

Education and earnings

Lucy Chung

Between 1980 and 2000, and particularly the latter half of the 1990s, the earnings gap widened between young workers who were less-educated and those who were well-educated. Several explanations have been suggested. Some research attributes the gap to skill-biased technological change, whereby workplaces supplanted manual labour with newer technology and processes requiring more skilled and better educated workers. The subsequent demand resulted in higher wages for such workers and hence increased returns to education. Other explanations include the growth of international trade (Wood 1994) and institutional changes such as the de-unionization of workplaces (Dinardo and Lemieux 1997).

In a global economy, industries that do not require a highly skilled, highly educated workforce search the world for cheap labour, often finding it in developing countries such as China, India or Mexico. This leaves Canadian workers with no postsecondary education facing significant uncertainty. Moreover, as the economy becomes more dependent on those with high levels of education, it is expected that the education wage premium will increase and the earnings gap between university and high school graduates will widen.

Recently, however, hot commodity and housing markets, as well as increased consumer spending since 2000, have led to a change in the industries and occupations with the most job growth. The frontrunners have been mining and oil and gas extraction, construction, and real estate, with increases of 17%, 18% and 10% respectively between 2000 and 2004 (Cross 2005). The retail sector also saw strong employment growth.

Although both blue-collar and white-collar jobs have become more plentiful since 2000, the most substantial growth occurred in positions not requiring post-

secondary education, such as retail sales and clerical for white-collar, and construction and mining for blue-collar. Such jobs generally employ a larger proportion of young, less-educated workers.

The favourable conditions in these industries and occupations in recent years raise the question as to what extent the wages of young, less-educated workers have recovered, if at all, since 2000 as a result of strong employment growth in lower-skilled jobs. This study aims to answer this question by comparing employment rates, the education gap, and the changing demand for less-educated and well-educated workers between 1980 and 2005 (see *Data sources and definitions*). Young workers refers to those aged 25 to 34 while older workers are 35 to 54.

Education levels still rising

In 1980, individuals without a high school diploma represented roughly one-third of young workers, and half of older workers (Table 1). However, from 1980 to 2000, the proportion of young workers without a

Table 1 Distribution of employees by educational attainment and age group

	Census		LFS	
	1980	2000	2000	2005
	%			
25 to 34	100	100	100	100
Some high school or less	29	16	12	9
High school diploma	17	13	20	18
Some postsecondary	40	48	44	46
University degree	14	24	24	27
35 to 54	100	100	100	100
Some high school or less	47	22	18	13
High school diploma	11	16	22	22
Some postsecondary	33	44	41	43
University degree	10	19	19	22

Sources: *Census of Population*; *Labour Force Survey*, January and July

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Data sources and definitions

This study uses census data from 1980, 1985, 1990, 1995 and 2000. The **Census**, which is taken every five years, is the only available source that provides consistent information on education level over the 20-year period in question. Since census data for 2005 are not yet available, the **Labour Force Survey** (LFS) was used to analyze changes in the labour market between 2000 and 2005. January and July data for each year were used.

The population is restricted to individuals aged 25 to 54 living in private households, and excludes full-time students, those living in the territories, unpaid family workers, and those working in the Armed Forces. Workers 55 and over were excluded since their performance in the labour market

may be affected by early retirement decisions. As well, other studies (Morissette and Johnson 2004; Morissette, Ostrovsky, and Picot 2004) have used this age cutoff, thus facilitating comparison with this study. The sample size for 2000 using the LFS was 110,668, representing 13.4 million Canadians. For 2005 the sample size was 53,114, representing 13.8 million.

Educational attainment is divided into four categories: some high school or less, high school diploma, some postsecondary, and university degree. **Real weekly earnings** are defined as annual earnings in 2004 dollars divided by the number of weeks actually worked.

diploma fell 13 percentage points, compared with 25 points for the older group. Meanwhile, the proportion with a university degree increased about 10 points for both groups. During the first five years of this decade the trend continued, with both age groups experiencing a 3-to-5-point reduction in their share of workers without a high school diploma and a 3-point rise in their share of university graduates. Clearly then, the educational landscape has changed over the last 25 years so that now a quarter of 25 to 34 year-olds and a fifth of 35 to 54 year-olds are university graduates, while the proportion without a high school diploma has dropped below 15%. If demand for less- and well-educated workers were constant, one would expect these changes in supply to have a positive effect on the employment and earnings of less-educated workers while negatively affecting those of the well-educated.

Falling employment rates for men throughout the 1980s and 1990s

The moderate increase in the overall employment rate for workers from 1980 to 2000 masks underlying differences by sex, age and edu-

Table 2 Employment rates by sex, age, and educational attainment

	Census			LFS		
	1980	1990	2000	2000	2003	2005
All employees	73.8	77.5	79.7	79.7	80.4	81.0
Men	87.7	84.5	84.6	85.5	84.8	85.1
25 to 34	90.8	85.3	86.9	88.8	87.7	88.3
Some high school or less	84.1	74.9	74.6	75.0	76.6	76.5
High school diploma	92.0	85.9	85.3	89.0	85.8	88.7
Some postsecondary	92.9	88.5	89.6	91.0	89.8	90.0
University degree	96.2	93.4	92.5	92.7	90.8	90.2
35 to 54	90.6	86.8	86.0	88.7	87.8	88.4
Some high school or less	85.7	77.9	75.3	80.1	77.3	79.1
High school diploma	92.1	88.1	86.9	89.2	87.7	88.5
Some postsecondary	93.9	89.5	88.6	90.4	90.2	89.9
University degree	97.1	94.6	92.2	92.7	91.1	91.7
Women	60.2	70.7	75.0	73.9	75.9	76.8
25 to 34	60.8	71.1	75.8	75.7	77.3	78.2
Some high school or less	46.1	52.4	52.0	46.8	48.8	49.0
High school diploma	57.8	68.6	67.4	70.9	69.3	72.0
Some postsecondary	68.1	76.7	79.2	79.0	81.6	81.0
University degree	79.9	85.5	86.0	84.9	83.1	84.8
35 to 54	56.8	70.9	75.7	75.0	77.1	77.9
Some high school or less	47.5	55.7	58.9	56.8	59.4	57.6
High school diploma	58.5	71.8	74.4	74.0	75.5	75.9
Some postsecondary	67.3	78.0	80.3	79.2	81.2	81.5
University degree	76.6	85.2	85.0	83.8	82.1	83.8

Sources: Census of Population; Labour Force Survey, January and July

cation. For example, while the increased participation of women in the labour market produced an enormous growth in their employment rate (15 percentage points), the employment rate for men fell by 3 points (Table 2).¹ Most of the drop for men occurred between 1980 and 1990, coinciding with the deepest and longest recession in the economy since the

Second World War. The decrease was seen for men in all age and education groups, but especially those without a high school diploma.²

Employment rates for those with a high school diploma or less were consistently lower than those of university graduates throughout the 1980-to-2000 period. The gap increased during these years, with employment rates declining more for less-educated men than for well-educated men in each age category. During the past five years, however, the trend has reversed. Rather than continuing to decline, employment rates among workers with less education remained relatively stable, while their university-educated counterparts witnessed only slight decreases in each age category.

Among young men, high school graduates found that their chances of being employed remained virtually unchanged, while university graduates saw their employment rate drop by 2.5 percentage points. During the 2000-to-2005 period, employment rates generally did not improve for men but continued to increase for women. The expectation that more blue-collar jobs would spur a rise in the proportion of less-educated men employed did not materialize. Only young men who had not completed high school saw their employment rate rise (from 75.0% in 2000 to 76.5% in 2005).

Employment rates of young, less-educated women rose slightly during the 2000-to-2005 period, with a 2.2 percentage point increase registered for those who did not finish high school. This could reflect the growth in retail sales and clerical jobs (Cross 2005). Employment rates for women university graduates remained fairly constant.

Possibly, the employment rates of less-educated men would have continued to decline had it not been for the rise in blue-collar jobs in mining, oil and gas extraction, construction, and real estate—

especially as the share of jobs in manufacturing continued its long-term trend of decline, from 19% in 1980 to 13% as of December 2005.³

Decomposition of employment

For analytic purposes, employment is often split into full-time paid, part-time paid, and self-employment. For the 1980-to-2000 period, full-time employment rates declined for men, regardless of their age or educational attainment. Between 2000 and 2005, decline in the full-time rate for men continued, but young workers with a university degree were responsible for most of it (Table 3). The overall employment rate for the well-educated group dropped 2.5 percentage points, as did their full-time employment rate (from 78.2% to 75.7%). And although the overall employment rate for young men with a high school diploma did not increase, examining the differences by employ-

Table 3 Full-time paid employment rates by sex, age, and educational attainment

	Census			LFS		
	1980	1990	2000	2000	2003	2005
	%					
All employees	56.5	59.1	59.3	58.8	59.9	60.4
Men	71.4	68.5	66.8	66.2	66.2	66.3
25 to 34	76.9	72.5	73.2	73.9	73.4	74.5
Some high school or less	68.5	61.6	60.5	59.7	61.2	62.9
High school diploma	78.5	72.6	70.4	72.1	71.9	74.6
Some postsecondary	80.1	76.2	76.1	76.8	75.4	76.5
University degree	82.1	80.2	79.4	78.2	76.7	75.7
35 to 54	72.0	69.3	67.6	67.0	67.3	67.1
Some high school or less	65.8	60.3	57.3	58.2	58.5	57.6
High school diploma	75.3	72.0	69.2	69.2	68.7	67.5
Some postsecondary	76.0	72.6	70.8	69.5	69.8	69.5
University degree	79.3	74.5	71.3	67.5	67.4	68.2
Women	41.7	49.9	52.0	51.3	53.5	54.5
25 to 34	43.9	52.4	56.0	56.4	59.5	59.9
Some high school or less	31.1	35.3	33.7	32.1	31.9	33.4
High school diploma	42.3	49.6	46.1	51.7	51.0	53.1
Some postsecondary	48.7	56.9	57.6	57.4	62.1	60.8
University degree	63.2	68.3	69.5	67.8	67.9	68.9
35 to 54	35.9	48.6	52.5	51.4	53.7	55.0
Some high school or less	29.4	37.1	39.5	37.0	40.3	40.2
High school diploma	37.5	50.2	51.8	52.0	53.0	53.5
Some postsecondary	41.9	52.9	55.4	54.2	56.0	57.5
University degree	55.7	61.6	61.2	57.8	58.7	59.6

Sources: Census of Population; Labour Force Survey, January and July

Table 4 Change in weekly earnings

	Overall				Full-time			
	Median		Average		Median		Average	
	1980-2000	2000-2005	1980-2000	2000-2005	1980-2000	2000-2005	1980-2000	2000-2005
				% change				
All employees	-1.2	-1.0	4.1	1.7	-0.3	0.1	5.3	1.7
Men	-6.5	-0.6	1.2	0.2	-5.8	-1.3	3.1	0.4
25 to 34	-16.9	0.9	-10.6	2.5	-15.7	1.9	-9.5	2.7
Some high school or less	-22.9	4.4	-21.1	7.8	-21.7	3.8	-20.3	8.1
High school diploma	-24.9	1.1	-21.0	5.2	-23.6	3.0	-19.8	5.1
Some postsecondary	-19.0	1.4	-14.5	2.6	-17.6	1.5	-13.6	2.7
University degree	-9.3	-1.3	0.3	-2.8	-8.0	0.9	1.2	-2.3
35 to 54	-6.8	-1.8	-0.4	-0.6	-5.7	-2.3	0.8	-0.5
Some high school or less	-14.0	-0.8	-10.6	0.6	-12.8	-1.2	-9.6	0.3
High school diploma	-16.9	-5.3	-15.7	-1.8	-15.1	-5.8	-14.4	-1.6
Some postsecondary	-10.5	-2.8	-5.6	-1.3	-9.8	-2.1	-4.6	-1.2
University degree	-11.4	-2.7	0.0	-3.9	-10.1	-4.4	1.9	-3.8
Women	12.6	4.1	18.1	4.8	14.2	2.0	19.1	4.5
25 to 34	0.8	3.5	5.3	5.3	-0.4	2.2	4.3	4.5
Some high school or less	-17.0	-1.8	-7.6	-1.6	-15.3	-0.9	-8.0	1.0
High school diploma	-20.2	0.4	-10.2	2.0	-15.2	-0.9	-9.4	0.5
Some postsecondary	-10.0	5.1	-4.4	5.1	-9.7	2.2	-5.4	3.8
University degree	-6.8	-0.6	0.5	2.4	-6.7	1.7	-1.1	2.7
35 to 54	17.2	3.5	22.8	5.4	16.3	3.6	19.1	4.6
Some high school or less	-1.5	2.1	5.9	5.5	-0.8	1.8	4.3	4.0
High school diploma	3.2	0.4	8.2	3.3	3.9	0.6	4.2	3.8
Some postsecondary	5.7	1.6	10.5	3.5	2.6	1.2	6.8	2.2
University degree	-4.5	-2.8	4.9	-0.1	-5.4	-4.8	2.5	-0.2

Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

ment type indicates that full-time paid employment for this group went up 2.5 percentage points, but was offset by a decrease in self-employment (data not shown).

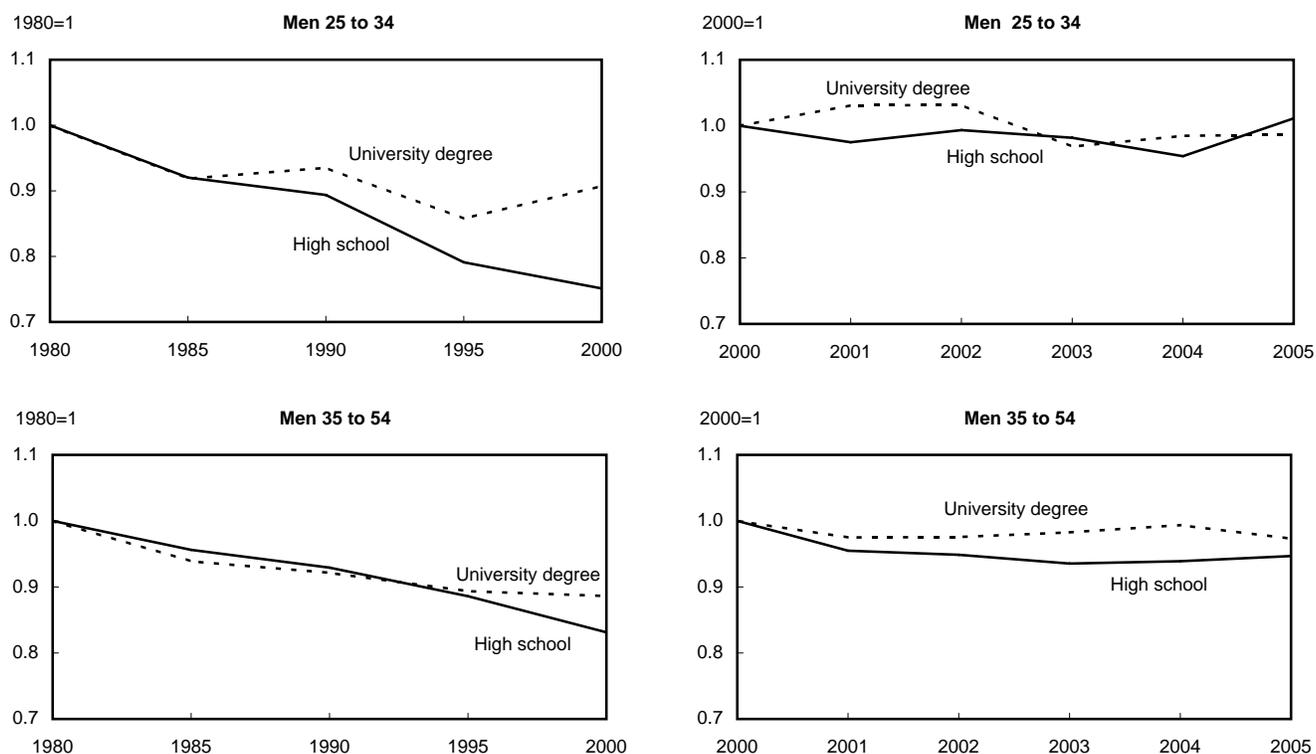
Between 1980 and 2000, full-time employment rates for women rose by at least 10 percentage points. This increase was more pronounced for the older age group where the rate increased almost 17%. Although full-time employment rates increased at all education levels, the rise was more pronounced among young, well-educated women than among those with less education. The older group saw increases at all education levels. Between 2000 and 2005, the full-time employment rate for women continued to climb for both age groups and for every level of education.

Given that full-time paid employment rates have risen slightly since 2000 for the young and less-educated, regardless of sex, it is interesting to see how the

increase and the concomitant shift to blue-collar and non-management white-collar jobs have affected their earnings.

Education–earnings gap

On the whole, the constant-dollar median weekly earnings of paid workers have seen little change in the past 25 years (Table 4).⁴ However, it is possible to find certain differences when examining earnings by age, sex and educational attainment. For example, between 1980 and 2000, men's median weekly earnings dropped by 7% while women's grew by 13%. In the last five years, median earnings have remained relatively constant for men while continuing to rise for women (4%). Average weekly earnings showed similar patterns.

Chart A Median real weekly wages of men

Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

The increase in women's earnings between 1980 and 2000 was concentrated among older women, who saw their average real weekly earnings rise by 23%, compared with 5% for younger women. Older men also fared better than their younger counterparts over this period, their average weekly earnings remaining relatively constant while those of young men fell 11%.⁵ Young male workers definitely bore the brunt of negative labour market changes in the 1980s and 1990s. Indeed, previous research has shown that between 1980 and 2000, real weekly earnings of young male high school graduates employed in the private sector fell 20% (Morissette, Ostrovsky and Picot, 2004).

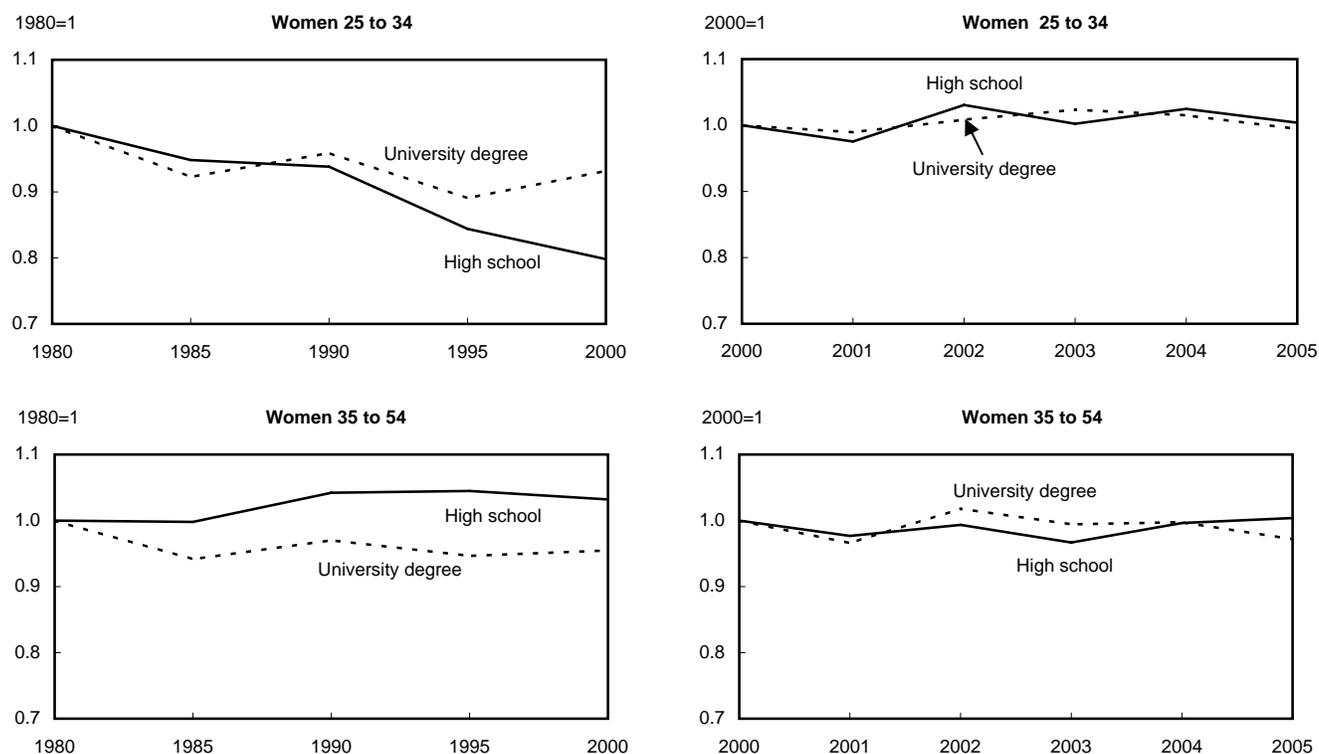
High school graduates in both age groups saw their earnings fall in relation to those with a university degree over this period (except for older women). For instance, average weekly earnings of young male high school graduates fell 21% between 1980 and 2000,

while their university-educated counterparts saw a slight increase of 0.3%. As a result, the wage gap between young workers with university and high school credentials rose over the period (Charts A and B).

Over the last five years, however, earnings trends have changed somewhat. In the case of younger men, the trend has reversed. Between 2000 and 2005, the average weekly earnings of young male employees with a high school diploma rose by 5% while dropping 3% for those with a university degree. Even though the earnings gap between university-educated workers and those with a high school diploma remains large, these recent movements have somewhat narrowed the gap.

Earnings effects of bust and boom

In an increasingly knowledge-based economy such as Canada's, the recent drop in real earnings among men with a university degree has been unexpected.

Chart B Median real weekly wages of women

Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

However, while many lost their jobs in the high-tech bust of 2001, others have found work in the flourishing oil and gas, mining and construction industries. In fact, the oil boom led to a 43% growth in employment in the oil and gas sector between 2000 and 2004 (Cross 2005). Construction was also booming over this period (26%), while overall employment growth from 2000 to 2005 was less than 10%.

In order to determine the extent to which the high-tech meltdown was a cause of the decline in earnings of men with a university degree over the past five years, the computer and telecommunications (CT) sector was excluded from the calculation of weekly earnings (Table 5).⁶ With this sector excluded, the average weekly earnings of young men fell by less than 1%, compared with 2.8% when it was included. For older men, median and average weekly earnings either

remained relatively constant or dropped even more when the CT sector was excluded. Wage changes in the CT sector therefore did not explain the drop in weekly earnings for this group of workers.

Employment growth in mining and oil and gas extraction, construction, and real estate likely contributed to the increase in weekly earnings for employees with high school education.⁷ Excluding these sectors should therefore lessen the increase, and indeed this is true for certain groups of workers. All sectors included, young men with a high school diploma saw their average weekly earnings increase by 5.2% from 2000 to 2005. With the high-growth sectors excluded, their real earnings increased only 3.2%. For young men without a high school diploma, including all sectors showed an average weekly earnings gain of 7.8%. When mining and oil and gas extraction, construction,

Table 5 Change in weekly earnings, 2000 to 2005

	Excluding computer and telecommunications sector				Excluding mining, oil and gas, construction, and real estate			
	Overall		Full-time		Overall		Full-time	
	Median	Average	Median	Average	Median	Average	Median	Average
	% change							
All employees	0.3	2.0	1.5	1.9	-0.2	1.4	0.6	1.4
Men	-0.9	0.5	-1.6	0.7	-1.1	-0.2	-1.6	0.1
25 to 34	1.6	3.5	1.3	3.7	0.1	1.5	0.7	1.7
Some high school or less	4.2	7.8	3.8	8.1	3.4	3.6	4.3	4.2
High school diploma	1.1	5.0	4.1	4.9	-0.2	3.2	0.4	3.0
Some postsecondary	0.1	3.1	0.7	3.2	0.3	2.2	1.4	2.4
University degree	0.4	-0.7	-1.0	-0.2	-1.9	-3.2	-0.1	-2.7
35 to 54	-3.5	-0.4	-2.3	-0.4	-3.5	-0.9	-2.7	-0.8
Some high school or less	-1.0	0.5	-1.2	0.2	-3.1	-0.3	-2.4	-0.4
High school diploma	-5.3	-1.7	-5.8	-1.6	-4.8	-2.3	-5.6	-2.1
Some postsecondary	-2.8	-1.3	-3.1	-1.1	-2.4	-1.6	-2.8	-1.4
University degree	-5.5	-3.7	-2.7	-3.5	-2.7	-4.0	-3.5	-4.0
Women	4.4	5.0	3.5	4.6	3.8	4.7	2.0	4.5
25 to 34	5.5	5.8	2.6	4.7	3.0	5.1	2.2	4.3
Some high school or less	-1.8	-1.9	-0.9	0.6	-0.5	-1.4	-0.9	0.9
High school diploma	0.4	2.6	-0.6	0.8	0.4	1.9	-0.9	0.2
Some postsecondary	6.3	5.4	3.0	4.1	4.6	4.6	2.2	3.4
University degree	0.3	2.9	2.9	2.8	-0.6	2.4	1.7	2.6
35 to 54	2.8	5.3	4.2	4.5	4.0	5.3	3.4	4.5
Some high school or less	1.0	5.4	1.6	3.8	1.1	5.2	1.3	3.6
High school diploma	0.1	3.4	1.8	4.0	0.4	3.2	1.2	3.6
Some postsecondary	1.8	3.6	1.9	2.3	2.0	3.5	1.0	2.4
University degree	-3.9	-0.5	-5.1	-0.7	-2.3	-0.2	-5.1	-0.3

Source: Labour Force Survey, January and July

and real estate were excluded, the rise was only 3.6%. For women, the high employment growth sectors had little effect on the earnings of those with a high school diploma or less.

It appears then that the CT sector explains a portion of the decrease in the average weekly earnings of young university-educated male workers but not those of their older counterparts. In addition, the sectors with high employment growth during the last five years contributed to the increase in earnings among young male employees with a high school diploma or less, but

had little effect on their older counterparts or women with the same education.

Summary

Over the last 25 years, technological advancement has increased the need for highly educated workers. In 2005, 72% of Canadians aged 25 to 34 had some type of postsecondary education, compared with 54% in 1980.

Employment rates also changed over the period. Women, regardless of education level, saw their employment rates increase as more

of them moved into the labour market. For men, however, rates decreased. Between 1980 and 2000, the decline was more pronounced for men with lower levels of education.

As a result of strong commodity and real estate markets, the past five years have seen a change from white-collar to blue-collar jobs, where young people with less education are mainly employed. Although this change does not appear to have boosted the employment rate of young, less-educated men, it may have mitigated any further

downward pressure on their employment rates. However, when employment rates are examined separately for full-time, part-time and self-employment, full-time employment of less-educated workers did rise over the last five years but was offset by a drop in self-employment.

Coinciding with the recent movement toward blue-collar jobs, average real earnings have increased more for young, less-educated men than for any other group. (Men with a university degree actually saw their decline.) Nevertheless, the real earnings of these men are still below their 1980 levels, and the gap between them and their university-educated counterparts is still large. Moreover, earnings growth among less-educated workers is not expected to be sustainable since the recent increases appear to be a result of short-term fluctuations in demand, mainly due to the boom in oil and gas, mining and construction.

Perspectives

■ Notes

- 1 Estimates for workers aged 15 to 24 are not presented because of small sample sizes.
- 2 The decline in employment rates does not reflect an absolute decline in employment but rather a decline relative to the growth in population.
- 3 The recent drop in male workers with a university degree could be attributed to the high-tech bust in 2001. The next year, employment in the computer and telecommunications sector fell by 10% and the unemployment rate jumped from 3.9% to 6.6%.
- 4 Overall median weekly earnings in 2005 were \$640; average weekly earnings were \$715.
- 5 The patterns are much the same for full-time employees (Table 3).
- 6 The CT sector includes the following NAICS (North American Industry Classification System) industries: commercial and service industry machinery manufacturing (3333), computer and peripheral equipment manufacturing (3341), communications equipment manufacturing (3342), audio and video equipment manufacturing (3343), semiconductor and other electronic components manufacturing (3344), navigational, measuring, medical and control instruments manufacturing (3345), computer and communications equipment and supplies wholesaler-distributors (4173), software publishers (5112), telecommunications (5133), data processing services (5142), computer systems design and related services (5415), electronic and precision equipment repair and maintenance (8112).
- 7 These high-growth sectors include the following NAICS industries: oil and gas extraction (2111), support activities for mining, and oil and gas extraction (2131), construction (23), real estate and rental and leasing (53).

■ References

- Cross, Philip. 2005. "Recent changes in the labour market." *Canadian Economic Observer* (Statistics Canada, catalogue no. 11-010) 18, no. 3 (March) 3.1-3.10.
- Dinardo, John and Thomas Lemieux. 1997. "Diverging male wage inequality in the United States and Canada, 1981-1988: Do institutions explain the difference?" *Industrial and Labor Relations Review* 50, no. 4 (July): 629-651.
- Morissette, René and Anick Johnson. 2004. *Are Good Jobs Disappearing in Canada?* Analytical Studies Branch Research Paper Series, no. 239. Catalogue no. 11-F0019-MIE2004239. Ottawa: Statistics Canada.
- Morissette, René, Yuri Ostrovsky and Garnett Picot. 2004. *Relative Wage Patterns among the Highly Educated in a Knowledge-based Economy.* Analytical Studies Branch Research Paper Series, no. 232. Catalogue no. 11-F0019-MIE2004232. Ottawa: Statistics Canada.
- Wood, Adrian. 1994. *North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-driven World.* Oxford: Clarendon Press.

Data sources and definitions

This study uses census data from 1980, 1985, 1990, 1995 and 2000. The **Census**, which is taken every five years, is the only available source that provides consistent information on education level over the 20-year period in question. Since census data for 2005 are not yet available, the **Labour Force Survey** (LFS) was used to analyze changes in the labour market between 2000 and 2005. January and July data for each year were used.

The population is restricted to individuals aged 25 to 54 living in private households, and excludes full-time students, those living in the territories, unpaid family workers, and those working in the Armed Forces. Workers 55 and over were excluded since their performance in the labour market

may be affected by early retirement decisions. As well, other studies (Morissette and Johnson 2004; Morissette, Ostrovsky, and Picot 2004) have used this age cutoff, thus facilitating comparison with this study. The sample size for 2000 using the LFS was 110,668, representing 13.4 million Canadians. For 2005 the sample size was 53,114, representing 13.8 million.

Educational attainment is divided into four categories: some high school or less, high school diploma, some postsecondary, and university degree. **Real weekly earnings** are defined as annual earnings in 2004 dollars divided by the number of weeks actually worked.

diploma fell 13 percentage points, compared with 25 points for the older group. Meanwhile, the proportion with a university degree increased about 10 points for both groups. During the first five years of this decade the trend continued, with both age groups experiencing a 3-to-5-point reduction in their share of workers without a high school diploma and a 3-point rise in their share of university graduates. Clearly then, the educational landscape has changed over the last 25 years so that now a quarter of 25 to 34 year-olds and a fifth of 35 to 54 year-olds are university graduates, while the proportion without a high school diploma has dropped below 15%. If demand for less- and well-educated workers were constant, one would expect these changes in supply to have a positive effect on the employment and earnings of less-educated workers while negatively affecting those of the well-educated.

Falling employment rates for men throughout the 1980s and 1990s

The moderate increase in the overall employment rate for workers from 1980 to 2000 masks underlying differences by sex, age and edu-

Table 2 Employment rates by sex, age, and educational attainment

	Census			LFS		
	1980	1990	2000	2000	2003	2005
All employees	73.8	77.5	79.7	79.7	80.4	81.0
Men	87.7	84.5	84.6	85.5	84.8	85.1
25 to 34	90.8	85.3	86.9	88.8	87.7	88.3
Some high school or less	84.1	74.9	74.6	75.0	76.6	76.5
High school diploma	92.0	85.9	85.3	89.0	85.8	88.7
Some postsecondary	92.9	88.5	89.6	91.0	89.8	90.0
University degree	96.2	93.4	92.5	92.7	90.8	90.2
35 to 54	90.6	86.8	86.0	88.7	87.8	88.4
Some high school or less	85.7	77.9	75.3	80.1	77.3	79.1
High school diploma	92.1	88.1	86.9	89.2	87.7	88.5
Some postsecondary	93.9	89.5	88.6	90.4	90.2	89.9
University degree	97.1	94.6	92.2	92.7	91.1	91.7
Women	60.2	70.7	75.0	73.9	75.9	76.8
25 to 34	60.8	71.1	75.8	75.7	77.3	78.2
Some high school or less	46.1	52.4	52.0	46.8	48.8	49.0
High school diploma	57.8	68.6	67.4	70.9	69.3	72.0
Some postsecondary	68.1	76.7	79.2	79.0	81.6	81.0
University degree	79.9	85.5	86.0	84.9	83.1	84.8
35 to 54	56.8	70.9	75.7	75.0	77.1	77.9
Some high school or less	47.5	55.7	58.9	56.8	59.4	57.6
High school diploma	58.5	71.8	74.4	74.0	75.5	75.9
Some postsecondary	67.3	78.0	80.3	79.2	81.2	81.5
University degree	76.6	85.2	85.0	83.8	82.1	83.8

Sources: Census of Population; Labour Force Survey, January and July

cation. For example, while the increased participation of women in the labour market produced an enormous growth in their employment rate (15 percentage points), the employment rate for men fell by 3 points (Table 2).¹ Most of the drop for men occurred between 1980 and 1990, coinciding with the deepest and longest recession in the economy since the

Second World War. The decrease was seen for men in all age and education groups, but especially those without a high school diploma.²

Employment rates for those with a high school diploma or less were consistently lower than those of university graduates throughout the 1980-to-2000 period. The gap increased during these years, with employment rates declining more for less-educated men than for well-educated men in each age category. During the past five years, however, the trend has reversed. Rather than continuing to decline, employment rates among workers with less education remained relatively stable, while their university-educated counterparts witnessed only slight decreases in each age category.

Among young men, high school graduates found that their chances of being employed remained virtually unchanged, while university graduates saw their employment rate drop by 2.5 percentage points. During the 2000-to-2005 period, employment rates generally did not improve for men but continued to increase for women. The expectation that more blue-collar jobs would spur a rise in the proportion of less-educated men employed did not materialize. Only young men who had not completed high school saw their employment rate rise (from 75.0% in 2000 to 76.5% in 2005).

Employment rates of young, less-educated women rose slightly during the 2000-to-2005 period, with a 2.2 percentage point increase registered for those who did not finish high school. This could reflect the growth in retail sales and clerical jobs (Cross 2005). Employment rates for women university graduates remained fairly constant.

Possibly, the employment rates of less-educated men would have continued to decline had it not been for the rise in blue-collar jobs in mining, oil and gas extraction, construction, and real estate—

especially as the share of jobs in manufacturing continued its long-term trend of decline, from 19% in 1980 to 13% as of December 2005.³

Decomposition of employment

For analytic purposes, employment is often split into full-time paid, part-time paid, and self-employment. For the 1980-to-2000 period, full-time employment rates declined for men, regardless of their age or educational attainment. Between 2000 and 2005, decline in the full-time rate for men continued, but young workers with a university degree were responsible for most of it (Table 3). The overall employment rate for the well-educated group dropped 2.5 percentage points, as did their full-time employment rate (from 78.2% to 75.7%). And although the overall employment rate for young men with a high school diploma did not increase, examining the differences by employ-

Table 3 Full-time paid employment rates by sex, age, and educational attainment

	Census			LFS		
	1980	1990	2000	2000	2003	2005
	%					
All employees	56.5	59.1	59.3	58.8	59.9	60.4
Men	71.4	68.5	66.8	66.2	66.2	66.3
25 to 34	76.9	72.5	73.2	73.9	73.4	74.5
Some high school or less	68.5	61.6	60.5	59.7	61.2	62.9
High school diploma	78.5	72.6	70.4	72.1	71.9	74.6
Some postsecondary	80.1	76.2	76.1	76.8	75.4	76.5
University degree	82.1	80.2	79.4	78.2	76.7	75.7
35 to 54	72.0	69.3	67.6	67.0	67.3	67.1
Some high school or less	65.8	60.3	57.3	58.2	58.5	57.6
High school diploma	75.3	72.0	69.2	69.2	68.7	67.5
Some postsecondary	76.0	72.6	70.8	69.5	69.8	69.5
University degree	79.3	74.5	71.3	67.5	67.4	68.2
Women	41.7	49.9	52.0	51.3	53.5	54.5
25 to 34	43.9	52.4	56.0	56.4	59.5	59.9
Some high school or less	31.1	35.3	33.7	32.1	31.9	33.4
High school diploma	42.3	49.6	46.1	51.7	51.0	53.1
Some postsecondary	48.7	56.9	57.6	57.4	62.1	60.8
University degree	63.2	68.3	69.5	67.8	67.9	68.9
35 to 54	35.9	48.6	52.5	51.4	53.7	55.0
Some high school or less	29.4	37.1	39.5	37.0	40.3	40.2
High school diploma	37.5	50.2	51.8	52.0	53.0	53.5
Some postsecondary	41.9	52.9	55.4	54.2	56.0	57.5
University degree	55.7	61.6	61.2	57.8	58.7	59.6

Sources: Census of Population; Labour Force Survey, January and July

Table 4 Change in weekly earnings

	Overall				Full-time			
	Median		Average		Median		Average	
	1980-2000	2000-2005	1980-2000	2000-2005	1980-2000	2000-2005	1980-2000	2000-2005
	% change							
All employees	-1.2	-1.0	4.1	1.7	-0.3	0.1	5.3	1.7
Men	-6.5	-0.6	1.2	0.2	-5.8	-1.3	3.1	0.4
25 to 34	-16.9	0.9	-10.6	2.5	-15.7	1.9	-9.5	2.7
Some high school or less	-22.9	4.4	-21.1	7.8	-21.7	3.8	-20.3	8.1
High school diploma	-24.9	1.1	-21.0	5.2	-23.6	3.0	-19.8	5.1
Some postsecondary	-19.0	1.4	-14.5	2.6	-17.6	1.5	-13.6	2.7
University degree	-9.3	-1.3	0.3	-2.8	-8.0	0.9	1.2	-2.3
35 to 54	-6.8	-1.8	-0.4	-0.6	-5.7	-2.3	0.8	-0.5
Some high school or less	-14.0	-0.8	-10.6	0.6	-12.8	-1.2	-9.6	0.3
High school diploma	-16.9	-5.3	-15.7	-1.8	-15.1	-5.8	-14.4	-1.6
Some postsecondary	-10.5	-2.8	-5.6	-1.3	-9.8	-2.1	-4.6	-1.2
University degree	-11.4	-2.7	0.0	-3.9	-10.1	-4.4	1.9	-3.8
Women	12.6	4.1	18.1	4.8	14.2	2.0	19.1	4.5
25 to 34	0.8	3.5	5.3	5.3	-0.4	2.2	4.3	4.5
Some high school or less	-17.0	-1.8	-7.6	-1.6	-15.3	-0.9	-8.0	1.0
High school diploma	-20.2	0.4	-10.2	2.0	-15.2	-0.9	-9.4	0.5
Some postsecondary	-10.0	5.1	-4.4	5.1	-9.7	2.2	-5.4	3.8
University degree	-6.8	-0.6	0.5	2.4	-6.7	1.7	-1.1	2.7
35 to 54	17.2	3.5	22.8	5.4	16.3	3.6	19.1	4.6
Some high school or less	-1.5	2.1	5.9	5.5	-0.8	1.8	4.3	4.0
High school diploma	3.2	0.4	8.2	3.3	3.9	0.6	4.2	3.8
Some postsecondary	5.7	1.6	10.5	3.5	2.6	1.2	6.8	2.2
University degree	-4.5	-2.8	4.9	-0.1	-5.4	-4.8	2.5	-0.2

Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

ment type indicates that full-time paid employment for this group went up 2.5 percentage points, but was offset by a decrease in self-employment (data not shown).

Between 1980 and 2000, full-time employment rates for women rose by at least 10 percentage points. This increase was more pronounced for the older age group where the rate increased almost 17%. Although full-time employment rates increased at all education levels, the rise was more pronounced among young, well-educated women than among those with less education. The older group saw increases at all education levels. Between 2000 and 2005, the full-time employment rate for women continued to climb for both age groups and for every level of education.

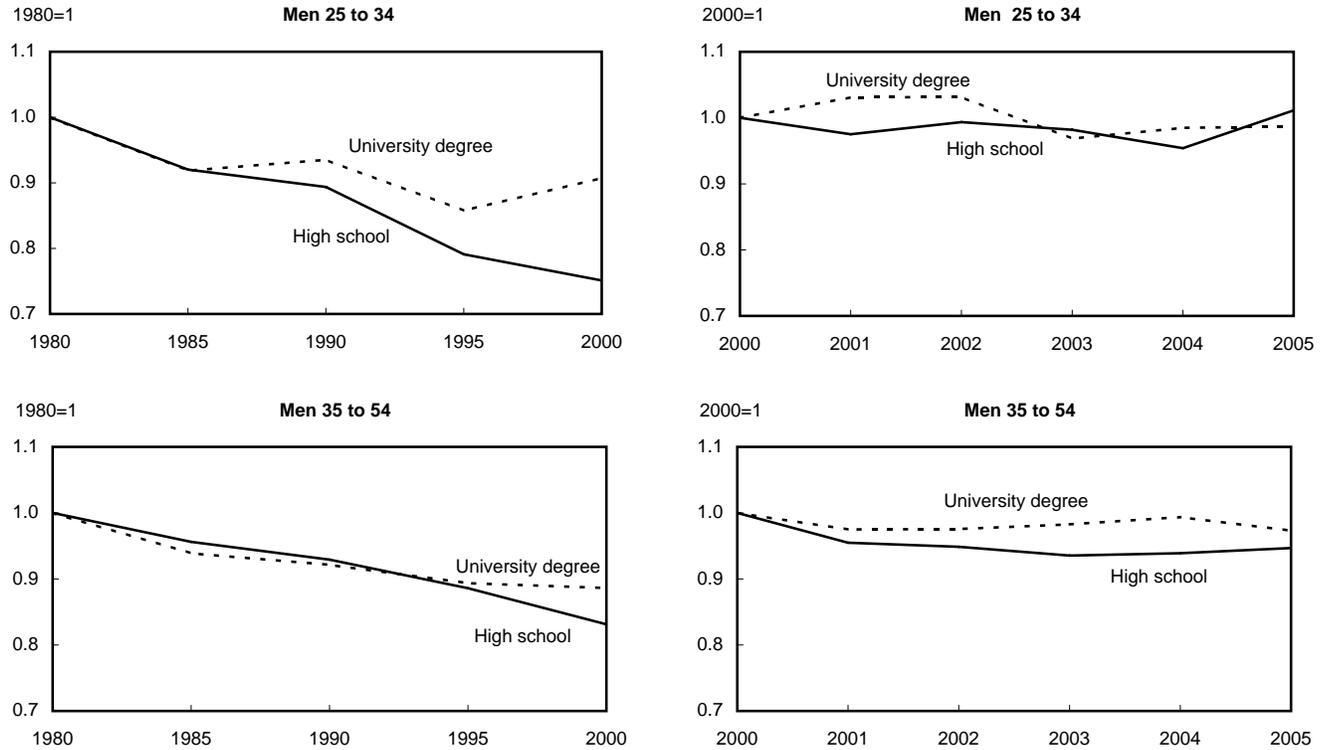
Given that full-time paid employment rates have risen slightly since 2000 for the young and less-educated, regardless of sex, it is interesting to see how the

increase and the concomitant shift to blue-collar and non-management white-collar jobs have affected their earnings.

Education–earnings gap

On the whole, the constant-dollar median weekly earnings of paid workers have seen little change in the past 25 years (Table 4).⁴ However, it is possible to find certain differences when examining earnings by age, sex and educational attainment. For example, between 1980 and 2000, men's median weekly earnings dropped by 7% while women's grew by 13%. In the last five years, median earnings have remained relatively constant for men while continuing to rise for women (4%). Average weekly earnings showed similar patterns.

Chart A Median real weekly wages of men



Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

The increase in women’s earnings between 1980 and 2000 was concentrated among older women, who saw their average real weekly earnings rise by 23%, compared with 5% for younger women. Older men also fared better than their younger counterparts over this period, their average weekly earnings remaining relatively constant while those of young men fell 11%.⁵ Young male workers definitely bore the brunt of negative labour market changes in the 1980s and 1990s. Indeed, previous research has shown that between 1980 and 2000, real weekly earnings of young male high school graduates employed in the private sector fell 20% (Morissette, Ostrovsky and Picot, 2004).

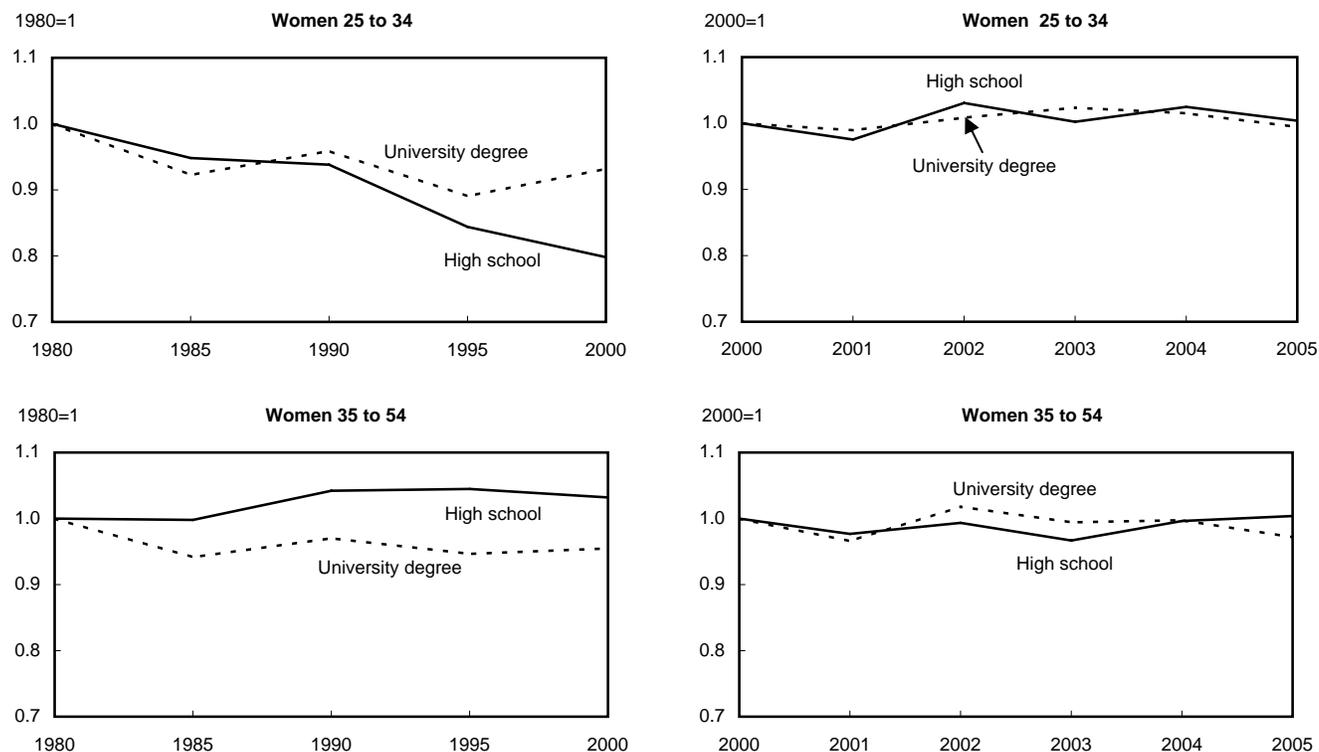
High school graduates in both age groups saw their earnings fall in relation to those with a university degree over this period (except for older women). For instance, average weekly earnings of young male high school graduates fell 21% between 1980 and 2000,

while their university-educated counterparts saw a slight increase of 0.3%. As a result, the wage gap between young workers with university and high school credentials rose over the period (Charts A and B).

Over the last five years, however, earnings trends have changed somewhat. In the case of younger men, the trend has reversed. Between 2000 and 2005, the average weekly earnings of young male employees with a high school diploma rose by 5% while dropping 3% for those with a university degree. Even though the earnings gap between university-educated workers and those with a high school diploma remains large, these recent movements have somewhat narrowed the gap.

Earnings effects of bust and boom

In an increasingly knowledge-based economy such as Canada’s, the recent drop in real earnings among men with a university degree has been unexpected.

Chart B Median real weekly wages of women

Sources: Census of Population, 1980 to 2000; Labour Force Survey, January and July 2000 to 2005

However, while many lost their jobs in the high-tech bust of 2001, others have found work in the flourishing oil and gas, mining and construction industries. In fact, the oil boom led to a 43% growth in employment in the oil and gas sector between 2000 and 2004 (Cross 2005). Construction was also booming over this period (26%), while overall employment growth from 2000 to 2005 was less than 10%.

In order to determine the extent to which the high-tech meltdown was a cause of the decline in earnings of men with a university degree over the past five years, the computer and telecommunications (CT) sector was excluded from the calculation of weekly earnings (Table 5).⁶ With this sector excluded, the average weekly earnings of young men fell by less than 1%, compared with 2.8% when it was included. For older men, median and average weekly earnings either

remained relatively constant or dropped even more when the CT sector was excluded. Wage changes in the CT sector therefore did not explain the drop in weekly earnings for this group of workers.

Employment growth in mining and oil and gas extraction, construction, and real estate likely contributed to the increase in weekly earnings for employees with high school education.⁷ Excluding these sectors should therefore lessen the increase, and indeed this is true for certain groups of workers. All sectors included, young men with a high school diploma saw their average weekly earnings increase by 5.2% from 2000 to 2005. With the high-growth sectors excluded, their real earnings increased only 3.2%. For young men without a high school diploma, including all sectors showed an average weekly earnings gain of 7.8%. When mining and oil and gas extraction, construction,

Table 5 Change in weekly earnings, 2000 to 2005

	Excluding computer and telecommunications sector				Excluding mining, oil and gas, construction, and real estate			
	Overall		Full-time		Overall		Full-time	
	Median	Average	Median	Average	Median	Average	Median	Average
	% change							
All employees	0.3	2.0	1.5	1.9	-0.2	1.4	0.6	1.4
Men	-0.9	0.5	-1.6	0.7	-1.1	-0.2	-1.6	0.1
25 to 34	1.6	3.5	1.3	3.7	0.1	1.5	0.7	1.7
Some high school or less	4.2	7.8	3.8	8.1	3.4	3.6	4.3	4.2
High school diploma	1.1	5.0	4.1	4.9	-0.2	3.2	0.4	3.0
Some postsecondary	0.1	3.1	0.7	3.2	0.3	2.2	1.4	2.4
University degree	0.4	-0.7	-1.0	-0.2	-1.9	-3.2	-0.1	-2.7
35 to 54	-3.5	-0.4	-2.3	-0.4	-3.5	-0.9	-2.7	-0.8
Some high school or less	-1.0	0.5	-1.2	0.2	-3.1	-0.3	-2.4	-0.4
High school diploma	-5.3	-1.7	-5.8	-1.6	-4.8	-2.3	-5.6	-2.1
Some postsecondary	-2.8	-1.3	-3.1	-1.1	-2.4	-1.6	-2.8	-1.4
University degree	-5.5	-3.7	-2.7	-3.5	-2.7	-4.0	-3.5	-4.0
Women	4.4	5.0	3.5	4.6	3.8	4.7	2.0	4.5
25 to 34	5.5	5.8	2.6	4.7	3.0	5.1	2.2	4.3
Some high school or less	-1.8	-1.9	-0.9	0.6	-0.5	-1.4	-0.9	0.9
High school diploma	0.4	2.6	-0.6	0.8	0.4	1.9	-0.9	0.2
Some postsecondary	6.3	5.4	3.0	4.1	4.6	4.6	2.2	3.4
University degree	0.3	2.9	2.9	2.8	-0.6	2.4	1.7	2.6
35 to 54	2.8	5.3	4.2	4.5	4.0	5.3	3.4	4.5
Some high school or less	1.0	5.4	1.6	3.8	1.1	5.2	1.3	3.6
High school diploma	0.1	3.4	1.8	4.0	0.4	3.2	1.2	3.6
Some postsecondary	1.8	3.6	1.9	2.3	2.0	3.5	1.0	2.4
University degree	-3.9	-0.5	-5.1	-0.7	-2.3	-0.2	-5.1	-0.3

Source: Labour Force Survey, January and July

and real estate were excluded, the rise was only 3.6%. For women, the high employment growth sectors had little effect on the earnings of those with a high school diploma or less.

It appears then that the CT sector explains a portion of the decrease in the average weekly earnings of young university-educated male workers but not those of their older counterparts. In addition, the sectors with high employment growth during the last five years contributed to the increase in earnings among young male employees with a high school diploma or less, but

had little effect on their older counterparts or women with the same education.

Summary

Over the last 25 years, technological advancement has increased the need for highly educated workers. In 2005, 72% of Canadians aged 25 to 34 had some type of postsecondary education, compared with 54% in 1980.

Employment rates also changed over the period. Women, regardless of education level, saw their employment rates increase as more

of them moved into the labour market. For men, however, rates decreased. Between 1980 and 2000, the decline was more pronounced for men with lower levels of education.

As a result of strong commodity and real estate markets, the past five years have seen a change from white-collar to blue-collar jobs, where young people with less education are mainly employed. Although this change does not appear to have boosted the employment rate of young, less-educated men, it may have mitigated any further

downward pressure on their employment rates. However, when employment rates are examined separately for full-time, part-time and self-employment, full-time employment of less-educated workers did rise over the last five years but was offset by a drop in self-employment.

Coinciding with the recent movement toward blue-collar jobs, average real earnings have increased more for young, less-educated men than for any other group. (Men with a university degree actually saw their decline.) Nevertheless, the real earnings of these men are still below their 1980 levels, and the gap between them and their university-educated counterparts is still large. Moreover, earnings growth among less-educated workers is not expected to be sustainable since the recent increases appear to be a result of short-term fluctuations in demand, mainly due to the boom in oil and gas, mining and construction.

Perspectives

■ Notes

- 1 Estimates for workers aged 15 to 24 are not presented because of small sample sizes.
- 2 The decline in employment rates does not reflect an absolute decline in employment but rather a decline relative to the growth in population.
- 3 The recent drop in male workers with a university degree could be attributed to the high-tech bust in 2001. The next year, employment in the computer and telecommunications sector fell by 10% and the unemployment rate jumped from 3.9% to 6.6%.
- 4 Overall median weekly earnings in 2005 were \$640; average weekly earnings were \$715.
- 5 The patterns are much the same for full-time employees (Table 3).
- 6 The CT sector includes the following NAICS (North American Industry Classification System) industries: commercial and service industry machinery manufacturing (3333), computer and peripheral equipment manufacturing (3341), communications equipment manufacturing (3342), audio and video equipment manufacturing (3343), semiconductor and other electronic components manufacturing (3344), navigational, measuring, medical and control instruments manufacturing (3345), computer and communications equipment and supplies wholesaler-distributors (4173), software publishers (5112), telecommunications (5133), data processing services (5142), computer systems design and related services (5415), electronic and precision equipment repair and maintenance (8112).
- 7 These high-growth sectors include the following NAICS industries: oil and gas extraction (2111), support activities for mining, and oil and gas extraction (2131), construction (23), real estate and rental and leasing (53).

■ References

- Cross, Philip. 2005. "Recent changes in the labour market." *Canadian Economic Observer* (Statistics Canada, catalogue no. 11-010) 18, no. 3 (March) 3.1-3.10.
- Dinardo, John and Thomas Lemieux. 1997. "Diverging male wage inequality in the United States and Canada, 1981-1988: Do institutions explain the difference?" *Industrial and Labor Relations Review* 50, no. 4 (July): 629-651.
- Morissette, René and Anick Johnson. 2004. *Are Good Jobs Disappearing in Canada?* Analytical Studies Branch Research Paper Series, no. 239. Catalogue no. 11-F0019-MIE2004239. Ottawa: Statistics Canada.
- Morissette, René, Yuri Ostrovsky and Garnett Picot. 2004. *Relative Wage Patterns among the Highly Educated in a Knowledge-based Economy.* Analytical Studies Branch Research Paper Series, no. 232. Catalogue no. 11-F0019-MIE2004232. Ottawa: Statistics Canada.
- Wood, Adrian. 1994. *North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-driven World.* Oxford: Clarendon Press.