



Comparing annual and weekly earnings from the Current Population Survey

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Information on both annual and usual weekly earnings of full-time wage and salary workers is available from the Current Population Survey (CPS). The annual data are collected each March from the entire household survey sample as part of the supplemental questions on work experience and income in the previous calendar year. In contrast, the weekly earnings data are obtained each month from one quarter of the CPS sample as part of the regular survey on employment and unemployment.¹ To increase the reliability of the weekly data, the data are aggregated into quarterly and annual averages, which show trends in earnings.²

Because the weekly data are available before the annual March data for a given year, questions have arisen regarding the comparability between the two earnings series. In particular, it has often been asked how closely annualized weekly earnings (usual weekly earnings times 52) approximate reported annual earnings.

This report evaluates the comparability of the series in two ways. First, the reported 1981 earnings of men and women who worked full time, year round in 50 occupations are compared with the estimated annual earnings of all full-time workers in those occupations. The estimates for the latter series are obtained by taking the annual averages of the usual weekly earnings times 52. Second, the ratio of women's earnings to men's is calculated, using both reported annual and average usual weekly earnings for 1981.

Estimated earnings lower

The first two columns of tables 1 and 2 show the reported annual earnings and annual averages of the usual weekly earnings in 1981 for men and for women. The third column shows the estimated annualized weekly earnings (usual weekly earnings times 52). Column 4 in each table presents ratios of annualized weekly earnings

to reported annual earnings. A ratio of 1.00 indicates that annualized weekly earnings are the same as the estimate of annual earnings, while a ratio greater than (less than) 1.00 indicates that annualized weekly earnings are more than (less than) reported annual earnings.

The ratios of annualized weekly earnings to annual earnings range from .67 to 1.14. In most occupations the estimate of annual earnings based on usual weekly earnings is less than the reported earnings of those who actually worked the whole year. It is also apparent that the degree of such understatement is greater for men than for women. Moreover, the ratios do not vary systematically by sex and occupation; for men, they range from a low of .81 for transport equipment operatives to 1.06 for miners, and for women, from a low of .81 for protective service workers to a high of 1.14 for personal service workers.

A number of basic differences between the two earnings series should be noted. First, both estimates of earnings vary because of sampling error. The standard error is a measure of the extent to which a sample is representative of the universe and tends to vary inversely with the size of the sample. The weekly data generally have smaller standard errors because the households surveyed are triple the number in the annual survey.³

Second, while the reference period for the weekly data is the previous week, it is 2 to 14 months earlier for the annual data. As a result, the annual data are more affected than the weekly data by the ability of respondents to recall events. Moreover, the annual data relate to all jobs held during the reference year, whereas the weekly data relate only to primary jobs. Moonlighting is typical of only a small percentage of workers—4.9 percent in May 1980 (the most recently available figure).⁴ For those holding more than one job, total annual earnings as reported in March should, of course, exceed an annualized estimate derived from average weekly earnings. Moreover, the annualized estimate will result in a greater understatement of earnings for men than for women because moonlighting is more common among men. In May 1980, the dual and multiple job-holding rate for men was 5.8 percent and for women, 3.8 percent.

Third, the occupation to which earnings are assigned in the March CPS is that of the longest job held during the previous year, while in the weekly data it is that of the primary job. For most workers, the primary and

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longest jobs are the same; only about 10 percent of workers change occupations in a year.⁵ Annualized weekly earnings and reported annual earnings will thus vary to the extent that earnings from the longest job differ from the earnings of the primary job held the rest of the year.

Fourth, the weekly data refer to "usual" earnings, rather than "actual." Among workers employed the same number of hours each week, usual and actual weekly earnings should be identical. However, for work-

ers with irregular hours from either overtime or part-time work, usual and actual weekly earnings will tend to vary. This possible exclusion of overtime earnings in reporting usual weekly earnings would also lead to an annualized figure that falls short of actual annual earnings. Because men are more likely than women to work overtime, this would tend to lead to a greater underestimation of men's annual earnings.

Fifth, income from self-employment in incorporated businesses is included in the annual data and excluded

Table 1. Median weekly and annual earnings of male full-time wage and salary workers by occupation, 1981

Occupation	Weekly earnings	Annual earnings	Weekly earnings times 52	Ratio of weekly (times 52) to annual earnings
Total	\$346.74	\$20,593	\$18,030	0.88
Professional and technical workers	439.26	25,350	\$22,842	.90
Engineers	547.13	31,069	\$28,451	.92
Physicians, dentists, and related practitioners	494.95	38,504	\$25,737	.67
Health workers, except practitioners	331.19	16,389	17,222	1.05
Teachers, except college and university	384.37	20,369	19,987	.98
Engineering and science technicians	371.00	21,690	\$19,292	.89
Other professional and technical workers	443.34	(¹)	23,054	(¹)
Managers and administrators, except farm	466.28	26,656	\$24,247	.91
Salaried workers, manufacturing	558.22	30,444	\$29,027	.95
Salaried workers, other industries	440.82	(¹)	22,923	(¹)
Salesworkers	365.67	22,144	\$19,015	.86
Retail trade	258.65	15,948	\$13,450	.84
Other industries	421.29	24,599	\$21,907	.89
Clerical workers	327.67	18,728	\$17,039	.91
Bookkeepers	320.37	18,065	\$16,659	.92
Office machine operators	324.39	16,062	16,868	1.05
Stenographers, typists, and secretaries	290.58	(²)	15,110	(²)
Other clerical workers	328.23	19,065	\$17,068	.90
Craft and kindred workers	359.93	20,458	\$18,716	.91
Carpenters	324.86	16,635	16,893	1.02
Other construction craftworkers	371.72	20,480	\$19,329	.94
Blue-collar supervisors, not elsewhere classified	408.57	24,097	\$21,246	.88
Machinists and job setters	359.33	19,022	\$18,685	.98
Metal craftworkers, except mechanics, machinists, and job setters	411.17	22,555	\$21,381	.95
Mechanics, automobiles	287.03	16,305	\$14,926	.92
Mechanics, except automobiles	348.33	20,074	\$18,113	.90
Other craft and kindred workers	359.53	20,859	\$18,696	.90
Operatives, except transport	298.13	16,686	\$15,503	.93
Mine workers	412.95	20,194	21,473	1.06
Motor vehicles and equipment	386.33	20,182	20,089	1.00
Other durable goods manufacturing	294.05	16,987	\$15,291	.90
Nondurable goods manufacturing	277.13	16,554	\$14,411	.87
Other industries	263.83	15,054	\$13,719	.91
Transport equipment operatives	306.94	17,425	\$15,961	.92
Delivery and route workers	306.09	16,973	\$15,917	.94
Other transport equipment operatives	310.87	19,961	\$16,165	.81
Nonfarm laborers	243.63	14,690	\$12,669	.86
Construction	246.87	12,860	12,837	1.00
Manufacturing	259.46	15,991	\$13,492	.84
Other industries	233.98	14,569	\$12,167	.84
Private household workers	174.31	(²)	9,064	(²)
Service workers, except private household	238.08	14,255	\$12,380	.87
Cleaning service workers	221.99	12,634	\$11,543	.91
Food service workers	186.09	9,618	9,677	1.01
Health service workers	216.12	12,827	\$11,238	.88
Personal service workers	223.63	14,018	\$11,629	.83
Protective service workers	321.52	19,654	\$16,719	.85
Farmworkers:				
Farmers and farm managers	246.42	(²)	(²)	(²)
Farm laborers and supervisors	180.47	9,016	9,384	1.04
Paid workers	180.47	9,016	9,384	1.04

¹ Although median annual earnings for men employed in these occupations exceeded \$25,000, the medians are reported as \$25,000-plus in the tabulations from which these data are derived.

² Data not shown where base is less than 75,000 for annual data or 50,000 for weekly data.

³ Difference between reported annual earnings and annual averages of weekly earnings times 52 is significant at the .10 level, based on comparability test used by the Bureau of

the Census.

NOTE: Data on annual earnings refer to full-time year-round wage and salary workers and are collected in the March supplement to the Current Population Survey. Weekly earnings data, which are collected monthly in the CPS, refer to the annual average of usual median weekly earnings of full-time wage and salary workers.

in the weekly. The effect of this difference is apparent among male physicians, dentists, and related practitioners. A substantial proportion of workers in these occupations have income from their own incorporated businesses (for example, private practice) as well as from wages and salaries (as received from hospitals and clinics). Annualized weekly earnings thus very much understate reported annual earnings in these occupations. In most other occupations, the proportion of self-employed incorporated workers is quite small, and there is little reason to suppose that annual earnings as estimated from the data on weekly earnings would lead to

a large understatement of reported annual earnings.

Sixth, compositional differences among workers in the two series also arise because of the time reference. The annual data show the earnings of all individuals who were usually employed full time, year round. In contrast, the weekly data provide just a snapshot of the workers who were usually employed full time one week of each month during the year. The annual averages of the weekly data thus relate not only to all persons who worked full time, year round but also those who worked full time part of the year. The latter group consists disproportionately of women and young workers.

Table 2. Median weekly and annual earnings of female full-time wage and salary workers by occupation, 1981

Occupation	Weekly earnings	Annual earnings	Weekly earnings times 52	Ratio of weekly (times 52) to annual earnings
Total	\$224.45	\$12,345	² \$11,671	0.95
Professional and technical workers	315.55	16,312	16,409	1.01
Engineers	370.84	(¹)	² 19,284	(¹)
Physicians, dentists, and related practitioners	400.64	(¹)	² 20,833	(¹)
Health workers, except practitioners	313.87	16,471	16,321	.99
Teachers, except college and university	310.98	15,769	² 16,171	1.03
Engineering and science technicians	279.22	14,371	14,519	1.01
Other professional and technical workers	320.91	16,627	16,687	1.00
Managers and administrators, except farm	283.31	15,432	² 14,732	.95
Salaried workers, manufacturing	312.44	16,367	16,247	.99
Salaried workers, other industries	280.54	15,331	² 14,588	.95
Salesworkers	190.04	11,395	² 9,882	.87
Retail trade	157.64	8,833	² 8,197	.93
Other industries	277.11	14,861	14,410	.97
Clerical workers	219.69	11,929	² 11,424	.96
Bookkeepers	222.39	12,315	² 11,564	.94
Office machine operators	223.17	12,102	² 11,605	.96
Stenographers, typists, and secretaries	226.15	12,041	² 11,760	.98
Other clerical workers	215.30	11,693	² 11,196	.96
Craft and kindred workers	239.42	13,275	12,450	.94
Carpenters	(¹)	(¹)	(¹)	(¹)
Other construction craftworkers	(¹)	(¹)	(¹)	(¹)
Blue-collar supervisors, not elsewhere classified	262.34	14,289	13,642	.95
Machinists and job setters	(¹)	(¹)	(¹)	(¹)
Metal craftworkers, except mechanics, machinists, and job setters	(¹)	(¹)	(¹)	(¹)
Mechanics, automobiles	(¹)	(¹)	(¹)	(¹)
Mechanics, except automobiles	279.28	(¹)	² 14,523	(¹)
Other craft and kindred workers	214.24	12,008	11,140	.93
Operatives, except transport	187.38	10,191	² 9,744	.96
Mine workers	(¹)	(¹)	(¹)	(¹)
Motor vehicles and equipment	280.47	(¹)	² 14,584	(¹)
Other durable goods manufacturing	211.06	11,721	² 10,975	.94
Nondurable goods manufacturing	174.63	9,359	² 9,081	.97
Other industries	169.39	9,021	8,808	.98
Transport equipment operatives	237.04	12,850	12,326	.96
Delivery and route workers	228.16	13,139	² 11,864	.90
Other transport equipment operatives	(¹)	(¹)	(¹)	(¹)
Nonfarm laborers	193.20	10,477	10,046	.96
Construction	(¹)	(¹)	(¹)	(¹)
Manufacturing	208.59	11,934	10,847	.91
Other industries	182.69	9,652	9,500	.98
Private household workers	104.18	5,216	5,417	1.04
Service workers, except private household	169.82	8,625	² 8,831	1.02
Cleaning service workers	167.90	8,337	8,731	1.05
Food service workers	148.35	7,153	² 7,714	1.08
Health service workers	184.56	9,860	² 9,597	.97
Personal service workers	207.92	9,513	² 10,812	1.14
Protective service workers	226.14	14,578	² 11,759	.81
Farmworkers:				
Farmers and farm managers	(¹)	(¹)	(¹)	(¹)
Farm laborers and supervisors	146.30	(¹)	7,608	(¹)
Paid workers	146.30	(¹)	7,608	(¹)

¹ Data not shown where base is less than 75,000 for annual data or 50,000 for weekly data.

² See footnote 3, table 1.

Note: Data on annual earnings refer to full-time year-round wage and salary workers

and are collected in the March supplement to the Current Population Survey. Weekly earnings data, which are collected monthly in the CPS, refer to the annual average of usual median weekly earnings of full-time wage and salary workers.

For example, the 16–24 age group accounted for 19 percent of full-time workers in the weekly series but only 13 percent of those in the annual data. When combined with the fact that young workers are typically in relatively low-paying jobs, their differential weights in the computation of the two series mean that they tend to lower the weekly earnings average more than they do the measures of annual earnings.

Overall, the absence of any clear pattern in the ratios of annualized weekly to reported annual earnings highlights the many dimensions in which the annual and weekly earnings series vary. Both series are affected by sampling error. They differ in terms of the definition of full-time employment, the demographic composition of the workers and the characteristics of the jobs. As a result, it is difficult to isolate any one factor as the reason one ratio is larger (smaller) than another.

Sex-earnings ratios differ

The usual weekly and reported annual earnings also differ in terms of the ratios of women's earnings to men's. As shown in table 3, the earnings of women are generally closer to those of men when based on the weekly data rather than annual earnings data, although the ratios in the series are not consistent within the same occupation. Thus, for purposes of comparing women's earnings to men's by occupation, it is advisable to use the same series, especially if the sex-earnings ratio is being contrasted among a number of occupations.

As a last observation, the data in table 4 present trends in sex-earnings ratios based on both the annual earnings of full-time, year-round workers and the weekly earnings of full-time workers (ratios are shown only for totals, not by occupation). The annual data are from the March CPS for the period 1955–81, while the weekly data, available only since 1967, are from the May CPS for 1967–78, and from the second quarterly averages of the CPS for 1979–82.

Both series convey the same information: There has been very little change in the ratio of women's to men's earnings. There are, however, slight variations in the trends depicted by the ratios in the two series because of differences in the weekly and annual data noted earlier. The ratios based on the weekly data have always been about 2–5 percentage points above the ratios based on the annual data. Moreover, the ratios within each series have fluctuated by about 3 percentage points. Thus, put in historical context, neither the annual nor weekly CPS earnings series necessarily signifies any real change in women's earnings relative to men's earnings.

THE RESULTS of this research have indicated that the annual averages of weekly earnings when multiplied by

Table 3. Ratio of women's to men's annual and weekly earnings based on full-time employment by occupation, 1981

Occupation	Ratio of women's to men's earnings	
	Annual	Weekly
Total	59.9	64.7
Professional and technical workers	64.3	71.8
Engineers	(¹)	67.8
Physicians, dentists, and related practitioners	(¹)	80.9
Health workers, except practitioners	100.5	94.9
Teachers, except college and university	77.4	80.9
Engineering and science technicians	66.3	75.2
Other professional and technical workers	(²)	72.5
Managers and administrators, except farm	57.9	60.8
Salaried workers, manufacturing	53.8	55.9
Salaried workers, other industries	(²)	63.7
Salesworkers	51.4	52.0
Retail trade	55.4	61.0
Other industries	60.4	65.8
Clerical workers	63.7	67.0
Bookkeepers	68.2	69.4
Office machine operators	75.3	68.8
Stenographers, typists, and secretaries	(¹)	77.1
Other clerical workers	61.3	65.5
Craft and kindred workers	64.9	66.5
Carpenters	(¹)	(¹)
Other construction craftworkers	(¹)	(¹)
Blue-collar supervisors, not elsewhere classified	59.3	64.1
Machinists and job setters	(¹)	(¹)
Metal craftworkers, except mechanics, machinists, and job setters	(¹)	(¹)
Mechanics, automobiles	(¹)	(¹)
Mechanics, except automobiles	(¹)	80.2
Other craft and kindred workers	57.6	59.4
Operatives, except transport	61.1	62.9
Mine workers	(¹)	(¹)
Motor vehicles and equipment	(¹)	72.5
Other durable goods manufacturing	69.0	71.8
Nondurable goods manufacturing	56.5	63.2
Other industries	59.9	64.0
Transport equipment operatives	73.7	77.2
Delivery and route workers	77.4	74.5
Other transport equipment operatives	(¹)	(¹)
Nonfarm laborers	71.3	79.3
Construction	(¹)	(¹)
Manufacturing	74.6	80.7
Other industries	66.3	78.2
Private household workers	(¹)	(¹)
Service workers, except private household	60.5	71.3
Cleaning service workers	66.0	75.6
Food service workers	74.4	79.7
Health service workers	76.9	85.4
Personal service workers	67.9	80.0
Protective service workers	74.2	70.3
Farmworkers:		
Farmers and farm managers	(¹)	(¹)
Farm laborers and supervisors	(¹)	(¹)
Paid workers	(¹)	(¹)

¹ Not available.

² Not computed. Although median annual earnings for men employed in these occupations exceeded \$25,000, the medians are reported as \$25,000-plus in the tabulations from which these data are derived.

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52 are generally less than the reported annual earnings of men and women by occupation. Moreover, the ratio of women's earnings to men's, although slightly higher when based on the weekly rather than annual data, shows about the same trend. Both series have their

Unemployment experience in Canada: a 5-year longitudinal analysis

SUNDER MAGUN

This report presents a picture of Canadian joblessness over 5 years and reveals serious chronic unemployment. In a 1975-79 longitudinal analysis, we used three indicators: total amount of all unemployment across all spells over the period; the number of unemployment spells per person; and the average duration of such a spell. Also, we considered sex, age, province, industry, and occupation. Among our findings:

- A few bear the greatest unemployment burden;
- The people with histories of hardcore unemployment are at a relatively greater disadvantage in the labor market and risk further episodes of chronic unemployment;
- Long-term spells are relatively few but account for much greater unemployment than would be expected on the basis of probability.

We find that the long-run structure of unemployment in Canada is not consistent with the "dynamic" or the "turnover" view of the labor market. According to this view, the characteristics of the unemployment problem are rapid job turnover and brief spells of unemployment, and the burden of unemployment is not concentrated, but is widely shared among workers. This "benevolent" viewpoint of unemployment contends that unemployment is mainly frictional and voluntary. The benign view, by rejecting the existence of chronic and persistent unemployment, de-emphasizes the social and economic costs of joblessness. Our results do not support the turnover view. As noted, there are, in fact, three aspects of the real problem of unemployment in the country.

We used the linked Longitudinal Labour Force Data Base, which is composed of several administrative data files of the Canada Unemployment Insurance Commission. This data base contains microdata on the labor market experience of a 10-percent sample of all "insured" workers.¹ A sample of about 20,200 people who had at least one episode of unemployment from 1975 to 1979 was drawn from the data set. These individuals had filed regular unemployment insurance claims² for about 56,000 job separations over the 5-year span. The sample is a representation of Canadian workers who have relatively more difficulties in the labor market and

Sunder Magun is an economist in the Strategic Policy and Planning Division of Employment and Immigration Canada. The author alone is responsible for the content of this report, which is adapted from a larger study, *Labour Market Experience in Canada: A Longitudinal Analysis*.

Table 4. Ratio of women's to men's annual and weekly earnings based on full-time employment, 1955-82

Year	Annual	Weekly
1955	64	()
1956	63	()
1957	64	()
1958	63	()
1959	61	()
1960	61	()
1961	59	()
1962	60	()
1963	60	()
1964	60	()
1965	60	()
1966	58	()
1967	58	62
1968	58	()
1969	61	61
1970	59	62
1971	60	62
1972	58	63
1973	57	62
1974	59	61
1975	59	62
1976	60	62
1977	59	62
1978	59	61
1979	60	62
1980	60	63
1981	60	64
1982	(¹)	65

¹ Not available.

Note: Data on annual earnings refer to full-time, year-round wage and salary workers and are collected in the March supplement to the Current Population Survey. Weekly earnings data, which are collected monthly in the CPS, refer to usual median weekly earnings of full-time wage and salary workers. Data shown for the years 1967-78 were collected in May; for 1979-82, they are second quarter averages.

strengths and weaknesses. The purposes for which the data are to be used thus largely determine whether the annual or weekly data are more appropriate. □

FOOTNOTES

¹ Prior to 1979, comparable weekly earnings data were collected in the May CPS.

² Quarterly data on weekly earnings from the CPS are published in the press release, "Weekly Earnings of Workers and Their Families." For annual averages of weekly earnings, see *Analyzing 1981 Earnings Data from the Current Population Survey*, Bulletin 2149 (Bureau of Labor Statistics, 1982). For uses of reported annual earnings data, see *Linking Employment Problems to Economic Status*, Bulletin 2123 (Bureau of Labor Statistics, 1982); and Sylvia L. Terry, "Unemployment and its effect on family income," *Monthly Labor Review*, April 1982, pp. 35-43. Also, the Bureau of the Census regularly publishes the reported annual earnings data as part of the Current Population Reports P-60 Series.

³ The sample size for the monthly CPS is about 60,000 households. Thus, one quarter or 15,000 times 12 equals about 180,000 households as the base for the annual averages. For further discussion, see *Technical Description of the Quarterly Data on Weekly Earnings from the Current Population Survey*, Bulletin 2113 (Bureau of Labor Statistics, 1982).

⁴ See Daniel E. Taylor and Edward S. Sekscenski, "Workers on long schedules, single and multiple jobholders," *Monthly Labor Review*, May 1982, pp. 47-53.

⁵ See Nancy F. Rytina, "Occupational changes and tenure, 1981," *Monthly Labor Review*, September 1982, pp. 29-33.