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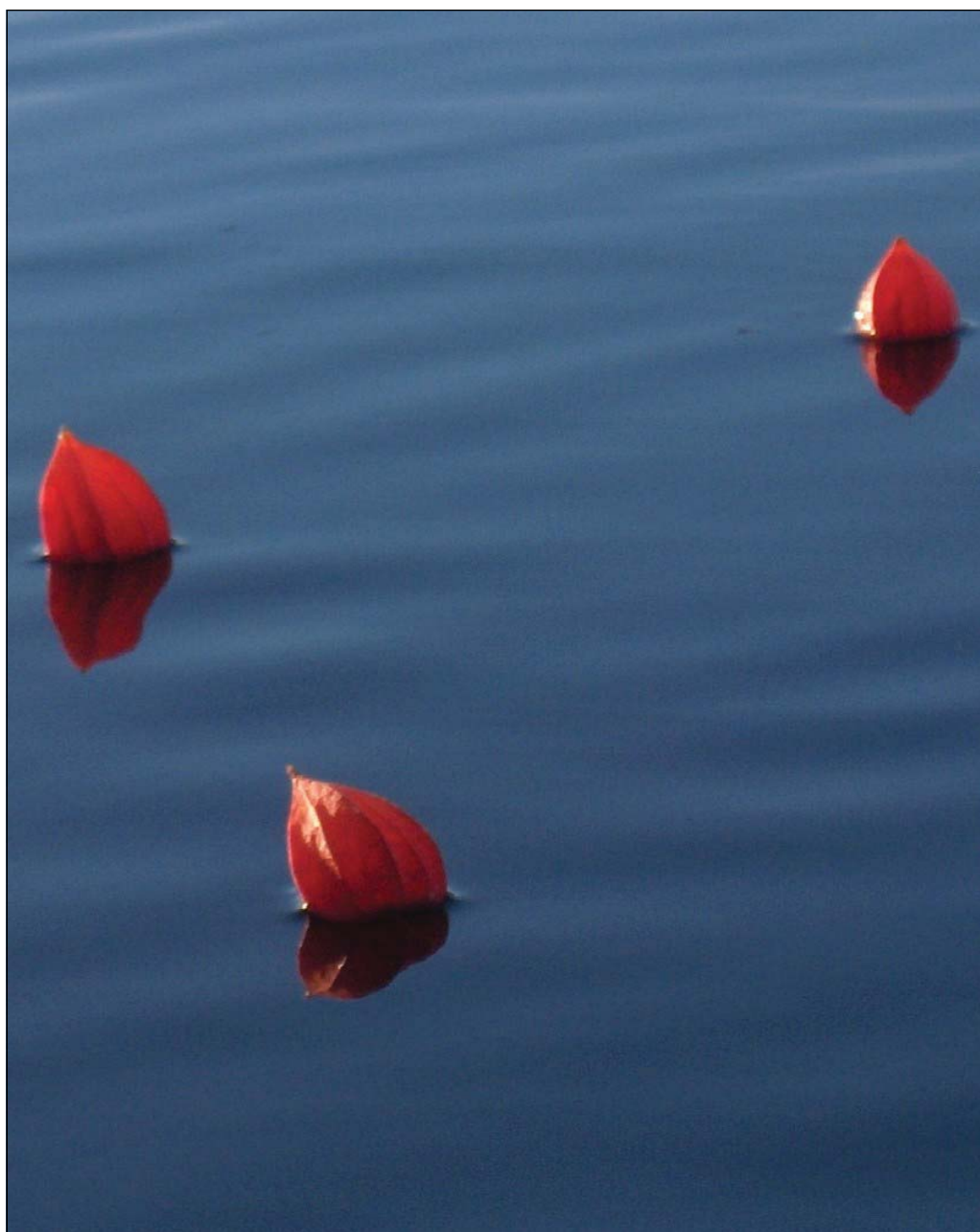
PERSPECTIVES

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- Labour market activity among seniors
- Income in manufacturing regions



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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0 ^s	value rounded to 0 (zero) where a meaningful distinction exists between true zero and the value rounded
P	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the <i>Statistics Act</i>
E	use with caution
F	too unreliable to be published

Highlights

In this issue

■ Labour market activity among seniors

- Employment rates among seniors have been on the rise in recent years after registering declines in the 1980s and 1990s. Between 1996 and 2006, the rate increased from 11.8% to 14.8% for men and from 4.0% to 5.8% for women.
- Among those who also worked the previous year, many worked on a full-time, full-year basis: 41.6% of men and 30.6% of women in 2005.
- Almost one-half of working seniors were employed in the business and consumer services industries. Farmer was the most common occupation among senior men, while senior women were more likely to be employed as retail salespersons and sales clerks.
- Senior men and women at the top and bottom of the family income scale (from sources other than individual employment earnings) were more likely to be employed compared with those in the middle.
- Higher levels of education, not having activity limitations and having a mortgage were also associated with being employed.
- Among those who were employed, men and women at the bottom of the family income group were more likely to be working full year, full time (50.4% of men and 40.2% of women).
- A detailed analysis of other income sources showed that both being employed and working full year, full time were negatively associated with public pensions and private income (excluding employment income), but positively related to the earnings of other family members (usually the spouse).

■ Income in manufacturing regions

- From 2000 to 2007, median employment income decreased by just over 2% in regions with a high concentration of manufacturing employment, compared with increases of more than 10% in low-concentration regions.
- Over the same period, the number of low-income people rose nearly 6% in high-concentration regions, while it dropped 16% in low-concentration regions.
- In regions with high manufacturing concentration, job losses resulted in an increase of more than 12% in the number of people receiving EI. In contrast, low-concentration regions saw an 11% decline in EI beneficiaries over the same period.
- Persons living in regions with a high concentration of manufacturing employment were from 18% to 30% more likely to experience substantial income loss (20% or more) between 2000 and 2007 than those in low-concentration regions. Residents of small cities were more likely to experience income loss than people living in large urban centres.
- Although the decline in manufacturing had a greater impact on the incomes of manufacturing workers, it also affected the incomes of workers in other sectors. The latter also had a significantly higher risk of experiencing income loss if they were employed in a region with a high concentration of manufacturing employment.

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Labour market activity among seniors

Sharanjit Uppal

In Canada, 65 remains the standard retirement age in the sense that full public pension benefits are available given work and residence requirements.¹ However, a number of policy changes have been made to lower barriers for seniors who wish to remain in the labour market. For example, mandatory retirement has been eliminated in most jurisdictions and the earned income exemption for the Guaranteed Income Supplement was recently raised. Other than policy makers, senior labour supply may be of interest to employers who have concerns about issues like knowledge transmission and skill shortages.

Despite the prominence of these issues, relatively little is known about how key factors such as education, health and financial status relate to senior labour market activity. Even though other studies have been devoted to the labour supply of individuals past the traditional retirement age of 65 (Duchesne 2002 and 2004, Haider and Loughran 2001, Walsh 1999, and Blau and Riphahn 1999),² recent information on the labour market participation of seniors in Canada is sparse.³

This study has three major objectives. First it provides detailed trends on the labour market activity of seniors by calculating employment rates among those at least 65 years of age and examining their industrial and occupational profiles. Next it examines the factors that may be associated with labour market participation after age 64. And, finally, it looks at the intensity of work and the characteristics associated with full-year, full-time hours reported by seniors. The study uses census data, the census being the only data source with an adequate sample size and a wide enough range of information to allow a detailed examination of senior workers.

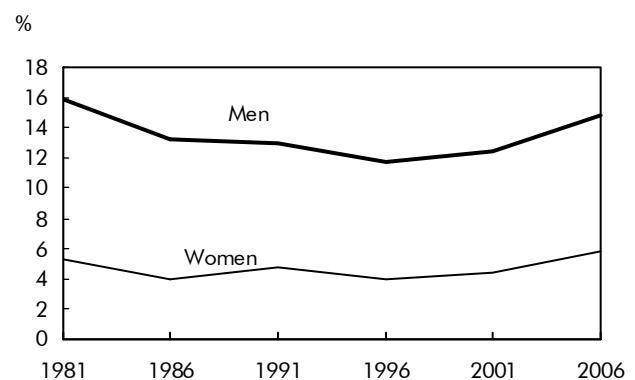
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Seniors' employment rates

In 2006, about 1 in 10 seniors participated in the labour market. Participation was higher for men (14.8%) than women (5.8%). These compare to rates of 15.9% for men and 5.3% for women in 1981 (Chart A).

The long-term trends in seniors' employment can be broken down into three periods: a period of significant decline (1981 to 1986), a period of relatively stable rates (1986 to 1996), and a period of increasing employment rates (1996 to 2006). For men, the rate fell by 2.6 percentage points between 1981 and 1986, followed by smaller declines in the next 10 years to reach 11.8% in 1996. Subsequent increases in the next two census years brought the employment rate for senior men to almost 15% in 2006. For senior women, the employment rate oscillated between 4% and 6% over the period ending with a gain of 1.4 percentage points between 2001 and 2006.⁴

Chart A Employment rates among seniors

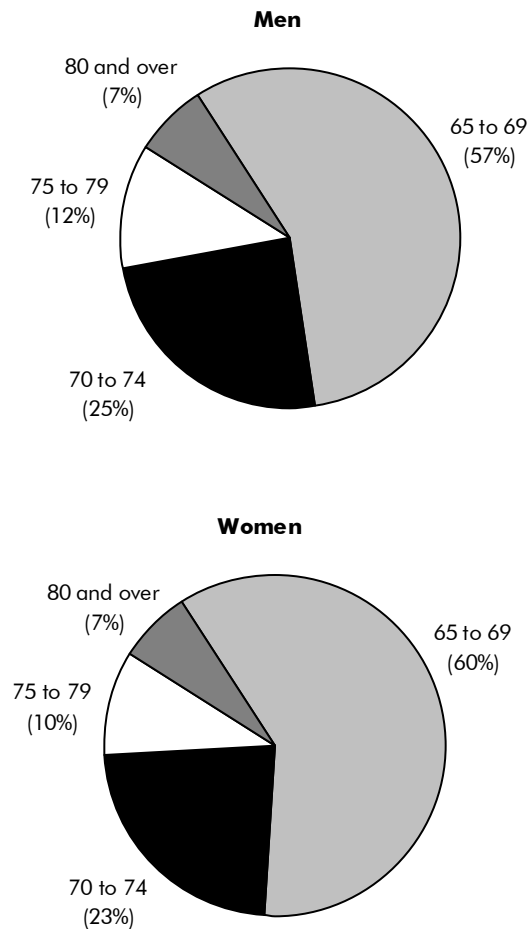


Source: Statistics Canada, Census of Population.

Among all employed seniors, 65- to 69-year-olds accounted for 56.5% of employed men and 60.1% of employed women (in 2006), while 70- to 74-year-olds accounted for an additional 24.5% and 23.0% for men and women, respectively (Chart B). Those 75 to 79 constituted 11.9% of the employed among men and 10.0% among women. Men and women 80 and over represented approximately 7% of employed seniors.

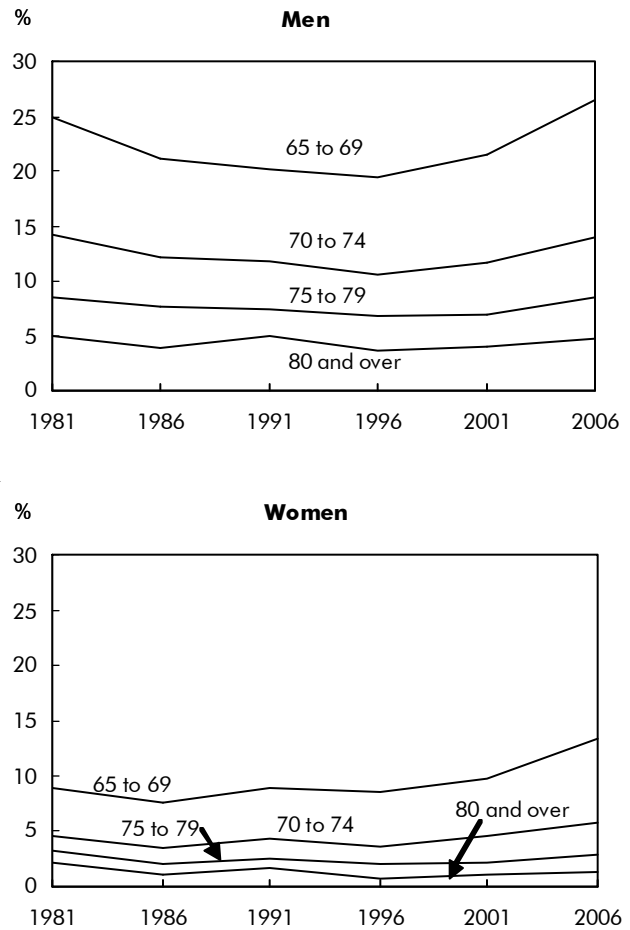
Among seniors, labour market participation generally declines with age. Men age 65 to 69 had higher rates of employment than their older counterparts in all years

Chart B Distribution of employment among seniors by age group



Source: Statistics Canada, Census of Population, 2006.

Chart C Employment rates among seniors by age group



Source: Statistics Canada, Census of Population.

and also showed the largest recent increase between 2001 and 2006: 5.1 percentage points (Chart C). Over the entire 1981 to 2006 period, employment rates increased much faster for women age 65 to 69 than for any other group.

Employment rates typically decline by 40% to 50% for men and 50% to 60% for women from their late 60s to their early 70s. In 2006, men age 70 to 74 had nearly the same employment rate as in 1981 following earlier losses and more recent gains. Women in this age group increased their employment rate by 1.2 percentage points over the 25-year span. Employment

Table 1 Employment by industry, senior versus prime-age workers

	Men		Women	
	25 to 64	65 and over	25 to 64	65 and over
	%			
Primary goods	5.8	17.1	2.3	11.1
Manufacturing	17.7	8.3	8.4	5.2
Construction and utilities	12.0	8.6	2.2	2.3
Transport	6.6	5.5	2.1	1.8
Consumer services	25.6	28.8	28.8	36.4
Business services	16.9	20.6	18.3	17.7
Education	5.0	3.6	11.4	7.6
Health	3.9	4.7	19.9	14.8
Public administration	6.5	2.8	6.5	3.1

Source: Statistics Canada, Census of Population, 2006.

rates were lower for workers age 75 and over and did not vary significantly in the 25-year period.

Many seniors working in consumer services

Older workers were concentrated in a few industries (Table 1).⁵ Among men, three industries were of particular importance as they employed two-thirds of all working seniors: consumer services, business services and primary goods. Of the three, consumer services had the largest share of seniors as 28.8% of working men were employed in this industry in 2006. Among older women, more than two-thirds were employed in consumer services, business services or health-related industries with consumer services accounting for 36.4% of employment.

Senior men and women were not necessarily employed in the same industries. The male–female gap was the most predominant in the health sector as 14.8% of employed women were working in this industry in 2006 compared with only

4.7% of employed men. In contrast, men were more likely to be employed in primary goods, and in construction and utilities.

The industrial profile of senior workers in 2006 was also quite different from that of younger workers. Senior men were much more likely to be employed in primary goods (17.1% for seniors versus 5.8% for younger workers), whereas men age 25 to 64 were

much more likely to be working in manufacturing (17.7% for younger workers versus 8.3% for seniors) and in public administration (6.5% for younger workers versus 2.8% for seniors). Among women, seniors had a much higher likelihood of being employed in primary goods (11.1% for seniors versus 2.3% for younger workers) and in consumer services (36.4% for seniors versus 28.8% for younger workers), but were less likely to work in public administration (3.1% for seniors versus 6.5% for younger workers).

There were also significant changes in the concentration of senior workers across industries between 2001 and 2006 (Table 2).⁶ Although consumer services was the largest employer of senior men in both years, other categories varied in importance over the period. Primary goods industries lost the most ground as its share declined by 5.6 percentage points between 2001 and 2006. In contrast, construction and utilities recorded the largest gain (1.4 percentage points). Among employed senior women, health-related industries recorded

Table 2 Senior employment by industry, 2001 versus 2006

	Men		Women	
	2001	2006	2001	2006
	%			
Primary goods	22.8	17.1	16.7	11.1
Manufacturing	8.3	8.3	5.7	5.2
Construction and utilities	7.2	8.6	2.1	2.3
Transport	4.4	5.5	1.3	1.8
Consumer services	27.7	28.8	35.6	36.4
Business services	19.4	20.6	16.7	17.7
Education	2.7	3.6	6.7	7.6
Health	4.5	4.7	12.5	14.8
Public administration	3.0	2.8	2.9	3.1

Source: Statistics Canada, Census of Population.

the biggest gain as their share increased by 2.3 percentage points over the period. In contrast, the share of senior women working in primary goods industries decreased by 5.6 percentage points between 2001 and 2006.

Farmer still the most common occupation for senior men

Among working senior men, the top occupation was farmer and farm manager, with 11.5% of seniors employed in this group in 2006 (Table 3). This differed from men age 25 to 64 as farmers and farm managers represented only 1.6% of the workforce for this group. The second most common occupation for senior men was retail salesperson and sales clerk, employing 3.8% of working men in 2006. The third and fourth most frequent occupational categories were truck driver and janitor, caretaker and building super-

intendent, at 2.9% each. Among women, the top occupation was retail salesperson and sales clerk (6.6% among seniors versus 3.8% among prime-age workers).

Working seniors were more concentrated in a few occupations compared with younger workers. Among senior men, for example, the top five occupations accounted for 23.7% of employment compared with 12.3% among workers age 25 to 64. Occupational concentration was also much higher among senior women as almost 26% of employed women age 65 and over were concentrated in the top five occupations, compared with about 18% among younger women.

Significant changes also occurred in the occupational profile of seniors between 2001 and 2006 (Table 4). First, the concentration decreased over the period as the top 25 occupations employed 50.4% of working men in 2006 (compared with 53.6% in 2001). Among women, the proportion fell from 62.3% to 59.8% over the same period. The decrease in the concentration of older workers among farmers and farm managers was particularly noticeable. Between 2001 and 2006, the proportion of older men employed in this category fell from 17.6% to 11.5%. Among women, this proportion fell from 10.1% to 6.1%. The share of senior women increased in many other occupations, including retail salespersons and sales clerks, secretaries (except legal and medical) and nurses. Hence, the occupational profile of older workers has become more diverse.

Table 3 Top 5 occupations, seniors versus prime-age

Men	%
25 to 64	
Truck drivers	3.7
Retail salespersons and sales clerks	2.6
Retail trade managers	2.5
Janitors, caretakers and building superintendents	1.8
Automotive service technicians, truck and bus mechanics and mechanical repairers	1.7
65 and over	
Farmers and farm managers	11.5
Retail salespersons and sales clerks	3.8
Truck drivers	2.9
Janitors, caretakers and building superintendents	2.9
General farm workers	2.6
Women	
25 to 64	
Retail salespersons and sales clerks	3.8
Registered nurses	3.8
Secretaries (except legal and medical)	3.4
General office clerks	3.4
Elementary school and kindergarten teachers	3.3
65 and over	
Retail salespersons and sales clerks	6.6
Secretaries (except legal and medical)	6.5
Farmers and farm managers	6.1
Bookkeepers	3.8
General office clerks	2.9

Source: Statistics Canada. Census of Population. 2006.

Descriptive overview of factors associated with employment

Among factors that can be expected to be associated with seniors' employment, four may be of particular significance (see *Data source and definitions*). They are financial status (family income other than individual employment income, adjusted for family size), educational attainment, health status (proxied by activity limitation information), and financial obligations (proxied with a mortgage payment indicator).

Past research indicates that financial resources do not necessarily have a straightforward relationship with work among older workers. The relationship varies according to the level and other sources of income. At the lower end, those with low levels of income other than individual earnings might have to work to maintain a minimum standard of living. At the other

Table 4 Top 25 occupations for employed seniors

	2001	2006
		%
Men		
Farmers and farm managers	17.6	11.5
Retail salespersons and sales clerks	2.6	3.8
Truck drivers	2.1	2.9
Janitors, caretakers and building superintendents	2.8	2.9
General farm workers	2.5	2.6
Retail trade managers	3.4	2.4
Security guards and related occupations	2.0	2.0
Sales representatives, wholesale trade (non-technical)	1.8	1.7
Financial auditors and accountants	1.6	1.6
Bus drivers and subway and other transit operators	1.1	1.5
Senior managers - goods production, utilities, transportation and construction	1.3	1.4
Real estate agents and salespersons	1.3	1.3
Ministers of religion	1.3	1.2
Senior managers - financial, communications and other business services	1.2	1.2
Senior managers - trade, broadcasting and other services, n.e.c.	1.2	1.2
Taxi and limousine drivers and chauffeurs	...	1.2
Delivery and courier service drivers	1.0	1.2
Lawyers and Quebec notaries	1.1	1.2
Carpenters	1.1	1.2
General practitioners and family physicians	1.3	1.1
Property administrators	1.2	1.1
Landscaping and grounds maintenance labourers	0.9	1.1
Automotive service technicians, truck and bus mechanics and mechanical repairers	...	1.0
Sales, marketing and advertising managers	1.0	1.0
Specialist physicians	0.8	1.0
Construction managers	0.9	...
Restaurant and food service managers	0.9	...
Women		
Retail salespersons and sales clerks	5.3	6.6
Secretaries (except legal and medical)	6.1	6.5
Farmers and farm managers	10.1	6.1
Bookkeepers	4.4	3.8
General office clerks	2.9	2.9
Light duty cleaners	2.6	2.8
Registered nurses	1.5	2.7
Retail trade managers	2.7	2.2
General farm workers	3.4	2.1
Visiting homemakers, housekeepers and related occupations	1.6	2.1
Administrative officers	1.5	2.0
Babysitters, nannies and parents' helpers	3.1	1.9
Receptionists and switchboard operators	1.6	1.9
Cashiers	1.2	1.7
Accounting and related clerks	1.5	1.6
Real estate agents and salespersons	1.2	1.5
Elementary school and kindergarten teachers	...	1.4
Early childhood educators and assistants	1.5	1.4
Janitors, caretakers and building superintendents	1.6	1.4
Food counter attendants, kitchen helpers and related occupations	1.3	1.4
Nurse aides, orderlies and patient service associates	...	1.3
Property administrators	1.3	1.2
Other elemental sales occupations	1.5	1.2
Cooks	1.2	1.2
Financial auditors and accountants	1.2	1.0
Musicians and singers	1.3	...
Accommodation service managers	0.9	...

Source: Statistics Canada, Census of Population, 2001 and 2006.

Data source and definitions

Census data on men and women, 65 years of age and over, for the years 1981, 1986, 1991, 1996, 2001 and 2006 were used in the study. The choice of census as a data source was predominantly motivated by a need for a detailed analysis and the accompanying requirements of relatively large sample sizes for various sub-groups. The census is conducted every five years. Four-fifths of households receive the short form, which asks for basic information only. The remaining 20% of households receive the long form which, in addition to the basic information, also asks more detailed questions on matters including labour market activities. The 20% sample information is later weighted to represent all Canadians.

Variable definitions

Employed: a person is considered employed if he or she had a job in the reference week (week preceding the census)—includes persons who were temporarily absent for the entire week because of vacation, illness, a labour dispute at work, maternity/parental leave, bad weather, fire or family responsibilities, or for some other reason.

Employment rate: the number of employed persons expressed as a percentage of the relevant population.

Employee: a person paid for work via wages, salary, tips or commission.

Self-employed: includes individuals who had a job in the reference week and were self-employed without paid help and not incorporated; self-employed with paid help and not incorporated; or paid workers who were incorporated business owners with or without paid help.

Unpaid family worker: a person working without pay for a relative in a family business or on a farm.

Work activity: based on data prior to the census year as data on weeks worked are for the previous year. An individual was classified as working full year, full time if he or she worked 49 to 52 weeks full time (30 hours or more per week).

Other family income: this variable is calculated by first subtracting individual employment income (if any) from total economic family income and then adjusting for family size by dividing it by an adjustment factor that takes the lower relative needs of additional family members into account.

Income quintiles are then calculated using the adjusted other family income. Note that information on income variables is for the year prior to the census year.

Education: education levels are constructed using the highest certificate, diploma or degree variable. The various categories are collapsed into five levels. The lowest level, Level 1, is below a high school graduation certificate or equivalency diploma. Level 2 is a high school graduation certificate or equivalency diploma. Level 3 includes other trade certificates/diplomas or registered apprenticeship certificates. Level 4 consists of college, CEGEP or other non-university certificates or diplomas from a program of 3 months to less than 1 year, college, CEGEP or other non-university certificates or diplomas from a program of 1 year to 2 years, college, CEGEP or other non-university certificates or diplomas from a program of more than 2 years, or certificates or diplomas below bachelor. The highest level, Level 5, includes bachelor's degrees, certificates or diplomas above bachelor, degrees in medicine, dentistry, veterinary medicine or optometry, master's degrees, or earned doctorate degrees.

Activity limitations: the limited often and limited sometimes variables are based on the following census questions, which refer to conditions or health problems that have lasted or are expected to last six months or more:

- 1. "Does this person have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?" (Yes, often; Yes, sometimes; No).
- 2. "Does a physical condition or mental condition or health problem reduce the amount or the kind of activity this person can do: (a) at home? (b) at school or at work? (c) in other activities, for example, transportation or leisure?" (Yes, often; Yes, sometimes; No).

Mortgage payments: the variable is "yes" if any regular mortgage or loan payments are being made; "none" if none are being made; "not applicable" if the individual does not own the dwelling. Other than information on the value of the dwelling and mortgage payments, the census does not include other measures of individual wealth.

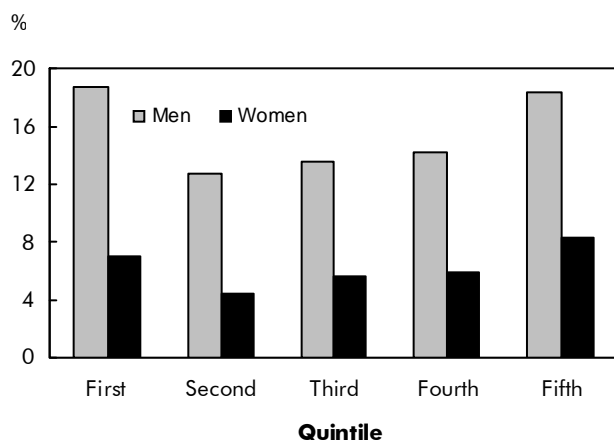
Occupation: Based on National Occupational Classification (520 occupations).

extreme, those with high levels of other income are also likely to be highly educated and, given that education is positively related to employment (Haider and Loughran 2001), they are more likely to be employed. In addition, those with high levels of such income are more likely to have spouses who are still employed (as spousal earnings are a part of this income). Earlier research (Blau and Riphahn 1999, and Schirle 2008) has shown that one member of a couple is much more

likely to be employed if the other spouse is employed than if the spouse is not employed. Another factor could be that those in higher income quintiles may be business owners.

To account for both income size and composition effects, the total and its separate components were examined. The total, 'other family income,' is defined as family income minus employment income (if any),

Chart D Employment rates among seniors by 'other family income' quintile



Source: Statistics Canada, Census of Population, 2006.

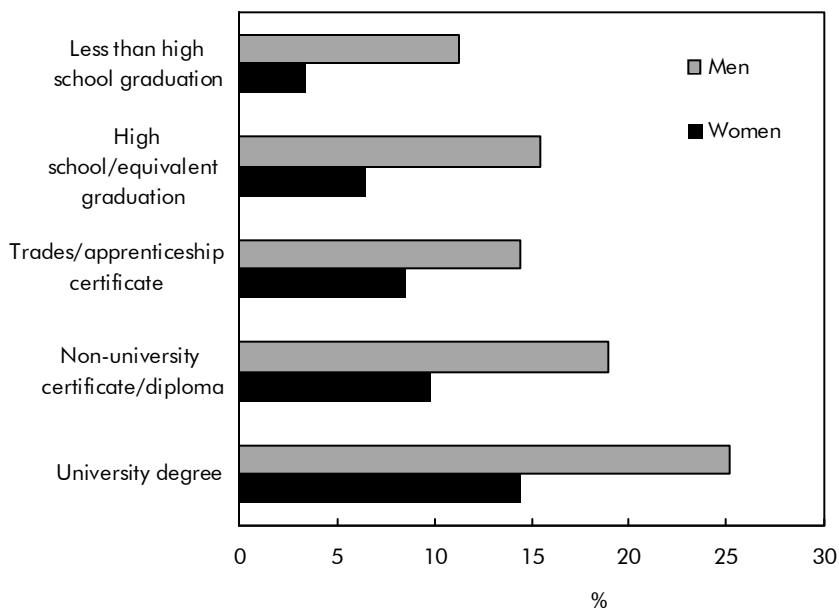
fourth quintiles, the proportions were 12.7%, 13.5% and 14.2%, respectively. The same pattern is evident for women, although at lower levels than for men.

Highly educated seniors are much more likely to continue working past the traditional retirement age (Haider and Loughran 2001, and Parries and Sommers 1994) (Chart E). In 2006, 25.2% of men with at least a university degree were employed compared with 11.3% of those without a high school diploma. Among women, the respective rates were 14.4% and 3.4%. The employment rates for intermediate levels of education were located between these two extremes. One of the reasons for the positive relationship between education and employment among seniors is that jobs requiring higher levels of education are usually less physically demanding (Park 2007). In such conditions, physical limitations associated with aging may be less likely to lead to retirement.

and is adjusted for family size (see *Data source and definitions*). Other family income consists of three main components: public pensions (Canada Pension Plan/Quebec Pension Plan, Old Age Security, and other government transfers [e.g., Guaranteed Income Supplement]), private income (private pensions, registered retirement savings plans, investment income, and other money income), and employment income of other family members.⁷ Descriptive results are presented for other family income, while the three components are incorporated into multivariate models.

Men and women in the lowest and highest other family income quintiles were more likely to be employed compared with those in the second, third and fourth quintiles. In 2006, 18.7% of men in the first quintile and 18.3% of those in the fifth quintile were employed (Chart D). In the second, third and

Chart E Employment rates among seniors by level of education

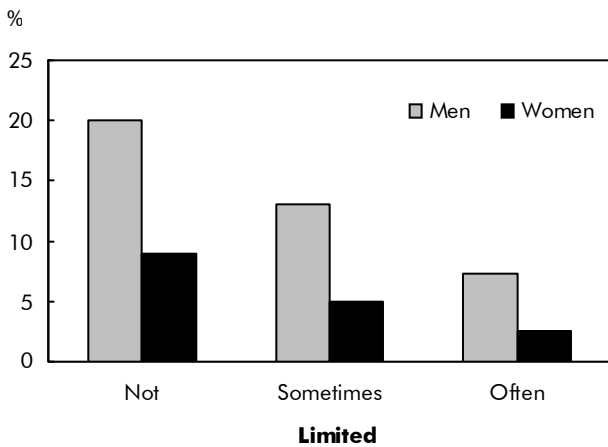


Source: Statistics Canada, Census of Population, 2006.

Health status has also been cited as a determinant of labour market activity among seniors. Activity limitations—a key element of the health status of seniors—have been found to be negatively associated with employment among the elderly (Haider and Loughran 2001, and Parries and Sommers 1994). In 2006, 21.8% of senior men and 24.0% of senior women reported that they were “often” limited in their daily activities. Another 26.2% of men and 27.5% of women stated that they were “sometimes” limited. Activity limitations were associated with employment decisions (Chart F). Among men, 20.1% of those without any limitations were employed, while 13.1% of the “sometimes” limited and 7.3% of the “often” limited were working. Among women, 8.9% of those who did not report any limitations were employed. For those with some form of activity limitation, the rates were less than 5%.

Finally, seniors carrying debt might be constrained to stay in the labour market to meet their financial obligations.⁸ Even though the census does not provide a complete balance sheet, it does have information on the presence of a mortgage—the largest debt for most individuals. On the basis of this measure, 18.8% of senior men and 16.3% of senior women reported that their households were making regular mortgage payments. Another 20.9% of men and 28.8% of women

Chart F Employment rates among seniors by activity limitation



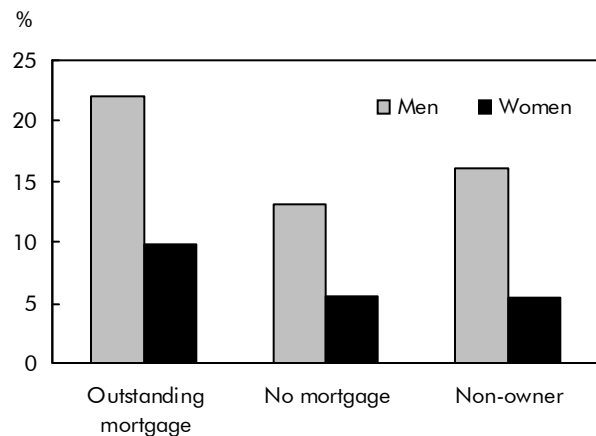
Source: Statistics Canada, Census of Population, 2006.

did not own their dwellings. The remainder owned their homes mortgage-free. Overall, 22.1% of men and 9.9% of women who had a mortgage were still active in the labour market (Chart G). Seniors without a mortgage, whether renters or mortgage-free owners, were less likely to work.

Modelling the employment of seniors

In order to gauge the potential relationship between the above factors and the probability of being employed, a logit model was estimated with all four explanatory factors as independent variables. A number of sociodemographic variables were also included as controls.

Chart G Employment rates among seniors by outstanding mortgage



Source: Statistics Canada, Census of Population, 2006.

The results indicated that education is positively associated with employment (Table 5). When those with a high school diploma were used as the reference group, women with the lowest educational attainment had lower odds of being employed. In contrast, those with higher education levels were more likely to be employed. This was especially true for university-educated women. In fact, the odds ratio⁹ for women in this level was two times higher than for those with a high school diploma. Among men, those with less than high school

Table 5 Odds ratios for employment model¹ for seniors

	Men	Women
	ratio	
Other family income		
First quintile	1.51*	1.59*
Second quintile	1.01	0.93*
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.93*	0.88*
Fifth quintile	1.15*	1.11*
Highest level of education		
Less than high school	0.77*	0.62*
High school or equivalent (ref.)	1.00	1.00
Trades/apprenticeship certificate	0.93*	1.24*
Non-university certificate/diploma	1.23*	1.44*
University degree	1.80*	2.01*
Activity limitations		
None (ref.)	1.00	1.00
Sometimes	0.68*	0.64*
Often	0.39*	0.39*
Mortgage payments		
Yes (ref.)	1.00	1.00
None	0.55*	0.55*
Non-owners	0.92*	0.79*

* significantly different from the reference group (ref.) at the 0.01 level
 1. Dependent variable = 1 if employed in the reference week,
 0 otherwise.

Note: Models also controlled for age, marital status, immigrant/
 Aboriginal status, official language, type of region, and province.
 Source: Statistics Canada, Census of Population, 2006.

or with a trades/apprenticeship certificate were less likely to be employed. As with women, men with a university education were the most likely to work.

A mortgage can be a good proxy for total household debt levels. Homeowners without mortgage payments and non-owners were less likely to be employed compared with those making regular mortgage payments.¹⁰ The odds ratios were lower by 0.45 and 0.08 for men without mortgage payments and non-owners, respectively. For women, the odds ratios related to these two categories were lower by 0.45 and by 0.21.

Seniors with activity limitations were also less likely to be employed. In comparison with men without any activity limitations, the odds ratio for men who stated they were “sometimes” limited was lower by 0.32. The odds were even lower (by 0.61) for those who stated that they were “often” limited, which is indicative of the severity of a disability. Similarly, the odds were

lower by 0.61 for women who indicated they were often limited and by 0.36 for those who were sometimes limited.

The model indicated that men in the bottom and top other family income quintiles were more likely to be employed compared with those in the middle quintile, while the coefficients for the second quintile were not significantly different from the middle quintile.¹¹ Compared with those in the middle quintile, the odds ratio for those in the bottom quintile was higher by 0.51. The corresponding number for those in the top quintile was 0.15. Similarly, women in the bottom and top income quintiles were more likely to be employed compared with those in the middle. However, women in the second and fourth income quintiles were less likely to be employed. The odds ratios for those in the first and fifth quintiles were higher by 0.59 and 0.11, respectively, compared with the middle quintile. On the other hand, the odds ratios were lower by 0.07 and 0.12 for those in the second and fourth quintiles, respectively.

Descriptive statistics showed that both men and women in the bottom and top income quintiles were more likely to work. However, because employment was also positively related with high educational attainment, and because individuals in the top income quintile are also likely to be highly educated, the impact on employment from being part of the top quintile could be expected to be much lower when education variables are accounted for. However, even after controlling for education, men in the top quintile were still more likely to be working as opposed to those in the middle. One potential explanation is that a high level of other family income may be indicative of other family members working. Moreover, the source of other income may affect the decision to work.

To study the impact of other family income in more detail, it was split into three components: public pensions (Canada Pension Plan/Quebec Pension Plan, Old Age Security, and other government transfers [e.g., Guaranteed Income Supplement]), private income (private pensions, registered retirement savings plans, investment income, and other money income), and an indicator for the presence of another family member with positive employment earnings. Quintiles for public pensions and private income were included in the model. However, earnings of other family members could not be split into quintiles as approximately 70% did not have another family member with positive earnings.

Men and women in the top two quintiles of public pensions and private income became less likely to be employed than those in the middle quintile when earnings of other family members were taken out of the equation, while those in the bottom two quintiles of public and private pensions remained more likely to work (Table 6). Seniors with positive earnings from other family members (spouses in most cases) were more likely to be working themselves, especially men. Thus, the employment decision for those in the top quintile appears to be driven by work decisions of other family members (mostly the spouse), and for those in the bottom quintile by relatively low income from public pensions and private sources. The models were also estimated separately for the youngest group (65 to 69 years of age) as they constitute the majority of senior workers. The conclusions remained unchanged.¹²

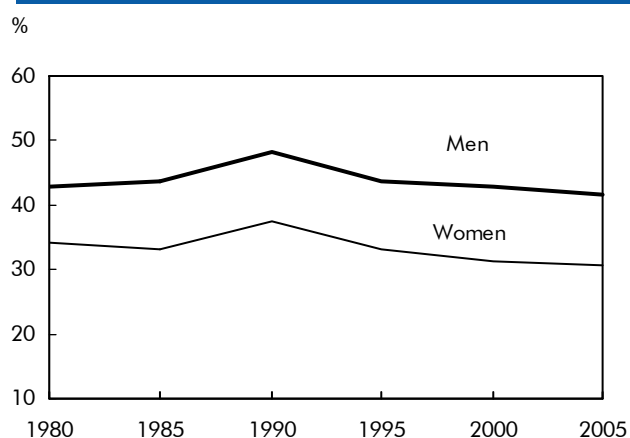
Descriptive overview of work intensity

The amount of time seniors spend on the job is also of interest. A significant minority of senior workers reported full-year, full-time jobs (Chart H).¹³ Among

men, slightly more than 40% worked full year, full time in 2005. Just under one-third of working women also worked on a full-year, full-time basis in 2005 (31%), although just as many worked on a part-time, part-year basis (31%). These results were similar across census years.

The proportion of seniors working full time, full year varied little across age groups (Table 7). Among men, those age 65 to 74 were slightly more likely to work full year, full time compared with those 75 and over (41.8% versus 40.4%). Among women, 30.2% of the 65 to 74 group worked full year, full time in 2005, compared with 32.2% of working women 75 and over.

Chart H Seniors employed full year, full time



Source: Statistics Canada, Census of Population, 1981 to 2006.

Table 6 Odds ratios for alternative seniors' employment model¹

	Men	Women
	ratio	
Public pensions/government transfers		
First quintile	1.92*	1.83*
Second quintile	1.20*	1.19*
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.90*	0.93*
Fifth quintile	0.93*	0.95*
Private income		
First quintile	1.30*	1.10*
Second quintile	1.34*	1.21*
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.78*	0.79*
Fifth quintile	0.81*	0.69*
Other family member with positive earnings		
Yes	2.16*	1.68*
No (ref.)	1.00	1.00

* significantly different from the reference group (ref.) at the 0.01 level
1. Dependent variable = 1 if employed in the reference week, 0 otherwise.

Note: Models also controlled for education, activity limitations, mortgage payment indicator, age, marital status, immigrant/Aboriginal status, official language, type of region, and province.
Source: Statistics Canada, Census of Population, 2006.

Some personal and job characteristics were associated with a higher probability of working full year, full time. This was the case for women who were unpaid family workers and men who were self-employed. Both men and women in management positions were much more likely to work full year, full time (53.0% for men and 46.4% for women). In contrast, unskilled workers were much less likely to work on a full-year, full-time basis.

In the previous section, results indicated that men who were in the bottom quintile of other family income were more likely to be employed. They were not only

Table 7 Full-year, full-time employment rates by age, employment status and occupation

	Men	Women
Total	41.6	30.6
Age		
65 to 74	41.8	30.2
75 and over	40.4	32.2
Employment status		
Employee	39.8	29.6
Self-employed	43.8	32.0
Unpaid family worker	30.1	40.4
Occupation		
Management	53.0	46.4
Professional	35.9	23.4
Skilled	45.4	33.5
Semi-skilled	38.3	29.6
Unskilled	30.1	23.2

Source: Statistics Canada, Census of Population, 2006.

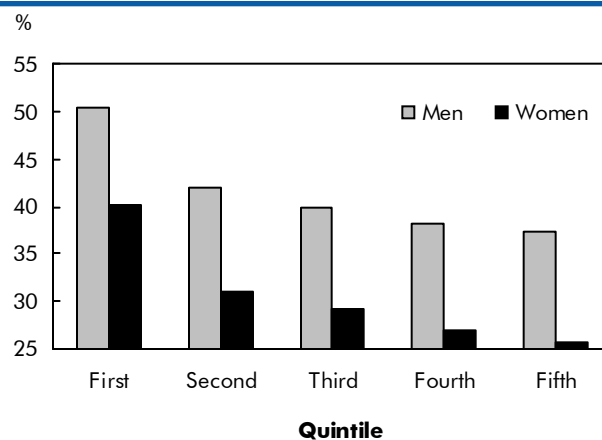
more likely to be employed, but were also working more intensively as 50.4% of employed men and 40.2% of employed women in the bottom quintile worked the entire year on full-time basis (Chart I).

Results indicated that men in the top quintile were more likely to be working as opposed to those in the middle. However, they were less likely to be working full-year, full-time compared with men in any other quintile. Similar trends were found among women.

Modelling work intensity

To test the robustness of the above findings, another logit model was estimated to study the association of various variables with the probability of working full year, full time. Results indicate that working seniors in the bottom income quintile were more likely to work full year, full time in comparison with those in the middle quintile, while the opposite was true for seniors in the top two quintiles (Table 8). Among men, the odds ratio for those in the bottom quintile was higher by 0.46 compared with those in the middle.

Although higher educational attainment was associated with a lower probability of working full year, full time for men, the results for women were not as clear.

Chart I Full-year, full-time rates by other family income quintile

Source: Statistics Canada, Census of Population, 2006.

Those with a trades/apprenticeship certificate were less likely to work on a full-year, full-time basis than those with a high school diploma, with results statistically insignificant for other levels. Seniors with activity limitations were less likely to work full year, full time than those without. Finally, those without mortgage payments were less likely to work full year, full time.

Models were again re-estimated after splitting other family income into public pensions, private income, and an indicator of another family member with positive earnings. Men in the bottom two quintiles of public pensions and private income were more likely and those in the top two quintiles less likely to work full year, full time compared with those in the middle quintile (Table 9). For women, this was only true for private income.

For public pension income, women in the bottom two quintiles and the top quintile were more likely to work full year, full time compared with those in the third quintile. For both men and women, those who had another family member with positive earnings were more likely to work full year, full time.

When the models were estimated to include only those age 65 to 69, the conclusions remained unchanged for men. For women, one conclusion regarding public pensions changed—the coefficient for the fifth quintile was statistically insignificant.¹⁴

Table 8 Odds ratios for seniors' work intensity model¹

	Men	Women
	ratio	
Other family income		
First quintile	1.46*	1.48*
Second quintile	1.06	1.04
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.94**	0.89**
Fifth quintile	0.90*	0.82*
Highest level of education		
Less than high school	1.08*	1.03
High school or equivalent (ref.)	1.00	1.00
Trades/apprenticeship certificate	0.91*	0.89**
Non-university certificate/diploma	0.92*	0.94
University degree	0.84*	0.93
Activity limitations		
None (ref.)	1.00	1.00
Sometimes	0.74*	0.74*
Often	0.74*	0.81*
Mortgage payments		
Yes (ref.)	1.00	1.00
None	0.71*	0.68*
Non-owners	1.08*	0.91**

* significantly different from the reference group (ref.) at the 0.01 level; ** at the 0.05 level

1. Dependent variable = 1 if employed full year, full time, 0 otherwise.

Note: Models also controlled for age, marital status, immigrant/Aboriginal status, official language, industry, occupation, employment status, type of region, and province.

Source: Statistics Canada, Census of Population, 2006.

Conclusion

While most seniors retire by age 65, many continue to work beyond this traditional milestone. In addition to policy changes that have eliminated the mandatory age of retirement, improved education levels and health status over time have created conditions for people to work longer.

Using Canadian census data, this study examined trends in work activity among seniors at least 65 years of age from 1981 to 2006. It also used 2006 Census data to study the factors that are associated with employment at this age. Results indicate that the employment rate among seniors has been on the rise in recent years after registering declines in the 1980s and early 1990s. Between 1996 and 2006, the rate increased from 11.8% to 14.8% for men and from 4.0% to 5.8% for women.

Table 9 Odds ratios for alternative seniors' work intensity model¹

	Men	Women
	ratio	
Public pensions/government transfers		
First quintile	1.68*	1.75*
Second quintile	1.16*	1.25*
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.91*	0.99
Fifth quintile	0.90*	1.10**
Private income		
First quintile	1.42*	1.51*
Second quintile	1.34*	1.28*
Third quintile (ref.)	1.00	1.00
Fourth quintile	0.81*	0.84*
Fifth quintile	0.68*	0.65*
Other family member with positive earnings		
Yes	1.19*	1.08**
No (ref.)	1.00	1.00

* significantly different from the reference group (ref.) at the 0.01 level; ** at the 0.05 level

1. Dependent variable = 1 if employed full year, full time, 0 otherwise.

Note: Models also controlled for education, activity limitations, mortgage payment indicator, age, marital status, immigrant/Aboriginal status, official language, industry, occupation, employment status, type of region, and province.

Source: Statistics Canada, Census of Population, 2006.

Among those who also worked the previous year, many did so on a full-time, full-year basis (41.6% of men and 30.6% of women). Working seniors were highly concentrated in consumer services and had a less diverse occupational profile than younger workers.

This study also modelled many factors associated with the labour market participation of seniors. Men and women in the bottom and top quintiles of other family income were more likely to be employed compared with those in the middle, although the association was stronger for those in the bottom quintile. Bottom-quintile individuals were not only more likely to work—they also worked more intensively. However, a detailed analysis of income sources showed that not all sources of income equally affected seniors' probability of working. Private sources of income and public pensions were negatively associated with labour market participation, while earnings of family members (mostly spouses) were positively associated with

labour market participation. Higher levels of education, the absence of activity limitations and the presence of mortgage payments were other factors associated with a higher probability of employment. Overall, such results suggest that even if some seniors stay in the labour market by choice, many others likely remain working out of necessity. And the work intensity of those who are financially constrained is significantly higher.

Perspectives

■ Notes

1. Other countries also began introducing policy changes to deal with an aging workforce. For example, the United States raised the eligibility age for social security to 67 for those born after 1960. Also, it provides delayed retirement credits to seniors working past retirement age.
2. However many studies focus on early retirement behaviour. Examples of studies using Canadian data include Baker et al. 2003, Campolieti 2001 and 2002, and Maki 1993.
3. Some examples of studies on the determinants of labour market participation among seniors can be found in other countries. For example, Haider and Loughran (2001) used U.S. data and found that the labour supply of seniors was concentrated among the most educated, wealthiest and healthiest. It also reported that non-pecuniary considerations play an important role in determining employment decisions among seniors. Using data from Germany, Blau and Riphahn (1999) found that one member of a couple was much more likely to be employed if the other spouse was also employed.
4. These numbers are mainly influenced by the labour market participation of pre-baby boomers. With the much better-educated baby boomers now approaching their retirement years, the employment rates could rise even further in the future.
5. For the remainder of the paper, institutional residents are excluded from the analysis as information on various variables is not available for them. Note that for the rest of the population, the employment rate in 2006 was 15.5% among men and 6.3% among women.
6. Comparisons are made with 2001 rather than 1981 as the industrial and occupational classification has changed over time. Also, most of the increase in labour market participation occurred between 2001 and 2006.
7. Some of the existing Canadian studies addressing the association between labour market decisions and pensions include Baker et al. (2003), and the association between labour market decisions and spousal earnings include Schirle (2008). Parries and Sommers (1994) study the relationship between “non-labour income” (in addition to other variables) and the labour force participation of men age 68 and over in the United States.
8. Fortin (1995) shows that among married Canadian women age 35 to 65, labour force participation rates were higher for women in home-owning families with mortgages compared with women from families that either rent or own a home with no mortgage. Using Australian data, Belkar et al. (2007) find that indebtedness increases an individual’s probability of participation in the labour force, especially the levels of owner-occupied mortgage debt for men.
9. The odds ratio is the ratio for the odds of an event occurring in one group compared with the odds of it occurring in another group. An odds ratio greater than 1 indicates that the event is more likely to occur in that particular group compared with the reference group. On the other hand, an odds ratio less than 1 indicates that the event is less likely to occur. For example, in an employment model, if the odds ratio for men is 1.20 with women being the reference group, it would imply that the odds for men being employed are higher by 0.20 compared with women. On the other hand, an odds ratio of 0.80 for men can be interpreted as the odds for men being employed are lower by 0.20 compared with women.
10. The causal nature of the relationship between mortgage debt and employment might be argued. Belkar et al. (2007), Del Boca and Lusardi (2002), and Fortin (1995) find that mortgage payments are exogenous to the labour force decision. This exogeneity is more likely to hold for seniors as they are less likely to take on bigger mortgage debts due to their work activity.
11. Some of the independent variables might be related. For example, individuals in the higher income quintile are also likely to be the ones with higher levels of education. Keeping this in mind, first a model was estimated without education and a mortgage rate indicator. The results, which are qualitatively the same as the ones from the full model presented here, are available from the author upon request.
12. The results are available from the author upon request.
13. The employed sample was restricted to men and women 66 years of age and over in the census year because information on weeks of work is available for the year prior to the census. The sample consisted of individuals who worked both in the census year and the previous year. This should not create much of a bias given that a very small proportion of individuals worked in the census year and not the previous year. For example, for the 2006 Census this proportion was 0.9% among men and 0.5% among women.
14. The results are available from the author upon request.

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Income in manufacturing regions

Manon Langevin

Shrinking employment in manufacturing is a trend observed in OECD (Organisation for Economic Co-operation and Development) countries as a whole (Bernard 2009a). From 2000 to 2007, the sector lost 278,000 jobs in Canada, or one in six, which reduced its share of total employment from 16% to 12%.¹ The decline took place during a period of general economic growth with a vibrant labour market and low unemployment: in 2007, there were employment gains in every sector except manufacturing, and the unemployment rate fell to 6.0%, its lowest level in 33 years. Some sectors, such as natural resources, experienced vigorous growth, even verging on a shortage of workers. During those years, for every job lost in manufacturing, nearly two jobs were created in construction, health care and social assistance (Lin 2008).

The decline of the manufacturing sector can have serious repercussions for the economic health of some regions, particularly when jobs with manufacturing firms are an important source of employment at the local level. In those regions, the downsizing or closure of a single company can have a snowball effect, affecting not only the company's employees but also business activity and employment among its suppliers. The decrease in employment earnings of workers who are laid off or affected by cuts in work hours can lead to lower household spending and reduced profitability for local retail stores and service firms. The indirect layoffs that result from this process increase the number of unemployed workers, which puts downward pressure on the wages offered by local employers in every sector. Ultimately, the combined effects may impede the local job creation process and thereby weaken the economy of the affected regions.²

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Economic and employment trends in the manufacturing sector are fairly well documented. Much less so, however, is the impact that those trends have on personal income, depending on the sector's regional importance. Taking advantage of the high level of regional detail in the Longitudinal Administrative Database (LAD) (see *Data source and definitions*), this article examines median income, low-income incidence and use of Employment Insurance (EI) in the various regions, which are ranked by the level of concentration in manufacturing employment. These indicators are compared at two points in time: the most recent peak in manufacturing employment (2000) and the last full year of economic growth (2007). The probability of income loss between those two years for persons living in the same region in 2000 and 2007 is then studied. The estimated probabilities are based on the degree of regional concentration of manufacturing employment and whether these individuals were working in manufacturing in 2000.

Since the economic environment is fundamentally different between major centres and smaller cities (especially with regard to low income), the results of the cross-sectional analysis for metropolitan areas with a population of more than 500,000 are presented separately from the results for smaller areas (see *Income and employment in census metropolitan areas with a population of 500,000 or more*).

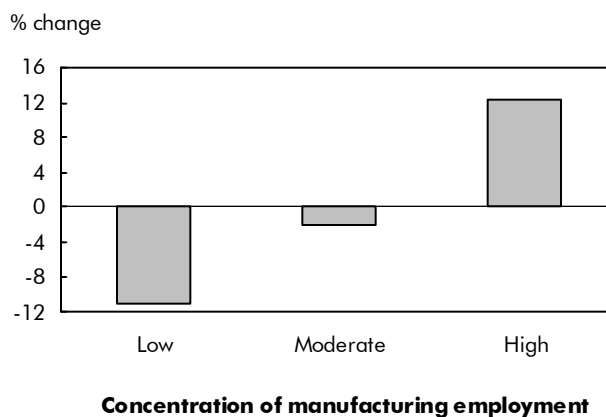
Greater decline in employment in regions with high manufacturing concentration

The loss of a job can result in several unemployment episodes and a loss of employment income (Galarneau and Stratyckuk 2001, Bernard and Galarneau 2010) when workers are forced to take lower-paying jobs. Employment income may start falling even before the job loss, and such decreases often persist much longer

than the duration of unemployment benefits (Morissette et al. 2007). The following sections describe some indicators of the incidence of the decline in manufacturing at the regional level, with census metropolitan areas (CMAs) and census agglomerations (CAs) grouped by level of employment concentration in manufacturing (low, moderate and high) (see *Concentration rate*).

The majority of regions with a high concentration of manufacturing employment are in Quebec (for example, Granby and Thetford Mines) and Ontario (for example, Windsor and Oshawa)—a complete list of CMAs and CAs is provided in the appendix. Those regions have been hardest hit by the slump in manufacturing. From 2000 to 2007, losses of manufacturing jobs totalled 68,600, a 21.9% drop. In comparison, low-concentration regions lost 11,300 manufacturing jobs, a decline of 13.3%.

Chart A Change in number of EI beneficiaries



Note: The concentration of manufacturing employment was kept constant with that calculated in 2000.
Source: Statistics Canada, Longitudinal Administrative Database, 2000 and 2007.

Income and employment in census metropolitan areas with a population of 500,000 or more

From 2000 to 2007, manufacturing employment shrank in every census metropolitan area (Table 1). The leaders were Toronto and Montréal, which together lost 172,800 jobs. Toronto suffered the heaviest loss (95,300 jobs).³ Along with Hamilton, which had the largest proportion of manufacturing

employment, Toronto was one of the few regions that experienced a decline in market income (6.8%). However, because those regions have a very different economic profile than smaller regions, it is difficult to draw any conclusions from these statistics.

Table 1 Change in employment and income in census metropolitan areas with a population of 500,000 or more

	Share of manufacturing employment %	Number of manufacturing jobs			Median market income		
		2000	2007	% change	2000 (\$)	2007 (\$)	% change
Ottawa-Gatineau	9.1	42,530	25,300	-40.5	37,800	38,500	1.9
Québec	10.8	34,440	30,325	-11.9	29,500	32,300	9.5
Edmonton	11.5	48,850	45,710	-6.4	31,700	37,700	18.9
Vancouver	12.1	97,540	88,335	-9.4	29,500	30,700	4.1
Calgary	12.3	54,365	47,660	-12.3	33,500	38,700	15.5
Winnipeg	16.1	48,970	42,150	-13.9	29,300	31,200	6.5
Montréal	19.6	292,945	215,420	-26.5	29,100	29,000	-0.3
Toronto	20.4	399,995	304,675	-23.8	33,600	31,300	-6.8
Hamilton	23.3	62,645	51,220	-18.2	35,200	34,200	-2.8

Note: The concentration of manufacturing employment was kept constant with that calculated in 2000.
Source: Statistics Canada, Longitudinal Administrative Database, 2000 and 2007.

More people on Employment Insurance

Manufacturing layoffs had a significant impact on the number of EI beneficiaries, and that impact varied considerably with the regional rate of employment

concentration in the sector. In regions with a high concentration of manufacturing employment, job losses resulted in an increase of 12.4% in the number of people on EI, from 173,600 in 2000 to 195,000 in 2007 (Chart A).

Data source and definitions

The **Longitudinal Administrative Database (LAD)** is a longitudinal and cross-sectional sample composed of 20% of Canadian tax filers. The data are drawn from the T1 income tax returns of individuals. The large number of observations in LAD makes it possible to produce reliable estimates, not only for all of Canada and the provinces, but also for census metropolitan areas (CMAs) and census agglomerations (CAs). LAD also provides a wide range of income sources, which facilitates the study of changes in income and its composition over time. The industry sector variable, based on the North American Industry Classification System, is produced by matching LAD with the Business Register.

This article has a cross-sectional part and a longitudinal part. The target population is somewhat different depending on whether the analysis is cross-sectional or longitudinal. For the cross-sectional analysis, the 2000 and 2007 samples are independent and include persons age 20 to 64 living in a CMA or CA. Non-CMA and non-CA residents are excluded. The longitudinal sample includes all persons age 20 to 57 in 2000 (27 to 64 in 2007) living in the same CMA or CA in 2007 and 2000. The age restrictions for the longitudinal sample were established to avoid having to take variations due to retirement into account, without excluding variations due to unplanned and early retirement that may be the result of a decline in a company's business activity. The longitudinal population makes up 90% of the 2000 population. For both analyses, the 2000 boundaries are used for CMAs and CAs. For 2007, the 2000 boundaries were recreated using postal codes available in LAD. For more information on the advantages of keeping area boundaries constant over time, see Heisz et al. (2005).

All amounts are in 2007 constant dollars.

Employment income is the sum of all employment income reported on T4 slips. It includes salaries, wages and commissions before deductions and excludes self-employment income.

Market income includes the following components:

- employment income (reported on T4 slips)
- other employment income
- net self-employment income
- exemption of Indian employment income
- income from other pensions and retirement pensions
- dividends
- interest and other investment income
- net partnership income

- net rental income
- support payments
- registered retirement savings plan income of persons age 65 and over
- other income

Total income includes all market income components plus the following:

- Old Age Security pension
- Canada Pension Plan and Quebec Pension Plan benefits
- family benefits
- Employment Insurance benefits
- Universal Child Care Benefit
- non-taxable income
- refundable provincial tax credits
- child tax credits
- Canada Child Tax Benefit
- goods and services tax (GST) and Québec sales tax (QST) credits

Total income after tax is total income minus provincial and federal income tax, plus the Quebec abatement.

The **low-income indicator** identifies low-income persons according to the Low Income Measure (LIM). LIM represents one-half of median family income after tax, adjusted for family size.

The analysis covers only two periods and cannot capture all labour and income dynamics between the two periods. A more detailed study of the dynamics between personal income and labour market activity is needed to better understand how wealth creation mechanisms were affected in regions with a high concentration of manufacturing employment. Moreover, since the study focuses largely on people who lived in the same place during the observation period, it does not take labour mobility into account. It thus excludes people who moved to improve their employment conditions. Consider the case of Alberta, for example. The province benefited substantially from declining employment in manufacturing in other regions and served as a major source of re-employment, notably in construction, for less skilled manufacturing workers. It is also important to note that LAD contains relatively little information on the demographic characteristics of the persons included in the database. For example, it has no information on level of schooling, an essential variable for studying employment income and workers' ability to find new jobs.

In contrast, regions with a low concentration of manufacturing employment saw a decrease of 22,500 beneficiaries, or 11.0%, over the same period. These statistics suggest that job security deteriorated in regions of high manufacturing concentration, leaving workers at greater risk of unemployment episodes and hence more likely to be on EI.

Sharp decline in income in regions with high manufacturing concentration

A high level of employment concentration in manufacturing also appears to be associated with larger income losses.⁴ In high-concentration regions, employment income fell by 2.4%, compared with low-concentration regions, where it rose by 10.5% (Chart B). The pattern is similar for market income, which indicates that the decrease in employment income was not offset by increases in other components of market income (see *Data source and definitions*). This finding suggests that the decline in employment income is not due to a rise in retirement in those regions, mainly because the decline in employment income would have been partially offset by an increase in pension income for those persons. The decrease in market income would

have been smaller than the decline in employment income, however, the data show the opposite.⁵ Government transfers and the tax system had a stabilizing effect in those regions, since total income before tax and total income after tax rose during the period.

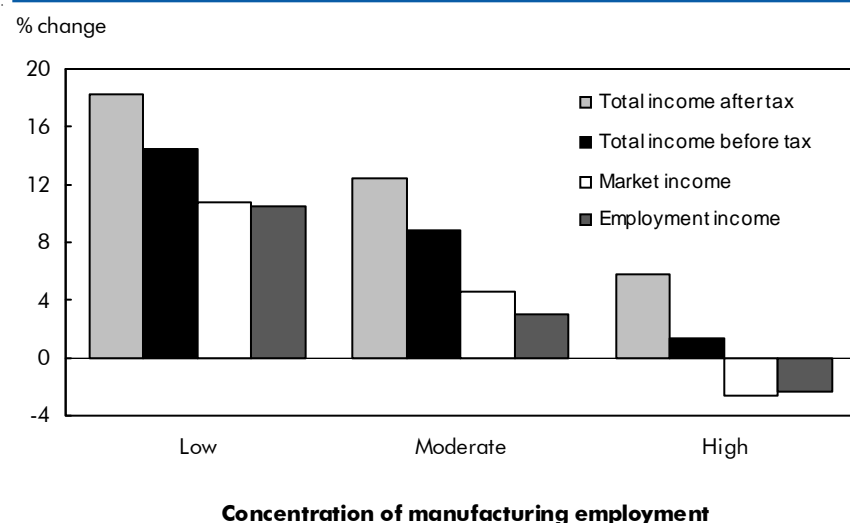
The variations changed the regions' comparative income ranking. In 2000, regions with high manufacturing concentration had the highest median income (all types of income), while in 2007 the reverse was true, as those regions had the lowest incomes.

Moreover, residents of high-concentration regions who were in the lowest income quartile (1st quartile) experienced relatively large losses—a 4.8% drop in their market income, compared with a 16.8% increase for their counterparts in low-concentration regions (Chart C). The median income in the lowest income quartile was higher in low-concentration regions (\$7,200) than in high-concentration regions (\$6,100), whereas the opposite was true in 2000.

These trends have widened income disparity in high-concentration regions and reduced it in low-concentration regions. Income decreases in the two lower quartiles in high-concentration regions were accom-

panied by an increase in the number of low-income people—from 2000 to 2007, the number of low-income people rose 5.6% in those regions, compared with a drop of 15.5% in low-concentration regions (Chart D).

Chart B Change in median total¹ market and employment incomes

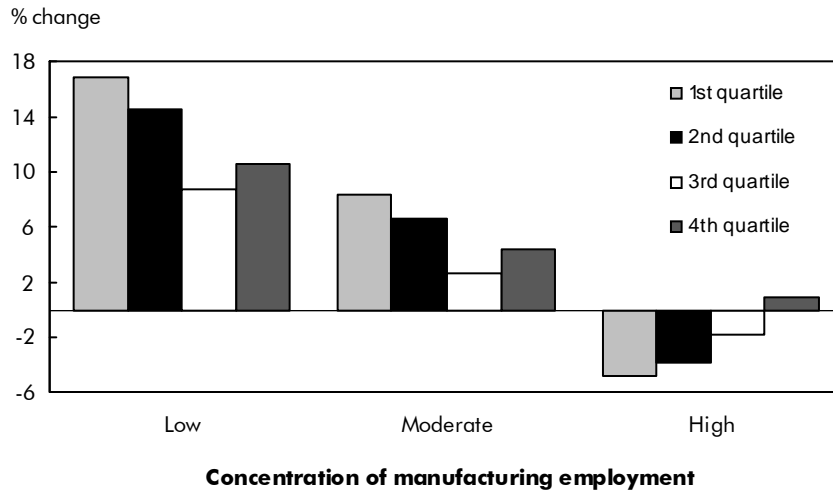


More frequent income declines in small, high-concentration regions

The following sections concern workers who were living in the same CMA or CA in 2000 and 2007. The data are from an ordered logistic regression model. The model isolates the effects of manufacturing concentration on income changes, for various levels of income loss, depending on whether the worker was employed in the manufacturing sector.⁶ More specifically, it estimates the probability of experiencing various levels of total income loss,⁷ by relative concentration of local employment in the manufacturing sector, for the

1. Before and after tax.
 Note: The concentration of manufacturing employment was kept constant with that calculated in 2000.
 Source: Statistics Canada, Longitudinal Administrative Database, 2000 and 2007.

Chart C Change in median income, by market income quartile



Note: The concentration of manufacturing employment was kept constant with that calculated in 2000. For a given quartile, the income change is equal to the difference between the median income of persons in this quartile based on the 2007 income distribution, and the median income of persons in the same quartile based on the 2000 income distribution.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 and 2007.

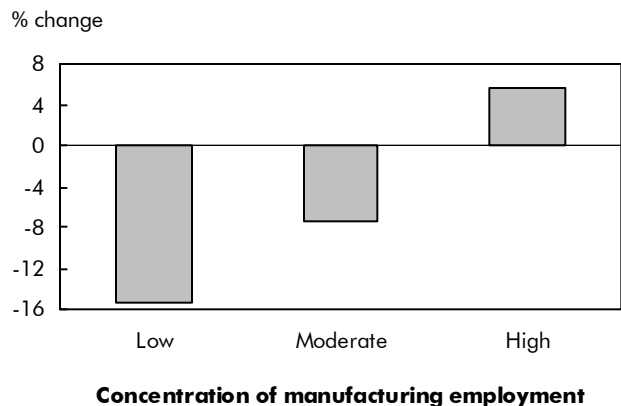
People in high-concentration regions were more likely to experience relatively large income losses (20% or more of their initial income), the probability of experiencing such a loss was between 18.4% and 29.9% higher than in low-concentration regions, depending on region size. They were also less likely to experience an income gain or no income loss during the period—the probability was between 4.1% and 6.0% lower than in low-concentration regions.

Region size mattered as well, since residents of small cities were more likely to experience income loss than residents of large urban centres. Residents of small regions (population 30,000 or less) with high manufacturing concentration were between 20.8% and 29.9% more likely to experience income loss than those in low-concentration regions of comparable size.

entire population, for manufacturing workers and for workers in other sectors. The same model was also used to estimate the probability that workers would receive EI benefits a specific number of times during the period. The results are all presented in the form of differences in predicted probabilities relative to the reference group, to determine how likely individuals are to experience one of the events in question: income loss, receiving EI or low-income status (see *Models*).

The probability that a person will experience a decline in total income⁸ is significantly associated with the concentration of local employment in manufacturing (Table 2). In fact, the higher the concentration of employment in manufacturing, the greater the probability of experiencing a decline in total income. The probability was between 12.6% and 18.4% higher than in low-concentration regions (for all region sizes combined). In moderate-concentration regions, the probability was between 7.1% and 10.1% higher.⁹

Chart D Change in number of persons with low income after tax



Note: The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 and 2007.

Manufacturing workers lost more income in regions with high manufacturing concentration

Workers employed in manufacturing were at greater risk of experiencing a decrease in income if they were employed in regions with high manufacturing concentration. That was the case regardless of region size or magnitude of loss. Overall, they were between 9.4% and 16.3% more likely to experience income loss than workers in a comparable job in a low-concentration region, and 5.0% less likely to experience a gain or no loss in income (Table 2). In addition, manufacturing workers were at greater risk of experiencing relatively high income losses, regardless of region size, but to a greater extent if they were employed outside a large urban centre. In such cases, the effect ranged between 19.6% for regions with a population

of 30,000 or less and 36.0% for regions with a population of 500,000 or less.

Income also decreases for workers in other sectors

Although the decline in manufacturing had a greater impact on the incomes of manufacturing workers, it also affected the incomes of workers in other sectors. The latter also had a significantly higher risk of experiencing income loss if they were employed in a region with high manufacturing concentration. That was the case for all levels of income loss and all sizes of region of residence. However, the effect was more pronounced outside large urban centres (population of 500,000 or less). For income losses of 20% or more of initial income, the effect ranged between 15.0% and 23.3%, compared with 10.5% for all regions, including large centres. This finding indicates that the decline in manufacturing employment seems to have had a greater impact on smaller regions, where labour demand is less diversified.

Table 2 Marginal effect on probability of loss in total income, by region size and concentration of manufacturing employment

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
%					
Overall population					
Moderate concentration					
Gain or no loss	-2,3	-1,6	-2,0	-1,6	-2,7
10% or less	7,1	5,0	6,7	5,4	9,7
Between 10% and 20%	8,3	5,8	7,8	6,2	11,3
20% or more	10,1	7,0	9,3	7,4	13,4
High concentration					
Gain or no loss	-4,1	-4,2	-5,3	-5,4	-6,0
10% or less	12,6	13,2	17,3	17,4	20,8
Between 10% and 20%	14,8	15,5	20,4	20,6	24,7
20% or more	18,4	19,1	25,0	25,4	29,9
Manufacturing workers					
High concentration					
Gain or no loss	-5,0	-5,1	-9,1	-6,7	-5,2
10% or less	9,4	10,7	21,4	14,0	12,1
Between 10% and 20%	12,3	13,8	27,8	18,3	15,6
20% or more	16,3	17,8	36,0	23,8	19,6
Workers in other sectors					
High concentration					
Gain or no loss	-2,3	-2,5	-3,2	-3,4	-4,4
10% or less	7,5	7,9	10,7	11,5	16,8
Between 10% and 20%	8,6	9,2	12,4	13,4	19,5
20% or more	10,5	11,1	15,0	16,2	23,3

Note: All data represent a significant difference from the reference group (persons age 20 to 29 in Quebec, living as a couple, with or without children, in a region with a low concentration of manufacturing employment) at the 0.05 level. The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

Risk of income loss higher among younger workers

For all sectors and concentration levels combined, persons age 40 and over in 2000—especially those from 50 to 57—had a significantly higher risk of experiencing income loss during the study period. The latter group was, on average, nearly 1.5 times more likely to experience income loss than those age 20 to 29 (Table 3). This may be attributable to the higher propensity of persons in the older age group to go into semi-retirement or retirement.

On the other hand, the most affected groups differ when degree of concentration and sector are

Table 3 Marginal effect on probability of loss in total income, by age group in 2000 and size of area of residence

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
Overall population					
30 to 39	46.4	43.6	45.3	44.1	47.2
40 to 49	82.7	79.6	84.6	82.7	92.7
50 to 57	141.6	144.7	149.9	144.8	162.0

Note: All data represent a significant difference from the reference group (persons age 20 to 29) at the 0.05 level. The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

controlled for. For example, among manufacturing workers in high-concentration regions, younger people were hardest-hit by the decline in manufacturing employment (Table 4). Workers age 20 to 29 were more likely to experience income loss (between 29.1% and 102.7%) than their same-age counterparts in low-concentration regions. However, they were also more likely to experience a loss of income when they lived in a smaller region. This suggests that younger workers were the first to be affected by the decline in manufacturing employment, probably because they had less job tenure.

Models

The estimates were generated by an ordered logistic regression model. The model's specifications are as follows:

$$Prob(y_i = m_j) = \alpha + \beta_1 Z_i + \beta_2 C_i + \epsilon_i$$

The **dependent variable** (y_i) is **total income loss** as a percentage of initial income for the analysis of income change, and **number of years** of receipt when the probability of being on EI is analyzed. In each case, the dependent variable is an ordered categorical variable—since the events (m_j) can be arranged in order of size—and requires the use of an ordered model.

The **events** considered in the analysis of income change are the following:

- gain or no loss in total income;
- total income loss less than or equal to 10%;
- total income loss greater than 10% but less than 20%;
- total income loss equal to or greater than 20%.

For the analysis of EI use, the events are the following:

- did not receive EI benefits at any time;
- received EI benefits for a period of one year;
- received EI benefits for a period of two consecutive years or not;
- received EI benefits for a period of three consecutive years or not, or for a longer period of time.

The C_i term refers to a vector of dummy variables indicating the level of local manufacturing concentration (as previously defined). The Z_i term contains dummy variables for province of residence, age and family composition.

The **predicted probabilities** were calculated using the ordered logistic regression model. Since the variables indicating the level of manufacturing concentration are

dummy variables, the marginal effect of living in a high-concentration region is equal to the difference in predicted probability between this group and the reference group, when the other independent variables are held constant. The reference group is composed of persons age 20 to 29 in 2000 (27 to 36 in 2007) living as a couple, with or without children, in a region with a low concentration of manufacturing employment in Quebec.

To **control for the effect of the size** of census metropolitan areas (CMAs) and census agglomerations (CAs), separate models were estimated for various subsamples based on population size:

- all CMAs and CAs;
- CMAs and CAs with a population of 1 million or less;
- all CMAs and CAs with a population of 500,000 or less;
- CAs with a population of 100,000 or less;
- CAs with a population of 30,000 or less.

Separate models were also estimated for manufacturing workers and workers in other sectors.

The **data in Tables 3 and 4** are from a simple logistic regression model. In the model, the dependent variable has a value of 1 if there is a loss in total income between 2000 and 2007, and 0 otherwise. The explanatory variables and the model's specifications are identical to those used in the ordered model.

The **data in Tables 5 and 7** are also from a simple logistic regression model. In this case, however, the dependent variable has a value of 1 if the person receives EI benefits or is in a low-income situation (depending on the situation studied), and 0 otherwise.

Table 4 Marginal effect on probability of loss in total income, by age group in 2000, size of area of residence, and concentration of manufacturing employment

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
%					
Manufacturing workers					
High concentration					
20 to 29	29.1	31.7	60.4	50.0	102.7
30 to 39	13.5	14.2	30.3	23.6	27.9
40 to 49	8.1	10.0	17.9	11.7	n.s.
50 to 57	9.5	8.5	11.1	5.6	n.s.
Workers in other sectors					
High concentration					
20 to 29	19.5	20.6	23.1	19.3	14.5
30 to 39	11.1	13.1	17.6	16.3	22.0
40 to 49	7.5	8.1	10.0	12.2	19.9
50 to 57	n.s.	n.s.	2.8	5.3	10.8

Note: n.s. is a not significant difference relative to the reference group (persons age 20 to 29 in Quebec, living as a couple, with or without children, in a region with a low concentration of manufacturing employment) at the 0.05 level. The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

ever, workers employed in manufacturing had a higher probability of EI use (Table 5).¹⁰ This is consistent with the findings of a previous study (Bernard 2009b), namely that job security dropped significantly for manufacturing workers, and, as a result, the difference in the duration of unemployment spells between manufacturing workers and workers in other sectors has never been so large. In other words, the job stability of manufacturing workers appears to have declined faster in regions with high manufacturing concentration, which can affect the job stability of workers in other sectors.

The risk of receiving EI for a (consecutive or not consecutive) period of one year, two years or three years or more between 2000 and 2007 (see *Models*) was also calculated. Overall, the findings show that living in a region with high manufacturing concentration

The same was also true, though to a lesser degree, for younger workers in other sectors, who were generally more likely to experience income loss if they were employed in a large urban centre than in a small city. The opposite effect was observed for older workers, who were more likely to experience income loss if they had a job in a small city.

Greater receipt of EI benefits in high-concentration regions

Overall, workers employed in a region with high manufacturing concentration were significantly more likely to receive EI benefits, irrespective of whether they were employed in manufacturing. How-

Table 5 Marginal effect on probability of being on Employment Insurance in 2007, by size of area of residence and concentration of manufacturing employment

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
%					
High concentration					
Manufacturing workers	39.1	36.3	21.9	10.6	n.s.
Workers in other sectors	17.6	16.4	5.6	4.6	26.0

Note: n.s. is a not significant difference relative to the reference group (persons age 20 to 29 in Quebec, living as a couple, with or without children, in a region with a low concentration of manufacturing employment) at the 0.05 level. The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

Table 6 Marginal effect on probability of being on Employment Insurance between 2000 and 2007, by size of area of residence and concentration of manufacturing employment

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
Manufacturing workers					
High concentration %					
0	-12.9	-13.1	9.0	n.s.	n.s.
1 year	-4.4	-5.3	-3.8	n.s.	n.s.
2 years	1.7	0.2	-0.4	n.s.	n.s.
3 years or more	13.8	12.6	7.8	n.s.	n.s.
Workers in other sectors					
High concentration					
0	-10.5	-10.3	-1.9	-2.1	-17.6
1 year	-1.9	-2.9	-0.7	-0.8	-7.2
2 years	3.3	1.8	n.s.	n.s.	-0.9
3 years or more	13.0	11.2	1.7	1.8	16.9

Note: n.s. is a not significant difference relative to the reference group (persons age 20 to 29 in Quebec, living as a couple, with or without children, in a region with a low concentration of manufacturing employment) at the 0.05 level.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

ers living in high-concentration regions with a population of 100,000 or less were not significantly more likely to receive EI than their counterparts in low-concentration regions (Table 6). In contrast, the effect on workers in other sectors tended to increase as region size decreased, rising from 13.0% for all CMAs and CAs to 16.9% for CAs with a population of 30,000 or less. In other words, manufacturing workers were more likely to receive EI if they were employed in a large urban centre, while workers in other sectors had a higher risk if their jobs were outside the major urban centres.

Increased low-income incidence in regions of high manufacturing concentration

Between 2000 and 2007, low-income incidence increased in regions with a high concentration

significantly increased the risk of receiving EI on several occasions (three years or more) during this period. It also lowered the probability of never filing an EI claim. That was true for both manufacturing workers and other workers.

Manufacturing workers in these regions were from 7.8% to 13.8% more likely to receive EI for a period of three years or more than their counterparts in low-concentration regions. For workers in other sectors, the difference was between 1.7% and 16.9% (Table 6).

The higher risk of receiving EI on several occasions in high-concentration regions disappears, however, with decreasing region size. In other words, manufacturing work-

Table 7 Marginal effect on probability of being in low income

	All regions combined	Census metropolitan areas and census agglomerations		Census agglomerations	
		1 million or less	500,000 or less	100,000 or less	30,000 or less
High concentration					
Combined population %					
2000	-7.3	-1.8	-5.6	-5.6	n.s.
2007	10.5	16.1	11.8	16.6	34.9
Manufacturing workers					
2000	-30.2	-17.2	-18.5	-16.6	n.s.
2007	n.s.	17.4	18.8	33.5	n.s.
Workers in other sectors					
2000	4.4	6.3	n.s.	n.s.	n.s.
2007	21.1	25.6	24.6	28.1	41.6

Note: n.s. is a not significant difference relative to the reference group (persons age 20 to 29 in Quebec, living as a couple, with or without children, in a region with a low concentration of manufacturing employment) at the 0.05 level. The concentration of manufacturing employment was kept constant with that calculated in 2000.

Source: Statistics Canada, Longitudinal Administrative Database, 2000 to 2007.

of manufacturing employment (Table 7). The higher incidence affected the overall population as well as manufacturing workers and workers in other sectors. In 2000, manufacturing workers living in high-concentration regions were less likely to be in low income than their counterparts in low-concentration regions, but in 2007, they were more likely.

Workers in other sectors living in high-concentration regions were 4.4% more likely in 2000 to be in low income than their counterparts in low-concentration regions. By 2007, the difference had increased to 21.1%. The incidence was considerably greater as region size decreased: 25.6% for areas with a population of 1 million or less and 41.6% for areas with a population of 30,000 or less. The increase in low-income incidence among those workers supports the idea that the decline in manufacturing employment affected the employment and income of workers in other sectors if manufacturing was an important part of the regional economy. A similar effect among manufacturing workers was observed, but the effect on smaller regions was not significant.

Conclusion

The global slowdown in manufacturing has affected Canada in a number of ways. Plant closures and mass layoffs had an impact not only on employment and working conditions for workers in the manufacturing sector, but also on economic activity and workers in other sectors. The goal of this study was to determine whether job losses in manufacturing were actually accompanied by income

Concentration rate

The **rate of employment concentration** in manufacturing was calculated for each census metropolitan area (CMA) and each census agglomeration (CA) in 2000. It is equal to the relative proportion of local employment in manufacturing, i.e., the number of manufacturing workers divided by the total number of workers. For comparability purposes, and because 2000 was the most recent peak in manufacturing employment, the concentration rate used for the entire observation period is the 2000 rate.

CMAs and CAs with a population of 500,000 or less were divided into three equally sized groups by level of concentration of local employment in manufacturing. The categories are as follows:

- **Low concentration:** 12% or less of employed persons in the CA or CMA work in manufacturing;
- **Moderate concentration:** more than 12% but less than 20% of employed persons in the CA or CMA work in manufacturing;
- **High concentration:** 20% or more of employed persons in the CA or CMA work in manufacturing.

CMAs and CAs with a population of more than 500,000 were excluded because they could skew the results with the size of their populations.

decreases at the regional level, and, if so, whether those losses were associated with the local rate of employment concentration in the manufacturing sector. Its aim was also to determine whether those job losses were behind a widespread slowdown in employment affecting the income of workers with jobs in other sectors.

The overall growth of employment and income in Canada masked changes experienced by some population groups, particularly those living in regions of high manufacturing concentration. These regions suffered the biggest job losses, which led to an increase in the number of workers on EI at the local level. Employment income and market income also declined in these regions, whereas they rose substantially in low-concentration regions. Moreover, the slowdown in manufacturing activ-

ity had a greater effect on those who were least well off, which resulted in an increase in the number of low-income people.

At the individual level, even though manufacturing workers were more affected by recent layoffs, workers in other sectors were significantly more likely to experience income loss if their jobs were in regions with a high concentration of manufacturing employment. They were also more likely to go receive EI benefits, which appears to indicate a decrease in job stability in those regions. The bottom line is that low-income incidence increased significantly for both the population as a whole and workers in all sectors.

These findings confirm the idea that the decline in manufacturing employment had an impact on the entire economy of regions where

manufacturing activity played a key part, thus affecting the employment and income of workers in other sectors. In those regions, job and income losses among manufacturing workers may have disrupted the employment market and local consumption decisions, thereby affecting all mechanisms of regional wealth creation. Apart from those considerations, the results show that not only manufacturing workers, but all types of workers in those regions, may experience income losses when there is a slowdown in the sector.

Perspectives

■ Notes

1. For more details concerning recent trends in manufacturing, see Kowaluk and Larmour (2009).
2. For information on the relationship between manufacturing and services, see François and Woerz (2007).
3. For more information on the dynamics of the manufacturing sector in Toronto, Montréal and Vancouver, see Vinodrai (2001).
4. This applies to total income (before and after tax), market income and employment income.
5. This is further supported by the proportion of people who reported earnings from retirement-related sources, which is quite similar from one concentration category to another in 2000 and 2007. In addition, the distribution of the proportion of those earnings relative to total reported income was, for all intents and purposes, identical for the three categories.
6. The levels of loss considered are as follows: 10% or less loss of total income, between 10% and 20% loss of total income, and 20% or more loss of total income.
7. The model includes variables for province of residence, family composition and age.
8. The same patterns were found in separate analyses for employment income and market income. However, total income is a better indicator of individual standard of living because it captures changes in income composition that may be due to retirement, transition from paid employment to self-employment, or job loss.
9. The comparison here is between total income in 2000 and 2007, in 2007 constant dollars.
10. The data in Table 5 are from a simple logistic regression model on the probability of a person being on EI in 2007 if he or she was not on EI in 2000. The model uses the same specifications as the ordered model.

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Appendix Ranking of census metropolitan areas and census agglomerations by relative proportion of manufacturing employment

Low concentration of manufacturing employment

St. John's	Corner Brook	Charlottetown
Gander	Labrador City	Halifax
Cape Breton	Thompson	Grande Prairie
Fredericton	Regina	Wood Buffalo
Bathurst	Yorkton	Wetaskiwin
Rimouski	Moose Jaw	Cranbrook
Sept-Îles	Swift Current	Victoria
Val-d'Or	North Battleford	Nanaimo
Rouyn-Noranda	Prince Albert	Courtenay
Kingston	Estevan	Prince George
North Bay	Medicine Hat	Dawson Creek
Sudbury	Lethbridge	Fort St. John
Elliot Lake	Red Deer	Whitehorse
Timmins	Camrose	Yellowknife
Kenora	Lloydminster	
Portage la Prairie	Grand Centre	

Moderate concentration of manufacturing employment

Grand Falls-Windsor	Pembroke (Quebec)	Brandon
Summerside	Bellefleur	Saskatoon
Kentville	Peterborough	Penticton
Truro	Lindsay	Kelowna
Moncton	St. Catharines-Niagara	Vernon
Saint John	London	Kamloops
Campbellton (Quebec)	Sarnia	Chilliwack
Matane	Owen Sound	Abbotsford
Rivière-du-Loup	Barrie	Duncan
Chicoutimi-Jonquière	Orillia	Campbell River
Alma	Haileybury	Powell River
Trois-Rivières	Sault Ste. Marie	Williams Lake
Joliette	Thunder Bay	Terrace

High concentration of manufacturing employment

New Glasgow	La Tuque	Hawkesbury
Edmundston	Drummondville	Brockville
Baie-Comeau	Granby	Cobourg
Dolbeau	Saint-Hyacinthe	Port Hope
Saint-Georges	Sorel	Oshawa
Thetford Mines	Saint-Jean-sur-Richelieu	Kitchener
Sherbrooke	Salaberry-de-Valleyfield	Brantford
Magog	Lachute	Woodstock
Cowansville	Cornwall	Tillsonburg
Victoriaville	Windsor	Simcoe
Shawinigan	Collingwood	Guelph
Stratford	Midland	Quesnel
Chatham	Port Alberni	Prince Rupert
Leamington		Kitimat
Strathroy		