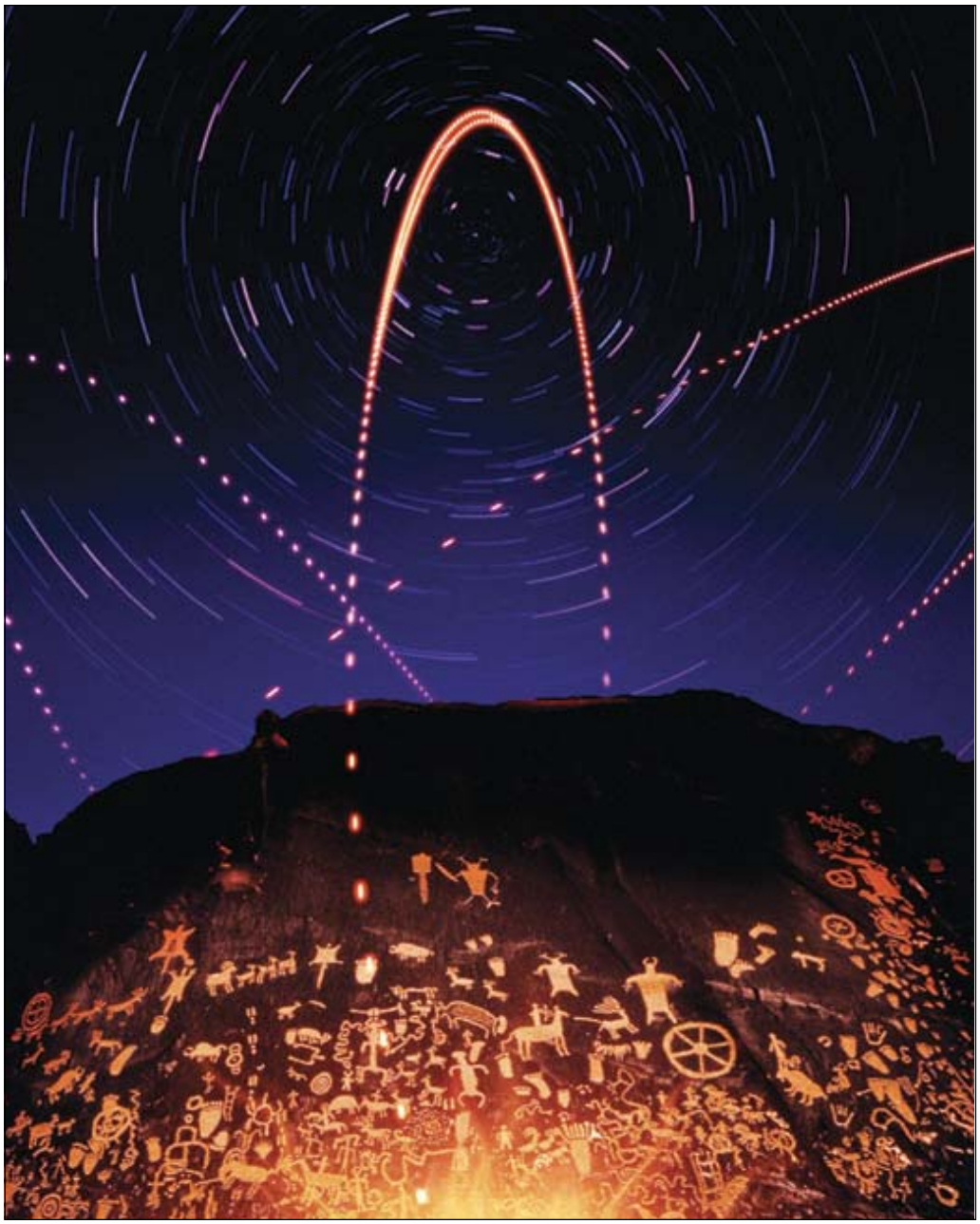
Catalogue no. 75-001-XIE

PERSPECTIVES

ON LABOUR AND INCOME

NOVEMBER 2002
Vol. 3, No. 11

- CUMULATIVE EARNINGS AMONG YOUNG WORKERS
- EARNINGS OVER TIME
- INCOME AND WEALTH



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(Catalogue no. 75-001-XIE; aussi disponible en français: *L'emploi et le revenu en perspective*, nº 75-001-XIF au catalogue) is published monthly by authority of the Minister responsible for Statistics Canada. ©Minister of Industry 2002.
ISSN: 0840-8750.

PRICE: CDN $5.00 per issue, CDN $48.00 for a one-year subscription, plus applicable taxes.

Symbols

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
p	preliminary
r	revised
x	confidential
E	use with caution
F	too unreliable to be published

Highlights

In this issue

Cumulative earnings among young workers

- Between 1988 and 1999, Canadian-born men aged 26 to 35 in 1999 cumulated $246,500 in wages and salaries (in 1999 dollars), fully $40,000 less then their counterparts between 1973 and 1984. Young immigrant men fared worse. Their cumulative wages and salaries fell by more than $75,000 between the 1973 to 1984 and 1988 to 1999 periods.
- Canadian-born women of the same age amassed $172,000 between 1988 and 1999, $20,000 more than between 1973 and 1984. Cumulative wages and salaries of young immigrant women remained virtually unchanged at $176,000.
- The decline in cumulative earnings (wages and salaries plus self-employment earnings) of young men is likely the major factor underlying the decline in median wealth of young families. Median wealth of young Canadian-born and immigrant families (aged 26 to 35) fell by $8,000 and $23,000, respectively. The substantial decline in cumulative earnings of young immigrants was associated with a decline in homeownership among these families.
- Student debt played only a minor role. Between 1982 and 1995, the average amount owed at graduation by male bachelor's graduates increased by about $4,000 (in 1999 dollars). This is less than one-tenth the decline in cumulative earnings of young Canadian-born men between the 1973 to 1984 and 1988 to 1999 periods.

Earnings over time

- The overall variation of age-adjusted earnings among men increased substantially (13%) between the periods 1982 to 1989 and 1990 to 1997. In comparison, the increase among women was quite modest (1.5%).

Income and wealth

- Persons under 25 are the poorest in terms of both net worth ($1,800) and after-tax income ($12,600), likely because most of them are students or young unskilled workers.
- Debt peaks in the 35 to 49 age group and then falls rapidly, helping net worth to increase rapidly. Between the ages 25 to 34 and 35 to 49, income rose from $33,000 to $42,100 (+28%) and net worth more than tripled, from $28,100 to $86,500 (+208%).
- After those under 25, those 65 and over are the poorest in terms of after-tax income. Income in this group fell to $24,400 from $39,300 in the 50 to 64 age group. On the other hand, debts are almost non-existent.

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Cumulative earnings among young workers

René Morissette

THE LABOUR MARKET has changed markedly over the last three decades. Young people now stay in school longer than in the mid-1970s. Young men not attending school are less likely to be employed full time, and for much of the 1990s, those who worked full year, full time, received lower earnings than their counterparts in the mid-1970s. But, young women not attending school are generally more likely to have a full-time job than their counterparts three decades ago, and many of those who work full year, full time receive higher earnings.

While changes in *annual* earnings of various groups of workers over the last three decades have been well documented (Morissette, Myles and Picot 1994; Beach and Slotsve 1996; Heisz, Jackson and Picot 2002), the combined effect of changes in school attendance, full-time employment rates, and annual earnings on *cumulative* earnings—the sum of earnings that individuals receive over several years—has not been investigated.

Cumulative earnings are important for several reasons. Decreases in cumulative earnings and the resulting effect on wealth holdings may lessen the ability of individuals to buffer income losses caused by permanent layoffs. With a smaller financial cushion, they may postpone the decision to leave home, get married, have children, buy a first house, or start a business. They may also reduce consumption during unemployment spells, search more intensely for a new job if unemployed, and be less likely to quit a job.

Using the Survey of Consumer Finances and the Survey of Labour and Income Dynamics, this article first reviews changes in school attendance, employment rates, and earnings in Canada since the mid 1970s. It then provides estimates of cumulative earnings over two 12-year periods—1973 to 1984 and 1988 to 1999—and examines the extent to which changes in cumulative earnings can explain changes in wealth holdings of families.

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Table 1: School attendance, employment and earnings

	1976	1981	1986	1989	1996	2001
				%		
Attending school full time						
Men						
16 to 24	34.0	34.0	39.6	42.8	50.1	47.7
25 to 29	4.0	3.6	4.6	4.8	7.9	7.7
Women						
16 to 24	30.7	32.2	38.9	43.7	51.7	52.5
25 to 29	2.0	1.8	3.0	4.1	6.3	7.3
Non-students employed full time*						
Men						
16 to 24	79.6	77.6	74.3	78.5	66.5	69.1
25 to 29	90.0	88.1	83.7	86.8	80.5	83.8
30 to 44	92.3	91.0	87.3	88.7	82.8	85.3
45 to 54	88.9	87.5	84.7	87.3	80.5	81.6
Women						
16 to 24	59.4	61.0	60.2	63.4	49.2	56.3
25 to 29	44.4	50.9	57.3	61.6	59.5	66.2
30 to 44	37.4	45.9	51.5	56.6	56.1	61.1
45 to 54	35.8	38.4	41.2	49.1	51.5	58.1

	1975	1981	1986	1989	1996	2000
Earnings of full-year, full-time employees (1975=100)						
Men						
16 to 24	100.0	102.2	88.0	90.6	81.7	91.3
25 to 29	100.0	102.4	91.8	91.5	86.6	99.2
30 to 44	100.0	96.2	96.0	96.2	93.1	100.0
45 to 54	100.0	100.6	103.3	103.6	106.8	108.8
Women						
16 to 24	100.0	102.3	91.0	96.5	97.8	103.5
25 to 29	100.0	101.7	96.8	97.2	99.6	103.7
30 to 44	100.0	106.6	110.6	111.0	118.7	121.6
45 to 54	100.0	101.7	109.2	111.0	133.9	142.9

Sources: Labour Force Survey (September); Survey of Consumer Finances, 1975, 1981, 1986, 1989 and 1996; Survey of Labour and Income Dynamics, 2000

* *May include part-time students. Full-year, full-time employees work mainly full time for at least 48 weeks per year and receive no self-employment income.*

School, employment and earnings: 1976-2001

In 1976, only about one-third of young men (aged 16 to 24) attended school full time (Table 1). Twenty-five years later, almost half of them did so. Of those who were not in school full time, 80% had a full-time job in 1976, compared with only 69% in 2001.[1] Furthermore, even though their annual pay (in constant dollars) rose substantially between 1996 and 2000, young men employed full year, full time received 9% lower wages and salaries in 2000 than their counterparts in 1975 (Chart), and even less in the mid-1980s and mid-1990s.

Longer school attendance and lower chances of having a full-time job when not in school were also observed for men aged 25 to 29. Between the mid-1980s and the mid-1990s, the annual wages and salaries of those working full year, full time were much lower than in 1975. Between 1996 and 2000, they rose markedly, returning almost to their 1975 level in 2000.[2]

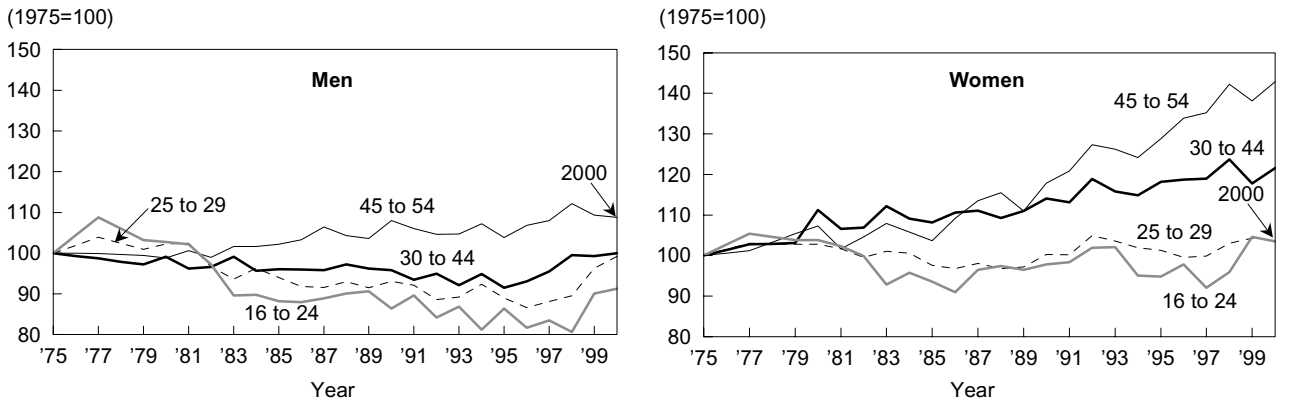
Men aged 30 to 54 were less likely to hold a full-time job in 2001 than in 1976. Among those employed full year full time, only those 45 to 54 saw an increase in wages and salaries over the 25 years.

The story is different for women. While young women increased their school attendance markedly, even more so than young men, women 25 and over saw their chances of holding a full-time job once out of school increase by at least 20 percentage points over the same period.[3] Furthermore, their wages and salaries evolved much more favourably, staying fairly constant for women aged 25 to 29 and increasing at least 20% for those 30 to 54.

Cumulative earnings: 1973-1984, 1988-1999

Changes in school attendance and in the wage structure have been documented for Canada and several other OECD countries. While considerable effort has been spent assessing the causes of the changes in the distribution of earnings (Katz and Murphy 1992; DiNardo, Fortin and Lemieux 1996; Beaudry and Green 2002; Card and DiNardo 2002), little has been done to examine the consequences of such changes on the cumulative earnings of individuals over 10 or more years. To do so, the wages and salaries received by individuals over the 1973 to 1984 and 1988 to 1999 periods were summed for synthetic cohorts of individuals (see *Data sources and definitions*). Cumulative earnings were calculated in each 12-year period for both Canadian-born individuals and immigrants. Immigrants counted in the 1973 to 1984 period arrived in 1972 or earlier, and those counted in the 1988 to 1999 period arrived in 1987 or earlier.

Chart: For men working full year full time, real wages and salaries between 1975 and 2000 increased only for those aged 45 to 54.



Sources: Survey of Consumer Finances, 1975-1995; Survey of Labour and Income Dynamics, 1996-2000

Down for young men born here

The results are striking. Over the period from 1973 to 1984, Canadian-born men aged 26 to 35 in 1984 received $289,500 (in 1999 dollars) in wages and salaries (Table 2). However, between 1988 and 1999, their counterparts received only $246,500.[4] In contrast, Canadian-born women of the same age amassed $171,600 between 1988 and 1999, about $20,000 more than between 1973 and 1984.[5] For this age group as a whole, cumulative wages and salaries dropped by roughly $10,000 between the two periods.

Table 2: Cumulative earnings over 12 years

	Cumulative wages and salaries			Cumulative earnings*		
	1973-1984	1988-1999	Change	1973-1984	1988-1999	Change
	1999 $		%	1999 $		%
Canadian-born						
26 to 35	220,600	209,000	-5.3	229,200	217,800	-5.0
Men	289,500	246,500	-14.9	304,100	258,600	-15.0
Women	151,400	171,600	13.3	154,100	177,100	14.9
26 to 30	186,000	157,500	-15.3	191,600	162,300	-15.3
Men	231,700	180,300	-22.2	241,100	186,800	-22.5
Women	140,100	134,200	-4.2	142,000	137,300	-3.3
31 to 35	261,300	256,100	-2.0	273,600	268,600	-1.8
Men	357,800	308,400	-13.8	378,600	325,800	-13.9
Women	164,400	205,100	24.8	168,300	212,900	26.5
36 to 45	303,000	316,200	4.4	322,500	338,200	4.9
Men	454,300	406,700	-10.5	489,400	438,100	-10.5
Women	151,600	224,400	48.0	155,500	236,900	52.3
46 to 55	295,600	345,600	16.9	321,900	373,900	16.2
Men	461,000	451,800	-2.0	509,400	495,800	-2.7
Women	131,100	239,900	83.0	135,600	252,600	86.3
Immigrants						
26 to 35	246,100	212,300	-13.7	254,600	220,800	-13.3
Men	318,800	243,600	-23.6	333,500	256,400	-23.1
Women	175,400	176,200	0.5	177,800	179,800	1.1
36 to 45	319,800	306,500	-4.2	341,900	329,000	-3.8
Men	467,600	393,200	-15.9	505,700	429,200	-15.1
Women	170,800	226,300	32.5	176,900	236,100	33.5
46 to 55	330,600	355,100	7.4	357,500	390,100	9.1
Men	487,200	473,500	-2.8	532,000	530,400	-0.3
Women	152,700	244,400	60.1	159,200	258,900	62.6

Sources: Survey of Consumer Finances, 1973-1995; Survey of Labour and Income Dynamics, 1996-1999

* *Wages and salaries plus net self-employment income. Estimates for 1974, 1976 and 1978 are based on interpolation. For the 1973-1984 period, immigrants are those who arrived in 1972 or earlier; and for the 1988-1999 period, in 1987 or earlier.*

Why the decline for 26 to 35 year-old men? The answer is simple. First, young men now stay in school longer than their counterparts did during the mid-1970s, thus decreasing the number of years in which they receive significant wages. Second, once out of school, they are less likely to have a full-time—and therefore relatively well-paid—job than in the past. Third, those who did work full year, full time earned less annually during much of the 1980s and 1990s than their counterparts did previously.

Why the rise for women? Changes in school attendance cannot be an explanation since young women also stay in school longer. The greater presence of women in full-time jobs may have increased their cumulative earnings by giving them greater access to better-paid jobs and also by increasing their annual workhours. Second, for some of those who worked full year, full time—for example, those 30 and over—annual wages and salaries may have increased partly because of the growing tendency of women to be employed in high-paying occupations.

For older age groups, the increasing participation of women in the labour market and their move towards better-paying occupations has resulted in massive increases in cumulative wages and salaries. For instance, Canadian-born women 46 to 55 increased their cumulative wages and salaries by more than $100,000 between the two periods. The increase for Canadian-born women 36 to 45 was about $70,000. In contrast, Canadian-born men saw drops of about $10,000 and $50,000 respectively.

Data sources and definitions

This article uses the **Survey of Consumer Finances** and the **Survey of Labour and Income Dynamics** to estimate the sum of earnings earned by individuals over two 12-year periods: 1973 to 1984 and 1988 to 1999. To do so, synthetic cohorts of individuals were constructed and their average earnings summed over each period (for example, average earnings received in 1973 by Canadian-born men aged 15 to 24 in 1973, plus those received in 1974 by Canadian-born men aged 16 to 25, and so on to include those received in 1984 by Canadian-born men aged 26 to 35. The same process was carried out for the later period.)

If an individual was not employed in a given year (because of attending school, being unemployed or unable to work, or simply not participating in the labour market), zero earnings were attributed in that year. Therefore, the cumulative wages and salaries stated in this paper are lower than those earned by someone who worked full year, full time every year.

These estimates are *not* based on longitudinal data. Conceptually, they differ for two reasons: death and international migration. For instance, some men aged 16 to 25 in 1974 would no longer have been alive in 1984. Similarly, some would have moved out of Canada. Nevertheless, the estimates provide a reasonable approximation of the sum of earnings received by a given cohort over several years. More importantly, as long as mortality rates and international migration rates remained fairly constant over the two periods, estimates of changes in cumulative earnings should be reasonably accurate.

Families include unattached individuals as well as economic families of two persons or more.

As a result, while cumulative wages and salaries of Canadian-born men aged 36 to 55 were three times as high as those of their female counterparts during the 1973-1984 period, the ratio dropped to about 1.8 during the subsequent period.

All the above patterns held for cumulative *earnings*—that is, wages and salaries plus net self-employment income.

Down even more for young immigrant men

During the 1973 to 1984 period, immigrant men aged 26 to 35 cumulated about $319,000 in wages and salaries, roughly $30,000 more than their Canadian-born counterparts. However, while cumulative wages and salaries of Canadian-born men aged 26 to 35 fell by fully $40,000 between the two periods, they dropped by more than $75,000 for immigrant men. As a result, during the 1988-1999 period, the cumulative wages and salaries of immigrant men no longer exceeded those of their Canadian-born counterparts. Immigrant men aged 36 to 45 also experienced a sharper decline.[6]

The poorer performance of immigrants was also observed among women. While Canadian-born women 26 to 35 enjoyed an increase in cumulative wages and salaries between the two periods, their immigrant counterparts experienced virtually no change. Similarly, cumulative wages and salaries of older Canadian-born women rose by at least $15,000 more than those of their immigrant counterparts.

Once again, all aforementioned patterns held when cumulative earnings rather than cumulative wages and salaries were examined.[7]

Why have cumulative earnings of immigrants evolved less favourably? At least part of the answer lies in the average weeks worked and weekly earnings in the two 12-year periods.

Among men aged 26 to 35, weekly earnings fell roughly 15% for both the Canadian-born and immigrants (Table 3). However, weeks worked by immigrant men fell 7% while those of Canadian-born men remained virtually constant. Therefore, cumulative earnings of immigrant men fell more. Among men aged 36 to 45, the sharper decline in cumulative earnings of immigrants resulted from greater drops in both their weekly earnings and weeks worked. In contrast, Canadian-born women of all age groups enjoyed a greater increase in cumulative earnings than immigrant women, mainly because they increased their number of weeks worked at a much faster pace. Hence, for most age-sex combinations, cumulative earnings of immigrants evolved less favourably, mainly because of differences in time worked rather than differences in weekly earnings.

Wealth implications

Unless declines in cumulative wages and salaries are completely offset by increases in other types of income (for example, Employment Insurance, social assistance benefits, or interests and dividends) or increases in savings rates, individuals are likely to feel an effect on their wealth holdings. For instance, the drop of about $10,000 in average cumulative earnings from one 12-year period to the next was likely a major factor underlying the decline in median wealth of family

Table 3: Average weeks worked and weekly earnings over 12 years

	Weeks worked			Weekly earnings*		
	1973-84	1988-99	Change	1973-84	1988-99	Change
			%	1999 $		%
Men						
26 to 35						
Canadian-born	38.6	38.5	-0.3	656	555	-15.4
Immigrants	40.4	37.6	-6.9	687	587	-14.6
36 to 45						
Canadian-born	46.8	45.1	-3.6	872	808	-7.3
Immigrants	47.9	45.2	-5.6	878	790	-10.0
46 to 55						
Canadian-born	46.3	45.1	-2.6	916	916	0.0
Immigrants	47.9	46.4	-3.1	924	948	2.6
Women						
26 to 35						
Canadian-born	28.8	35.2	22.2	444	414	-6.8
Immigrants	32.3	34.3	6.2	455	434	-4.6
36 to 45						
Canadian-born	26.9	37.4	39.0	479	524	9.4
Immigrants	30.1	37.4	24.3	484	523	8.1
46 to 55						
Canadian-born	25.6	37.5	46.5	437	557	27.5
Immigrants	29.6	38.4	29.7	442	559	26.5

Sources: Survey of Consumer Finances, 1973-1995; Survey of Labour and Income Dynamics, 1996-1999. For the 1973-1984 period, immigrants are those who arrived in 1972 or earlier; and for the 1988-1999 period, in 1987 or earlier

* *Average weekly earnings of individuals who worked at least one week in a year.*

units whose major income recipient was Canadian-born and aged 26 to 35.[8] Between 1984 and 1999, median wealth of such families fell by about $8,000 (Table 4).[9] Likewise, the drop of more than $30,000 in the average cumulative earnings of young immigrants probably explains a large fraction of the $23,000 decline in median wealth observed among family units headed by young immigrants.

Changes in cumulative earnings over 12 years will likely be less correlated with changes in wealth holdings for older families than they are for younger ones for at least two reasons. First, wealth holdings of individuals aged 46 to 55, for example, depend among other factors on earnings received over at least *30* years (since these individuals were 16 to 25). Second, for a given level of cumulative earnings, consumption patterns are likely to change more over two distinct 30-year periods than over two 12-year periods, thereby weakening the relationship between cumulative earnings and wealth holdings.

Changes in family composition and in the correlation between spouses' earnings may also affect family wealth. The growth in the proportion of unattached individuals over the last 20 years implies that an increasing proportion of individuals do not benefit from the economies of scale associated with cohabitation. This tends to depress savings and, thus, wealth holdings of family units. Furthermore, the growing tendency of highly paid men to be married to highly paid women increases wealth holdings of many dual-earner couples and likely increases wealth inequality.

The role of student debt

The greater debt load of students may also have contributed to a decrease in wealth holdings of young families. However, its effect is limited for two reasons. First, student debt is likely to be carried mainly by postsecondary graduates, who represent only a fraction of young individuals. Second, between 1982

Table 4: Median wealth of families,* by age of major income recipient

	Canadian-born			Immigrants		
	1984	1999	Change	1984**	1999†	Change
	1999 $		%	1999 $		%
26 to 35	30,100	22,200	-26.2	50,900	28,300	-44.4
36 to 45	75,900	67,100	-11.6	102,400	94,700	-7.5
46 to 55	120,300	114,500	-4.8	148,200	199,500	34.6

Sources: Assets and Debts Survey,1984; Survey of Financial Security, 1999

* *Families include unattached individuals*

** *Arrived in 1972 or earlier.*

† *Arrived in 1987 or earlier.*

and 1995, average amounts owed at graduation by bachelor's graduates increased only by about $3,700 (in 1999 dollars) for men and $4,000 for women (Finnie 2001). Furthermore, average amounts owed by other postsecondary graduates increased even less. In contrast, cumulative earnings of young Canadian-born men fell by at least $40,000 between the periods 1973 to 1984 and 1988 to 1999. Clearly, the decline in cumulative earnings of young men contributed much more to the decline in wealth holdings of young families than did the growth in student debt.[10]

Other factors must also have played a role. Young individuals now get married later, thereby delaying benefits from the economies of scale associated with cohabitation. This may be offset by some individuals staying longer with parents or cohabiting in other ways.[11]

Homeownership implications

If individuals are waiting until they have a certain level of savings before buying a first house, one would expect the decline in cumulative earnings of young workers to result in a postponement of homeownership. Indeed, this was the case for families with a young immigrant as the major income recipient. In 1984, 55% of these families owned a principal residence (Table 5). Fifteen years later, only 43% of their counterparts did so.[12] In contrast, family units headed by young Canadian-born individuals experienced virtually no decline in homeownership. About half owned a house both in 1984 and 1999.

The fall in homeownership among young immigrants but not among young Canadian-born individuals is consistent with the greater decline in cumulative earnings among young immigrants. The easier access to mortgage loans observed during the 1990s may be one reason why homeownership did not fall among Canadian-born individuals, despite a fall in their cumulative earnings.

Summary

Relative to their counterparts in the mid-1970s, young men today stay in school longer, are less likely to be employed full time and, until recently, received lower earnings (in constant dollars) when working full year, full time. Taken together, these three factors explain why they had much lower cumulative earnings over the 12-year period from 1988 to 1999 than their counterparts did from 1973 to 1984.

Table 5: Families* owning a principal residence

	Canadian-born		Immigrant	
	1984	1999	1984**	1999†
	%			
26 to 35	51.1	50.4	54.9	43.4
36 to 45	70.1	68.0	75.2	67.3
46 to 55	72.5	73.2	78.0	79.0

Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999
* *Includes unattached individuals.*
** *Arrived in 1972 or earlier.*
† *Arrived in 1987 or earlier.*

Among Canadian-born individuals, this decline was partly offset by the growth of cumulative earnings of young women. Overall, young Canadian-born individuals cumulated roughly $10,000 less between 1988 and 1999 than between 1973 and 1984. Young immigrants fared worse. Their cumulative earnings dropped by more than $30,000. The decline in cumulative earnings was likely a major factor underlying the decline in median wealth of young families. While the growth in student debt also played a role, its contribution was much more limited.

Consequently, as measured by median wealth, the typical young family in the late 1990s had less assets than its counterpart in the mid-1980s.[13] Having less assets reduces the ability of a family to absorb financial shocks in the event of a permanent layoff, unforeseen expenses or health problems, or the decision of one of its members to quit a job. It may also influence the effort expended by an individual to find a new job or the decision to leave a job with unsatisfactory working conditions.

The decline in cumulative earnings may also have affected the decision of some young families to buy a home or have children. Indeed, homeownership fell among families headed by young immigrants, and the average age of mothers at the birth of their first child rose from 25.7 to 27.1 between 1986 and 1996 (Statistics Canada 1999). The extent to which the decline in wealth holdings may have contributed to postponing having children in some families cannot be examined with the data currently available and thus remains an open question.[14]

The increase in the labour force participation of women is well documented. This increased participation and the move towards better-paying occupations have resulted in massive increases in cumulative earnings during a 12-year period for women in their mid-30s and older.

It should be pointed out that these results are based on averages and so may not apply equally to all individuals. For instance, changes in the cumulative earnings of young men may have been different for university graduates than for those with only a high school diploma. Likewise, cumulative earnings of full-year, full-time workers may have evolved differently from those of the 'average' individual. Because many individuals increase their education level or make transitions into and out of full-year, full-time employment over a 12-year period, data based on synthetic cohorts cannot provide accurate estimates of changes in cumulative earnings by education level or by full-year, full-time status. To do so, longitudinal data are needed.

Notes

1 The unemployment rate of young men not attending school full time was 10.4% in 1976 and 11.8% in 2001.

2 To produce earnings trends for the 1975-2000 period, earnings data from the 1996 Survey of Labour and Income Dynamics (SLID) were first compared with those of the 1996 Survey of Consumer Finances (SCF). If earnings in the SCF were, say, 2% higher than those in SLID, the SLID data for the 1996-2000 period were adjusted upwards by 2% in order to produce comparable numbers. The adjustment was done separately for each age-sex combination.

3 The increase in school attendance of Canadian-born young individuals was similar to that of young immigrants. Census data indicate that the percentage of Canadian-born young men enrolled in school full time rose by 15 percentage points, from 39% to 54%, between 1981 and 1996. The percentage of immigrant young men enrolled in school full time increased by 16 points, from 45% to 61%. The corresponding rates for Canadian-born young women in 1981 and 1996 were 37% and 56%, and 39% and 59% for immigrant young women.

4 Cumulative wages and salaries of men aged 26 to 30 and those aged 31 to 35 fell by about $50,000 in both cases.

5 The growth in cumulative wages and salaries of women aged 26 to 35 was due to a solid rise of $40,000 for women aged 31 to 35. Cumulative wages and salaries for women aged 26 to 30 did not rise.

6 Although immigrant men aged 46 to 55 experienced a somewhat larger drop in cumulative wages and salaries than their Canadian-born counterparts, they experienced a much smaller decrease in cumulative earnings.

7 Since immigration status is unknown for some respondents in the Survey of Labour and Income Dynamics, it is worth investigating the extent to which the poorer performance of immigrants could be affected by missing information. Data from the Survey of Consumer Finances indicate that immigrants aged 24 to 43 in 1997 (therefore aged 26 to 45 in 1999) who came to Canada in 1987 or earlier represented between 7% and 11% of the selected population in 1997. Accordingly, the cumulative earnings of immigrants were calculated under two assumptions. First, all individuals who did not know their immigration status were considered immigrants who came to Canada in 1987 or earlier. Second, of all individuals who did not know their immigration status, only those in the *top decile* of the distribution of earnings were considered immigrants who came to Canada in 1987 or earlier. Results based on the first assumption strengthened the study's finding of the poorer performance of immigrants 26 to 45 or younger (in 1999) in respect to cumulative earnings. Under the second assumption, cumulative earnings of immigrant men aged 26 to 45 fell at least $14,000 more than those of their Canadian-born counterparts, and the cumulative earnings of similar-aged immigrant women rose at least $10,000 less than those of their Canadian-born counterparts. Thus, the finding of poorer performance by immigrants aged 26 to 45 does not appear to be a result of excluding observations of unknown immigration status.

8 Ideally, one would like to correlate changes in cumulative earnings with changes in wealth holdings of *individuals*. Since the 1984 Assets and Debts Survey and the 1999 Survey of Financial Security measure wealth only at the family level, this analysis is limited to changes in wealth holdings of family units.

9 Ideally, the present discounted value of earnings (at the beginning of each period) received over each 12-year period should be computed and the resulting changes in wealth holdings estimated—assuming no changes in consumption expenditures between the two periods. Using a discount rate of 3%, the present discounted value (in 1973) of earnings received by Canadian-born men aged 26 to 35 amounted to $252,700 for the 1973-1984 period, compared with $213,900 (in 1988) for the 1988-1999 period. The corresponding amounts were $128,700 and $147,600 for their female counterparts, and $190,800 and $180,800 overall. If one assumes that the extra earnings were saved and generated a real rate of return of 3%, then differences in the present value of discounted earnings would generate changes in average wealth holdings of -$53,600 for the men, +$26,200 for the women, and -$13,800 overall.

10 While the increase in school attendance may lead to an increase in student debt and a decrease in the number of years young individuals will be able to work full time before they reach, say, age 30, more education may increase their earnings in the longer term.

11 Card and Lemieux (1997) showed that between 1971 and 1994, the proportion of youth living with their parents rose more in Canada than in the United States. They concluded that the greater increase observed in Canada was related to poor labour market conditions in this country.

12 The decrease is statistically significant at the 10% level (two-tailed test).

13 Part of the decrease may have resulted from some young dual-earner couples' deciding to hold less in precautionary assets because the risk of income loss is spread over two earners.

14 Admittedly, changes in values and lifestyles have played an important role.

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Earnings over time

Charles Beach, Ross Finnie and David Gray

A RECENT STUDY EXAMINED the earnings of Canadians between 1982 and 1997 to assess changes in the variance of wages and salaries over time and to determine the extent to which these fluctuations were caused by permanent or transitory factors.[1]

Changes in *permanent* earnings were measured by calculating the differences in earnings across workers during two sub-periods, after adjusting for age effects. In contrast, variations in *transitory* earnings were measured by calculating the average variance of the deviations in earnings for individuals around their mean earnings over a sub-period. These longitudinal measurements of year-to-year earnings variations reflect the instability of individual wages and salaries from one year to the next (see *Data source*).

In other words, a person might have consistently above or below average earnings from one year to another, relative to others of the same age (the permanent component), while their earnings might also vary around their personal earnings profile over time (the transitory component).

Main findings[2]

- The overall variation of age-adjusted earnings among men increased substantially (13%) between the 1982-89 and 1990-97 periods (Chart A); in comparison, the increase among women was quite modest (1.5%).
- The permanent component accounted for most of the inequality in both men's and women's earnings in the two eight-year periods (roughly two-thirds of the variation).

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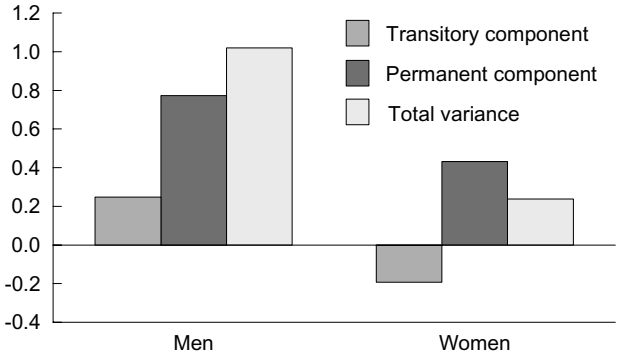
Chart A: Earnings inequality increased between the 1980s and 1990s, particularly among men.*



Source: Small Area and Administrative Data Division (Longitudinal Administrative Database)
** Broad estimation sample comparisons between 1982-1989 and 1990-1997.*

- The increased inequality in men's earnings between the 1980s and 1990s was due mainly to the permanent component. The transitory component played a lesser role, reflecting some rising volatility in individual earnings.
- In the case of women, the permanent component was solely responsible for the rising dispersion of their earnings over time. In fact, the transitory component worked in the opposite direction by restraining the expansionary effects of the permanent component.
- The variability of women's earnings exceeded men's throughout the study period; however, the differential fell by about half between the 1980s and 1990s.
- The increased variability in earnings between the two time frames was smaller in the more homogeneous narrow estimation sample, which contained continuously employed workers only (Chart B).

Chart B: The transitory component is curbing the rising dispersion of earnings.*

Source: Small Area and Administrative Data Division (Longitudinal Administrative Database)
** Narrow estimation sample comparisons between 1982-1989 and 1990-1997.*

The rising dispersion of wages and salaries because of variations in permanent earnings may reflect widening differentials in relatively stable personal characteristics associated with income such as educational attainment and skill levels. Such a trend could be mitigated or even reversed in the coming years with improvements in educational programs targeting youth, and the acquisition of lifelong learning habits generally, including the pursuit of skills upgrading or retraining by older workers.

In contrast, short-term earnings instability among men has declined in relative importance in recent years, while the size of the transitory component among women has been reduced altogether. Indeed, the small increase in the dispersion of women's earnings via the permanent component was limited in scope by the countervailing reduction in the dispersion of their transitory earnings, reflecting general improvements in the earnings stability of working women. These findings should temper concerns over rising earnings instability and place more emphasis in policy discussions on long-term differences in earnings across individuals.

Data source

The study population consisted of employees aged 20 to 64 during the 1982-97 period in Statistics Canada's **Longitudinal Administrative Database**. This database was originally created from a 10% sample of Canada Customs and Revenue Agency T-1 taxation files. Workers with a limited attachment to the labour market in a given taxation year were excluded from the analysis (for example, full-time students and employees earning less than $1,000).

The study population was further subdivided into two separate estimation samples for each sex and sub-period (1982-89 and 1990-97):

- a broad estimation sample, which comprised all records satisfying basic inclusion criteria, including workers who reported earning at least $1,000 (in 1997 dollars) *for at least two years* in the relevant eight-year sub-period, and
- a narrow estimation sample, which included only those persons who reported earning at least $1,000 *each year* of the applicable sub-period.

Although this study was based on administrative tax data rather than the Survey of Consumer Finances and the Survey of Labour and Income Dynamics, the findings are consistent over a similar time frame. In particular, declining long-term earnings among young men working full year full time, observed with the survey data, likely contributed to the widening dispersion of earnings noted by Beach, Finnie and Gray. Similarly, the rising earnings of young women may be reflected by the reduced variance of their earnings over time.

Perspectives

Notes

1 *Earnings over time* is adapted from a working paper by Charles Beach, Ross Finnie and David Gray entitled *Earnings variability and earnings instability of women and men in Canada: How do the 1990's compare to the 1980's.* The paper is published by the School of Policy Studies, Queen's University, Kingston, Ontario, 2001. A paper of the same title will also appear in a forthcoming issue of *Canadian Public Policy.*

2 Unless otherwise stated, these findings are based on the broad estimation sample only.

Income and wealth

Baudelaire Augustin and Dimitri Sanga

THE LARGE AMOUNT OF DATA on income distribution has proved useful in shedding light on inequalities, standard of living, and related problems such as poverty. However, in order to reach appropriate conclusions on such issues, it is important not to confuse income and wealth. Although some correlation exists between the two, it is far from perfect.

Inequality and poverty continually fuel debates in the political and academic spheres. Measures are commonly based on income and would present quite a different picture if based on wealth. For example, the statement that the elderly are among society's poorest members could be either true or false, depending on whether the measure is income or wealth. If wealth, the statement could be false. Retired persons often have less onerous liabilities, since mortgages and other obligations such as educational debts have already been paid off. While the flow of income is smaller for most elderly persons, their stock of wealth could be larger.

This article begins by looking at the basic concepts that distinguish income and wealth: flow and stock. Wealth and income distributions are then used to show the difference between these two concepts using a variety of tools (see *Techniques used*).

Wealth is a stock, income a flow

In everyday language, little distinction is made between income and net worth (wealth). It is sometimes said that a person with high earnings is rich—for example, an athlete. Sometimes, being rich is evaluated on the basis of assets owned. The two ideas are quite different.

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A flow is a quantity per unit of time. A stock is a quantity at a given point in time. A useful image is an open faucet from which water runs into a bathtub. The water running from the faucet is a flow. A specific number of litres flow per minute or per hour. On the other hand, the quantity of water accumulating in the bathtub is a stock. To determine this quantity, the only time information required is when the stock was measured. No periodicity is necessary. The link between the flow from the faucet and the quantity of water in the tub is obvious: the greater the former, the more rapidly the latter will increase.

The concepts of flow and stock are used widely. For example, in demography, population growth is a flow, whereas the population at a given point in time is a stock. In accounting, the items on the income statement (income, expenditures, profits) are flows, while those on the balance sheet (assets, liabilities, equity) are stocks.

In the case of income and wealth, income is a flow, since it is meaningful only when defined in relation to a period of time (hourly, weekly, monthly or annual income). Net worth is a stock, increasing as new assets are acquired, debts repaid, or savings accumulated. Each of these elements depends more or less directly on income.

However, income and net worth are not synonymous. Just as a strong flow from the faucet could be running into an empty bathtub, a high income may be associated with low net worth. This is the case, for example, with young people starting their careers. Conversely, just as a weak flow from the faucet may be running into a nearly full bathtub, so could a low income accompany high net worth. This is the case with some retirees who have little income but who have accumulated and paid for substantial assets—for example, a house or RRSPs.

The link between wealth and income can be expressed as a simple mathematical equation:

Wealth(t) = Wealth(t-1) • (1+r) + after-tax income(t) + net inter-family transfers(t) – expenditures(t) with t as the present time and r the constant annual rate of return.

The wealth of a family at a given point in time is simply the sum of its net assets, which could include inheritances, and its savings invested at an annual rate of return r, plus inter-family transfers. Savings are equal to after-tax income minus expenditures. A family that spends all its after-tax income in a given period will not be adding to its wealth during that period (see *Data source and definitions*).

Table 1: Households by income and net worth quintiles

		Net worth quintile				
		1	2	3	4	5
	Lower limits ($)	*0*	*7,400*	*50,000*	*126,100*	*270,400*
Income quintile				%		
1	*0*	11	4	2	2	1
2	*16,000*	5	5	4	3	2
3	*27,700*	2	5	5	4	3
4	*40,100*	1	4	5	5	4
5	*58,700*	0	1	4	6	9

Source: Survey of Financial Security, 1999

Net worth and after-tax income: a clear but imperfect relationship

If income and wealth were synonymous, people better off in terms of income should also be better off in terms of wealth. In other words, the top 20% of persons in terms of income should also be the top 20% in terms of net worth. The corresponding case should apply for the bottom 20% and for all other quintiles.

For example, in a table of income quintiles by wealth quintiles, the cells on the main diagonal should all have 20% of the population and all the other cells should have 0%. If income and wealth were totally unrelated, the population would be distributed equally among all the cells. In that case, all the cells would have a value of 4%. Clearly, this is not the case (Table 1). Consider, for example, the lowest income quintile. Only slightly more than half of this quintile (11% out of 20%) are in the lowest wealth quintile. Indeed, one-twentieth of them (1% out of 20%) are in the highest wealth quintile.

However, income and wealth have an imperfect but clearly discernible relationship. A person who is poor from a net worth standpoint has more than one chance in two of also being poor from an income standpoint. However, there is a 45% chance that the person will fall into a higher quintile for income than for net worth. On the other hand, a person in the top net worth quintile has a 45% chance of also being in the top income quintile. But then again, 55% of people who fall into the top net worth quintile do not fall into the top net income quintile.

Household shares of income and wealth differ

Households in the top and bottom quintiles have a larger share of net worth than after-tax income (Table 2). Households in the third and fourth quintiles have a larger share of after-tax income than net worth, while the second quintile shows equal shares of income and net worth.

This relationship can also be observed in terms of centiles of after-tax income. (Centiles divide households into 100 equal portions ranging from lowest income to highest.)

If after-tax income and net worth shares were identical, the relationship between the two measures would take the form of a straight line (Chart A). In effect, each centile would claim the same percentage of after-tax income as of net worth. On the contrary, the shares of income and wealth are different in many respects, whichever centile is considered.

Households in the lowest after-tax income centiles generally have a larger share of wealth than of after-tax income. This may be because elderly persons, for whom C/QPP and OAS are often the only sources of income, fall into the low after-tax income centiles. On the other hand, they have substantial net worth in the sense that they have paid off most of their debts. These centiles also contain self-employed workers who may be sustaining losses, causing their after-tax income to be negative even though they have substantial net worth.

Table 2: Household shares of wealth and after-tax income

After-tax income quintile	Average after-tax income	Average net worth	Share of after-tax income	Share of wealth
	$		%	
1	8,300	135,700	5	6
2	22,000	128,700	11	11
3	33,500	173,400	17	16
4	48,400	260,800	24	22
5	104,200	889,300	43	45

Source: Survey of Financial Security, 1999

The higher centiles contain many families with a larger share of after-tax income than net worth. These families earn sizeable incomes but also have sizeable liabilities such as mortgages, student loans, and other debts.

Between the two extremes are centiles in which shares of after-tax income and net worth are equal. (The relationship between shares of income and net wealth for economic families and unattached individuals is the same as that observed for all families since all families, are composed of economic families plus unattached individuals.)

Income and wealth tend to vary in the same direction but not at the same rate

Continuing the analogy of net worth and net income to water from a faucet running into an open bathtub: the water from the faucet is income, the water accumulating in the tub is wealth. What goes down the drain represents current expenditures—that is, the portion of income that has been consumed and not kept as wealth.

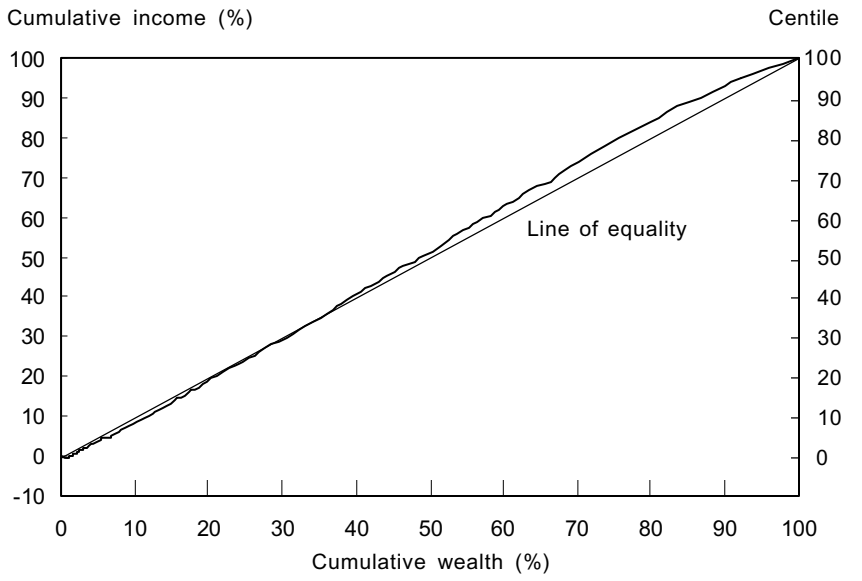
This relationship is always present, but varies considerably from one stage in the life cycle to the next. While the particular experiences of individuals differ considerably, everyone tends to follow a general pattern: we are born, grow as children, go to school, set up a household, and start a family. We struggle to find our first job, pursue a career, and eventually retire. This is the life cycle. Each stage involves very different behaviours with respect to income creation, expenditures, and savings.

In the absence of longitudinal data, cross-sectional data by age must be used to approximate various stages in the life cycle. Rather than following the same individuals over their lifetime, different individuals are compared at different stages in the cycle. The data used reflect not only life-cycle effects (purely age) but also cohort effects (Table 3).

Persons in the under-25 age group appear to be the poorest in terms of both net worth ($1,800) and after-tax income ($12,600). This group is probably made up largely of students with unstable jobs or no income, or of young workers who are unskilled or just starting their career. Also, with respect to wealth, they would have had little time to accumulate savings.

The 25 to 34 age group is likely made up largely of young people beginning their career and starting families. Income and assets increase rapidly, but so do debts. This has the effect of slowing the increase in net worth. Persons from 35 to 49 are advancing in their careers. Their earnings increase slowly but rise steadily. Debt growth slows, causing net worth to increase very

Chart A: A household's share of wealth is not the same as its share of after-tax income.



Source: Survey of Financial Security, 1999

Table 3: Median after-tax income, wealth, assets and debts

	After-tax income	Net worth	Total assets	Total debts
			$	
Less than 25	12,600	1,800	5,900	2,900
25 to 34	33,000	28,100	54,900	15,000
25 to 29	28,800	13,900	27,000	10,700
30 to 34	36,900	45,500	102,400	23,000
35 to 49	42,100	86,500	155,000	26,000
35 to 39	39,200	65,300	138,900	30,000
40 to 44	41,000	89,400	155,200	25,000
45 to 49	46,800	120,100	181,100	23,200
50 to 64	39,300	164,900	215,000	7,100
50 to 54	44,700	152,700	216,800	18,000
55 to 59	41,200	171,500	221,300	6,000
60 to 64	29,200	174,600	200,200	500
65 and over	24,400	154,600	161,800	0
65 to 69	27,800	176,600	193,700	0
70 to 74	26,200	174,500	177,000	0
75 to 79	23,800	146,700	148,000	0
80 and over	19,400	109,500	109,500	0

Source: Survey of Financial Security, 1999

rapidly. Whereas income rises from $33,000 to $42,100, an increase of 28%, net worth more than triples, climbing from $28,100 to $86,500, an increase of 208%.

Between 50 and 64 years of age, earnings hardly increase at all. Nevertheless, assets continue to grow as a result of saving, and total debt declines as homes and cars are paid off. Those aged 50 to 64 have the greatest net worth, even though their income differs little from that of the preceding age group. The 65-and-over age group is phasing into retirement. Income falls dramatically, from an average of $39,300 to $24,400, making them the poorest after those under 25 in terms of after-tax income. Assets also decline. But because debts are now almost nonexistent, net worth does not decline as much. In fact, the 65-and-over age group is in second place in terms of net worth.

One way to see the relationship between income and wealth is to look at after-tax income, net worth, assets and debts by age and, for each variable, compare one group's median with the highest median for all groups. This value is then expressed as a percentage (Chart B).[1] This approach shows how each variable changes over time—when it peaks and when it declines—not the

Data source and definitions

This study used the 1999 **Survey of Financial Security**, which gathered data on the assets and debts of families and unattached individuals.

Family unit: economic family or unattached individual.

Economic family: two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption.

Unattached individual: person who lives alone or with unrelated persons.

Total income: income from all sources (including government transfers) before deduction of federal and provincial taxes. Total income is also known as income before taxes (but after transfers). It includes market income and government transfer payments.

Market income: total earnings (from paid employment or self-employment), investment income, retirement income (private pension plan) and other income. It corresponds to total income minus government transfers. It is also known as income before taxes and transfers.

Government transfers: all direct payments to individuals and families by the federal, provincial and municipal governments: Old Age Security, the Guaranteed Income Supplement, Spouse's Allowance, Canada and Quebec Pension Plan benefits, Child Tax Benefits, Employment Insurance benefits, workers' compensation benefits, credits for the goods and services tax (GST) or the harmonized sales tax (HST), provincial or territorial tax credits, social assistance payments, and other payments.

Income tax: total federal and provincial taxes on income and capital gains in a given year.

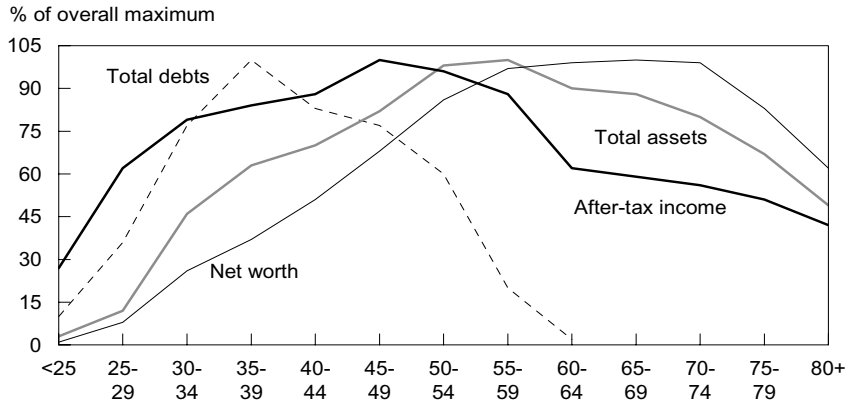
After-tax income: total income minus income taxes.

Assets: all family assets, including financial assets (RRSPs, other registered plans, deposits in financial institutions, mutual/investment funds, stocks, savings bonds and other bonds, and other financial assets) and non-financial assets (principal residence, other real estate, vehicles, other non-financial assets, and equity in a business).

Debts: all debts owed by the family. They include mortgages, lines of credit, credit cards, student loans, vehicle loans, and other debt.

For further information on the definitions of the different components, see the concepts and definitions guide produced by the Income Statistics Division.

Chart B: Debts peak early and virtually disappear after age 65.



Source: Survey of Financial Security, 1999

actual levels. (Because of sample size limitations, the two extremes were collapsed—under 25, and 80 or more.)

After-tax income and net worth evolve along similar lines in that they grow at the beginning of the cycle and then slowly decline. However, some differences are apparent. After-tax income peaks in the 45 to 49 age group. The average income of this group is 3.5 times that of the under-25 group. Net worth does not peak until 20 years later at the beginning of retirement in the 65 to 69 age group. At this age, median net worth is more than 98 times that of the under-25 group.

At the beginning of the life cycle, young households take on debt in order to finance their education and start a family. Debt is therefore the variable that increases the most rapidly for the first age groups. On a dollar level, debt is not very significant in comparison with net worth and total assets. But debt change over time shows the relationship between net worth, total debts, and after-tax income over the life cycle. Debt reaches its peak in the 35-39 age group, falling rapidly until it almost disappears after age 65.

Income is also increasing for these groups, causing debt growth to cease and total assets to grow. Around 45 to 49 years of age, income growth ceases. Nevertheless, net worth continues to increase, owing not only to saving but also to declining debt and possibly to inheritances. But the growth in net worth is fleeting. Starting at 55 to 59 years of age, it slows appreciably and drops in the last two age groups.

In short, wealth and income evolve along similar lines but at a different pace. At the start of the life cycle, income increases more rapidly than wealth. Toward the middle of the cycle, income stalls while wealth continues to grow. In retirement, income and wealth both tend to decrease.

Techniques used

The difference between income and net worth may be illustrated using several concepts, among which is the way each is distributed for a given population. A preferred way to determine the distribution of income or wealth is to look at the share of each held by a given percentage of the population of interest. The focus is therefore on quintiles, deciles or centiles. These describe what share of wealth or income is held by 20%, 10%, or 1% percent of the population, ranging from the lowest to the highest.

Quintiles and centiles have been used in this study. Quintiles (Table 1) divide the population into fifths from least to most for after-tax income and net worth. Centiles are given for after-tax income, and so wealth is also calculated by after-tax income centile to maintain the same population by centile. Net worth could also have been used as the starting point and then calculating after-tax income for each wealth centile.

As is generally done for studies on wealth and income where extreme values are common, median values are used. The median is less sensitive to values on the extreme.

Summary

Income and wealth are commonly used to assess the well-being of individuals, families or entities. While the two measures are related, the relationship is not perfect: greater income is likely to mean greater wealth—but not always.

Perspectives

Note

1 The median value was used in the tables in preference to the average because the median is considered to be more representative of households in each group. The median is less sensitive to extreme cases, such as a small group of individuals with unusually high income or large assets.