# Restructuring in the Canadian Manufacturing Sector from 1970 to 1990: Industry and Regional Dimensions of Job Turnover

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## SUMMARY

This paper investigates the pattern and magnitude of job reallocation due to job growth and decline in the manufacturing sector of Canada. Job growth and decline occur as some firms enter and exit industries and other firms grow and decline. The rate of job growth is the number of additional employment created by firms that are expanding employment divided by base year employment in all firms. The rate of job decline is the amount of employment lost in firms that are contracting employment divided by base year employment in all firms. The job turnover rate is the sum of the job growth and the job decline rate. It is a manifestation of the intensity of the dynamic competitive process that is associated with the introduction of new products and technologies. It results in a reallocation of resources as more-successful firms grow at the expense of less-successful ones. The intensity of job turnover reveals how much restructuring is taking place and the industries and regions in which it is occurring.

This paper also investigates how the effect of cyclical as opposed to structural influences on job turnover have changed over time. Restructuring occurs when jobs are gained or lost as a result of innovations in products or processes that have differential effects on firms in an industry. Cyclical factors influence job turnover when changes in aggregate economic conditions impact on employment in firms.

Finally, the paper focuses on whether the pattern of job creation and job destruction is the same across regions in Canada. It investigates whether national patterns are reproduced in most regions or whether there are distinct differences, either caused by differences in the cyclical sensitivity of job creation and destruction or in the extent to which restructuring is taking place in the manufacturing sector.

To do this, the paper examines job turnover in five Canadian regions--Atlantic Canada, Quebec, Ontario, the Prairies, and British Columbia (B.C.); and five different industrial sectors within the manufacturing sector--the natural resource-based sector, the labour intensive sector, the scale-based sector, the product-differentiated sector, and the science-based sector.

The questions which are posed are:

1) Which industrial sectors and which regions have higher job turnover?

2) What has happened to the volatility in total job turnover over time across regions and across industries?

3) Are movements in job turnover correlated across regions and has the relationship changed over time?

4) What is the relative importance of restructuring as opposed to cyclical factors in job turnover?

5) Does the relative importance of restructuring differ across regions, across industries, and over time?

6) What is the importance of entry and exit relative to expansion and contraction of existing establishments and has it changed over time?

These questions are examined by dividing the period of study into two parts--1973-1979 and 1980-1990. In the first section, measures of job turnover are defined. In the second section, job volatility at the regional level for the entire manufacturing sector is investigated. The third section focuses on cross-regional and cross-sectoral volatility. Regression analysis is used to investigate which regions and industries are more volatile.

The findings are:

**Inter-regional volatility in job turnover in the manufacturing sector**

1) In the 1970s, total job turnover rates (the sum of job growth and job decline) in the manufacturing sector are large in Canada and in all regions. On average, 20.5% of jobs are reallocated annually from declining to growing plants in Canada. Total job turnover differs across regions and the differences are statistically significant. The largest job turnover occurs in the Prairies, followed by Quebec, Atlantic Canada, B.C., and Ontario.

2) Although job gain and job loss are dominated by expansion and contraction of existing establishments, entry and exit play a significant role in the job turnover process in both periods. In the 1970s, entry and exit jointly contribute about 16.7% of total job turnover in Canada. Their joint contribution to total turnover ranges from 19.1% in the Prairies to 14.4% in Ontario.

3) Between 1973-1979 and 1980-1990, total job turnover increases in Canada and in all regions. The increase is 4.1 percentage points in Canada.

4) The largest increase in total turnover occurs in B.C., followed by Ontario, the Prairies, Atlantic Canada, and Quebec.

5) In the 1980s, total job turnover still differs across regions, but the differences are no longer statistically significant. Quebec has one of the highest rates of turnover in the 1970s because it began its restructuring process earlier than other regions. By the 1980s, most of the other regions had begun their own restructuring and their total job turnover caught up or surpassed that of Quebec.

6) The increase in total turnover in the 1980s is due to an increase in both job gains and job losses in Canada and in all regions. This indicates that restructuring has become more important in the 1980s.

7) Other evidence indicates that restructuring became more important in the 1980s.

    a) Job reallocation is influenced more by cyclical factors in the 1970s than the 1980s.

b) While job gain, job loss, and total turnover are related in one region to those in another in the 1970s, this relationship changes in the 1980s. Job gain in one region is less related to that in another region in the 1980s. Job loss is more closely related in the 1980s than the 1970s. This once again confirms the decline in cyclical influences and the increase in structural effects since job growth is more dependent on cyclical factors while job decline is more closely related to structural adaptation.

c) The relative importance of entry and exit increases in the 1980s in Canada as a whole and in all regions, while that of expansion and contraction of existing establishments declines. The pace of structural change then increases mainly due to the entry and exit of firms since entry and exit is a manifestation of basic structural shifts in the underlying firm population. This supports the conclusion that the pace of restructuring increased in the 1980s.

**Inter-sectoral and inter-regional volatility**

8) At the national level, total job turnover is most volatile in the labour intensive sector, followed by the product-differentiated, science-based, natural resource-based, and scale-based sectors in the 1970s.

9) The ranking of sectors by job turnover changes in the 1980s. The product-differentiated sector becomes the most volatile; labour intensive industries follow closely behind. The scale-based sector remains the least volatile in the 1980s.

10) All regions experience increases in total job turnover in all sectors; the increase is largest in the individual labour-intensive and product-differentiated sectors. Thus the pace of job reallocation has increased in all sectors in all regions with particular emphasis on the labour intensive and the product-differentiated sectors.

11) The importance of the move towards restructuring in the 1980s is largest in B.C.; and lowest in Quebec, followed by Atlantic Canada. However, moderate restructuring has been taking place in each region's natural resource-based and scale-based sectors.

12) Multivariate analysis confirms that the largest turnover occurs in the product-differentiated and labour intensive sectors of each region; that B.C. has been undergoing the greatest restructuring in these two sectors in comparison with other regions; and that the 1980s are more volatile than the 1970s.

# INTRODUCTION

Studies of the dynamics of job turnover focus on the size of job gains and job losses measured at the establishment or firm level. Pioneering work on employment dynamics can be traced to Birch (1981, 1987), Dunne, Roberts and Samuelson (1988, 1989), and Davis and Haltiwanger (1990, 1992) for the US manufacturing sector; Boeri and Cramer (1992) for Germany; Baldwin and Gorecki (1990) for the Canadian manufacturing sector; and Baldwin, Dunne and Haltiwanger (1994) for a comparison of the manufacturing sectors of Canada and the US.

Job turnover occurs as a response to changes in aggregate economic conditions and to micro-conditions, such as changing technology. Changes in economic conditions can influence firms in general to grow or to decline and thereby create fluctuations in employment through the creation of new jobs and the destruction of existing jobs. Micro-conditions, on the other hand, affect firms differently and are related to changing product offerings, new technologies, and competition that lead some firms to grow and others to decline.

Job creation may originate from the creation of an establishment or the expansion of existing ones. Job destruction arises from the closure of an establishment or the contraction of existing ones. Thus a part of job turnover originates from expansion and contraction of existing establishments; a part is associated with the process of entry and exit of establishments. A comprehensive examination of total job turnover requires analysis of job creation and destruction due to both processes.

Job turnover is influenced by a number of factors. When it arises from macroeconomic factors associated with business cycles, the fluctuations in employment have a short-run effect. When the process is influenced by allocative shocks associated with structural change, such as those involving shifts of employment across different industries or across different firms within an industry, the impact is semi-permanent--lasting until the next shock occurs.

Previous Canadian studies of job turnover concentrate on the analysis of employment dynamics either for the entire manufacturing sector or for a broadly defined cross section of 2-digit manufacturing industries [e.g., Baldwin and Gorecki (1990), Baldwin, Dunne and Haltiwanger (1994)]. In recent years, industrial policy in Canada has been directed in large part at facilitating growth in Canada's scale-based industries and in high value-added knowledge-based industries which provide high-paying jobs. Other industries, such as labour intensive and natural resource-based industries are facing increasing foreign competition which either have caused them to contract or to pay lower relative wages [Baldwin and Rafiquzzaman (1994)].

Each region of Canada specializes in one or two broadly defined group of industries, which tend to vary from region to region. Natural resource industries make up the largest sector in Atlantic Canada, labour-intensive industries the largest in Quebec, scale-based industries dominate in Ontario, natural resource-based industries in the Prairies, and the scale-based sector is the largest in British Columbia. Because of these differences, the regions of Canada are likely to be affected differently by the forces leading to structural change. In addition, changes in macro-economic conditions which create fluctuations in the job creation and destruction process might be expected to have a differential effect on Canadian regions if they affect sectors in

different ways. Therefore, the present study examines how job turnover varies in different Canadian regions.

A related study [Baldwin and Rafiquzzaman (1994)] examines the extent to which the structure of the manufacturing sector has been adapting and changing. It demonstrates that, between 1970 and 1990, the distribution of employment in the manufacturing sectors of Canada and in different regions has changed as the labour-intensive sector has declined. It also shows that divergences in wage rates between the highest and lowest paying sectors have increased.

The present study complements the previous one in that it focuses on the process of job creation and destruction in the manufacturing sector of different regions. It considers five Canadian regions--Atlantic Canada, Quebec, Ontario, the Prairies, and British Columbia (B.C.); and five different industrial sectors--the natural resource-based sector, the labour intensive sector, the scale-based sector, the product-differentiated sector, and the science-based sector within each region (see Appendix B which contains the listing of industries classified to each sector and the share of employment in 1980).

The period of study is divided into two parts--1973-1979 and 1980-1990--in order to investigate whether the pattern of job turnover in the 1970s differs from the 1980s. The paper examines the extent to which the process of job turnover is affected by cyclical fluctuations and structural change. It examines the relative importance of entry and exit, and expansion and contraction of existing establishments on job turnover. The importance of cyclical fluctuations and structural change, entry and exit, and expansion and contraction of existing establishments in job turnover are compared and contrasted across regions, industry sectors and time periods.

The analysis has three parts. First, measures of job turnover are defined. Second, changes in volatility during the period are investigated using annual rates of job creation and destruction. The importance of entry and exit is examined in order to evaluate the contribution being made to the dynamics of competition by new as opposed to existing plants. Third, volatility in job turnover is compared across different industrial sectors within a region and regression analysis is used to investigate cross-regional differences in job growth and decline.

## 1. Measurement of Job Creation and Destruction

Job turnover is measured at the level of the establishment using employment data derived from a longitudinal file of Canadian manufacturing plants [see Baldwin (1995)]. Each establishment is classified into one of six categories: greenfield entrant, continuing-firm growing, continuing-firm new, close-down exiter, continuing-firm declining, and continuing-firm closed. The sum of employment in these six categories at time t constitutes the total employment at time t.

A greenfield entrant is a new plant associated with entry by a firm to the 4-digit industry in which the new plant is located. A continuing-firm new plant is a newly established plant owned by a firm that previously possessed plants in the same 4-digit industry. A continuing-firm growing plant is one whose employment (production plus non-production workers) increases between two periods. A close-down exit is a plant that ceases to exist, and causes its parent firm

to no longer own any plants in the 4-digit industry in which the closedown occurred. A continuing-firm closed plant is the opposite of a continuing-firm new plant. A continuing-firm declining plant is a continuing-firm plant whose employment declines between two periods.

Total job creation measures for Canada and five different regions are calculated by summing employment gains at 1) continuing-firm growing, 2) continuing-firm new establishments, and 3) new establishments of greenfield entrants within a sector between years t-1 and t; the sum of job creation in the first two categories is the job creation resulting from the expansion of existing firms. Total job destruction is calculated by summing employment losses at 1) continuing-firm declining, 2) continuing-firm closed establishments, and 3) close-down exits within a sector between years t-1 and t; the sum of job destruction in the first two categories is the job destruction due to contraction of existing firms. Rates of job gain (GAIN) and rates of job loss (LOSS) between years t-1 and t are calculated by dividing total job creation and destruction by sector size, which is calculated as the average employment between t-1 and t. The sum and the difference between GAIN and LOSS are used to measure the total job turnover rate (TOTAL TURNOVER) and the net employment growth rate (NET) of a sector between years t-1 and t, respectively. The sum of job-gain and job-loss rates due to expansion and contraction of establishments is the job turnover rate (TURNOVER 1) due to expansion and contraction of existing establishments. The job turnover rate due to entry and exit (TURNOVER 2) is the sum of job-gain and job-loss rates due to greenfield entry and closedown exit. The following identity holds: TOTAL TURNOVER = TURNOVER 1 + TURNOVER 2.

Total job turnover (TOTAL TURNOVER), as measured by the sum of GAIN and LOSS, represents the number of workers affected by establishment level employment changes.[1] This measure of job reallocation must be positive if net employment change is different from zero and thus might be expected to be affected by the level of net job creation or the strength of the economy. The measure EXCESS, defined as TOTAL TURNOVER minus the absolute value of NET (ABNET), is the amount of job reallocation in excess of that required to facilitate net employment changes. This is the base amount of change in the amount of restructuring taking place.[2] The excess job-turnover measure (EXCESS) is used here to determine whether the base portion of the job turnover process due to restructuring increases or decreases with business cycles. For example, if EXCESS and the absolute value of NET (ABNET) are negatively correlated, job turnover declines at peaks and troughs; if it is positively associated with the business cycle, then the base restructuring increases at peaks and troughs.

## 2. Intra-Regional Job Turnover in the Manufacturing Sector

This section examines the volatility in job turnover in the manufacturing sectors of Canada and different regions and how it has been changing. The annual average rates of job gain (GAIN), job loss (LOSS), net employment growth (NET), the total turnover rate (TOTAL TURNOVER), and the total turnover rate in excess of net employment growth (EXCESS) are presented in Table 1 for Canada and different regions for the periods 1973-1979 and 1980-1990.

In Canada, during the 1970s, the average annual total turnover rate is 20.5 percent; excess turnover and net employment growth rates are 17.4 percent and 3.1 percent, respectively.

The high level of job reallocation in Canada is the outcome of both high levels of job gains and job losses. In the 1970s, the average annual job-gain rate is 11.8 percent; the job-loss rate is 8.7 percent.

The correlation of -.58 between job gain (GAIN) and job loss (LOSS) rates indicates that job creation and job destruction are negatively associated in the period 1973-1979 (Table 3). The correlation of -.59 between EXCESS and ABNET indicates that the structural component of job reallocation declines at the trough and the peak of the business cycle (Table 3).

Between 1973-1979 and 1980-1990, both total turnover and excess turnover grow but net employment declines (Table 1 and Table 2). Average total job turnover increases from 20.5 percent to 24.6 percent and average excess turnover increases from 17.4 percent to 21.6 percent. The volatility of job turnover also increases in the 1980s, as evidenced by a larger standard deviation of the turnover rate for the period 1980-1990 than for the period 1973-1979 (Table 1). Higher total turnover occurs both as a result of increased job-gain and job-loss rates. Between 1973-1979 and 1980-1990, the average annual job-gain rate grows from 11.8 to 13.8 percent; the job-loss rate increases from 8.7 to 10.8 percent.

The changes in turnover measures between the periods 1973-1979 and 1980-1990 are presented in Table 2. The increase in the rate of job loss is larger than the increase in the rate of job gain. As a consequence there is a slight decline in the average annual net employment growth (-0.05%). In addition, cyclical factors appear to be less important in the 1980s for two reasons. First, there is a lower value of the correlation coefficient between GAIN and LOSS in the period 1980-1990 (-.48). The cyclical factors that caused an inverse relationship to generally prevail between GAIN and LOSS are diminished in the 1980s when job loss rates occasionally increase at the same time as do job gain rates. Second, the effect of cyclical factors in the job reallocation process changes in the 1980s. The correlation coefficient between EXCESS and ABNET is small and insignificant in the period 1980-1990 (Table 3). The restructuring component of job turnover responds less to the cyclical forces that are influencing the movement of net employment.

There are considerable differences in job turnover in the manufacturing sectors across different regions. In 1973-1979, the largest total turnover rate occurs in the Prairies followed by Quebec, Atlantic Canada, B.C., and Ontario--with a 23.2, 22.7, 22.6, 20.6, and 18.6 percent average annual turnover rate, respectively. Excess turnover is also high; but it does not follow the same pattern as total turnover. It is largest in Quebec (19.8%), followed by Atlantic Canada (18.1%), the Prairies (17.2%), B.C. (17.0%), and Ontario (16.0%). Net employment growth ranges from a low of 2.6 percent annually in Ontario to 2.8 percent in Quebec, 3.5 percent in B.C., 4.4 percent in Atlantic Canada, and 6.0 percent in the Prairies.

Regions experience both high levels of job gains and high levels of job losses. The Prairies experience the largest level of job gain (14.6%) followed by Atlantic Canada (13.5%), Quebec (12.8%), B.C. (12%), and Ontario (10.6%). Ontario experiences the smallest level of job loss (8.0%), while Quebec experiences the largest level (9.9%). A high negative correlation between job gain and job loss rates across regions indicates that job creation and destruction are affected in all regions by the business cycle. However, the association is more pronounced in Atlantic Canada, Quebec and B.C. than in the Prairies and Ontario (Table 3).

Volatility in total job turnover in the 1970s differs across regions. The higher standard deviation of the total turnover rate in Quebec, the Prairies and B.C. confirms that job turnover is more volatile in these regions (Table 1). Thus the Prairies and Quebec had both the highest and most volatile rates of job turnover.

Correlations between EXCESS and ABNET across regions were estimated for the period 1973-1979 in order to examine the effect of cyclical factors on job reallocation. These correlations are generally very high and significant across all regions except Ontario (Table 3). They indicate that cyclical factors in the 1970s more strongly influenced job reallocation in Atlantic Canada, followed by B.C., the Prairies, and Quebec.

Between 1973-1979 and 1980-1990, all regions experience changes in total turnover and excess turnover (Table 1 and Table 2). Total turnover increases annually from 22.6% to 25.2% in Atlantic Canada, 22.7% to 25.2% in Quebec, 18.6% to 23.6% in Ontario, 23.2% to 27.7% in the Prairies, and 20.6% to 25.6% in B.C.. Excess turnover also increases across all regions. The increase is highest in the western provinces, moderately high in Ontario and Atlantic Canada, and lowest in Quebec. Both job-gain and job-loss rates in each region are higher in the period 1980-1990 than in the period 1973-1979. The largest decline in net employment occurs in the Prairies and Atlantic Canada (each 1.6% annually), followed by Quebec and B.C.; Ontario experiences a slight increase in net employment (0.5% annually).

Increases in the variance of job turnover also occur in the 1980s. The standard deviation of the turnover rates in each region increases except in Quebec. The increase is particularly large in Ontario and Atlantic Canada (Table 1).

Macroeconomic factors which affected job reallocation in all regions but Ontario in the 1970s have less effect in the job reallocation process in the 1980s. Although job creation and job destruction are negatively related in both periods, the relationship is less pronounced in the period 1980-1990 (Table 3). In addition, a highly significant negative correlation between EXCESS and ABNET in Atlantic Canada, Quebec, the Prairies and B.C. during the period 1973-1979 has been reduced to a low and insignificant correlation in the period 1980-1990 (Table 3).

In order to investigate how the job-turnover process is related across regions, cross-region correlation coefficients of various turnover measures were estimated for the period 1973-1979 (Table 4). These indicate the extent to which growth and decline is synchronous in Canadian regions. They show that job gains between regions are highly correlated. The cross-region correlation values of GAIN during the 1970s range from .73 to .99. All correlations are highly significant. The relation is particularly strong between Ontario and Quebec (.97), and Ontario and other regions. Cross-region correlations of LOSS are also generally large with certain exceptions. In all cases, the values of cross-region correlations with respect to GAIN are larger than cross-region correlation values with respect to LOSS, thereby suggesting that job growth responds more to common cyclical factors but that the restructuring forces leading to job loss were less coincident in the 1970s. Cross-region correlations of NET and TOTAL TURNOVER are also generally high and significant.

Between 1973-1979 and 1980-1990, the synchronization of job gain, job loss, net employment growth, and total turnover changes. In the period 1980-1990, cross-region

correlations of GAIN fall. This is consistent with a decline in the importance of cyclical factors, since GAIN is closely related to the cycle. Cross-region correlations of LOSS between regions generally increase between 1973-1979 and 1980-1990. Job loss between regions is more closely related in the 1980s than the 1970s. The restructuring that affects job loss begins to take on similar characteristics across Canadian regions in the 1980s.

**The Relative Importance of Entry and Exit, and Expansion and Contraction of Existing Establishments in Job Turnover**

Job turnover occurs as establishments enter and exit from industries--the entry and exit process--and as continuing establishments contract and others expand. An examination of the relative importance of these components indicates how important new establishments are to the turnover process (see Table 1). The greater is the importance of the new establishments, the more fundamental are the changes that are taking place in the industrial system. High job turnover rates provide evidence that the relative position of firms is changing. High turnover rates accompanied by high entry rates indicate that the relative position is changing because the identity of market participants is rapidly shifting.

During 1973-1979 in Canada, the annual average job-gain rate stemming from expansion of continuing establishments is 10.3%. The majority of annual job gains during this period is accounted for by continuing-firm growing establishments (9.6%). Continuing-firm new establishments play no significant role in creating jobs. Similarly, most annual job loss is accounted for by the contraction of existing establishments (6.8%). Continuing-firm closed establishments contribute very little to job destruction. A positive annual net expansion rate (3.5%) in the continuing-firm category indicates that more jobs are gained due to expansion than lost due to contraction of existing establishments. Total job turnover due to expansion and contraction of existing establishments (TURNOVER 1) is 17.1% annually, which is about 83.3% of total turnover (Table 5).

In the period 1973-1979, in Canada, the average annual job-gain rate due to entrants and the job-loss rate due to exits is 1.5% and 1.9%, respectively. The total turnover due to entry plus exit (TURNOVER 2) is 3.4% annually, which is about 16.7% of the total turnover rate (Table 5).

Between 1973-1979 and 1980-1990, all components of job-gain and job-loss increase (Table 1 and Table 2). Most of the increase in job gain (2 percentage points) stems from an increase in job gain due to the expansion of establishments (1.2 percent points). Most of the increase in job-loss (2.1 percentage points) is attributed to the increase in job-loss in contracting establishments (1.3 percentage points). TURNOVER 2 increases by more than 45%, and TURNOVER 1 increases by only about 14.7%. The importance of entry and exit in the job-reallocation process increases relatively more than the importance of expansion and contraction of existing establishments in the period 1980-1990. In the period 1980-90, 20.3% of total turnover is attributable to TURNOVER 2 (Table 5). Thus, entry and exit has become more important, thereby pointing to the fact that the 1980s are marked by greater amounts of structural change.

To examine whether the trend was broadly or narrowly based, the experience of different regions is examined. In every region, in the 1970s, most of the job gain comes from expansion of

existing establishments (Table 1). Job gain due to expansion of existing establishments ranges from 9.4% in Ontario to 12.4% in the Prairies. Similarly, the majority of job loss in all regions is accounted for by the contraction of existing establishments. The annual average job-loss rate due to contraction of existing establishments ranges from 6.4% in the Prairies to 7.4% in Quebec. The net expansion rate is positive in all regions. It is largest in the western provinces and Atlantic Canada, moderately large in Quebec, and smallest in Ontario. Relatively more jobs were created than destroyed in existing establishments in western regions and in Atlantic Canada than in Quebec and Ontario. Total turnover due to expansion and contraction of existing establishments is largest in the Prairies (18.7%), followed by Atlantic Canada (18.5%), Quebec (18.3%), B.C. (17.3%), and Ontario (15.9%).

The largest annual job-gain rate due to entry occurs in the Prairies (2.2%); the smallest in Ontario (1.2%). Both components of the job-gain rate--gain due to expansion and gain due to entry--are largest in the Prairies, followed by Atlantic Canada, Quebec, B.C., and Ontario. The average annual job loss due to exits is generally small across all region; but larger than the job-gain rate due to entry--making the net entry rate negative across all regions. The job-loss rate due to exit ranges from 1.5% in Ontario to 2.5% in Quebec. Both components of the job-loss rate--loss due to contraction and loss due to exits-- are largest in Quebec.

Entry and exit jointly make an important contribution to the job-turnover process across all regions. In the 1970s, turnover due to entry and exit (TURNOVER 2) ranges from 2.7% annually in Ontario to 4.4% in the Prairies; it is relatively high in the western provinces, Atlantic Canada and Quebec; lowest in Ontario. The contribution of TURNOVER 2 to total turnover (TOTAL TURNOVER ) varies from 14.4% in Ontario to 19.2% in Quebec(Table 5). Once again, this confirms that Quebec was engaged in more restructuring in the 1970s.

Between 1973-1979 and 1980-1990, both components of the job- gain rate increase in all regions (Table 1 and Table 2). The annual increase in job gain due to expansion of existing establishments is particularly large in Ontario (1.9 percentage points) and B.C. (1.2 percentage points). Entry also increases across all regions; B.C. experiences the largest increase (1.2 percentage points). Similarly, both components of job loss increase. The increase due to contraction of existing establishments is particularly large in the Prairies (2.2 percentage points), Atlantic Canada (2.0 percentage points), B.C. (1.7 percentage points), and Ontario; Quebec suffers the least. The annual increase in the job-loss rate due to close-down exits is less than 1 percentage point across all regions.

The importance of entry and exit increases across all regions since TURNOVER 2 increases at a faster rate than TURNOVER 1 everywhere. TURNOVER 1 increases by 11.1% in Atlantic Canada, 6% in Quebec, 20.3% in Ontario, 16% in the Prairies, and 16.5% in B.C.; TURNOVER 2 increases by 15.1%, 31.7%, 63.4%, 35.0%, and 68.1% in Atlantic Canada, Quebec, Ontario, the Prairies, and B.C., respectively. As a result, the contribution of entry and exit (TURNOVER 2) to total turnover increases. The largest annual increase in the contribution due to TURNOVER 2 occurs in B.C. (5.5 percentage points), followed by Ontario (4.2 percentage points), Quebec (3.6 percentage points), the Prairies (2.5 percentage points), and Atlantic Canada (0.5 percentage points) (Table 5). This confirms the earlier conclusion that change in the 1980s was particularly intense in British Columbia.

The increase then in the importance of entry and exit across most Canadian regions confirms that the fundamental nature of change was widespread and not restricted to just one segment of the country.

## 3. Sectoral Job Turnover

In this section, the difference in job turnover across different sectors within each region is examined. Several questions are examined: Which sectors have higher turnover? Does the turnover of a sector differ across regions? How important is entry and exit in the job turnover process within a sector? Does it differ across regions and across sectors? How do cyclical factors and restructuring affect a sector? Does their relative importance differ both across regions and across sectors?

The first part examines the nature of job turnover by industry sector and the changes therein since 1970. The second part examines the sectoral results by region so as to investigate the extent to which the national patterns are duplicated in each region. The third uses multivariate analysis to examine the extent to which the regional and sectoral differences exist separately.

### i) Sectoral Job Turnover at the National Level

Job-gain, job-loss, turnover, and excess-turnover rates and their components by industrial sector are presented in Table 6. There is considerable variation in the magnitude of job-gain, job-loss, total turnover and excess turnover rates across sectors.

In Canada, during the period 1973-1979, the highest total turnover occurs in labour-intensive industries (24.1%), followed by product-differentiated (23.9%), science-based (22.5%), natural resource-based (20.4%) and scale-based (16.3%) industries. Excess turnover follows the same pattern. The inverse relationship between GAIN and LOSS is highest in the scale-based sector (correlation = -.74), followed by the science-based, labour-intensive, product-differentiated sectors and the natural resource-based sector (Table 8). Net employment grows at a rate of slightly more than 3% annually in all sectors except the labour intensive sector where it increases at a rate of 2.7% annually.

Correlations between EXCESS and ABNET were estimated across all sectors (Table 8). The correlations suggest that, in the 1970s, cyclical factors have a greater impact on job reallocation in the scale-based and product-differentiated sectors; a lesser impact on the natural resource-based, labour intensive and science-based sectors.

Between 1973-1979 and 1980-1990, both total turnover and excess turnover increase everywhere but the science-based sector (Table 6 and Table 7). The largest increase occurs in the product-differentiated sector; but the labour-intensive sector follows closely behind. The smallest increase occurs in the scale-based sector. The science-based sector experiences a decline in both total and excess turnover rates. Both job-gain and job-loss rates increase in the natural resource-

based, labour intensive, scale-based, and product-differentiated industries; the science-based sector experiences an increase in the job-gain rate, but a decline in the job-loss rate.

Correlations between EXCESS and ABNET for the period 1980-1990 were also estimated in order to investigate, at the sectoral level, changes in the effect of the business cycle on job turnover (Table 8). These correlations are generally smaller (and insignificant) in the natural resource-based, labour intensive, scale-based and product-differentiated sectors, and larger (and significant) in the science-based sector in the 1980s. The impact of restructuring increases in the former set of industries; the effect of the business cycle increases in the science-based sector.

All components of job loss and job gain generally increase between 1973-1979 and 1980-1990 (Table 6 and Table 7). The job-gain rate due to expansion of existing establishments increases in all sectors except the science-based sector. The job-turnover rate due to expansion and contraction of existing establishments declines in the science-based sector and increases in all other sectors; the annual increase is particularly large in the labour intensive (4.0 percentage points) and product-differentiated (4.2 percentage points) sectors. The contribution of entry and exit (TURNOVER 2) to total job turnover increases across all sectors while the importance of expansion and contraction of existing establishments declines (Table 9). The contribution of TURNOVER 2 to total turnover ranges from 15.3% in the scale-based sector to 24.8% in the labour intensive sector (Table 9). The largest increase occurs in the product-differentiated sector (7.1 percentage points); the lowest in the labour intensive sector (1.3 percentage points).

In summary, structural change increased in most sectors during the 1980s--with the change being particularly strong in the labour and product-differentiated sectors.

### ii) Intra-Sectoral Job Turnover at the Regional Level

Differences in turnover at the regional and at the sectoral level have been described in the previous sections. Substantial differences were shown to exist across regions with the Prairies being the most volatile, and Ontario the least volatile region. Differences were also revealed in industry or sectoral turnover rates, with the labour intensive and product-differentiated sectors having the highest job-change rates. In this section, we examine whether the industry differences also occur within regions. In particular, we ask whether the national pattern of cross-sectoral volatility is also found at the regional level. An in-depth analysis of the turnover of each sector across regions is presented in Appendix A.

The cross-industry pattern of turnover at the sectoral level is presented using total turnover (Table 10) and the ranking of turnover (Table 11) for the 1970s. The national rankings for the different sectors are generally similar to the regional rankings. The scale-based sector is ranked fifth nationally and is also fifth in every region. The labour-intensive sector has the highest turnover nationally and is first in B.C., second in Ontario and Quebec (but only by fractions of a percentage point, Table 10) and third in Atlantic Canada.

Comparisons can also be made across regions within industries to examine whether differences in regions found at the national level apply to each sector (Table 12). This is generally the case. For example, at the national level, Ontario ranks fifth; within each industry,

Ontario also ranks fifth. Thus, Ontario's position stems not so much from the fact that it concentrates in the industrial sector (scale-based) that is relatively stable, but that its sectors have less turnover than those of other regions. In most other regions, the same conclusion holds. The ranking of the region is basically the ranking of most industries in the region. Several exceptions are worth noting. While Atlantic Canada is ranked third nationally, its natural resource based sector is the most volatile. While British Columbia is ranked fourth nationally, its labour-based sector is the most volatile. Finally, Quebec is second in the country in terms of volatility because of only two of its industries--the scale-based and natural resource sectors. Its other sectors are almost as stable as those of Ontario.

While job turnover increases in the 1980s, it is still the case that the broad pattern of national intersectoral differences still applies within each region and the regional differences at the national level are to be found in most industries (Tables 13, 14, and 15).

The increase in job turnover between the 1970s and 1980s also contain broad cross-sectoral and cross-regional similarities. The national ranking of sectors is generally reflected within regions (see Tables 16, 17, and 18). For example, the product-differentiated sector has the most increase at the national level and is first or second in each region. The labour intensive sector is second at the national level and is second or first within each region. Thus regions experience the largest increase in total job turnover in their respective labour intensive and product-differentiated sectors (Table 17). This suggests that, although restructuring has been taking place in all sectors across regions, these two sectors have been undergoing the greatest restructuring in each region. The sector with the most regional variation is the science-based sector. Changes in this sector are ranked fifth at the national level but this is the result of its having the lowest changes in Atlantic Canada, Quebec, and Ontario but its being third in the Prairies and British Columbia. Once more, this suggests very different pressures for restructuring in this sector--at least between east and west.

The national rankings for changes in turnover for different regions also generally apply at the industry level (Table 18). British Columbia has the greatest increase in turnover in total and it also has the greatest increase of all regions in four out of its five sectors. Ontario has the second highest increase primarily because its scale based sector experiences the largest increase in turnover, but its other industrial sectors are ranked either second or third. Quebec ranks last or second last in terms of all its sectors.

### iii) The Relative Importance of Industry and Regional Effects in the Volatility of Job Turnover

In the previous sections, similarities and differences in the cross-industry or cross-regional patterns of turnover rates were examined separately. Evidence of both regional and industry differences were found. This section utilizes regression analysis to investigate how the relationship between job turnover measures (i.e., GAIN, LOSS, TOTAL TURNOVER, EXCESS) differ across regions and across industries. A multivariate analysis permits examination of the importance of the regional as opposed to industry effects when both are considered simultaneously. This section also asks how job-gain, job-loss, and job turnover react to cyclical changes in employment and whether volatility has increased over time.

To examine the cross-regional and cross-sectoral differences in job turnover, GAIN, LOSS, and TOTAL TURNOVER are first regressed on four regional dummies to measure regional effects--ATLANTIC CANADA (A.C.), QUEBEC (QUE), PRAIRIES (PRA), and BRITISH COLUMBIA (B.C.); four sectoral dummies to estimate the industry effects--NATURAL RESOURCES (NR), LABOUR INTENSIVE (LI), PRODUCT-DIFFERENTIATED (PD), and SCIENCE-BASED (SCI); and 16 time dummies--T74-T90--to capture year effects. The scale-based sector in Ontario becomes the base case against which regional and industry effects are measured (Table 19).

In all regions except Quebec, both job gain and job loss are significantly higher than in Ontario (Table 19). Total job turnover is largest in British Columbia. The coefficients of GAIN, LOSS, and TOTAL TURNOVER indicate that each of these measures is significantly higher in all sectors relative to the scale-based sector; they are particularly large in the labour intensive and product differentiated sectors.

In order to investigate how job turnover changes as net employment varies over the business cycle, EXCESS[3] is regressed on the absolute value of NET (ABNET), and the value of ABNET when NET is positive (PABNET); regional, sectoral, and time dummies (Table 20, equation 1). Several sets of interaction terms are included in the regression equation as explanatory variables. First, interaction terms between regions and ABNET and between regions and PABNET are included to test whether the cyclicality of job turnover varies by region (Table 20, equation 2). Second, interactions between regions and industrial sectors are used to test whether regional differences occur generally or are the result of differences in specific sectors (Table 20, equation 3).

The coefficients of ABNET and PABNET in equation 1 are -0.708 and 0.261, respectively, and they are statistically significant. The negative coefficient on ABNET indicates that the restructuring component of turnover is lower when net employment declines. It should be noted that if the dependent variable had been changed to TOTAL TURNOVER rather than EXCESS, the coefficient on net employment change (ABNET) is 0.261. Thus an increase in net employment growth is reflected in an upward movement of total turnover, as one would expect, but by an amount that is considerably smaller than the movement in net employment itself.

Since, the coefficient of PABNET is significantly different from zero, there is a significant difference between the effect of positive and negative values of NET on EXCESS. The degree to which churning declines with an increase in the amount of employment change differs with the sign in the employment change. Negative values of employment change lead to a greater decline in churning than do positive values of net employment change. Less basic restructuring takes place in the depth of a recession than at the peak of an expansion. Regional and industry effects are much as before. Most of the year binary variables in the 1980s are significant, thereby indicating that the 1980s involved more turnover than the 1970s.

The effect of adding regional interaction terms with ABNET and PABNET to capture differences in the cyclical behaviour of job turnover is described in equation 2. All regions have a larger coefficient than does Ontario, thereby indicating a greater sensitivity of excess turnover to cyclical changes in net employment (a lesser sensitivity of TOTAL TURNOVER). However, only the interaction term for Quebec is statistically significant.

The extent to which there are differential industry effects across regions can be inferred from equation 3. The coefficients of both ABNET and PABNET preserve their respective signs. The coefficient of ABNET is highly significant, while that of PABNET is slightly less significant. As in the case of equation (1), the coefficients of all industry dummies are statistically significant. The interaction terms indicate that regions with higher turnover (Atlantic Canada, the Prairies, and B.C.) have generally higher turnover in all industries (the signs are generally positive). Nevertheless, it should be noted that not all of the regions have a coefficient that is significantly positive. The Prairies have significantly higher turnover in the scale-based sector; Atlantic Canada in the product-differentiated and science-based sectors, British Columbia in the labour-intensive and science-based sectors.

## 4. Conclusion

The industrial structure of Canada and of different regions is continuously changing. Job turnover statistics mirror these changes. An analysis of the dynamics of job turnover reveals how much restructuring is taking place. It also reveals where it is occurring more intensively, and whether the degree of this intensity has been changing.

The present paper investigates the dynamics of job turnover in the Canadian manufacturing sector, both at industry and regional levels. When the entire manufacturing sector is examined, on average 20.5% of jobs are reallocated annually from declining to growing plants in Canada in the 1970s. The annual total job turnover rate increases in Canada in the 1980s. The increase of about 4.1 percentage points is due to an increase in both job gains and job losses.

Other evidence points to an increase in the importance of restructuring in the 1980s. First, cyclical factors have much less importance on job reallocation in the 1980s than in the 1970s. Second, although job gains and job losses are dominated by expansion and contraction of existing establishments in both periods, the relative importance of entry and exit to total turnover, an indicator of fundamental restructuring, has increased in the 1980s.

When the analysis of the dynamics of job turnover is extended to the regional level, the job reallocation process is seen generally to follow a similar pattern. In the 1980s, job turnover increases in all regions with a particularly large increase in British Columbia's manufacturing sector. Quebec increases least, probably because its restructuring started earlier in the 1970s. There is also a reduced impact of the business cycle on the job reallocation process in the 1980s across regions.

The increase in total turnover across regions is mainly due to expansion and contraction of existing establishments. But at the same time, the relative importance of entry and exit has increased substantially in all regions. The increase is largest in British Columbia.

A more detailed picture of the dynamics of job turnover is produced when the job reallocation process is examined across regions and across sectors. Although increases in job turnover show that restructuring has increased in all sectors, the product-differentiated and

labour-intensive sectors have been undergoing the greatest structural change at the national level and in all regions; the science-based sector the least.

This conclusion is also supported by examining the relative importance of restructuring as opposed to cyclical factors at the sectoral level. In the 1980s, the effect of the business cycle decreases in all sectors (except the science-based) thereby suggesting increased restructuring; the change is largest in the product-differentiated and labour-intensive sectors.

In addition, the absolute and relative importance of entry and exit to total turnover increases in all sectors. The largest increases have occurred in product-differentiated and labour intensive industries; and the smallest in science-based industries.

In summary, regions generally experience an increase in total job turnover in all sectors; the increase is largest in labour-intensive and product-differentiated sectors. The importance of restructuring has been taking place in all sectors across regions with the largest emphasis in the labour intensive and product-differentiated sectors of each region. Our analysis suggests that these two sectors of B.C. and the Prairies have been undergoing the greatest restructuring in comparison with other sectors.

## Notes

1. Assuming that a worker who loses a job and gains a job undergoes two job changes.

2. It is the base change and not the total amount of change due to restructuring if part of the net amount of job turnover is due to structural factors and not to cyclical disturbances.

3. Of the four turnover variables--GAIN, LOSS, TOTAL TURNOVER, and EXCESS, only one is linearly independent. Therefore, the coefficients of regressions using each of these separately can be derived from any other. We have arbitrarily chosen to report the results of the EXCESS equation here.

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## Table 1

## Average Annual Job Gain and Job Loss Rates in the Manufacturing Sector By Region (1973-1979 and 1980-1990)
### (Percent of Total Employment Using Production Workers)

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Atlantic Canada*** | ***Quebec*** | ***Ontario*** | ***Prairies*** | ***B. C.*** | ***Canada*** | ***Atlantic Canada*** | ***Quebec*** | ***Ontario*** | ***Prairies*** | ***B. C.*** | ***Canada*** |
| JOB GAIN (GAIN) | 13.50 | 12.76 | 10.60 | 14.56 | 12.04 | 11.81 | 14.02 | 13.85 | 13.33 | 16.01 | 14.44 | 13.82 |
| Continuing growing | 10.75 | 10.26 | 8.80 | 11.44 | 9.94 | 9.63 | 10.80 | 10.44 | 10.43 | 12.14 | 10.89 | 10.64 |
| Continuing new | 0.91 | 0.66 | 0.58 | 0.91 | 0.67 | 0.65 | 0.89 | 0.81 | 0.87 | 1.00 | 0.88 | 0.86 |
| Expansion | 11.66 | 10.92 | 9.38 | 12.35 | 10.61 | 10.28 | 11.69 | 11.25 | 11.30 | 13.14 | 11.77 | 11.50 |
| Greenfield entry | 1.84 | 1.84 | 1.22 | 2.21 | 1.43 | 1.53 | 2.33 | 2.60 | 2.03 | 2.87 | 2.67 | 2.32 |
| JOB LOSS (LOSS) | 9.06 | 9.92 | 8.02 | 8.59 | 8.51 | 8.72 | 11.20 | 11.31 | 10.23 | 11.69 | 11.16 | 10.78 |
| Continuing declining | 6.62 | 7.10 | 6.34 | 6.12 | 6.41 | 6.57 | 8.52 | 7.88 | 7.56 | 8.22 | 8.05 | 7.79 |
| Continuing dead | 0.25 | 0.31 | 0.22 | 0.25 | 0.30 | 0.25 | 0.37 | 0.30 | 0.32 | 0.36 | 0.35 | 0.32 |
| Contractions | 6.87 | 7.41 | 6.56 | 6.37 | 6.71 | 6.82 | 8.89 | 8.18 | 7.88 | 8.58 | 8.40 | 8.11 |
| Close-down exit | 2.19 | 2.51 | 1.46 | 2.22 | 1.80 | 1.90 | 2.31 | 3.13 | 2.35 | 3.11 | 2.76 | 2.67 |
| NET = GAIN - LOSS | 4.44 | 2.84 | 2.58 | 5.97 | 3.53 | 3.09 | 2.82 | 2.54 | 3.10 | 4.32 | 3.28 | 3.04 |
| Net entry (Entry-Exit) | -0.35 | -0.67 | -0.24 | -0.01 | -0.37 | -0.37 | 0.02 | -0.53 | -0.32 | -0.24 | -0.09 | -0.35 |
| Net expansion (Expansions-Contractions) | 4.79 | 3.51 | 2.82 | 5.98 | 3.90 | 3.46 | 2.80 | 3.07 | 3.42 | 4.56 | 3.37 | 3.39 |
| TURNOVER 1 (Expansion + Contraction) | 18.53 | 18.33 | 15.94 | 18.72 | 17.32 | 17.10 | 20.58 | 19.43 | 19.18 | 21.72 | 20.17 | 19.61 |
| TURNOVER 2 (Entry + Exit) | 4.03 | 4.35 | 2.68 | 4.43 | 3.23 | 3.43 | 4.64 | 5.73 | 4.38 | 5.98 | 5.43 | 4.99 |
| TOTAL TURNOVER | 22.56 | 22.68 | 18.62 | 23.15 | 20.55 | 20.53 | 25.22 | 25.16 | 23.56 | 27.70 | 25.60 | 24.60 |
| | [1.49] | [2.96] | [2.63] | [2.97] | [3.01] | [2.57] | [3.60] | [2.61] | [3.53] | [3.48] | [3.91] | [2.82] |
| EXCESS | 18.12 | 19.84 | 16.04 | 17.18 | 17.02 | 17.44 | 22.40 | 22.62 | 20.46 | 23.38 | 22.32 | 21.56 |

***Note : Figures in the bracket indicate the corresponding standard deviation***

**Table 2**

**Change in Job Gain and Job Loss Rates in the Manufacturing Sector By Region Between 1970s and 1980s**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B. C.* | *Canada* |
|---|---|---|---|---|---|---|
| | | | (*Percentage Points*) | | | |
| JOB GAIN (GAIN) | 0.52 | 1.09 | 2.73 | 1.45 | 2.40 | 2.01 |
| Continuing growing | 0.05 | 0.18 | 1.63 | 0.70 | 0.95 | 1.01 |
| Continuing new | -0.02 | 0.15 | 0.29 | 0.09 | 0.21 | 0.21 |
| Expansion | 0.03 | 0.33 | 1.92 | 0.79 | 1.16 | 1.22 |
| Greenfield entry | 0.49 | 0.76 | 0.81 | 0.66 | 1.24 | 0.79 |
| JOB LOSS (LOSS) | 2.14 | 1.39 | 2.21 | 3.10 | 2.65 | 2.06 |
| Continuing declining | 1.90 | 0.78 | 1.22 | 2.10 | 1.64 | 1.22 |
| Continuing dead | 0.12 | -0.01 | 0.10 | 0.11 | 0.05 | 0.07 |
| Contractions | 2.02 | 0.77 | 1.32 | 2.21 | 1.69 | 1.29 |
| Close-down exit | 0.12 | 0.62 | 0.89 | 0.89 | 0.96 | 0.77 |
| NET = GAIN - LOSS | -1.62 | -0.30 | 0.52 | -1.65 | -0.25 | -0.05 |
| Net entry (Entry-Exit) | 0.37 | 0.14 | -0.08 | -0.23 | 0.28 | 0.02 |
| Net expansion (Expansions-contractions) | -1.99 | -0.44 | 0.60 | -1.42 | -0.53 | -0.07 |
| TURNOVER 1 (Expansion + Contraction) | 2.05 | 1.10 | 3.24 | 3.00 | 2.85 | 2.51 |
| TURNOVER 2 (Entry + Exit) | 0.61 | 1.38 | 1.70 | 1.55 | 2.20 | 1.56 |
| TOTAL TURNOVER | 2.66 | 2.48 | 4.94 | 4.55 | 5.05 | 4.07 |
| EXCESS | 4.28 | 2.78 | 4.42 | 6.20 | 5.30 | 4.12 |

## Table 3

## Correlation Coefficient Between Different Turnover Measures By Region

| | *r(GAIN, LOSS)* | | *r(EXCESS, ABNET)* | |
|---|---|---|---|---|
| | ***1973-1979*** | ***1980-1990*** | ***1973-1979*** | ***1980-1990*** |
| ATLANTIC CANADA | -.90 | -.52 | -.96 | -.31 |
| QUEBEC | -.77 | -.40 | -.58 | -.39 |
| ONTARIO | -.46 | -.39 | -.33 | -.13 |
| PRAIRIES | -.35 | -.48 | -.62 | -.47 |
| B.C. | -.57 | -.50 | -.70 | -.39 |
| CANADA | -.58 | -.48 | -.59 | -.16 |

***Note: r( , ) represents correlation coefficient between arguments in the bracket***

**Table 4**
**Cross-Region Correlations of Different Turnover Measures**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CAN. | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .92 | 1.00 | | | | | .65 | 1.00 | | | | |
| ONTARIO | .97 | .97 | 1.00 | | | | .90 | .42 | 1.00 | | | |
| PRAIRIES | .87 | .93 | .88 | 1.00 | | | .80 | .48 | .91 | 1.00 | | |
| B.C. | .86 | .85 | .92 | .73 | 1.00 | | .86 | .60 | .91 | .88 | 1.00 | |
| CANADA | .96 | .99 | 1.00 | .91 | .91 | 1.00 | .94 | .63 | .97 | .92 | .95 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CAN. | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .70 | 1.00 | | | | | .96 | 1.00 | | | | |
| ONTARIO | .67 | .81 | 1.00 | | | | .85 | .90 | 1.00 | | | |
| PRAIRIES | .12 | .76 | .60 | 1.00 | | | .73 | .70 | .54 | 1.00 | | |
| B.C. | .75 | .42 | .71 | .02 | 1.00 | | .74 | .79 | .59 | .85 | 1.00 | |
| CANADA | .75 | .88 | .99 | .61 | .73 | 1.00 | .94 | .97 | .96 | .71 | .76 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CAN. | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .89 | 1.00 | | | | | .85 | 1.00 | | | | |
| ONTARIO | .93 | .92 | 1.00 | | | | .92 | .72 | 1.00 | | | |
| PRAIRIES | .74 | .93 | .74 | 1.00 | | | .76 | .64 | .80 | 1.00 | | |
| B.C. | .83 | .74 | .85 | .45 | 1.00 | | .83 | .72 | .82 | .87 | 1.00 | |
| CANADA | .94 | .97 | .98 | .83 | .84 | 1.00 | .96 | .85 | .97 | .86 | .89 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CAN. | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .80 | 1.00 | | | | | .60 | 1.00 | | | | |
| ONTARIO | .74 | .84 | 1.00 | | | | .77 | .40 | 1.00 | | | |
| PRAIRIES | .77 | .87 | .92 | 1.00 | | | .79 | .35 | .73 | 1.00 | | |
| B.C. | .87 | .63 | .85 | .74 | 1.00 | | .79 | .50 | .74 | .87 | 1.00 | |
| CANADA | .83 | .93 | .98 | .95 | .83 | 1.00 | .88 | .64 | .95 | .80 | .85 | 1.00 |

## Table 5

## "Contribution of Entry and Exit, and Expansion and Contraction of Existing Establishments to Job Turnover ( % )

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Atlantic Canada*** | ***Que*** | ***Ont*** | ***Prairies*** | ***B.C.*** | ***Canada*** | ***Atlantic Canada*** | ***Que*** | ***Ont*** | ***Prairies*** | ***B.C.*** | ***Canada*** |
| TURNOVER 1 | 82.14 | 80.82 | 85.61 | 80.86 | 84.28 | 83.29 | 81.60 | 77.23 | 81.41 | 78.41 | 78.79 | 79.72 |
| TURNOVER 2 | 17.86 | 19.18 | 14.39 | 19.14 | 15.72 | 16.71 | 18.40 | 22.77 | 18.59 | 21.59 | 21.21 | 20.28 |
| TOTAL TURNOVER | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

## Table 6

## Average Annual Job Gain and Job Loss Rates in the Manufacturing Sector of Canada By Industrial Sector (1973-1979 and 1980-1990)
**(Percent of Total Employment Using Production Workers)**

| | *1973-1979* | | | | | *1980-1990* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ***Natural Resource*** | ***Labour Intensive*** | ***Scale-Based*** | ***Product-Differen-tiated*** | ***Science-Based*** | ***Natural Resources*** | ***Labour Intensive*** | ***Scale-Based*** | ***Product-Differen-tiated*** | ***Science-Based*** |
| JOB GAIN (GAIN) | 11.77 | 13.40 | 9.70 | 13.84 | 12.77 | 13.76 | 17.11 | 10.46 | 17.85 | 13.07 |
| Continuing growing | 9.51 | 10.58 | 8.20 | 11.22 | 10.58 | 10.60 | 12.78 | 8.26 | 13.50 | 10.42 |
| Continuing new | 0.69 | 0.58 | 0.56 | 0.65 | 1.02 | 0.88 | 0.84 | 0.76 | 1.01 | 1.05 |
| Expansion | 10.20 | 11.16 | 8.76 | 11.87 | 11.60 | 11.48 | 13.62 | 9.02 | 14.51 | 11.47 |
| Greenfield entry | 1.57 | 2.24 | 0.94 | 1.97 | 1.17 | 2.28 | 3.49 | 1.44 | 3.34 | 1.60 |
| JOB LOSS (LOSS) | 8.61 | 10.74 | 6.60 | 10.05 | 9.71 | 10.35 | 13.60 | 8.76 | 13.62 | 9.02 |
| Continuing declining | 6.36 | 7.58 | 5.25 | 7.92 | 7.46 | 7.42 | 9.03 | 7.04 | 9.34 | 6.75 |
| Continuing dead | 0.27 | 0.35 | 0.20 | 0.35 | 0.11 | 0.31 | 0.45 | 0.21 | 0.46 | 0.23 |
| Contraction | 6.63 | 7.93 | 5.45 | 8.27 | 7.57 | 7.73 | 9.48 | 7.25 | 9.80 | 6.98 |
| Close-down exit | 1.98 | 2.81 | 1.15 | 1.78 | 2.14 | 2.62 | 4.12 | 1.51 | 3.82 | 2.04 |
| NET = GAIN - LOSS | 3.16 | 2.66 | 3.10 | 3.79 | 3.06 | 3.41 | 3.51 | 1.70 | 4.23 | 4.05 |
| Net entry (Entry-Exit) | -0.41 | -0.57 | -0.21 | 0.19 | - 0.97 | -0.34 | -0.63 | -0.07 | -0.48 | -0.44 |
| Net Expansion (Expansions-Contractions) | 3.57 | 3.23 | 3.31 | 3.60 | 4.03 | 3.75 | 4.14 | 1.77 | 4.71 | 4.49 |
| TURNOVER 1 (Expansion + Contraction) | 16.83 | 19.09 | 14.21 | 20.14 | 19.17 | 19.21 | 23.10 | 16.27 | 24.31 | 18.45 |
| TURNOVER 2 (Entry + Exit) | 3.55 | 5.05 | 2.09 | 3.75 | 3.31 | 4.90 | 7.61 | 2.95 | 7.16 | 3.64 |
| TOTAL TURNOVER | 20.38 | 24.14 | 16.30 | 23.89 | 22.48 | 24.11 | 30.71 | 19.22 | 31.47 | 22.09 |
| EXCESS | 17.22 | 21.48 | 13.20 | 20.10 | 19.42 | 20.70 | 27.20 | 17.52 | 27.24 | 18.04 |

## Table 7

## Change in Job Gain and Job Loss Rates in the Manufacturing Sector of Canada By Industrial Sector Between 1970s and 1980s

| | *Natural Resource* | *Labour Intensive* | *Scale-Based* | *Product-Differentiated* | *Science-Based* |
|---|---|---|---|---|---|
| | | | ***(Percentage Points)*** | | |
| JOB GAIN (GAIN) | 1.99 | 3.71 | 0.76 | 4.01 | 0.30 |
| Continuing growing | 1.09 | 2.20 | 0.06 | 2.28 | -0.16 |
| Continuing new | 0.19 | 0.26 | 0.20 | 0.36 | 0.03 |
| Expansion | 1.28 | 2.46 | 0.26 | 2.64 | -0.13 |
| Greenfield entry | 0.71 | 1.25 | 0.50 | 1.37 | 0.43 |
| JOB LOSS (LOSS) | 1.74 | 2.86 | 2.16 | 3.57 | -0.69 |
| Continuing declining | 1.06 | 1.45 | 1.79 | 1.42 | -0.71 |
| Continuing dead | 0.04 | 0.10 | 0.01 | 0.11 | 0.12 |
| Contraction | 1.10 | 1.55 | 1.80 | 1.53 | -0.59 |
| Close-down exit | 0.64 | 1.31 | 0.36 | 2.04 | -0.10 |
| NET = GAIN - LOSS | 0.25 | 0.85 | -1.40 | 0.44 | 0.99 |
| Net entry (Entry-Exit) | 0.07 | -0.06 | 0.14 | -0.67 | 0.53 |
| Net Expansion (Expansions-Contractions) | 0.18 | 0.91 | -1.54 | 1.11 | 0.46 |
| TURNOVER 1 (Expansion + Contraction) | 2.38 | 4.01 | 2.06 | 4.17 | -0.72 |
| TURNOVER 2 (Entry + Exit) | 1.35 | 2.56 | 0.86 | 3.41 | 0.33 |
| TOTAL TURNOVER | 3.73 | 6.57 | 2.92 | 7.58 | -0.39 |
| EXCESS | 3.48 | 5.72 | 4.32 | 7.14 | -1.38 |

**Table 8**

**Correlation Coefficient Between Turnover Measures By Region and By Industrial Sector**

| | *r(GAIN , LOSS)* | | *r(EXCESS , ABNET)* | |
|---|---|---|---|---|
| ***NATURAL RESOURCES*** | ***1973-79*** | ***1980-90*** | ***1973-79*** | ***1980-90*** |
| Atlantic Canada | -.72 | -.53 | -.94 | -.65 |
| Quebec | -.43 | -.01 | -.58 | -.65 |
| Ontario | -.14 | -.07 | -.23 | .42 |
| Prairies | -.16 | -.40 | -.59 | -.26 |
| B.C. | -.36 | -.47 | -.62 | -.46 |
| Canada | -.21 | -.26 | -.49 | -.07 |
| | *r(GAIN , LOSS)* | | *r(EXCESS , ABNET)* | |
| ***LABOUR INTENSIVE*** | ***1973-79*** | ***1980-90*** | ***1973-79*** | ***1980-90*** |
| Atlantic Canada | -.56 | -.38 | -.45 | .45 |
| Quebec | -.44 | -.37 | -.19 | -.20 |
| Ontario | -.56 | -.12 | -.45 | .25 |
| Prairies | -.60 | -.38 | .00 | -.39 |
| B.C. | -.31 | -.37 | -.37 | -.41 |
| Canada | -.54 | -.27 | -.37 | .30 |
| | *r(GAIN , LOSS))* | | *r(EXCESS , ABNET)* | |
| ***SCALE-BASED*** | ***1973-79*** | ***1980-90*** | ***1973-79*** | ***1980-90*** |
| Atlantic Canada | -.67 | -.51 | -.74 | -.65 |
| Quebec | -.92 | -.51 | -.91 | -.48 |
| Ontario | -.60 | -.59 | .06 | -.55 |
| Prairies | -.76 | -.15 | -.85 | -.51 |
| B.C. | -.79 | -.51 | -.73 | -.53 |
| Canada | -.74 | -.61 | -.78 | -.57 |
| | *r(GAIN , LOSS)* | | *r(EXCESS , ABNET)* | |
| ***PRODUCT-DIFFERENTIATED*** | ***1973-79*** | ***1980-90*** | ***1973-79*** | ***1980-90*** |
| Atlantic Canada | -.82 | -.67 | -.87 | -.66 |
| Quebec | -.49 | -.55 | -.52 | -.45 |
| Ontario | -.54 | -.44 | -.57 | -.04 |
| Prairies | -.17 | -.30 | -.56 | -.46 |
| B.C. | -.65 | -.54 | -.70 | -.35 |
| Canada | -.51 | -.56 | -.59 | -.35 |
| | *r(GAIN , LOSS)* | | *r(EXCESS , ABNET)* | |
| ***SCIENCE-BASED*** | ***1973-79*** | ***1980-90*** | ***1973-79*** | ***1980-90*** |
| Atlantic Canada | .66 | .02 | -.30 | -.35 |
| Quebec | .09 | -.27 | -.36 | -.60 |
| Ontario | -.35 | -.63 | .25 | -.63 |
| Prairies | .71 | -.88 | -.33 | -.87 |
| B.C. | -.63 | -.50 | -.49 | -.63 |
| Canada | -.56 | -.64 | -.49 | -.68 |

## Table 9

## Contribution of Entry and Exit and Expansion and contraction of Existing Establishments to Total Turnover by Industrial Sector and by Region (%)

| | | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B. C.* | *Canada* | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B. C.* | *Canada* |
| | TURNOVER 1 | 84.48 | 80.48 | 84.15 | 80.10 | 84.38 | 82.58 | 82.71 | 77.95 | 80.96 | 79.12 | 77.28 | 79.68 |
| NATURAL RESOURCES | TURNOVER 2 | 15.52 | 19.52 | 15.85 | 19.90 | 15.63 | 17.42 | 17.29 | 22.05 | 19.04 | 20.88 | 22.72 | 20.32 |
| | **TOTAL TURNOVER** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| | TURNOVER 1 | 80.95 | 76.87 | 82.27 | 80.04 | 71.22 | 79.08 | 72.44 | 72.55 | 77.97 | 75.87 | 73.02 | 75.22 |
| LABOUR INTENSIVE | TURNOVER 2 | 19.05 | 23.13 | 17.73 | 19.96 | 28.78 | 20.92 | 27.56 | 27.45 | 22.03 | 24.13 | 26.98 | 24.78 |
| | **TOTAL TURNOVER** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| | TURNOVER 1 | 81.64 | 83.72 | 89.46 | 84.04 | 89.04 | 87.18 | 86.06 | 82.89 | 85.77 | 80.13 | 85.80 | 84.65 |
| SCALE-BASED | TURNOVER 2 | 18.36 | 16.28 | 10.54 | 15.96 | 10.96 | 12.82 | 13.94 | 17.11 | 14.23 | 19.87 | 14.20 | 15.35 |
| | **TOTAL TURNOVER** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| | TURNOVER 1 | 75.37 | 85.51 | 85.12 | 79.17 | 83.51 | 84.30 | 72.40 | 76.62 | 77.92 | 77.47 | 73.79 | 77.25 |
| PRODUCT-DIFFERENTIATED | TURNOVER 2 | 24.63 | 14.49 | 14.88 | 20.83 | 16.49 | 15.70 | 27.60 | 23.38 | 22.08 | 22.53 | 26.21 | 22.75 |
| | **TOTAL TURNOVER** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| | TURNOVER 1 | 66.98 | 85.92 | 86.23 | 82.02 | 78.42 | 85.28 | 81.01 | 83.96 | 84.41 | 81.03 | 73.17 | 83.52 |
| SCIENCE-BASED | TURNOVER 2 | 33.02 | 14.08 | 13.77 | 17.98 | 21.58 | 14.72 | 18.99 | 16.04 | 15.59 | 18.97 | 26.83 | 16.48 |
| | **TOTAL TURNOVER** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |

**Table 10**
**Total Turnover in the Manufacturing Sector By Region and By Industrial sector (1973-1979)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| Natural Resources | 24.49 | 21.41 | 18.99 | 20.15 | 19.84 |
| Labour Intensive | 27.87 | 25.21 | 21.88 | 26.96 | 30.75 |
| Scale-Based | 17.59 | 18.37 | 14.52 | 19.74 | 17.98 |
| Product-differentiated | 30.57 | 24.84 | 22.05 | 31.74 | 25.96 |
| Science-Based | 30.89 | 25.93 | 20.33 | 26.98 | 26.14 |

**Table 11**
**Ranking of Total Turnover in the Manufacturing Sector By Industry Within Region (1973-1979)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* | *National* |
|---|---|---|---|---|---|---|
| Natural Resources | 4 | 4 | 4 | 4 | 4 | 4 |
| Labour Intensive | 3 | 2 | 2 | 3 | 1 | 1 |
| Scale-Based | 5 | 5 | 5 | 5 | 5 | 5 |
| Product-differentiated | 2 | 3 | 1 | 1 | 3 | 2 |
| Science-Based | 1 | 1 | 3 | 2 | 2 | 3 |

**Table 12**
**Ranking of Total Turnover in the Manufacturing Sector By Region Within Industry (1973-1979)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| Natural Resources | 1 | 2 | 5 | 3 | 4 |
| Labour Intensive | 2 | 4 | 5 | 3 | 1 |
| Scale-Based | 4 | 2 | 5 | 1 | 3 |
| Product-differentiated | 2 | 4 | 5 | 1 | 3 |
| Science-Based | 1 | 4 | 5 | 2 | 3 |
| National | 3 | 2 | 5 | 1 | 4 |

**Table 13**
**Total Turnover in the Manufacturing Sector**
**By Region and By Industrial Sector (1980-1990)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| Natural Resources | 25.45 | 23.90 | 23.69 | 23.23 | 26.15 |
| Labour Intensive | 33.63 | 30.89 | 28.73 | 34.40 | 42.07 |
| Scale-Based | 20.37 | 20.22 | 18.48 | 23.05 | 18.31 |
| Product-differentiated | 40.65 | 29.68 | 30.34 | 37.69 | 38.23 |
| Science-Based | 29.64 | 18.89 | 22.06 | 31.10 | 35.82 |

**Table 14**
**Ranking of Total Turnover in the Manufacturing Sector**
**By Industry Within Region (1980-1990)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* | *National* |
|---|---|---|---|---|---|---|
| Natural Resources | 4 | 3 | 3 | 4 | 4 | 4 |
| Labour Intensive | 2 | 1 | 2 | 2 | 1 | 1 |
| Scale-Based | 5 | 4 | 5 | 5 | 5 | 5 |
| Product-differentiated | 1 | 2 | 1 | 1 | 2 | 2 |
| Science-Based | 3 | 5 | 4 | 3 | 3 | 3 |

**Table 15**
**Ranking of Total Turnover in the Manufacturing Sector**
**By Region Within Industry (1980-1990)**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| Natural Resources | 2 | 3 | 4 | 5 | 1 |
| Labour Intensive | 3 | 4 | 5 | 2 | 1 |
| Scale-Based | 2 | 3 | 4 | 1 | 5 |
| Product-differentiated | 1 | 5 | 5 | 3 | 2 |
| Science-Based | 3 | 5 | 4 | 2 | 1 |
| National | 3 | 2 | 5 | 1 | 4 |

**Table 16**
**Change in Total Turnover in the Manufacturing Sector**
**By Region and by Industrial Sector Between the 1970s and 1980s**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| | | | *(Percentage Points)* | | |
| Natural Resources | 0.96 | 2.49 | 4.70 | 3.08 | 6.31 |
| Labour Intensive | 5.76 | 5.68 | 6.85 | 7.44 | 11.32 |
| Scale-Based | 2.78 | 1.85 | 3.96 | 3.31 | 0.33 |
| Product-differentiated | 10.08 | 4.84 | 8.29 | 5.95 | 12.27 |
| Science-Based | -1.25 | -7.04 | 1.73 | 4.12 | 9.68 |

**Table 17**
**Ranking of Changes in total Turnover in the Manufacturing Sector**
**By Industry Within Region**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* | *National* |
|---|---|---|---|---|---|---|
| Natural Resources | 4 | 3 | 3 | 4 | 4 | 3 |
| Labour Intensive | 2 | 1 | 2 | 1 | 2 | 2 |
| Scale-Based | 3 | 4 | 4 | 5 | 5 | 4 |
| Product-differentiated | 1 | 2 | 1 | 2 | 1 | 1 |
| Science-Based | 5 | 5 | 5 | 3 | 3 | 5 |

**Table 18**
**Ranking of Changes in Total Turnover in the Manufacturing Sector**
**By Region Within Industry**

| | *Atlantic Canada* | *Quebec* | *Ontario* | *Prairies* | *B.C.* |
|---|---|---|---|---|---|
| Natural Resources | 5 | 4 | 2 | 3 | 1 |
| Labour Intensive | 4 | 5 | 3 | 2 | 1 |
| Scale-Based | 3 | 4 | 1 | 2 | 5 |
| Product-differentiated | 2 | 5 | 3 | 4 | 1 |
| Science-Based | 4 | 5 | 3 | 2 | 1 |
| National | 4 | 5 | 2 | 3 | 1 |

**Table 19**

**Regression Coefficients for Region and Industries Using Job Gain, Job Loss and Total Turnover**

| *Variable* | *GAIN* | *LOSS* | *TOTAL TURNOVER* |
|---|---|---|---|
| ATLANTIC CANADA (AC) | 3.548 | 2.249 | 5.797 |
| QUEBEC (QUE) | 0.809 * | 0.640 * | 1.449 |
| PRAIRIES (PRA) | 4.155 | 1.196 | 5.351 |
| BRITISH COLUMBIA (BC) | 4.507 | 1.935 | 6.442 |
| NATURAL RESOURCES (NR) | 2.529 | 1.494 | 4.023 |
| LABOUR INTENSIVE (LI) | 7.362 | 4.742 | 12.104 |
| PRODUCT-DIFFERENTIATED (PD) | 8.313 | 4.860 | 13.173 |
| SCIENCE-BASED (SCI) | 5.437 | 2.332 | 7.769 |

***NOTE: 1) * Represents not significant at 5% or less.***
***2) Values without an asterisk are significant at 5% or less.***

**Table 20**
**Regression Coefficients Showing Cross-Sectoral and Cross-Regional Differences in the Volatility in Job Turnover (EXCESS)**

| | [1] | | | [2] | | | [3] | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Parameter Estimate** | **S.E.** | **Prob. > \|T\|** | **Parameter Estimate** | **S.E.** | **Prob. > \|T\|** | **Parameter Estimate** | **S.E.** | **Prob. > \|T\|** |
| INTERCEPT | 11.629 | 1.192 | 0.000 | 11.128 | 1.505 | 0.000 | 12.907 | 1.456 | 0.000 |
| ABNET | -0.708 | 0.120 | 0.000 | -0.428 | 0.294 | 0.147 | -0.747 | 0.115 | 0.000 |
| PABNET | 0.261 | 0.121 | 0.032 | 0.000 | 0.259 | 0.999 | 0.227 | 0.117 | 0.053 |
| ATLANTIC CANADA (AC) | 4.392 | 0.766 | 0.000 | 5.549 | 1.372 | 0.000 | 2.268 | 1.590 | 0.155 |
| QUEBEC (QUE) | 1.512 | 0.778 | 0.053 | 3.471 | 1.480 | 0.020 | 2.541 | 1.602 | 0.114 |
| PRAIRIES (PRA) | 4.114 | 0.760 | 0.000 | 5.279 | 1.483 | 0.000 | 4.123 | 1.593 | 0.010 |
| BRITISH COLUMBIA (BC) | 4.828 | 0.766 | 0.000 | 3.987 | 1.394 | 0.005 | 1.043 | 1.591 | 0.513 |
| NATURAL RESOURCES (NR) | 3.919 | 0.750 | 0.000 | 3.888 | 0.750 | 0.000 | 4.672 | 1.591 | 0.004 |
| LABOUR INTENSIVE (LI) | 10.556 | 0.764 | 0.000 | 10.561 | 0.765 | 0.000 | 8.606 | 1.591 | 0.000 |
| PRODUCT DIFFERENTIATED (PD) | 10.733 | 0.791 | 0.000 | 10.879 | 0.797 | 0.000 | 9.241 | 1.596 | 0 000 |
| SCIENCE-BASED (SCI) | 5.815 | 0.774 | 0.000 | 5.884 | 0.778 | 0.000 | 3.874 | 1.591 | 0.015 |
| T74 | -1.222 | 1.379 | 0.376 | -1.045 | 1.379 | 0.449 | -1.275 | 1.311 | 0.331 |
| T75 | 2.108 | 1.406 | 0.135 | 1.775 | 1.413 | 0.210 | 1.827 | 1.339 | 0.173 |
| T76 | -0.898 | 1.399 | 0.522 | -0.958 | 1.405 | 0.496 | -1.135 | 1.332 | 0.395 |
| T77 | -2.213 | 1.424 | 0.121 | -2.380 | 1.437 | 0.099 | -2.499 | 1.356 | 0.066 |
| T78 | 0.704 | 1.417 | 0.620 | 1.068 | 1.442 | 0.459 | 1.123 | 1.351 | 0.406 |
| T79 | -0.129 | 1.382 | 0.926 | 0.143 | 1.390 | 0.918 | -0.013 | 1.314 | 0.992 |
| T81 | -0.484 | 1.386 | 0.727 | -0.558 | 1.385 | 0.687 | -0.670 | 1.318 | 0.612 |
| T82 | 5.901 | 1.593 | 0.000 | 5.848 | 1.631 | 0.000 | 5.726 | 1.520 | 0 000 |
| T83 | 7.755 | 1.403 | 0.000 | 7.794 | 1.417 | 0.000 | 7.471 | 1.336 | 0 000 |
| T84 | 2.453 | 1.378 | 0.076 | 2.626 | 1.384 | 0.059 | 2.428 | 1.311 | 0.065 |
| T85 | 2.137 | 1.384 | 0.124 | 2.263 | 1.392 | 0.105 | 2.293 | 1.317 | 0.082 |
| T86 | 4.666 | 1.382 | 0.001 | 4.748 | 1.389 | 0.001 | 4.789 | 1.314 | 0 000 |
| T87 | 3.003 | 1.381 | 0.030 | 3.060 | 1.388 | 0.028 | 3.108 | 1.313 | 0.019 |
| T88 | 7.090 | 1.451 | 0.000 | 7.334 | 1.470 | 0.000 | 7.665 | 1.385 | 0 000 |
| T89 | 5.865 | 1.485 | 0.000 | 5.951 | 1.498 | 0.000 | 6.154 | 1.413 | 0 000 |
| T90 | 2.625 | 1.677 | 0.118 | 2.357 | 1.734 | 0.175 | 2.409 | 1.600 | 0.133 |
| AC x NR | | | | | | | 0.404 | 2.248 | 0.858 |
| AC x LI | | | | | | | 1.278 | 2.257 | 0.571 |
| AC x PD | | | | | | | 4.722 | 2.270 | 0.038 |
| AC x SCI | | | | | | | 5.136 | 2.253 | 0.023 |
| QUE x NR | | | | | | | -1.027 | 2.248 | 0.648 |
| QUE x LI | | | | | | | 0.586 | 2.248 | 0.794 |
| QUE x PD | | | | | | | -1.699 | 2.248 | 0.450 |
| QUE x SCI | | | | | | | -3.045 | 2.250 | 0.177 |
| PRA x NR | | | | | | | -3.859 | 2.251 | 0.087 |
| PRA x LI | | | | | | | 0.564 | 2.249 | 0.802 |
| PRA x PD | | | | | | | 2.529 | 2.250 | 0.262 |
| PRA x SCI | | | | | | | 1.527 | 2.258 | 0.499 |
| BC x NR | | | | | | | 0.785 | 2.248 | 0.727 |
| BC x LI | | | | | | | 8.329 | 2.266 | 0 000 |
| BC x PD | | | | | | | 3.499 | 2.260 | 0.123 |
| BC. x SCI | | | | | | | 7.363 | 2.267 | 0.001 |
| ABNET x AC | | | | -0.362 | 0.298 | 0.226 | | | |
| ABNET x QUE | | | | -0.739 | 0.423 | 0.081 | | | |
| ABNET x PRA | | | | -0.412 | 0.437 | 0.347 | | | |
| ABNET x BC | | | | -0.069 | 0.331 | 0.835 | | | |
| PABNET x AC | | | | 0.254 | 0.256 | 0.323 | | | |
| PABNET x QUE | | | | 0.440 | 0.369 | 0.235 | | | |
| PABNET x PRA | | | | 0.298 | 0.384 | 0.439 | | | |
| PABNET x BC | | | | 0.186 | 0.283 | 0.512 | | | |
| | R**2 | .53 | | R**2 | .54 | | R**2 | .59 | |
| | Adj R**2 | .49 | | Adj R**2 | .50 | | Adj R**2 | .54 | |
| | F(396,26) | 15.81 | | F(388,34) | 12.69 | | F(380,42) | 12.44 | |
| | Prob > F | 0.0001 | | Prob > F | 0.0001 | | Prob.> F | 0.0001 | |

***NOTE: S.E. represents standard error***

# APPENDIX A

## INTRA-SECTORAL JOB TURNOVER AT THE REGIONAL LEVEL

### a) Natural Resource-Based Sector

In the natural resource-based sector, turnover measures differ across regions in the 1970s (Table Ia). The largest average annual turnover in the natural resource-based sector occurs in Atlantic Canada (24.5%), followed by Quebec (21.4%), the Prairies (20.2 %), B.C. (19.8%), and Ontario (19.0%). The excess job-turnover rates follow the same pattern. Although rates of job creation and destruction are high in all regions, relatively more jobs are created in Atlantic Canada, the Prairies and B.C. than in Quebec and Ontario. As a result, the annual average net employment growth in the former three regions is considerably larger than the latter two. The negative correlation between GAIN and LOSS is highest in Atlantic Canada, and lowest in Ontario and the Prairies (Table 8, Text).

In order to examine the influence of the business cycle on job turnover, correlations between EXCESS and ABNET in the natural resource-based sector for all regions were estimated for the period 1973-1979 (Table 8, Text). In the 1970s, these correlations are significantly negative in all regions but Ontario.

Between 1973-1979 and 1980-1990, in the natural resource-based sector, job gain decreases in Atlantic Canada; but increases in all other regions (Table Ia and Table Ib). The increase is particularly large in Ontario, Quebec, and B.C.. The annual average decline in net employment growth in Atlantic Canada and the Prairies indicates that here relatively more jobs are created and less are destroyed in the 1970s, and relatively more are destroyed and less are created in the 1980s. Net employment grows in all other regions. Both total turnover and excess turnover increase in all regions. The correlation between GAIN and LOSS for the period 1980-1990 is smaller in Atlantic Canada, Quebec, and Ontario, and larger in the Prairies and B.C. than the period 1973-1979-- indicating that the negative relation between job creation and job destruction weakens in the former set of regions and strengthens in the latter set (Table 8, Text).

The impact of cyclical factors on total job turnover in the natural-resources sector decreases in all regions but Quebec, where the influence of cyclical factors increases. The negative correlation between EXCESS and ABNET is larger in Quebec but smaller in all other regions in the 1980s than the 1970s (Table 8, Text).

In the natural resource-based sector, most job gain, job loss, total turnover, and excess turnover stems from expansion and contraction of existing establishments in the period 1973-1979. Entry and exit of establishments do not contribute much to net job gain in all regions. Net entry is generally negative across regions. Despite the fact that entry and exit do not contribute much to net job creation, their contribution to total turnover is important. In the period 1973-1979, their contribution (TURNOVER 2) to total turnover ranges from 15.5% annually in Atlantic Canada to 19.9% annually in the Prairies (Table 9, Text). TURNOVER 2 contributes relatively more to total turnover in Quebec and the Prairies than in Atlantic Canada, Ontario and B.C.. Therefore, in the natural resource-based sector, entry and exit is more important in the job turnover process in Quebec and the Prairies than in any other region.

Between 1973-1979 and 1980-1990, job gains due to expansion of existing establishments and job loss due to contraction of existing establishments increase in all regions except in Atlantic Canada (Table Ia and Table Ib). The job-gain rate decreases in Atlantic Canada, while the job-loss rate increases. Job gain and job loss due to entry and exit increase across all regions in the period 1980-1990. The largest increase in the entry rate occurs in B.C. (1.2 percentage points annually); the largest increase in the exit rate also occurs in B.C. (1.6 percentage points annually). Net entry increases in Ontario and Quebec; it declines in other regions. The negative change in net employment in Atlantic Canada and the Prairies is mainly attributable to the decrease in the net expansion rate. The contribution of entry and exit (TURNOVER 2) to total turnover and excess turnover increases between periods 1973-1979 and 1980-1990 in all regions. B.C. experiences the largest increase (7.1 percentage points.)

In order to examine whether various measures of job turnover in the natural resource-based sector follow the same pattern across all regions, cross region correlations were estimated (Table Ic). Job gains between regions are generally significantly correlated in the 1970s. In the 1980s, these correlations generally decline and many of them become insignificant. This is especially the case for the correlation of GAIN between Quebec and all other regions. Cross-regional values of the correlation of LOSS are generally low in the period 1973-1979. Therefore, the job-loss rate in different regions does not generally follow the same pattern in the 1970s. However, in the 1980s, all correlations of LOSS between regions increase and become significant. Thus, job loss is more closely synchronized in the 1980s.

## Table Ia

## Average Annual Job Gain and Job Loss Rates in Natural Resource-Based Industries By Region (1973-1979 and 1980-1990) (Percent of Total Employment Using Production Workers)

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
| JOB GAIN (GAIN) | 15.43 | 12.08 | 10.68 | 12.34 | 11.46 | 11.77 | 14.12 | 13.42 | 13.90 | 12.86 | 14.79 | 13.76 |
| Continuing growing | 12.65 | 9.71 | 8.68 | 9.82 | 9.24 | 9.51 | 11.12 | 10.09 | 10.84 | 9.94 | 11.29 | 10.60 |
| Continuing new | 0.79 | 0.58 | 0.73 | 0.69 | 0.79 | 0.69 | 0.86 | 0.99 | 0.85 | 0.75 | 0.86 | 0.88 |
| Expansion | 13.44 | 10.29 | 9.41 | 10.51 | 10.03 | 10.20 | 11.98 | 11.08 | 11.69 | 10.69 | 12.15 | 11.48 |
| Greenfield entry | 1.99 | 1.79 | 1.27 | 1.83 | 1.43 | 1.57 | 2.14 | 2.34 | 2.21 | 2.17 | 2.64 | 2.28 |
| JOB LOSS (LOSS) | 9.06 | 9.33 | 8.31 | 7.81 | 8.38 | 8.61 | 11.33 | 10.48 | 9.79 | 10.37 | 11.36 | 10.35 |
| Continuing declining | 7.04 | 6.60 | 6.35 | 5.45 | 6.34 | 6.36 | 8.69 | 7.30 | 7.14 | 7.38 | 7.71 | 7.42 |
| Continuing dead | 0.21 | 0.34 | 0.22 | 0.18 | 0.37 | 0.27 | 0.38 | 0.25 | 0.35 | 0.31 | 0.35 | 0.31 |
| Contraction | 7.25 | 6.94 | 6.57 | 5.63 | 6.71 | 6.63 | 9.07 | 7.55 | 7.49 | 7.69 | 8.06 | 7.73 |
| Close-down exit | 1.81 | 2.39 | 1.74 | 2.18 | 1.67 | 1.98 | 2.26 | 2.93 | 2.30 | 2.68 | 3.30 | 2.62 |
| NET = GAIN - LOSS | 6.37 | 2.75 | 2.37 | 4.53 | 3.08 | 3.16 | 2.79 | 2.94 | 4.11 | 2.49 | 3.43 | 3.41 |
| Net entry (Entry-Exit) | 0.18 | -0.60 | -0.47 | -0.35 | -0.24 | -0.41 | -0.12 | -0.59 | -0.09 | -0.51 | -0.66 | -0.34 |
| Net Expansion (Expansions-Contractions) | 6.19 | 3.35 | 2.84 | 4.88 | 3.32 | 3.57 | 2.91 | 3.53 | 4.20 | 3.00 | 4.09 | 3.75 |
| TURNOVER 1 (Expansion + Contraction) | 20.69 | 17.23 | 15.98 | 16.14 | 16.74 | 16.83 | 21.05 | 18.63 | 19.18 | 18.38 | 20.21 | 19.21 |
| TURNOVER 2 (Entry + Exit) | 3.80 | 4.18 | 3.01 | 4.01 | 3.10 | 3.55 | 4.40 | 5.27 | 4.51 | 4.85 | 5.94 | 4.90 |
| TOTAL TURNOVER | 24.49 | 21.41 | 18.99 | 20.15 | 19.84 | 20.38 | 25.45 | 23.90 | 23.69 | 23.23 | 26.15 | 24.11 |
| EXCESS | 18.12 | 18.66 | 16.62 | 15.62 | 16.76 | 17.22 | 22.66 | 20.96 | 19.58 | 20.74 | 22.72 | 20.70 |

**Table Ib**

**Change in Job Gain and Job Loss Rates in Natural Resource-Based Industries By Region Between 1970s and 1980s**

| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
|---|---|---|---|---|---|---|
| | (Percentage Points) | | | | | |
| JOB GAIN (GAIN) | -1.31 | 1.34 | 3.22 | 0.52 | 3.33 | 1.99 |
| Continuing growing | -1.53 | 0.38 | 2.16 | 0.12 | 2.05 | 1.09 |
| Continuing new | 0.07 | 0.41 | 0.12 | 0.06 | 0.07 | 0.19 |
| Expansion | -1.46 | 0.79 | 2.28 | 0.18 | 2.12 | 1.28 |
| Greenfield entry | 0.15 | 0.55 | 0.94 | 0.34 | 1.21 | 0.71 |
| JOB LOSS (LOSS) | 2.27 | 1.15 | 1.48 | 2.56 | 2.98 | 1.74 |
| Continuing declining | 1.65 | 0.70 | 0.79 | 1.93 | 1.37 | 1.06 |
| Continuing dead | 0.17 | -0.09 | 0.13 | 0.13 | -0.02 | 0.04 |
| Contractions | 1.82 | 0.61 | 0.92 | 2.06 | 1.35 | 1.10 |
| Close-down exit | 0.45 | 0.54 | 0.56 | 0.50 | 1.63 | 0.64 |
| NET = GAIN - LOSS | -3.58 | 0.19 | 1.74 | -2.04 | 0.35 | 0.25 |
| Net entry (Entry-Exit) | -0.30 | 0.01 | 0.38 | -0.16 | -0.42 | 0.07 |
| Net expansion (Expansions-Contractions) | -3.28 | 0.18 | 1.36 | -1.88 | 0.77 | 0.18 |
| TURNOVER 1 (Expansion + Contraction) | 0.36 | 1.40 | 3.20 | 2.24 | 3.47 | 2.38 |
| TURNOVER 2 (Entry + Exit) | 0.60 | 1.09 | 1.50 | 0.84 | 2.84 | 1.35 |
| TOTAL TURNOVER | 0.96 | 2.49 | 4.70 | 3.08 | 6.31 | 3.73 |
| EXCESS | 4.54 | 2.30 | 2.96 | 5.12 | 5.96 | 3.48 |

**Table Ic**

**Cross-Region Correlations of Different Turnover Measures in Natural Resource-Based Industries**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CANADA | | | | | | | 1.00 | | | | | |
| QUEBEC | .86 | 1.00 | | | | | .33 | 1.00 | | | | |
| ONTARIO | .69 | .86 | 1.00 | | | | .68 | .03 | 1.00 | | | |
| PRAIRIES | .63 | .91 | .92 | 1.00 | | | .45 | .18 | .89 | 1.00 | | |
| B.C. | .77 | .94 | .73 | .89 | 1.00 | | .58 | .20 | .90 | .95 | 1.00 | |
| CANADA | .83 | .98 | .94 | .95 | .91 | 1.00 | .75 | .31 | .96 | .91 | .94 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CANADA | | | | | | | 1.00 | | | | | |
| QUEBEC | .07 | 1.00 | | | | | .78 | 1.00 | | | | |
| ONTARIO | .04 | .53 | 1.00 | | | | .74 | .80 | 1.00 | | | |
| PRAIRIES | -.45 | .75 | .76 | 1.00 | | | .65 | .63 | .53 | 1.00 | | |
| B.C. | .70 | .28 | -.22 | -.28 | 1.00 | | .40 | .67 | .39 | .74 | 1.00 | |
| CANADA | .42 | .78 | .83 | .62 | .32 | 1.00 | .84 | .95 | .90 | .75 | .69 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CANADA | | | | | | | 1.00 | | | | | |
| QUEBEC | .60 | 1.00 | | | | | .64 | 1.00 | | | | |
| ONTARIO | .41 | .65 | 1.00 | | | | .83 | .42 | 1.00 | | | |
| PRAIRIES | .09 | .77 | .80 | 1.00 | | | .54 | .47 | .73 | 1.00 | | |
| B.C. | .67 | .88 | .31 | .49 | 1.00 | | .51 | .44 | .79 | .91 | 1.00 | |
| CANADA | .66 | .94 | .84 | .81 | .76 | 1.00 | .86 | .67 | .94 | .83 | .85 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CANADA | | | | | | | 1.00 | | | | | |
| QUEBEC | .43 | 1.00 | | | | | .53 | 1.00 | | | | |
| ONTARIO | .42 | .98 | 1.00 | | | | .43 | .20 | 1.00 | | | |
| PRAIRIES | .43 | .98 | 1.00 | 1.00 | | | .48 | .24 | .91 | 1.00 | | |
| B.C. | .81 | .75 | .81 | .80 | 1.00 | | .46 | .48 | .63 | .77 | 1.00 | |
| CANADA | .54 | .98 | .99 | .99 | .86 | 1.00 | .64 | .57 | .91 | .89 | .80 | 1.00 |

**b) Labour Intensive Sector**

In the period 1973-1979, the average annual job-gain rate in the labour intensive sector ranges from 18.0% in B.C. to 12.4% in Ontario. The job-gain rate is larger than the job-loss rate in Atlantic Canada and the Western Provinces. As a result, annual net employment growth is higher in these regions (Table IIa). The negative correlation between GAIN and LOSS is generally small in B.C. and Quebec; larger in other regions (Table 8, Text). Both total turnover and excess turnover rates are high in all regions. The largest annual average turnover occurs in B.C. (30.8%), followed by Atlantic Canada (27.9%), the Prairies (27.0%), Quebec (25.2%), and Ontario (21.9%). Excess turnover generally follows the same pattern.

The effect of the business cycle on job turnover in the labour intensive sector for the period 1973-1979 was examined by estimating the correlation between EXCESS and ABNET (Table 8, Text). The estimated correlations between EXCESS and ABNET are quite small in magnitude and insignificant across all regions. Therefore, it is evident that, in the period 1973-1979, total job turnover in the labour intensive sector in all regions is not greatly affected by macroeconomic factors associated with business cycles. Restructuring is already taking place in this sector in the 1970s.

Between 1973-1979 and 1980-1990, job gain, job loss, total turnover, and excess turnover increase across all regions (Table IIa and Table IIb). The increase in job-gain is largest in B.C. (8.1% percentage points annually). The rate of job loss also increases in all regions. The largest increase occurs in the Prairies (4.3 percentage points). Both the Prairies and Atlantic Canada experience a decline in net employment growth because more jobs are lost and less are created in the 1980s than the 1970s. The decline is particularly large in the Prairies (1.2 percentage points annually). Ontario and Quebec experience a slight increase in net employment growth. The largest annual increase in net employment growth occurs in B.C. (4.9 percentage points). Both total turnover and excess turnover increase in all regions. The increase is largest in the western provinces. The correlation between GAIN and LOSS in the 1980s is smaller than the 1970s--indicating that the association between job creation and destruction declines in the 1980s. For each region, in the period 1980-1990, the correlation between EXCESS and ABNET remains small and insignificant (Table 8, Text). This confirms that job turnover in the labour intensive sectors of all regions continued to be influenced by structural change; cyclical factors had less of an impact.

The majority of job gains and job losses in both periods is attributable to expansion and contraction of existing establishments (Table IIa). However, job reallocation due to entry and exit is quite large--especially relative to other sectors. In the period 1973-1979, on average, entry and exit (TURNOVER 2) in the labour intensive sector reallocates more than 5% of jobs annually in Atlantic Canada, Quebec, and the Prairies; 9% in B.C., and 3.9% in Ontario. In this period, the contribution of TURNOVER 2 to total turnover ranges from 17.7% in Ontario to 28.8% in B.C. (Table 9, Text).

Between 1973-1979 and 1980-1990, the importance of entry and exit in job reallocation increases in all regions (Table IIa and Table IIb). The increase in annual job reallocation due to TURNOVER 2 ranges from 2.5 percentage points in Ontario to 4 percentage points in Atlantic Canada. The importance of expansion and contraction of existing establishments also increases. However, the relative importance of entry and exit increases and that of expansion and contraction declines in all regions but B.C. (Table 9, Text).

The inter-regional pattern of job turnover in the labour intensive sector was investigated by estimating cross-region correlations (Table IIc). Cross-region correlations of GAIN are generally high and statistically significant in the period 1973-1979. They are generally low and insignificant between Quebec and other regions. This suggests that, in the 1970s, the pattern of job gain is similar between most regions, except for Quebec probably because of Quebec's early restructuring. The correlation of GAIN between Quebec and other regions remains small and insignificant in the 1980s. The same pattern is true for job loss and total turnover in the 1980s.

**Table IIa**
**Average Annual Job Gain and Job Loss Rates in Labour Intensive Industries**
**By Region (1973-1979 and 1980-1990)**
**(Percent of Total Employment Using Production Workers)**

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
| JOB GAIN (GAIN) | 16.86 | 13.41 | 12.39 | 16.47 | 18.03 | 13.40 | 19.65 | 16.57 | 16.21 | 19.60 | 26.15 | 17.11 |
| Continuing growing | 11.86 | 10.49 | 10.08 | 12.66 | 13.18 | 10.58 | 13.54 | 12.09 | 12.50 | 14.57 | 18.48 | 12.78 |
| Continuing new | 2.13 | 0.50 | 0.51 | 1.06 | 0.70 | 0.58 | 0.80 | 0.79 | 0.80 | 1.15 | 1.16 | 0.84 |
| Expansion | 13.99 | 10.99 | 10.59 | 13.72 | 13.88 | 11.16 | 14.34 | 12.88 | 13.30 | 15.72 | 19.64 | 13.62 |
| Greenfield entry | 2.87 | 2.42 | 1.80 | 2.75 | 4.15 | 2.24 | 5.31 | 3.69 | 2.91 | 3.88 | 6.51 | 3.49 |
| ) | | | | | | | | | | | | |
| JOB LOSS (LOSS | 11.01 | 11.80 | 9.49 | 10.49 | 12.72 | 10.74 | 13.98 | 14.32 | 12.52 | 14.80 | 15.92 | 13.60 |
| Continuing declining | 8.36 | 8.05 | 7.06 | 7.62 | 7.33 | 7.58 | 9.53 | 9.15 | 8.63 | 9.79 | 10.44 | 9.03 |
| Continuing dead | 0.21 | 0.34 | 0.35 | 0.24 | 0.69 | 0.35 | 0.49 | 0.38 | 0.47 | 0.59 | 0.64 | 0.45 |
| Contraction | 8.57 | 8.39 | 7.41 | 7.86 | 8.02 | 7.93 | 10.02 | 9.53 | 9.10 | 10.38 | 11.08 | 9.48 |
| Close-down exit | 2.44 | 3.41 | 2.08 | 2.63 | 4.70 | 2.81 | 3.96 | 4.79 | 3.42 | 4.42 | 4.84 | 4.12 |
| NET = GAIN - LOSS | 5.85 | 1.61 | 2.90 | 5.98 | 5.31 | 2.66 | 5.67 | 2.25 | 3.69 | 4.80 | 10.23 | 3.51 |
| Net entry (Entry-Exit) | 0.43 | -0.99 | -0.28 | 0.12 | -0.55 | -0.57 | 1.35 | -1.10 | -0.51 | -0.54 | 1.67 | -0.63 |
| Net Expansion (Expansions-Contractions) | 5.42 | 2.60 | 3.18 | 5.86 | 5.86 | 3.23 | 4.32 | 3.35 | 4.20 | 5.34 | 8.56 | 4.14 |
| TURNOVER 1 (Expansion + Contraction) | 22.56 | 19.38 | 18.00 | 21.58 | 21.90 | 19.09 | 24.36 | 22.41 | 22.40 | 26.10 | 30.72 | 23.10 |
| TURNOVER 2 (Entry + Exit) | 5.31 | 5.83 | 3.88 | 5.38 | 8.85 | 5.05 | 9.27 | 8.48 | 6.33 | 8.30 | 11.35 | 7.61 |
| TOTAL TURNOVER | 27.87 | 25.21 | 21.88 | 26.96 | 30.75 | 24.14 | 33.63 | 30.89 | 28.73 | 34.40 | 42.07 | 30.71 |
| EXCESS | 22.02 | 23.60 | 18.98 | 20.98 | 25.44 | 21.48 | 27.96 | 28.64 | 25.04 | 29.60 | 31.84 | 27.20 |

**Table IIb**

**Change in Job Gain and Job Loss Rates in Labour-Intensive Industries By Region Between 1970s and 1980s**

| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
|---|---|---|---|---|---|---|
| | (Percentage Points) | | | | | |
| JOB GAIN (GAIN) | 2.79 | 3.16 | 3.82 | 3.13 | 8.12 | 3.71 |
| Continuing growing | 1.68 | 1.60 | 2.42 | 1.91 | 5.30 | 2.20 |
| Continuing new | -1.33 | 0.29 | 0.29 | 0.09 | 0.46 | 0.26 |
| Expansion | 0.35 | 1.89 | 2.71 | 2.00 | 5.76 | 2.46 |
| Greenfield entry | 2.44 | 1.27 | 1.11 | 1.13 | 2.36 | 1.25 |
| JOB LOSS (LOSS) | 2.97 | 2.52 | 3.03 | 4.31 | 3.20 | 2.86 |
| Continuing declining | 1.17 | 1.10 | 1.57 | 2.17 | 3.11 | 1.45 |
| Continuing dead | 0.28 | 0.04 | 0.12 | 0.35 | -0.05 | 0.10 |
| Contractions | 1.45 | 1.14 | 1.69 | 2.52 | 3.06 | 1.55 |
| Close-down exit | 1.52 | 1.38 | 1.34 | 1.79 | 0.14 | 1.31 |
| NET = GAIN - LOSS | -0.18 | 0.64 | 0.79 | -1.18 | 4.92 | 0.85 |
| Net entry (Entry-Exit) | 0.92 | -0.11 | -0.23 | -0.66 | 2.22 | -0.06 |
| Net expansion (Expansions-Contractions) | -1.10 | 0.75 | 1.02 | -0.52 | 2.70 | 0.91 |
| TURNOVER 1 (Expansion + Contraction) | 1.80 | 3.03 | 4.40 | 4.52 | 8.82 | 4.01 |
| TURNOVER 2 (Entry + Exit) | 3.96 | 2.65 | 2.45 | 2.92 | 2.50 | 2.56 |
| TOTAL TURNOVER | 5.76 | 5.68 | 6.85 | 7.44 | 11.32 | 6.57 |
| EXCESS | 5.94 | 5.04 | 6.06 | 8.62 | 6.40 | 5.72 |

**Table IIc**

**Cross-Region Correlations of Different Turnover Measures in Labour Intensive Industries**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .72 | 1.00 | | | | | .44 | 1.00 | | | | |
| ONTARIO | .60 | .96 | 1.00 | | | | .92 | .18 | 1.00 | | | |
| PRAIRIES | .51 | .88 | .84 | 1.00 | | | .84 | .30 | .89 | 1.00 | | |
| B.C. | .67 | .96 | .91 | .84 | 1.00 | | .82 | .42 | .84 | .92 | 1.00 | |
| CANADA | .69 | 1.00 | .98 | .89 | .95 | 1.00 | .95 | .55 | .92 | .91 | .91 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .73 | 1.00 | | | | | .90 | 1.00 | | | | |
| ONTARIO | .83 | .90 | 1.00 | | | | .86 | .83 | 1.00 | | | |
| PRAIRIES | .77 | .90 | .89 | 1.00 | | | .50 | .42 | .32 | 1.00 | | |
| B.C. | .54 | .61 | .65 | .39 | 1.00 | | .63 | .38 | .42 | .78 | 1.00 | |
| CANADA | .82 | .97 | .98 | .92 | .68 | 1.00 | .94 | .93 | .96 | .48 | .52 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .86 | 1.00 | | | | | .64 | 1.00 | | | | |
| ONTARIO | .81 | .96 | 1.00 | | | | .90 | .46 | 1.00 | | | |
| PRAIRIES | .62 | .92 | .84 | 1.00 | | | .76 | .44 | .78 | 1.00 | | |
| B.C. | .91 | .88 | .80 | .69 | 1.00 | | .78 | .40 | .75 | .93 | 1.00 | |
| CANADA | .86 | 1.00 | .98 | .90 | .87 | 1.00 | .95 | .72 | .94 | .83 | .80 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .45 | 1.00 | | | | | .47 | 1.00 | | | | |
| ONTARIO | .21 | .92 | 1.00 | | | | .90 | .36 | 1.00 | | | |
| PRAIRIES | .38 | .82 | .87 | 1.00 | | | .72 | .11 | .61 | 1.00 | | |
| B.C. | .12 | .91 | .97 | .89 | 1.00 | | .75 | .39 | .66 | .81 | 1.00 | |
| CANADA | .38 | .99 | .97 | .88 | .95 | 1.00 | .94 | .61 | .95 | .65 | .77 | 1.00 |

**c) Scale-Based Sector**

In the period 1973-1979, the scale-based sector in the Prairies experiences the highest level of job gain (13.0% annually); Ontario experiences the lowest ( 8.7%). The job-gain rate in other regions ranges from 9.8% annually to 10.7% annually (Table IIIa). Average annual job-loss rates vary from 7.8% in Atlantic Canada to 5.8% in Ontario. Job-gain rates are higher than job-loss rates across all regions. Annual net employment growth is largest in the Prairies (6.3% annually) and smallest in Atlantic Canada (2.0% annually); it is about the same in other regions. The total turnover rate is largest in the Prairies (19.7%), followed by Quebec (18.4%), B.C. (18%), Atlantic Canada (17.6%), and Ontario (14.5%). The excess turnover rate does not follow the same pattern. It is the highest in Atlantic Canada (15.7%), followed by Quebec (15.3%), B.C. (15.0%), the Prairies (13.4%), and Ontario (11.6%). The estimated correlations between GAIN and LOSS in all regions are significantly negative in the 1970s (Table 8, Text). In the period 1973-1979, the correlation between EXCESS and ABNET in the scale-based sector is significant in Atlantic Canada, Quebec, the Prairies and B.C.; it is low and insignificant in Ontario (Table 8, Text). Thus in the 1970s, job reallocation is relatively more affected by cyclical factors in regions other than Ontario.

All regions experience changes in turnover measures between 1973-1979 and 1980-1990 (Table IIIa and Table IIIb). The job-gain rate decreases in B.C.; it increases in all other regions, with the largest increase in Ontario (1.5 percentage points annually). The job-loss rate also increases in all regions. Net employment growth declines in all regions, with the largest decline occurring in the Prairies and B.C.. Both total turnover and excess turnover increase in almost all regions. The scale-based sector experiences the largest increase in total turnover in Ontario (4.0 percentage points), followed by the Prairies (3.3 percentage points), Atlantic Canada (2.8 percentage points), Quebec (1.9 percentage points) and B.C. (0.3 percentage points). The largest increase in excess turnover occurs in the Prairies (5.9 percentage points), followed by Ontario (5 percentage points), Atlantic Canada (3.5 percentage points), Quebec (3.3 percentage points), and B.C. (3.0 percentage points). The increase in excess turnover in B.C. is significantly higher than the increase in the total turnover rate.

The relative importance of the influence of restructuring on job turnover changes in the period 1980-1990. Correlations between GAIN and LOSS decline in all regions in the 1980s. The correlation between EXCESS and ABNET also declines in all regions except Ontario (Table 8, Text). Thus, in the 1980s, the scale-based sectors in most regions are less influenced by cyclical factors. Restructuring has become more important.

In the period 1973-1979, job creation across all regions is the result mainly of expansions of existing establishments. Job creation due to entry is generally low; it ranges from 0.7% annually in B.C. to 1.8% annually in the Prairies. Most jobs in this period are destroyed by contraction of existing establishments. Job loss due to exit is higher than job gain due to entry in Atlantic Canada, Quebec and B.C.. The positive magnitude of the net expansion rate indicates that existing establishments have created more jobs than have been destroyed. The contribution of entry and exit (TURNOVER 2) to total turnover ranges from 10.5% in Ontario to 18.4% in Atlantic Canada (Table 9, Text).

In the 1980s, job reallocation in the scale-based sector due to expansion and contraction of existing establishments generally increases in all regions, as does job reallocation due to entry and exit.

The contribution of entry and exit (TURNOVER 2) to total turnover increases sharply in Ontario, the Prairies, and B.C.; declines in Atlantic Canada, and remains approximately the same in Quebec (Table 9, Text).

The pattern of job gain is closely related across regions in the 1970s and remains so in the 1980s. Cross region correlations of LOSS indicate that job losses between regions are generally dissimilar in the 1970s (Table IIIc). However, their cross-regional correlation increases in the 1980s.

**Table IIIa**

**Average Annual Job Gain and Job Loss Rates in Scale-Based Industries**
**By Region (1973-1979 and 1980-1990)**
**(Percent of Total Employment Using Production Workers)**

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
| JOB GAIN (GAIN) | 9.81 | 10.74 | 8.70 | 13.03 | 10.47 | 9.70 | 10.83 | 10.93 | 10.15 | 13.40 | 9.29 | 10.46 |
| Continuing growing | 8.02 | 9.07 | 7.34 | 10.69 | 9.18 | 8.20 | 8.76 | 8.50 | 8.09 | 9.98 | 7.53 | 8.26 |
| Continuing new | 0.53 | 0.51 | 0.57 | 0.58 | 0.58 | 0.56 | 0.71 | 0.68 | 0.76 | 1.13 | 0.68 | 0.76 |
| Expansion | 8.55 | 9.58 | 7.91 | 11.27 | 9.76 | 8.76 | 9.47 | 9.18 | 8.85 | 11.11 | 8.21 | 9.02 |
| Greenfield entry | 1.26 | 1.16 | 0.79 | 1.76 | 0.71 | 0.94 | 1.36 | 1.75 | 1.30 | 2.29 | 1.08 | 1.44 |
| JOB LOSS (LOSS) | 7.78 | 7.63 | 5.82 | 6.71 | 7.51 | 6.60 | 9.54 | 9.29 | 8.33 | 9.65 | 9.02 | 8.76 |
| Continuing declining | 5.55 | 5.60 | 4.91 | 5.03 | 6.09 | 5.25 | 7.74 | 7.32 | 6.81 | 7.09 | 7.30 | 7.04 |
| Continuing dead | 0.26 | 0.20 | 0.17 | 0.29 | 0.16 | 0.20 | 0.32 | 0.26 | 0.19 | 0.27 | 0.20 | 0.21 |
| Contraction | 5.81 | 5.80 | 5.08 | 5.32 | 6.25 | 5.45 | 8.06 | 7.58 | 7.00 | 7.36 | 7.50 | 7.25 |
| Close-down exit | 1.97 | 1.83 | 0.74 | 1.39 | 1.26 | 1.15 | 1.48 | 1.71 | 1.33 | 2.29 | 1.52 | 1.51 |
| NET = GAIN - LOSS | 2.03 | 3.11 | 2.88 | 6.32 | 2.96 | 3.10 | 1.29 | 1.64 | 1.82 | 3.75 | 0.27 | 1.70 |
| Net entry (Entry-Exit) | -0.71 | -0.67 | 0.05 | 0.37 | -0.55 | -0.21 | -0.12 | 0.04 | -0.03 | 0.00 | -0.44 | -0.07 |
| Net Expansion (Expansions-Contractions) | 2.74 | 3.78 | 2.83 | 5.95 | 3.51 | 3.31 | 1.41 | 1.60 | 1.85 | 3.75 | 0.71 | 1.77 |
| TURNOVER 1 (Expansion + Contraction) | 14.36 | 15.38 | 12.99 | 16.59 | 16.01 | 14.21 | 17.53 | 16.76 | 15.85 | 18.47 | 15.71 | 16.27 |
| TURNOVER 2 (Entry + Exit) | 3.23 | 2.99 | 1.53 | 3.15 | 1.97 | 2.09 | 2.84 | 3.46 | 2.63 | 4.58 | 2.60 | 2.95 |
| TOTAL TURNOVER | 17.59 | 18.37 | 14.52 | 19.74 | 17.98 | 16.30 | 20.37 | 20.22 | 18.48 | 23.05 | 18.31 | 19.22 |
| EXCESS | 15.56 | 15.26 | 11.64 | 13.42 | 15.02 | 13.20 | 19.08 | 18.58 | 16.66 | 19.30 | 18.04 | 17.52 |

**Table IIIb**

**Change in Job Gain and Job Loss Rates in Scale-Based Industries By Region Between 1970s and 1980s**

| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
|---|---|---|---|---|---|---|
| | (Percentage Points) | | | | | |
| JOB GAIN (GAIN) | 1.02 | 0.19 | 1.45 | 0.37 | -1.18 | 0.76 |
| Continuing growing | 0.74 | -0.57 | 0.75 | -0.71 | -1.65 | 0.06 |
| Continuing new | 0.18 | 0.17 | 0.19 | 0.55 | 0.10 | 0.20 |
| Expansion | 0.92 | -0.40 | 0.94 | -0.16 | -1.55 | 0.26 |
| Greenfield entry | 0.10 | 0.59 | 0.51 | 0.53 | 0.37 | 0.50 |
| JOB LOSS (LOSS) | 1.76 | 1.66 | 2.51 | 2.94 | 1.51 | 2.16 |
| Continuing declining | 2.19 | 1.72 | 1.90 | 2.06 | 1.21 | 1.79 |
| Continuing dead | 0.06 | 0.06 | 0.02 | -0.02 | 0.04 | 0.01 |
| Contractions | 2.25 | 1.78 | 1.92 | 2.04 | 1.25 | 1.80 |
| Close-down exit | -0.49 | -0.12 | 0.59 | 0.90 | 0.26 | 0.36 |
| NET = GAIN - LOSS | -0.74 | -1.47 | -1.06 | -2.57 | -2.69 | -1.40 |
| Net entry (Entry-Exit) | 0.59 | 0.71 | -0.08 | -0.37 | 0.11 | 0.14 |
| Net expansion (Expansions-Contractions) | -1.33 | -2.18 | -0.98 | -2.20 | -2.80 | -1.54 |
| TURNOVER 1 (Expansion + Contractions) | 3.17 | 1.38 | 2.86 | 1.88 | -0.30 | 2.06 |
| TURNOVER 2 (Entry + Exit) | -0.39 | 0.47 | 1.10 | 1.43 | 0.63 | 0.86 |
| TOTAL TURNOVER | 2.78 | 1.85 | 3.96 | 3.31 | 0.33 | 2.92 |
| EXCESS | 3.52 | 3.32 | 5.02 | 5.88 | 3.02 | 4.32 |

**Table IIIc**

**Cross-Region Correlations of Different Turnover Measures in Scale-Based Industries**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .60 | 1.00 | | | | | .90 | 1.00 | | | | |
| ONTARIO | .56 | .88 | 1.00 | | | | .68 | .63 | 1.00 | | | |
| PRAIRIES | .85 | .68 | .60 | 1.00 | | | .65 | .73 | .85 | 1.00 | | |
| B.C. | .47 | .70 | .77 | .19 | 1.00 | | .49 | .54 | .50 | .52 | 1.00 | |
| CANADA | .69 | .94 | .97 | .68 | .81 | 1.00 | .81 | .80 | .96 | .90 | .65 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .60 | 1.00 | | | | | .72 | 1.00 | | | | |
| ONTARIO | .13 | .47 | 1.00 | | | | .32 | .77 | 1.00 | | | |
| PRAIRIES | .65 | .60 | .12 | 1.00 | | | .52 | .67 | .38 | 1.00 | | |
| B.C. | -.12 | .36 | .92 | .04 | 1.00 | | .58 | .60 | .34 | .63 | 1.00 | |
| CANADA | .24 | .63 | .98 | .28 | .91 | 1.00 | .58 | .93 | .93 | .62 | .59 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .61 | 1.00 | | | | | .89 | 1.00 | | | | |
| ONTARIO | .36 | .75 | 1.00 | | | | .62 | .73 | 1.00 | | | |
| PRAIRIES | .86 | .70 | .46 | 1.00 | | | .64 | .79 | .71 | 1.00 | | |
| B.C. | .19 | .61 | .92 | .16 | 1.00 | | .50 | .63 | .53 | .64 | 1.00 | |
| CANADA | .52 | .86 | .97 | .58 | .88 | 1.00 | .77 | .89 | .96 | .83 | .68 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .56 | 1.00 | | | | | .49 | 1.00 | | | | |
| ONTARIO | .39 | .45 | 1.00 | | | | .22 | .58 | 1.00 | | | |
| PRAIRIES | .56 | .56 | .30 | 1.00 | | | .56 | .48 | .59 | 1.00 | | |
| B.C. | .17 | -.14 | .53 | -.03 | 1.00 | | .59 | .33 | .09 | .45 | 1.00 | |
| CANADA | .59 | .61 | .95 | .48 | .55 | 1.00 | .52 | .78 | .91 | .76 | .40 | 1.00 |

**d) Product-Differentiated Sector**

In 1973-79, jobs are gained in the product-differentiated sector at a very high rate in Atlantic Canada (17.1% annually), the Prairies (20.7% annually), and B.C. (16.8%) (Table IVa). They are gained at the lowest rate in Ontario (12.4% annually); the job-gain rate in Quebec is 14.1% annually. Jobs are also lost at a very high rate across regions; the rates are particularly high in Atlantic Canada, Quebec and B.C.. Net employment growth is positive in all regions, with B.C. and the Prairies experiencing the largest rate of annual net employment growth. The amount of net employment growth is the lowest in Ontario (2.8%).

Both total turnover and excess turnover are high in most regions. The largest total turnover occurs in the Prairies (31.7%), followed by Atlantic Canada (30.6%), B.C. (26.0%), Quebec (24.8%), and Ontario (22.0%). The excess-turnover rate follows a different pattern. It is highest in Atlantic Canada (27.0%), followed by the Prairies (22.1%), Quebec (21.5%), Ontario (19.2%), and B.C. (18.3%).

Correlations between GAIN and LOSS indicate that job creation and job destruction are negatively related in Atlantic Canada, Quebec, Ontario, and B.C.; they are unrelated in the Prairies (Table 8, Text). The effect of cyclical factors on job reallocation in the product-differentiated sector was also examined by estimating the correlation between EXCESS and ABNET across all regions (Table 9, Text). The significant negative correlation between these variables once more indicates that cyclical factors are important in the period 1973-1979.

Between 1973-1979 and 1980-1990, the job-gain rate, the job-loss rate, net employment growth, total turnover and excess turnover increase in all regions (Table IVa and Table IVb). Changes in both job-gain and job-loss rates are high in all regions. Changes in job-gain rates are largest in Atlantic Canada, B.C., and Ontario. Changes in job-loss rates are largest in the Prairies and B.C.. Net employment growth declines in B.C. and the Prairies; the decline is particularly large in the Prairies (3.1 percentage points annually). It increases in Atlantic Canada, Ontario and Quebec; the largest increase occurs in Atlantic Canada (5.2 percentage points annually). Both total turnover and excess turnover increase in all regions. The increases are largest in Atlantic Canada, Ontario, and the Western Provinces.

The influence of the business cycle on job turnover falls in all regions in the period 1980-1990. The correlation between GAIN and LOSS is generally lower in the 1980s than the 1970s (Table 8, Text). Correlations between EXCESS and ABNET are lower in the 1980s than the 1970s and they are insignificant across all regions except Atlantic Canada (Table 8, Text). This confirms that in the 1980s job turnover in the product-differentiated sector of Quebec, Ontario, the Prairies and B.C. is less affected by cyclical factors than it was in the 1970s. In Atlantic Canada, cyclical factors remain more influential, but their impact nevertheless still declines.

While the majority of job gain and job loss stems from expansion and contraction of existing establishments, entry and exit play an important role in the job creation and destruction process. In the 1970s, the job-gain rate due to entry is largest in Atlantic Canada, Quebec and the Western Provinces. The job-loss rate due to exit is lowest in Atlantic Canada and the Prairies. The net entry rate is positive in Quebec and the Western Provinces; it is negative in Atlantic Canada and approximately zero in Ontario. Job reallocation due to entry and exit (TURNOVER 2) is high in most regions. It ranges from

7.5% annually in Atlantic Canada to 3.3% annually in Ontario. Entry and exit contribute at least 14.5% of total turnover across regions in the 1970s (Table 9, Text). Their contribution is particularly large in Atlantic Canada and the Western Provinces.

Between 1973-1979 and 1980-1990, the product-differentiated sector in all regions experiences changes in the components of job loss and job gain (Table IVa and Table IVb). The net expansion rate increases in Atlantic Canada, Quebec and Ontario, but declines in the Western Provinces. Job reallocation due to entry and exit increases in all regions and the increase is particularly large in B.C. (5.7 percentage points annually). Job reallocation due to expansion and contraction of existing establishments increases as well. The largest increase occurs in B.C. (6.5 percentage points), the smallest in Quebec (1.5 percentage points annually). The relative importance of entry and exit (TURNOVER 2) in total turnover increases in all regions; the increase is particularly large in B.C. (9.7 percentage points) and Quebec (8.9 percentage points). The importance of expansion and contraction of existing establishments in total turnover declines in all regions (Table 9, Text).

The pattern of job turnover between regions was investigated by examining cross-region correlations of various measures of job turnover (Table IVc). The pattern of job gain tends to be similar between regions in the 1970s and remains so in the 1980s. Job losses and total turnover follow the same pattern. Quebec does not follow the same patten and becomes less closely aligned with growth and decline in other regions.

**Table IVa**

**Average Annual Job Gain and Job Loss Rates in Product-Differentiated Industries By Region (1973-1979 and 1980-1990) (Percent of Total Employment Using Production Workers)**

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
| JOB GAIN (GAIN) | 17.07 | 14.09 | 12.44 | 20.71 | 16.80 | 13.84 | 24.71 | 16.60 | 17.02 | 22.13 | 22.88 | 17.85 |
| Continuing growing | 12.14 | 11.28 | 10.36 | 15.61 | 13.50 | 11.22 | 17.08 | 12.50 | 12.99 | 16.96 | 16.13 | 13.50 |
| Continuing new | 2.05 | 0.75 | 0.45 | 1.47 | 0.79 | 0.65 | 1.57 | 0.78 | 1.08 | 0.88 | 1.37 | 1.01 |
| Expansion | 14.19 | 12.03 | 10.81 | 17.08 | 14.29 | 11.87 | 18.65 | 13.28 | 14.07 | 17.84 | 17.50 | 14.51 |
| Greenfield entry | 2.88 | 2.06 | 1.63 | 3.63 | 2.51 | 1.97 | 6.06 | 3.32 | 2.95 | 4.29 | 5.38 | 3.34 |
| JOB LOSS (LOSS) | 13.50 | 10.75 | 9.61 | 11.03 | 9.16 | 10.05 | 15.94 | 13.08 | 13.32 | 15.56 | 15.35 | 13.62 |
| Continuing declining | 7.89 | 8.72 | 7.71 | 7.68 | 6.92 | 7.92 | 10.13 | 9.03 | 9.11 | 10.93 | 10.04 | 9.34 |
| Continuing dead | 0.96 | 0.49 | 0.25 | 0.37 | 0.47 | 0.35 | 0.65 | 0.43 | 0.46 | 0.43 | 0.67 | 0.46 |
| Contraction | 8.85 | 9.21 | 7.96 | 8.05 | 7.39 | 8.27 | 10.78 | 9.46 | 9.57 | 11.36 | 10.71 | 9.80 |
| Close-down exit | 4.65 | 1.54 | 1.65 | 2.98 | 1.77 | 1.78 | 5.16 | 3.62 | 3.75 | 4.20 | 4.64 | 3.82 |
| NET = GAIN - LOSS | 3.57 | 3.34 | 2.83 | 9.68 | 7.64 | 3.79 | 8.77 | 3.52 | 3.70 | 6.57 | 7.53 | 4.23 |
| Net entry (Entry-Exit) | -1.77 | 0.52 | -0.02 | 0.65 | 0.74 | 0.19 | 0.90 | -0.30 | -0.80 | 0.09 | 0.74 | -0.48 |
| Net Expansion (Expansions-Contractions) | 5.34 | 2.82 | 2.85 | 9.03 | 6.90 | 3.60 | 7.87 | 3.82 | 4.50 | 6.48 | 6.79 | 4.71 |
| TURNOVER 1 (Expansion + Contraction) | 23.04 | 21.24 | 18.77 | 25.13 | 21.68 | 20.14 | 29.43 | 22.74 | 23.64 | 29.20 | 28.21 | 24.31 |
| TURNOVER 2 (Entry + Exit) | 7.53 | 3.60 | 3.28 | 6.61 | 4.28 | 3.75 | 11.22 | 6.94 | 6.70 | 8.49 | 10.02 | 7.16 |
| TOTAL TURNOVER | 30.57 | 24.84 | 22.05 | 31.74 | 25.96 | 23.89 | 40.65 | 29.68 | 30.34 | 37.69 | 38.23 | 31.47 |
| EXCESS | 27.00 | 21.50 | 19.22 | 22.06 | 18.32 | 20.10 | 31.88 | 26.16 | 26.64 | 31.12 | 30.70 | 27.24 |

**Table IVb**

**Change in Job Gain and Job Loss Rates in Product-Differentiated Industries By Region Between 1970s and 1980s**

| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
|---|---|---|---|---|---|---|
| | | | (Percentage Points) | | | |
| JOB GAIN (GAIN) | 7.64 | 2.51 | 4.58 | 1.42 | 6.08 | 4.01 |
| Continuing growing | 4.94 | 1.22 | 2.63 | 1.35 | 2.63 | 2.28 |
| Continuing new | -0.48 | 0.03 | 0.63 | -0.59 | 0.58 | 0.36 |
| Expansion | 4.46 | 1.25 | 3.26 | 0.76 | 3.21 | 2.64 |
| Greenfield entry | 3.18 | 1.26 | 1.32 | 0.66 | 2.87 | 1.37 |
| JOB LOSS (LOSS) | 2.44 | 2.33 | 3.71 | 4.53 | 6.19 | 3.57 |
| Continuing declining | 2.24 | 0.31 | 1.40 | 3.25 | 3.12 | 1.42 |
| Continuing dead | -0.31 | -0.06 | 0.21 | 0.06 | 0.20 | 0.11 |
| Contractions | 1.93 | 0.25 | 1.61 | 3.31 | 3.32 | 1.53 |
| Close-down exit | 0.51 | 2.08 | 2.10 | 1.22 | 2.87 | 2.04 |
| NET = GAIN - LOSS | 5.20 | 0.18 | 0.87 | -3.11 | -0.11 | 0.44 |
| Net entry (Entry-Exit) | 2.67 | -0.82 | -0.78 | -0.56 | 0.00 | -0.67 |
| Net expansion (Expansions-Contractions) | 2.53 | 1.00 | 1.65 | -2.55 | -0.11 | 1.11 |
| TURNOVER 1 (Expansion + Contraction) | 6.39 | 1.50 | 4.87 | 4.07 | 6.53 | 4.17 |
| TURNOVER 2 (Entry + Exit) | 3.69 | 3.34 | 3.42 | 1.88 | 5.74 | 3.41 |
| TOTAL TURNOVER | 10.08 | 4.84 | 8.29 | 5.95 | 12.27 | 7.58 |
| EXCESS | 4.88 | 4.66 | 7.42 | 9.06 | 12.38 | 7.14 |

**Table IVc**

**Cross-Region Correlations of Different Turnover Measures in Product-Differentiated Industries**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .80 | 1.00 | | | | | .48 | 1.00 | | | | |
| ONTARIO | .76 | .95 | 1.00 | | | | .76 | .55 | 1.00 | | | |
| PRAIRIES | .70 | .93 | .86 | 1.00 | | | .73 | .65 | .76 | 1.00 | | |
| B.C. | .85 | .89 | .95 | .79 | 1.00 | | .76 | .70 | .91 | .69 | 1.00 | |
| CANADA | .80 | .97 | .99 | .90 | .95 | 1.00 | .79 | .72 | .97 | .84 | .94 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .47 | 1.00 | | | | | .89 | 1.00 | | | | |
| ONTARIO | .35 | .84 | 1.00 | | | | .80 | .88 | 1.00 | | | |
| PRAIRIES | -.18 | .07 | .15 | 1.00 | | | .49 | .40 | .52 | 1.00 | | |
| B.C. | .78 | .79 | .79 | .11 | 1.00 | | .87 | .86 | .77 | .62 | 1.00 | |
| CANADA | .42 | .91 | .98 | .23 | .85 | 1.00 | .86 | .92 | .98 | .62 | .86 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .72 | 1.00 | | | | | .77 | 1.00 | | | | |
| ONTARIO | .66 | .91 | 1.00 | | | | .86 | .79 | 1.00 | | | |
| PRAIRIES | .53 | .64 | .57 | 1.00 | | | .68 | .68 | .79 | 1.00 | | |
| B.C. | .89 | .84 | .86 | .54 | 1.00 | | .88 | .82 | .90 | .72 | 1.00 | |
| CANADA | .74 | .96 | .98 | .65 | .90 | 1.00 | .88 | .87 | .99 | .83 | .93 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .73 | 1.00 | | | | | .06 | 1.00 | | | | |
| ONTARIO | .55 | .92 | 1.00 | | | | .51 | .35 | 1.00 | | | |
| PRAIRIES | .22 | .80 | .80 | 1.00 | | | .59 | .28 | .44 | 1.00 | | |
| B.C. | .61 | .91 | .95 | .83 | 1.00 | | .47 | .53 | .76 | .55 | 1.00 | |
| CANADA | .59 | .96 | .99 | .85 | .97 | 1.00 | .55 | .54 | .96 | .60 | .85 | 1.00 |

**e) Science-Based Sector**

As is the case with other sectors, the annual average rates of job gain and job loss in the science-based sector are very high in all regions (Table Va). In the 1970s, the job-gain rate in Ontario is lower than in other regions. The job-loss rates in Atlantic Canada, the Prairies, and B.C. are higher than in both Quebec and Ontario. Net employment growth is positive in all regions and it is particularly large in Quebec and the Prairies. The highest level of total turnover occurs in Atlantic Canada (30.9%), followed by the Prairies (27.0%); B.C. and Quebec follow closely behind the Prairies; and Ontario (20.3%) experiences the lowest turnover rate. The largest amount of excess turnover takes place in Atlantic Canada (28.6%), followed by B.C. (24.2%), and the Prairies (20.5%); Ontario and Quebec experience the least (each at 19.1%).

Correlations between EXCESS and ABNET are small, thereby indicating that cyclical factors have little effect in the 1970s (Table 8, Text).

Between 1973-1979 and 1980-1990, changes take place across all regions in the science-based sector with respect to all measures of job turnover (Table Va and Table Vb). The job-gain rate increases in Ontario, the Prairies and B.C.; it sharply declines in Quebec. Almost all regions experience a decline in the job-loss rate and the decline is largest in Quebec and Atlantic Canada; B.C. experiences a slight increase. Net employment growth increases in Atlantic Canada, Ontario, the Prairies, and B.C.; the increase is particularly large in the Prairies and B.C.. Quebec experiences a sharp decline in net employment growth (-3.3 percentage points annually). B.C. (9.7 percentage points annually) experiences a very large increase in total turnover; but the Prairies follow closely behind (4.1 percentage points annually) and Quebec experiences a very sharp decline (-7.0 percentage points annually). Excess turnover declines in all regions but B.C.. The magnitude of this decline is very large in Quebec (-3.7 percentage points annually) and Atlantic Canada (-2.9 percentage points annually).

Changes also take place in the relative importance of restructuring on job turnover. In the 1980s, negative correlations between EXCESS and ABNET are generally large and significant for all regions but Atlantic Canada (Table 8, Text). Thus, contrary to the 1970s, job turnover in the 1980s in Quebec, Ontario, the Prairies, and B.C. is relatively more influenced by macroeconomic factors associated with business cycle. In this, the science-based sector is unique.

In the period 1973-1979, more jobs are destroyed due to exits than are created due to entry, and as a result, net entry is negative across regions (Table 10). It is -4.4% in Atlantic Canada and -1.5% in the Prairies. Job turnover due to entry and exit (TURNOVER 2) is relatively larger in Atlantic Canada, Quebec, and the Prairies. The contribution of entry and exit (TURNOVER 2) to total turnover is large in all regions. It ranges from 33.0% in Atlantic Canada to 13.8% in Ontario (Table 9, Text).

The components of job gain and job loss change between the two periods (Table Va and Table Vb). The net expansion rate increases in all regions except in Quebec and Atlantic Canada; Quebec experiences the sharpest decline (-4.1 percentage points annually). The net entry rate improves across regions. Turnover due to expansion and contraction of existing establishments increases in all regions but Quebec; the annual decline in Quebec is -6.4 percentage points. Turnover due to entry and exit also declines in Atlantic Canada (-4.6 percentage points) and Quebec (-0.6 percentage points annually); it increases in Ontario and the Prairies. The contribution of entry and exit (TURNOVER 2) to total

turnover increases in all regions except Atlantic Canada (Table 9, Text); it declines sharply in Atlantic Canada (-14.0 percentage points annually) and increases most in B.C. (5.3 percentage points annually).

The relationship of the various turnover measures across regions was also investigated for the science-based sector. The pattern of job gain between regions is similar but the relationship is weak in the period 1973-1979 (Table Vc). However, the relationship gets stronger in the 1980s as cross-region correlations of GAIN are generally larger in the 1980s than the 1970s. Patterns of job loss across regions are less similar in the 1970s than in the 1980s.

**Table Va**

**Average Annual Job Gain and Job Loss Rates in Science-Based Industries By Region (1973-1979 and 1980-1990) (Percent of Total Employment Using Production Workers)**

| | 1973-1979 | | | | | | 1980-1990 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
| JOB GAIN (GAIN) | 16.59 | 16.38 | 10.76 | 16.73 | 14.03 | 12.77 | 16.80 | 11.20 | 12.75 | 20.88 | 23.11 | 13.07 |
| Continuing growing | 11.70 | 13.19 | 9.23 | 12.72 | 11.06 | 10.58 | 12.46 | 8.99 | 10.33 | 15.96 | 15.96 | 10.42 |
| Continuing new | 1.98 | 1.85 | 0.58 | 2.32 | 0.30 | 1.02 | 2.64 | 0.81 | 1.05 | 1.70 | 1.31 | 1.05 |
| Expansion | 13.68 | 15.04 | 9.81 | 15.04 | 11.36 | 11.60 | 15.10 | 9.80 | 11.38 | 17.66 | 17.27 | 11.47 |
| Greenfield entry | 2.91 | 1.34 | 0.95 | 1.69 | 2.67 | 1.17 | 1.70 | 1.40 | 1.37 | 3.22 | 5.84 | 1.60 |
| JOB LOSS (LOSS) | 14.30 | 9.55 | 9.57 | 10.25 | 12.11 | 9.71 | 12.84 | 7.69 | 9.31 | 10.22 | 12.71 | 9.02 |
| Continuing declining | 6.79 | 7.10 | 7.63 | 6.90 | 9.09 | 7.46 | 8.66 | 5.95 | 6.97 | 7.23 | 8.44 | 6.75 |
| Continuing dead | 0.22 | 0.14 | 0.09 | 0.19 | 0.05 | 0.11 | 0.25 | 0.11 | 0.27 | 0.31 | 0.50 | 0.23 |
| Contraction | 7.01 | 7.24 | 7.72 | 7.09 | 9.14 | 7.57 | 8.91 | 6.06 | 7.24 | 7.54 | 8.94 | 6.98 |
| Close-down exit | 7.29 | 2.31 | 1.85 | 3.16 | 2.97 | 2.14 | 3.93 | 1.63 | 2.07 | 2.68 | 3.77 | 2.04 |
| NET = GAIN - LOSS | 2.29 | 6.83 | 1.19 | 6.48 | 1.92 | 3.06 | 3.96 | 3.51 | 3.44 | 10.66 | 10.40 | 4.05 |
| Net entry (Entry-Exit) | -4.38 | -0.97 | -0.90 | -1.47 | -0.30 | -0.97 | -2.23 | -0.23 | -0.70 | 0.54 | 2.07 | -0.44 |
| Net Expansion (Expansions-Contractions) | 6.67 | 7.80 | 2.09 | 7.95 | 2.22 | 4.03 | 6.19 | 3.74 | 4.14 | 10.12 | 8.33 | 4.49 |
| TURNOVER 1 (Expansion + Contraction) | 20.69 | 22.28 | 17.53 | 22.13 | 20.50 | 19.17 | 24.01 | 15.86 | 18.62 | 25.20 | 26.21 | 18.45 |
| TURNOVER 2 (Entry + Exit) | 10.20 | 3.65 | 2.80 | 4.85 | 5.64 | 3.31 | 5.63 | 3.03 | 3.44 | 5.90 | 9.61 | 3.64 |
| TOTAL TURNOVER | 30.89 | 25.93 | 20.33 | 26.98 | 26.14 | 22.48 | 29.64 | 18.89 | 22.06 | 31.10 | 35.82 | 22.09 |
| EXCESS | 28.60 | 19.10 | 19.14 | 20.50 | 24.22 | 19.42 | 25.68 | 15.38 | 18.62 | 20.44 | 25.42 | 18.04 |

**Table Vb**

**Change in Job Gain and Job Loss Rates in Science-Based Industries By Region Between 1970s and 1980s**

| | Atlantic Canada | Quebec | Ontario | Prairies | B.C. | Canada |
|---|---|---|---|---|---|---|
| | (Percentage Points) | | | | | |
| JOB GAIN (GAIN) | 0.21 | -5.18 | 1.99 | 4.15 | 9.08 | 0.30 |
| Continuing growing | 0.76 | -4.20 | 1.10 | 3.24 | 4.90 | -0.16 |
| Continuing new | 0.66 | -1.04 | 0.47 | -0.62 | 1.01 | 0.03 |
| Expansion | 1.42 | -5.24 | 1.57 | 2.62 | 5.91 | -0.13 |
| Greenfield entry | -1.21 | 0.06 | 0.42 | 1.53 | 3.17 | 0.43 |
| JOB LOSS (LOSS) | -1.46 | -1.86 | -0.26 | -0.03 | 0.60 | -0.69 |
| Continuing declining | -1.15 | -0.66 | 0.33 | -0.65 | -0.71 | 1.87 |
| Continuing dead | 0.03 | -0.03 | 0.18 | 0.12 | 0.45 | 0.12 |
| Contractions | 1.90 | -1.18 | -0.48 | 0.45 | -0.20 | -0.59 |
| Close-down exit | -3.36 | -0.68 | 0.22 | -0.48 | 0.80 | -0.10 |
| NET = GAIN - LOSS | 1.67 | -3.32 | 2.25 | 4.18 | 8.48 | 0.99 |
| Net entry (Entry-Exit) | 0.74 | 0.20 | 2.01 | 2.37 | 0.53 | 2.15 |
| Net expansion (Expansions-Contractions) | -0.48 | -4.06 | 2.05 | 2.17 | 6.11 | 0.46 |
| TURNOVER 1 (Expansion + Contraction) | 3.32 | -6.42 | 1.09 | 3.07 | 5.71 | -0.72 |
| TURNOVER 2 (Entry + Exit) | -4.57 | -0.62 | 0.64 | 1.05 | 3.97 | 0.33 |
| TOTAL TURNOVER | -1.25 | -7.04 | 1.73 | 4.12 | 9.68 | -0.39 |
| EXCESS | -2.92 | -3.72 | -0.52 | -0.06 | 1.20 | -1.38 |

**Table Vc**

**Cross-Region Correlations of Different Turnover Measures in Science-Based Industries**

| | *1973-1979* | | | | | | *1980-1990* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** | ***A.C.*** | ***QUE*** | ***ONT*** | ***PRA*** | ***B.C.*** | ***CANADA*** |
| ***GAIN*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .70 | 1.00 | | | | | .38 | 1.00 | | | | |
| ONTARIO | .34 | .73 | 1.00 | | | | .74 | .59 | 1.00 | | | |
| PRAIRIES | -.19 | .16 | .75 | 1.00 | | | .56 | .17 | .78 | 1.00 | | |
| B.C. | .48 | .48 | .83 | .65 | 1.00 | | .65 | .60 | .92 | .68 | 1.00 | |
| CANADA | .52 | .89 | .96 | .56 | .76 | 1.00 | .72 | .72 | .98 | .72 | .93 | 1.00 |
| ***LOSS*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .88 | 1.00 | | | | | .41 | 1.00 | | | | |
| ONTARIO | -.33 | -.02 | 1.00 | | | | .56 | .83 | 1.00 | | | |
| PRAIRIES | -.54 | -.29 | .86 | 1.00 | | | .18 | .65 | .70 | 1.00 | | |
| B.C. | -.38 | -.33 | .29 | -.04 | 1.00 | | .29 | .51 | .79 | .81 | 1.00 | |
| CANADA | -.01 | .32 | .94 | .71 | .17 | 1.00 | .55 | .91 | .98 | .74 | .76 | 1.00 |
| ***NET*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .72 | 1.00 | | | | | .65 | 1.00 | | | | |
| ONTARIO | .73 | .90 | 1.00 | | | | .79 | .83 | 1.00 | | | |
| PRAIRIES | .65 | .78 | .92 | 1.00 | | | .49 | .56 | .82 | 1.00 | | |
| B.C. | .81 | .63 | .70 | .66 | 1.00 | | .55 | .63 | .89 | .84 | 1.00 | |
| CANADA | .76 | .95 | .99 | .90 | .71 | 1.00 | .77 | .88 | .99 | .82 | .88 | 1.00 |
| ***TOTAL TURNOVER*** | | | | | | | | | | | | |
| ATLANTIC CANADA | 1.00 | | | | | | 1.00 | | | | | |
| QUEBEC | .79 | 1.00 | | | | | .07 | 1.00 | | | | |
| ONTARIO | -.43 | -.14 | 1.00 | | | | .51 | .41 | 1.00 | | | |
| PRAIRIES | -.54 | -.28 | .98 | 1.00 | | | .39 | -.43 | .27 | 1.00 | | |
| B.C. | -.18 | -.15 | .39 | .41 | 1.00 | | .50 | .37 | .75 | .30 | 1.00 | |
| CANADA | .13 | .51 | .78 | .68 | .29 | 1.00 | .52 | .68 | .94 | .14 | .79 | 1.00 |

## APPENDIX B
## CANADA: SHARE OF EMPLOYMENT BY OECD TAXONOMY

| PRODUCTION WORKERS | 1980 |
|---|---|
| **MANUFACTURING SECTOR** | 100.00 |
| ***NATURAL RESOURCES TAXONOMY*** | 24.65 |
| 1011 - SLAUGHTERING AND MEAT PROCESSORS | 1.98 |
| 1012 - POULTRY PROCESSORS | .65 |
| 1020 - FISH PRODUCTS | 1.71 |
| 1031 - FRUIT & VEGETABLE CANNERS & PRES | .72 |
| 1032 - FROZEN FRUIT & VEG. PROCESS | .25 |
| 1040 - DAIRY PRODUCTS | 1.05 |
| 1050 - FLOUR & BREAKFEST CEREAL PRODUCT | .25 |
| 1060 - FEED INDUSTRY | .44 |
| 1071 - BISCUITS MFGS | .35 |
| 1072 -BAKERIES | 1.33 |
| 1081 - CONFECTIONERY MFGS | .55 |
| 1082 - CANE & BEET SUGAR PROCESS | .14 |
| 1083 - VEGETABLE OIL MILLS | .07 |
| 1089 - MISCELLANEOUS FOOD PROCESS | 1.04 |
| 1091 - SOFT DRINK MFG | .46 |
| 1092 - DISTILLERIES | .21 |
| 1093 - BREWERIES | .55 |
| 1094 - WINERIES | .06 |
| 1510 - LEAF TOBACCO PROCESSORS | .05 |
| 1530 - TOBACCO PRODUCTS | .35 |
| 1650 - PLASTICS FABRICATING INDUSTRY (N.E.S.) | 1.90 |
| 1720 - LEATHER TANNERIES | .14 |
| 1894 - TEXTILE DYEING & FINISHING PLANTS | .22 |
| 2511 - SHINGLE MILLS | .14 |
| 2520 - VENEER & PLYWOOD MILLS | .82 |
| 2541 - SASH, DOOR & OTHER MILLWORK (N.E.S) | 1.30 |
| 2543 - PRE-FABRICATED BUILDINGS (WOOD FRAME) | .22 |
| 2580 - COFFIN & CASKET INDUSTRY | .05 |
| 2592 - WOOD HANDLES & TURNING INDS | .06 |
| 2593 - MFGS. OF PARTICLE BOARD | .13 |
| 2599 - MISC. WOOD INDUSTRIES | .17 |
| 2740 - MISCELLANEOUS PAPER CONVERTERS | .91 |
| 2880 - PUBLISHING ONLY | .00 |
| 2950 - SMELTING & REFINING | 1.85 |
| 2960 - ALUMINIUM ROLLING, CASTING & EXTRUDING | .35 |
| 2970 - COPPER & COPPER ALLOY ROLLING | .20 |
| 3010 - BOILER & PLATE WORKS | .54 |

## APPENDIX B
## CANADA: SHARE OF EMPLOYMENT BY OECD TAXONOMY

| PRODUCTION WORKERS | 1980 |
|---|---|
| ***NATURAL RESOURCES TAXONOMY (CON'T)*** | |
| 3511 - CLAY PROD. MFGS. (FROM DOMESTIC CLAYS) | .17 |
| 3520 - CEMENT MANUFACTURERS | .22 |
| 3530 - STONE PRODUCTS MANUFACTURERS | .08 |
| 3541 - CONCRETE PIPE MFGS | .11 |
| 3542 - MFGS. OF STRUCTURAL CONCRETE PRODS | .14 |
| 3549 - CONCRETE PRODUCTS MFGS. (N.E.S.) | .26 |
| 3550 - READY-MIX CONCRETE MANUFACTURERS | .53 |
| 3580 - LIME MANUFACTURERS | .06 |
| 3591 - REFRACTORIES MANUFACTURERS | .07 |
| 3599 - MISC. NON-METALLIC MINERAL PRODS (N.E.S.) | .42 |
| 3651 - PETROLEUM REFINING | .55 |
| 3652 - MFGS. OF LUBRICATING OILS & GREASES | .04 |
| 3970 - SIGNS & DISPLAYS INDUSTRIES | .38 |
| 3690 - MISC. PETROLEUM & COAL PRODUCTS | .03 |
| 3999 - OTHER MISC'. MANUFACTURING INDUSTRIES | .37 |
| ***LABOUR INTENSIVE*** | 22.14 |
| 1740 - SHOES FACTORIES | .26 |
| 1750 - LEATHER GLOVE FACTORIES | .06 |
| 1792 - BOOT & SHOE FINDINGS MFGS | .09 |
| 1799 - MISC. LEATHER PRODUCTS MFGS | .29 |
| 1810 - COTTON YARN & CLOTH MILLS | .52 |
| 1820 - WOOL YARN & CLOTH MILLS | .29 |
| 1831 - FIBRE & FILAMENT YARN MFGS | .31 |
| 1832 - THROWSTERS, SPUN YARN & CLOTH MILLS | .71 |
| 1840 - CORDAGE & TWINE INDUSTRY | .04 |
| 1851 - FIBRE PROCESSING MILLS | .04 |
| 1852 - PRESSED & PUNCHED FELT MILLS | .03 |
| 1860 - CARPET, MAT & RUG INDUSTRY | .34 |
| 1871 - COTTON & JUTE BAGS MFGS | .05 |
| 1872 - CANVAS PRODUCTS MFGS | .13 |
| 1880 - AUTOMOBILE FABRIC ACCESSORIES | .36 |
| 1891 - THREAD MILLS | .04 |
| 1892 - NARROW FABRIC MILLS | .11 |
| 1893 - EMBROIDERY, PLEATING & HEMSTITCHING | .09 |
| 1899 - MISC. TEXTILE INDUSTRIES | .70 |
| 2310 - HOSIERY MILLS | .34 |

## APPENDIX B
## CANADA: SHARE OF EMPLOYMENT BY OECD TAXONOMY

| PRODUCTION WORKERS | 1980 |
|---|---|
| ***LABOUR INTENSIVE*** **(CON'T)** | |
| 2391 - KNITTED FABRIC MFGS | .26 |
| 2392 - OTHER KNITTING MILLS | .79 |
| 2431 - MEN'S CLOTHING FACTORIES | 2.09 |
| 2432 - MEN'S CLOTHING CONTRACTORS | .53 |
| 2441 - WOMEN'S CLOTHING FACTORIES | 1.90 |
| 2442 - WOMEN'S CLOTHING CONTRACTORS | .71 |
| 2450 - CHILDREN'S CLOTHING INDUSTRIES | .42 |
| 2460 - FUR GOODS INDUSTRY | .15 |
| 2480 - FOUNDATION GARMENT INDUSTRY | .17 |
| 2491 - FABRIC GLOVE MFGS | .04 |
| 2492 - HAT & CAP INDUSTRY | .09 |
| 2499 - MISC. CLOTHING INDUSTRY (N.E.S.) | .11 |
| 2560 - WOODEN BOX FACTORIES | .22 |
| 2591 - WOOD PRESERVATION INDUSTRY | .11 |
| 2611 - FURNITURE RE-UPHOLSTERY & REPAIR SHOPS | .24 |
| 2619 - HOUSEHOLD FURNITURE MFGS (N.E.S.) | 1.67 |
| 2640 - OFFICE FURNITURE MANUFACTURERS | .43 |
| 2660 - MISCELLANEOUS FURNITURE & FIXTURES | .71 |
| 2680 - ELECTRIC LAMP & SHADE MANUFACTURERS | .09 |
| 3020 - FABRICATED STRUCTURAL METAL INDS | .99 |
| 3031 - METAL DOOR & WINDOW MFGS | .51 |
| 3039 - ORNAM. & ARCHITECT. METAL INDS | .48 |
| 3041 - METAL COATING INDUSTRIES | .32 |
| 3042 - METAL STAMPING & PRESSING INDS | 1.53 |
| 3090 - MISCELLANEOUS METAL FABRICATING INDS | 1.36 |
| 3280 - BOATBUILDING & REPAIR | .23 |
| 3915 - DENTAL LABORATORIES | .30 |
| 3920 - JEWELLERY & SILVERWARE | .37 |
| 3991 - BROOM, BRUSH & MOP MFGS | .10 |
| 3992 - BUTTON, BUCKLE & FASTENER MFGS | .07 |
| 3993 - FLOOR TILE, LINOLEUM & COATED FABRICS | .13 |
| 3994 - SOUND RECORDING & MUSICAL INSTRUMENT | .12 |
| 3996 - PEN & PENCIL MFGS | .04 |
| 3998 - FUR DRESSING & DYEING | .07 |
| ***SCALED-BASED*** | 33.41 |
| 1620 - RUBBER PRODUCTS INDUSTRIES | 2.28 |

## APPENDIX B
## CANADA: SHARE OF EMPLOYMENT BY OECD TAXONOMY

| PRODUCTION WORKERS | 1980 |
|---|---|
| ***SCALED-BASED (CON'T)*** | |
| 2513 - SAWMILLS & PLANNING MILLS | 4.15 |
| 2710 - PULP & PAPER MILLS | 4.92 |
| 2720 - ASPHALT ROOFING MANUFACTURERS | .07 |
| 2731 - FOLDING CARTON & SET-UP BOX MFGS | .42 |
| 2732 - CORRUGATED BOX MFGS | .65 |
| 2733 - PAPER & PLASTIC BAG MFGS | .39 |
| 2860 - COMMERCIAL PRINTING | 2.88 |
| 2870 - PLATEMAKING, TYPESETTING & TRADE BINDERY 2890 | .51 |
| -PUBLISHING & PRINTING | 1.34 |
| 2910 - IRON & STEEL MILLS | 3.55 |
| 2920 - STEEL PIPE & TUBE MILLS | .41 |
| 2940 - IRON FOUNDERIES | .57 |
| 2980 - METAL ROLLING, CASTING & EXTRUDING (N.E.S.) | .34 |
| 3050 - WIRE & WIRE PRODUCTS MFGS (N.E.S.) | 1.13 |
| 3241 - TRUCK BODY MANUFACTURERS | .34 |
| 3243 - COMMERCIAL TRAILER MFGS | .21 |
| 3230 - MOTOR VEHICLE MANUFACTURERS | 2.42 |
| 3250 - MOTOR VEHICLE PARTS & ACCESSORIES MFG | 2.75 |
| 3260 - RAILROAD ROLLING STOCK INDUSTRY | .55 |
| 3270 - SHIPBUILDING & REPAIR | 1.06 |
| 3290 - MISCELLANEOUS VEHICLE MANUFACTURERS | .10 |
| 3512 - CLAY PROD.MFGS. (FROM IMPORTED CLAYS) | .11 |
| 3561 - GLASS MANUFACTURERS | .48 |
| 3562 - GLASS PRODUCTS MANUFACTURERS | .21 |
| 3570 - ABRASIVES MANUFACTURERS | .15 |
| 3720 - MFG. OF MIXED FERTILIZERS | .05 |
| 3730 - MFG. OF PLASTICS & SYNTHETIC RESINS | .26 |
| 3781 - MFG. OF PIGMENTS & DRY COLOURS | .07 |
| 3782 - MFG. OF INDUSTRIAL CHEMICALS (INORGANIC) | .50 |
| 3783 - MFG. OF INDUSTRIAL CHEMICALS (ORGANIC) | .46 |
| 3791 - MFG. OF PRINTING INKS | .07 |
| ***PRODUCT-DIFFERENTIATED*** | 11.35 |
| 3060 - HARDWARE, TOOL & CUTLERY MANUFACTURERS | 1.20 |
| 3070 - HEATING EQUIPMENT MANUFACTURERS | .31 |
| 3080 - MACHINE SHOPS | .85 |
| 3110 - AGRICULTURAL IMPLEMENT INDUSTRY | .99 |

## APPENDIX B
## CANADA: SHARE OF EMPLOYMENT BY OECD TAXONOMY

| PRODUCTION WORKERS | 1980 |
|---|---|
| ***PRODUCT-DIFFERENTIATED (CON'T)*** | |
| 3150 - MISCELLANEOUS MACHINERY & EQUIPMENT | 3.73 |
| 3160 - COMMERCIAL REFRIG. & AIR COND. | .24 |
| 3180 - OFFICE & STORE MACHINERY MANUFACTURERS | .46 |
| 3242 - NON-COMMERCIAL TRAILER MFGS | .29 |
| 3310 - MFG OF SMALL ELECTRICAL APPLIANCES | .23 |
| 3320 - MFG OF MAJOR APPLIANCES | .65 |
| 3330 - MFG OF LIGHTING FIXTURES | .20 |
| 3380 - MFG OF ELECTRICAL WIRE & CABLE | .44 |
| 3391 - BATTERY MANUFACTURERS | .15 |
| 3399 - MFGS. OF MISC. ELEC. PRODS (N.E.S.) | .65 |
| 3770 - MFG. OF TOILET PREPARATIONS | .27 |
| 3931 - SPORTING GOODS MANUFACTURERS | .44 |
| 3932 - TOYS & GAMES MANUFACTURERS | .22 |
| ***SCIENCE-BASED TAXONOMY*** | 8.46 |
| 3210 - AIRCRAFT & AIRCRAFT PARTS MFG. | 2.21 |
| 3340 - MFG OF HOUSEHOLD RADIO & TV RECEIVERS | .16 |
| 3350 - COMMUNICATIONS EQUIPMENT MANUFACTURERS | 2.12 |
| 3360 - MFG OF ELECTRICAL INDUSTRIAL EQUIPMENT | 1.34 |
| 3740 - MFG. OF PHARMACEUTICALS & MEDECINES | .51 |
| 3750 - PAINTS & VARNISH MANUFACTURERS | .26 |
| 3760 - MFG. OF SOAP & CLEANING COMPOUNDS | .28 |
| 3799 - MISC. CHEMICAL INDUSTRIES (N.E.S.) | .65 |
| 3911 - INSTRUMENT & RELATED PROD.MFGS | .60 |
| 3912 - CLOCK & WATCH MFGS | .08 |
| 3913 - ORTHOPAEDIC & SURGICAL APPLIANCE MFGS | .03 |
| 3914 - OPHTALMIC GOODS MFGS | .21 |

SOURCE: MICRO-ECONOMIC ANALYSIS DIVISION, STATISTICS CANADA