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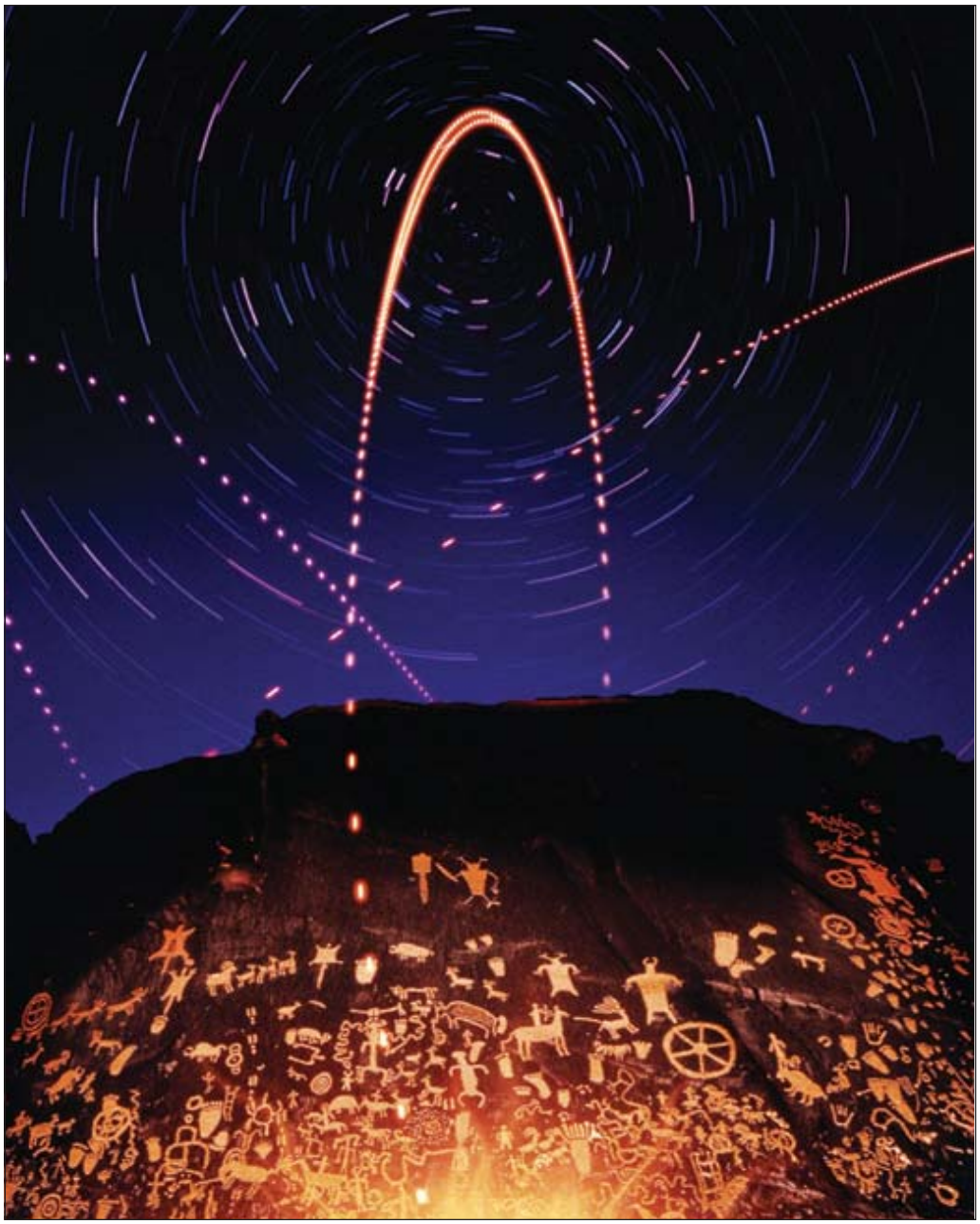

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Symbols

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

Family spending power

- Families with two or more adults have unadjusted incomes above the overall average because they have more potential earners. On the other hand, unattached individuals and lone parents have after-tax income averages just over half the overall average. Adjusting incomes to account for family size and composition—using an 'equivalence scale'—changes the picture.
- Based on the adjusted figures, the average family had the equivalent spending power of an unattached individual with $26,900 in after-tax income in 1999. Adjusted incomes fall into a narrower range, so the gap between the highest and lowest 20% falls from $8 (unadjusted) to $5 for every $1. This smaller gap indicates a tighter distribution when incomes are adjusted for family size.
- Many demographic trends contributed to changes in the size and type of families between 1980 and 1999. The family with two parents and children saw a decline, while other forms of household organization increased. The average family size in 1999 was 10% smaller than in 1980.

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Family spending power

Jamie Carson

IS INCOME A GOOD MEASURE of a family's economic well-being? Consider two families, each with an income of $40,000. One comprises two parents and three young children, the other a lone parent with a teenage child. The fortunes of these families differ according to the number of people present and their various demands on the family income.

Per capita income provides an alternative measure of well-being but fails to account for the benefits of 'income pooling' to meet joint expenses. Also, families generally enjoy 'economies of scale'—two can live more cheaply than twice one. Living spaces and automobiles are shared, and food and clothes shopping becomes more efficient—just ask any younger sibling about hand-me-downs. These factors enable persons living in families to achieve a higher standard of living than would be possible on their own.

To get a better picture of overall spending power and to make comparisons between different family types, it is necessary to look at both income pooling and economies of scale within families. An equivalence scale is the device most commonly used to level the playing field. Equivalence scales date back at least as far as Ernst Engel (1821-1896), a German statistician who found that lower-income families spent a relatively higher share of their income on food.

To construct an equivalence scale, family income is divided by an adjustment factor that reflects family size and composition, and the economies of scale that families enjoy.[1] The more the people, the more the slices of the income pie. But children, for example, would probably need a thinner slice than the adults in the family. The family would benefit from economies of scale by sharing living space and other big ticket items, as well as making more efficient use of food and clothing.[2]

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After the adjustments, or equivalencies, have been calculated, two families with adjusted incomes of $40,000 can be considered to have the same spending power, whether the family consists of 2 or 10 members. Adjusted incomes also allow the comparison of the well-being of unattached individuals with that of families.[3]

Equivalence scales are useful not only in comparing different family units at a point in time, but also in tracing the evolution of family spending power over time. This is particularly important when family composition changes, as it has in the past 20 years. Spending power is affected by both income trends and family composition trends. Equivalence scales inherently control for changes in family composition to place income comparisons across long periods of time on a more equal footing.

This article begins with a look at the main changes in family composition over the past 20 years (see *Data sources and definitions*). An equivalence scale adjustment is then applied to each family type to show how spending power has evolved for each one. Finally, the equivalence scale adjustment is used to generalize across family types to examine spending power for all families over time. Each section looks at average level and distribution of incomes using after-tax family incomes, before and after adjustment. (For details on the adjustment, see *The 40-30 equivalence scale*.)

Less togetherness

Most of the well-known demographic trends have contributed to changes in the size and type of families. The aging of the baby boom, the decline in fertility, the increasing average age at marriage, and the increase in family breakdown have contributed to the declining prevalence of the two-parents-with-children family and the increase in other forms of household organization.[4] The average family size in 1999 was 10% smaller than in 1980 (Table 1). In 1999, over one-third of families were unattached individuals, 1 in 25 families fell into the lone-parent category, 1 in 5 were couples with no children, and 1 in 6 were couples with children.

The 40-30 equivalence scale

Equivalence scales generally take a reference family size, usually a one-person family, and adjust the incomes of families of other sizes so that they are equivalent to the reference. Statistics Canada has developed a 40-30 equivalence scale to calculate its low-income measure (an alternative to the low-income cutoff).

The reference base—the unattached individual—is assigned a factor of 1. For other families, the factor is increased by 40% for each adult, and 30% for each child.[5] Adjusted family income is then derived by dividing family income by the factor. For example, a family comprising a husband, a wife and two children and having an income of $50,000 has an adjusted income of $25,000: $50,000 ÷ (1+0.4+0.3+0.3) = $50,000 ÷ 2 = $25,000. That is, the family (and each member) has spending power equivalent to that of an unattached individual with an income of $25,000.

Why 40-30? Indeed, no consensus exists as to the ideal adjustment factor. The 40-30 standard was chosen because it was better than other models in providing a reasonably accurate picture of low income in Canada. A major plus is that the standard is fairly easy to understand and use.

While the overall number of families grew by 39% between 1980 and 1999, the greatest change occurred in the lone-parent category—up 74%. Also fast-growing were unattached individuals and couples without children (up 61% and 46% respectively). The growth rate for couples with children was well below the overall average. In fact, their 4% growth rate was even lower than Canada's population growth rate during this period. Growth rates for 'other' families mirrored the situation for couples. Those without children grew at an above-average rate, while those with children came in below. The net effect, therefore, was a shift from larger to smaller families through the 1980s and 1990s.

Table 1: Families by type, 1999

		Change from 1980 to 1999			
	Share	Number	Family size	Number of adults	Number of children
			%		
Total	**100**	**39**	**-10**	**-6**	**-23**
Unattached individuals	34	61	0	0	...
Couple, no children	22	46	0	0	...
Couple, with children	17	4	-1	0	-1
Lone parent	4	74	1	0	1
Other, no children	16	51	-3	-3	...
Other, with children	7	5	-7	-7	-7

Sources: Survey of Consumer Finances, 1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

Since family size for individuals and couples without children cannot change, the overall decrease of 10% would have had to come from the other categories. Both couples and lone parents with dependent children experienced only minor changes in family size. Therefore, none of these four categories, which account for over 75% of families, factored into the overall 10% family size decrease between 1980 and 1999. The declines came from the 'other' categories, in particular families with children.

Different family types, different effects

Which family types had unadjusted incomes above the overall average? Not surprisingly, families with two or more adults have more potential income earners—reflected in their higher averages for unadjusted after-tax family income (Table 2). On the other hand, unattached individuals and lone parents had after-tax income averages just over half the overall average.

The family size adjustment provides a better comparison. In this case, instead of 'other' families, couples without children had the highest adjusted family incomes. Couples with children dropped from well above to just over the overall average. Unattached individuals remained relatively worse off, but they moved up from 53% to 82%. Lone parents, however, did not move up, remaining at 57%.

A perfectly even distribution would result in 20% of a given family type in each quintile (see *Quintiles 101)*. Using unadjusted income, the distribution of unattached individuals is significantly skewed to the lower quintiles (Chart A). However, this over-

Table 2: Income by family type

	1999 $		Ratio to overall average	
	After-tax income	Adjusted after-tax income	After-tax income	Adjusted after-tax income
	$		%	
Total	**41,600**	**26,900**	**100**	**100**
Unattached individuals	22,100	22,100	53	82
Couple, no children	46,000	32,900	111	122
Couple, with children	53,900	27,700	130	103
Lone parent	23,700	15,200	57	57
Other, no children	58,900	31,200	142	116
Other, with children	60,600	25,900	146	96

Source: Survey of Labour and Income Dynamics, 1999

Quintiles 101

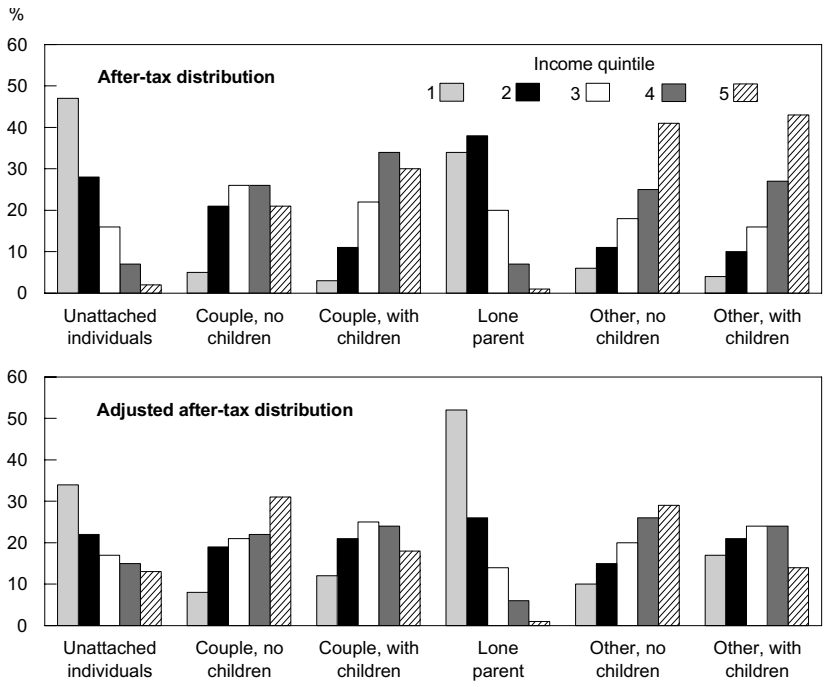
The 12.7 million families in 1999 were ordered from lowest after-tax income to highest, and split into five equal categories, or quintiles. The lowest quintile is made up of families with the bottom 20% of after-tax incomes, and so on up the line.

After the 40-30 equivalence scale was applied, families were re-ranked based on adjusted after-tax family income, and the quintiles were re-calculated. Since over half the families changed quintiles when adjusted figures were used, the membership of a given quintile differed decidedly on a pre- and post-adjustment basis.

weighting is mitigated somewhat if adjusted incomes are used. The opposite occurs for 'other' families. Lone parents remain skewed to the lower quintiles after the adjustment, with their proportion in the lowest actually increasing. Couples without children move from a fairly even distribution to a slight skew to higher quintiles, reflecting over-representation in the highest adjusted family income quintile. The distribution for couples with children, however, is more even on an adjusted basis.

The net result of ups and downs between 1980 and 1999 is that couples with children and lone-parent families saw the biggest gains in both after-tax income and spending power (Table 3). Factoring in the decline in family size affects only other families with children, with the change between 1980 and 1999 moving from 4% (unadjusted) to 8% (adjusted). Conversely, since no adjustment factor applies, the 5% improvement for unattached individuals is equal on either basis.

Chart A: Adjusting for family size changes the distribution of families by income.



Source: Survey of Labour and Income Dynamics, 1999

Table 3: Change in average income (1999$) by family type, 1980 to 1999

	After-tax income	Adjusted after-tax income
	%	
Total	**1**	**5**
Unattached individuals	5	5
Couple, no children	2	2
Couple, with children	11	11
Lone parent	15	16
Other, no children	4	5
Other, with children	4	8

Sources: Survey of Consumer Finances, 1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

Indeed, the income trend for every family type except the extended group was essentially unaffected by the choice of income measure.

Yet, the overall trend showed markedly better improvement, relative to unadjusted figures, with the declines in family size factored in. This paradox is easily explained. Aside from the decline in family size for families in the 'other' categories, the drop in average family size is accounted for by the shift from larger family types to smaller ones. Since these smaller families have lower unadjusted income averages and contribute more weight to the overall average, they drag down the overall level of growth, even if the average income of any particular family type remains constant.

Adjustment narrows the income gap

The equivalence adjustment enables comparison of spending power by type of family. The adjustment creates a level playing field for comparing families of different sizes and make-ups, and a different snapshot in terms of average level and distribution of spending power emerges.

Overall, average family after-tax income was $41,600 in 1999 (Table 4). One way to measure the spread or distribution of incomes is to compare average after-tax incomes of the top and bottom quintiles. The 1999 'after-tax income gap', or ratio, was 8.30 to 1, indicating that families in the highest quintile brought home $8.30 in disposable income for every $1 brought home by families in the lowest quintile.[6]

Table 4: Average family size and after-tax income by income quintile

	Family size			Family income
	Total	Adults	Children	
				$
Unadjusted				
Total	**2.38**	**1.89**	**0.49**	**41,600**
Bottom	1.31	1.16	0.15	10,700
Second	1.89	1.53	0.36	23,000
Third	2.37	1.85	0.52	34,900
Fourth	2.92	2.20	0.72	50,700
Top	3.44	2.73	0.71	88,500
Adjusted				
Total	**2.38**	**1.89**	**0.49**	**26,900**
Bottom	1.94	1.44	0.50	9,100
Second	2.34	1.77	0.57	17,000
Third	2.55	1.97	0.58	23,800
Fourth	2.61	2.12	0.49	32,000
Top	2.48	2.17	0.31	52,700

Source: Survey of Labour and Income Dynamics, 1999

Families in the top 20% had the largest family sizes: 2.73 adults and 0.71 children. Families in the lowest 20% averaged only 1.16 adults and 0.15 children.[7] Overall, average family size in 1999 was 2.38—1.89 adults and 0.49 children.

What is the effect of applying the 40-30 equivalence scale, re-ranking families based on the adjusted after-tax family income, and re-calculating quintiles? First, the average adjusted total income is lower than the unadjusted figure because of the family size adjustment. This factor was roughly 1.5 overall for 1999. Second, each quintile reflects a different membership, since over half the families changed quintiles when adjusted figures were used.

Based on the adjusted figures, the average family had the equivalent spending power of an unattached individual with $26,900 in after-tax income in 1999. Since adjusted incomes fall into a narrower range, the gap between the highest and lowest 20% also falls—to $5 for every $1. This smaller gap indicates a tighter distribution when family incomes are adjusted for family size.

With the new quintiles, family size rises from the lowest quintile, peaks in the middle and upper-middle quintiles, and drops off in the highest. Applying the adjustment removes the upward skew to family size as one moves up the income scale.

The average number of adults per family continues to climb with adjusted income, although not at the rate seen with the unadjusted data. Averages for children per family no longer climb; in fact, families in the highest 20% of adjusted after-tax incomes have the lowest average number of children.

Little change in after-tax income in 20 years

If the equivalence adjustment tends to yield a more equal income distribution at a point in time, how does it affect income trends? The adjustment process in this instance controls for changes in family structure that occurred over the years.

From 1980 to 1999, Canada's population, which grew by 25%, was characterized by two opposing trends: the number of economic families grew by almost 40%, while the size of the average family fell by 10% (Chart B).

For families overall, the average number of children per family fell almost four times as much as the number of adults (23% versus 6%). No pattern emerged in terms of changes by quintile (Table 5).[8]

The pattern for 1999 was representative of the entire period: family size rose steadily from one quintile to the next, based on family income after tax. Using adjusted income quintiles, the 1999 pattern—family size rising to a peak in the middle quintiles and falling off—essentially held as well.

Also keeping to the 1999 pattern was the adjustment's effect on family income averages and distributions. The net result of two decades of rises and drops in average adjusted after-tax incomes was an increase of 5% (Chart C). This compares slightly more favourably with the 1% increase in unadjusted incomes, the difference being caused by the inclusion of the decrease in family size.

The trends indicated by the two measures, however, are the same. Both income lines declined during periods that included economic downturns (the recessions of the early 1980s and 1990s) and peaked in 1989, along with the business cycle. For the mid-1990s, both lines show family incomes to be stagnant, with some gains evident in the latter half of the 1990s.

Data sources and definitions

Data are from the **Survey of Consumer Finances** for 1980 through 1995, and from the **Survey of Labour and Income Dynamics** for 1996 through 1999. The content and estimates from the two surveys line up very well (Cotton et al. 1999).

After-tax income is market income (wages and salaries, self-employment income, investment income, private pension income, etc.), plus government transfers (Canada and Quebec Pension Plans [C/QPP] and Child Tax credits and benefits) minus income taxes (federal and provincial).[9] Excluded from income taxes are contributions to Employment Insurance and C/QPP. Note also that this article refers to family income, while the income tax system is based for the most part on individual income, claims and deductions. After-tax income is the source of money for family expenditures, and as such is an excellent measure of a family's spending power. The term 'disposable income' is used interchangeably with 'after-tax income.' The after-tax measure also reflects the effect of Canada's income redistribution system, which relies on both taxes and government transfers.

Financial figures are in **constant (1999) dollars**.

An **economic family** consists of individuals related by blood, marriage (including common law) or adoption sharing a common dwelling. Unattached individuals, or 'families of size one,' are persons living alone or with unrelated persons.

Children are counted as such only if they are under 16. For this study, children under 16 are considered dependants, and children 16 and over are 'offspring' or non-dependants.

Family types[10]

Unattached individuals live alone or with people outside their economic family.

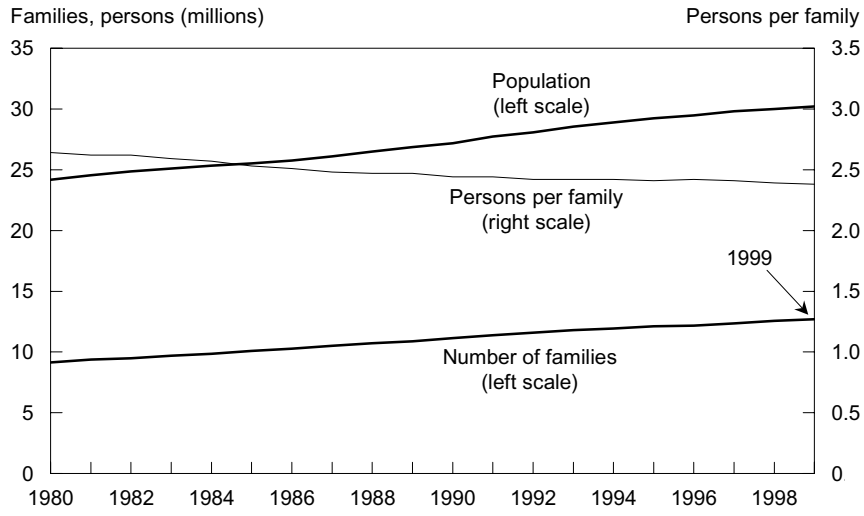
Couples with no children. The adjustment factor for this group is constant, at 1.4.

Couples with children are couples with only dependent children. These families have an adjustment factor of 1.4 plus 0.3 for each child in the family.[11]

Lone parents with children have an adjustment factor of 1, plus 0.4 for the first child, plus 0.3 for each of the other children.

Other families include lone parents who live with blood relatives such as brothers and sisters, couples with a child 16 or over living with them, and three-generation families who live under one roof. The group is subdivided into those with children under 16, and those in which all family members are 16 and over. Families in these categories have adjustment factors of at least 1.4 (for the first two in the household), plus 0.4 for each additional adult, and 0.3 for each additional child under 16.

Chart B: The number of families grew faster than the population, so average family size fell steadily.



Sources: Survey of Consumer Finances,1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

An unequal recovery in the 1990s

The trend lines for the income gap measures—the average income of the top fifth of families divided by that of the bottom fifth—also moved in tandem (Chart D). The gap moved opposite to the income average throughout the 1980s, reaching a minimum in 1989-1990. Beginning in 1992, however, this converse relationship broke down, and the income averages and the gap often rose or fell in tandem.[12]

Between 1980 and 1999, after-tax family income fell for the three middle quintiles (Chart E). In terms of family spending power, however, no real declines took place. Instead, families in the second and third (middle) quintiles showed a 1999 adjusted income average unchanged from 1980 levels.

The year 1989 marked a major turning point for the top and bottom quintiles. Up to 1989, the bottom quintile had been experiencing steady gains, totalling 15% in average after-tax income for the decade. Between 1989 and 1999, however, the trend reversed and the average fell 8%. For the top quintile, unadjusted family incomes rose only 1% up to 1989, but rose 6% in all thereafter. These changes were similar for the adjusted measures and re-calculated quintiles.

Taking the two decades together, for the top and bottom quintiles, unadjusted after-tax incomes rose 7% and 6% respectively, while growth in the adjusted figures was 10% and 11%. Since these changes were remarkably similar, the 1999 adjusted and unadjusted income gaps ended up essentially unchanged from 1980 levels.

Summary

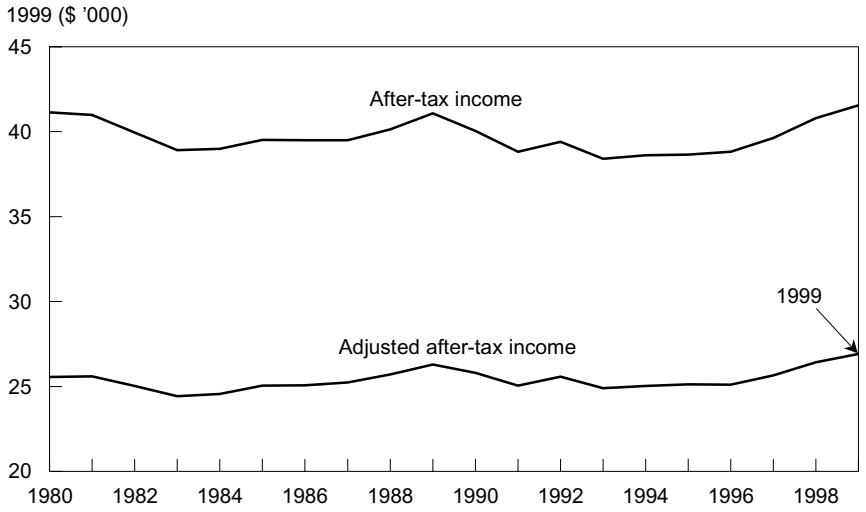
Family income distributions as typically produced mask the effects of income pooling and economies of scale within families, and do not allow for easy comparison of the economic well-being of different kinds of families. Adjusting family

Table 5: Family size and composition

	Population	Families	Family size
	'000		
1980	24,164	9,153	2.64
1999	30,189	12,685	2.38
% change	*25*	*39*	*-10*
		Change	
	Total	Adults	Children
Quintile*		%	
Total	**-10**	**-6**	**-23**
Bottom	-11	-7	-35
Second	-10	-8	-18
Third	-14	-6	-32
Fourth	-10	-4	-23
Top	-5	-4	-11

Sources: Survey of Consumer Finances, 1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999
** Based on unadjusted after-tax family income quintiles.*

Chart C: After-tax family incomes and spending power in 1999 were essentially unchanged from 1980.

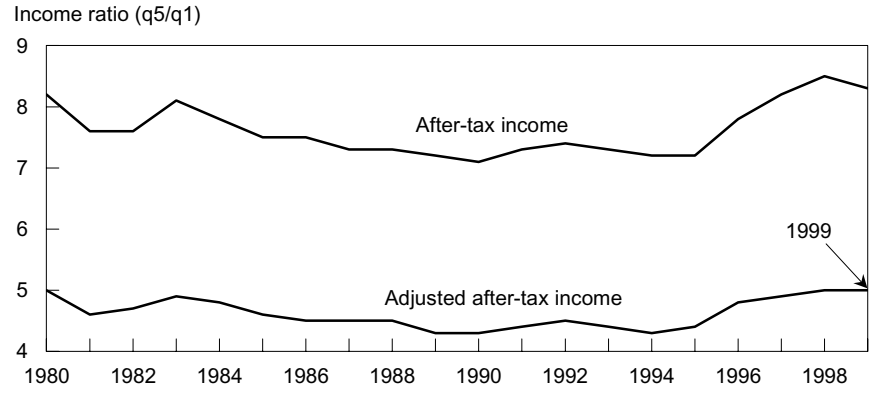


Sources: Survey of Consumer Finances,1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

incomes for family size and composition enables a better comparison.

When average family size declines, as it did during the 1980s and 1990s, changes in family income averages tend to show families as worse off than they really are. Using the 40-30 family size adjustment, after-tax family incomes were 5% higher in 1999 than in 1980, compared with a 1% gain shown by unadjusted data.

Chart D: Recent increases in the income gap reversed the reductions experienced for most of the 1980s and 1990s.



Sources: Survey of Consumer Finances,1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

The income distribution picture also varies depending on whether a family size adjustment is used or not. If families are ranked by after-tax income, the top 20% received roughly $8 for every $1 received by the bottom 20% in 1999. When re-ranked based on adjusted incomes, the gap narrows to approximately $5 versus $1.

Larger family sizes contribute to above-average family incomes, pushing averages up and making smaller families seem economically worse off than they actually are. Adjusting for family size makes for a fairer comparison of families of different sizes along the same relative scale.

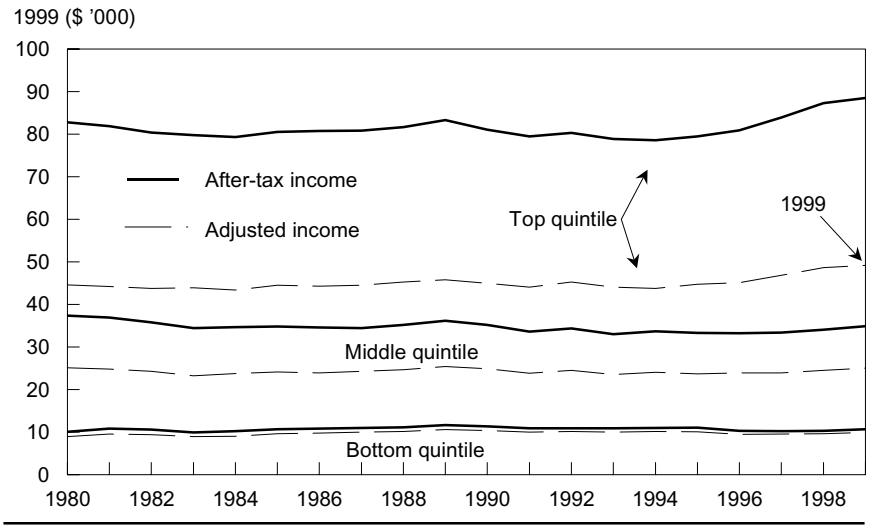
Changes in the shares of various family types explain most of the declines in average family size between 1980 and 1999. Growth rates in the number of smaller families, including unattached individuals, lone parents, and couples without children, exceeded the overall rate. After the 40-30 adjustment, couples without children had the highest levels of spending power, on average, while lone-parent families were the worst off.

Perspectives

Notes

1 Some equivalence scales get more complicated, adding in other family characteristics such as detailed age and sex breakdowns, along with other factors such as characteristics of the family's place of residence (urban centres having higher costs of living than rural). See Wolfson and Evans (1989) for a good discussion of this issue, Friedman (1952) for an interesting example of the challenges in constructing an equivalence scale, and Bittman and Goodin (1998) for an innovative application: an equivalence scale for time.

Chart E: The 40-30 adjustment had the greatest effect on the top quintile, the least on the bottom.



Sources: Survey of Consumer Finances,1980 to 1995; Survey of Labour and Income Dynamics, 1996 to 1999

2 Per capita family incomes are essentially an equivalence scale with no economies of scale factored in. All family members are assumed to use an equal share of the family's resources.

3 In the case of data published by Statistics Canada, estimates are shown separately for families made up of two or more persons and for unattached individuals. This split provides a very partial adjustment for family size—or the number of persons who derive their well-being from the family income. External citations of family income averages usually refer only to that for families, leaving out the effect of income averages for people living on their own.

4 See Milan (2000) for a complete discussion of trends in Canadian families.

5 More technically, family members are classified as adults if they are 16 years of age or over. Family members under 16 are counted as children and receive the 30% adjustment. For lone-parent families with no other adult present, 40% is added for the first child (regardless of age), and 30% for subsequent children. See Statistics Canada (1999) for a complete discussion.

6 A close cousin of the income gap measure is the share of overall income going to each quintile. This 'share of income' measure can be approximated by dividing the average income for each quintile by five times the overall average income ($41,600 in 1999). For example, the $10,700 average after-tax family income for the 20% of families in the lowest quintile amounts to a 5% share of overall income.

7 As a result of the steady growth in family size along the (after-tax) income scale, approximately 8.7 million people were in the highest quintile in 1999 and less than 3.3 million were in the lowest. Only the middle quintile (approximately 6.0 million people) represented 20% of the population as well as 20% of families.

8 Note that which families fall into a given quintile depends on independent rankings of family income for the year in question. As a result, one cannot conclude that families in the highest 20% of income in 1980 shrank in size by 5% over 16 years. Rather, the average size of families ranked in the top 20% in 1999 was 5% smaller than the 1980 selection of highest after-tax income families.

9 For details on income concepts used by the Agency, see Statistics Canada (2001).

10 In this study, estimates of income and number of families by type are derived from a sample survey of approximately 35,000 households. As with other sample surveys, these estimates are subject to sampling and non-sampling errors. Survey weighting procedures impose controls based on census counts for the number of families by size, but not for family type. However, reconciliation of survey estimates with census counts indicates sufficient reliability for this study's conclusions about comparative incomes and trends.

11 Couples with children aged 16 and over as well as children under 16 more closely resemble couples with all children 16 and over in terms of average adults and children per family, as well as average after-tax family incomes. Hence, for this study, couples with children both under and over 16 have been excluded from the couples with children category and included in the 'other' category. More refined breakdowns are available from the author.

12 See Zyblock and Lin (forthcoming) for a discussion of issues related to this observation.

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