-0.3
91-97**	-5.2	-1.0	-11.2	-2.2	17.6	-1.7
97-05	7.2	3.5	6.1	-0.3	-7.0	1.4

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29e: Tool and Die Maker Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	1,945	220	290	14.9	-	-
1992	1,695	180	265	15.6	-	-
1993	1,600	275	230	14.4	-	-
1994	1,615	440	165	10.2	-	-
1995	1,840	515	155	8.4	70.5	-
1996	2,105	505	190	9.0	105.6	84.4
1997	2,400	685	220	9.2	80.0	73.7
1998	2,665	695	315	11.8	71.6	76.8
1999	2,885	675	300	10.4	58.3	61.6
2000	3,125	755	410	13.1	81.2	72.1
2001	3,070	560	410	13.4	59.9	65.3
2002	3,010	545	260	8.6	37.4	38.0
2003	3,110	555	320	10.3	47.4	45.2
2004	3,040	490	335	11.0	44.4	50.5
2005	3,010	555	205	6.8	36.6	33.1
91-05**	3.2	6.8	-2.4	-8.1	-33.8	-51.4
91-97**	3.6	20.8	-4.5	-5.7	9.5	-10.7
97-05	2.9	-2.6	-0.9	-2.4	-43.4	-40.7

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29f: Steamfitter/Pipefitter Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	9,850	1,020	155	1.6	-	-
1992	8,930	885	220	2.5	-	-
1993	7,415	845	305	4.1	-	-
1994	7,155	1,020	330	4.6	-	-
1995	6,780	890	430	6.3	42.2	-
1996	6,280	815	355	5.7	40.1	38.7
1997	6,265	975	405	6.5	47.9	44.2
1998	6,340	1,020	370	5.8	36.3	40.3
1999	6,840	1,390	390	5.7	43.8	42.9
2000	7,520	1,570	385	5.1	47.2	43.1
2001	8,380	1,695	410	4.9	42.1	43.8
2002	9,200	1,665	415	4.5	40.7	36.8
2003	10,110	1,875	505	5.0	36.3	38.1
2004	10,730	1,860	645	6.0	41.1	41.6
2005	12,190	2,800	710	5.8	41.9	43.2
91-05**	1.5	7.5	11.5	4.3	-0.3	4.5
91-97**	-7.3	-0.7	17.4	4.9	5.8	5.5
97-05	8.7	14.1	7.3	-0.6	-6.0	-1.0

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 29g: Main 6 Manufacturing Trades Completion/Registration Ratio and Completion Rates, Canada, 1991-2005

Year	Registration and Completion Trends			Completion/Registration Ratio and Completion Rates		
	Reg. Total	New Reg.	Completions	Completion/ Registration Ratio	Completion Rate 1	Completion Rate 2
	Number	Number	Number	%	%	%
	A	B	C	$D_t = 100(C_t/A_t)$	$E_t = 100(C_t/B_{t-4})$	F_t = *
1991	36,015	5,305	3,010	8.4	-	-
1992	32,570	3,570	3,035	9.3	-	-
1993	27,895	3,705	2,890	10.4	-	-
1994	28,350	5,670	2,410	8.5	-	-
1995	29,040	5,955	2,340	8.1	44.1	-
1996	29,870	5,590	2,260	7.6	63.3	53.9
1997	32,465	7,370	2,605	8.0	70.3	60.4
1998	34,955	7,905	2,880	8.2	50.8	56.4
1999	37,200	7,280	3,990	10.7	67.0	69.5
2000	39,595	9,015	3,525	8.9	63.1	55.9
2001	42,980	9,485	3,795	8.8	51.5	54.6
2002	45,465	8,295	3,235	7.1	40.9	43.0
2003	47,955	8,390	3,740	7.8	51.4	46.4
2004	49,050	8,710	3,960	8.1	43.9	46.1
2005	53,300	11,790	3,785	7.1	39.9	42.4
91-05**	2.8	5.9	1.6	-1.3	-4.2	-11.5
91-97**	-1.7	5.6	-2.4	-0.3	26.2	6.5
96-05	6.6	8.6	5.9	-0.5	-23.4	-11.5

Sources: A, B, C - Statistics Canada, HRDC Apprenticeship Database

Notes: * - See Formula

$$F_t = 100\left(\frac{C_t}{\left[B_{t-3} + B_{t-4} + B_{t-5}/3\right]}\right)$$

**First period is 1991 or earliest year. For E it is 1995 and for F it is 1996.
Period growth rates for A, B, and C refer to compound average annual growth rates
Period growth rates for D, E, and F refer to percentage point differences

Table 30: Journeyperson Compulsory Regulation, by Province

	NL	NS	PEI	NB	QC	ON	MB	SK	AB	NWT	BC	YT	Number of provinces and territories requiring compulsory training	Percentage of provinces and territories requiring compulsory training*
Automotive Service Technician	V	C	C	C	C	C	V	V	C	V	C	V	7	58.3%
Bricklayer	V	C	V	C	C	V	V	V	V	n.a.	V	V	3	27.3%
Carpenter	V	V	V	V	C	V	V	V	V	V	V	V	1	8.3%
Construction Electrician	C	C	C	C	C	C	V	C	C	C	C	C	11	91.7%
Cook	V	V	V	V	V	V	V	V	V	V	V	V	0	0.0%
Hairstylist	V	V	C	n.a.	n.a.	C	C	C	C	V	C	V	6	60.0%
Industrial Electrician	**V**	**V**	**C**	**V**	**C**	**V**	**V**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**C**	**3**	**37.5%**
Industrial Instrument Mechanic	V	V	V	V	n.a.	V	V	V	V	V	V	V	0	0.0%
Industrial Mechanic	**V**	**V**	**V**	**V**	**C**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**1**	**8.3%**
Ironworker	V	V	V	V	C	V	V	V	C	n.a.	V	n.a.	2	20.0%
Machinist	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**0**	**0.0%**
Mobile Crane Operator	V	C	V	V	C	C	C	V	C	V	V	n.a.	5	45.5%
Motor Vehicle Body Repairer	V	V	V	V	C	C	V	V	C	V	C	V	4	33.3%
Painter and Decorator	V	V	V	V	C	V	V	V	V	V	V	V	1	8.3%
Plasterer	n.a.	n.a.	n.a.	n.a.	C	V	n.a.	V	n.a.	n.a.	V	n.a.	1	33.3%
Plumber	V	C	C	C	C	C	V	C	C	V	C	V	8	66.7%
Refrig. & Air Cond. Mechanic	V	C	V	C	C	C	C	C	C	V	C	V	8	66.7%
Roofer	V	V	V	V	C	V	V	V	V	V	C	V	2	16.7%
Sheet Metal Worker	V	V	V	V	C	C	V	C	C	V	C	V	5	41.7%
Steam-fitter / Pipe-fitter	**V**	**V**	**V**	**V**	**C**	**C**	**C**	**V**	**C**	**V**	**C**	**V**	**5**	**41.7%**
Tool and Die Maker	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**n.a.**	**V**	**n.a.**	**n.a.**	**n.a.**	**0**	**0.0%**
Truck and Transport Mechanic	V	C	V	V	V	C	V	V	C	n.a.	V	V	3	27.3%
Welder	**V**	**V**	**V**	**V**	**n.a.**	**V**	**V**	**V**	**C**	**V**	**V**	**V**	**1**	**9.1%**
Number of trades requiring compulsory training	1	7	5	5	16	10	4	5	12	1	9	2		
Percentage of trades requiring compulsory training*	4.5%	27.3%	22.7%	23.8%	80.0%	43.5%	13.6%	23.8%	57.1%	5.9%	42.9%	10.5%		29.6%

Source: Ellis Chart - Newfoundland and Labrador and British Columbia reflects 2001 data; All others reflect 2004 data

V - Voluntary

C - Compulsory

*Excluding n.a