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INCOME SIZE DISTRIBUTION STATISTICS IN CANADA
—A SURVEY AND SOME ANALYSIS
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INTRODUCTION

IN contrast with many other fields of Canada's relatively comprehensive statistical system, information and research on the size distribution of income have been slow to appear. Systematic collection of income size statistics is of very recent origin. Yet, scanty and imperfect though they are, the data and research on income size of the past represent an essential fund of experience from which the more recent work has benefitted a great deal. Furthermore, the bits of information collected in the past are the only guideposts available for making judgments – guesses might be a more appropriate word – regarding what happened to the size distribution over time.

In this paper it was necessary to make a choice between concentrating on a time analysis of available information, on the one hand, and an evaluative description of the evolution of information on income size, on the other; to carry out both objectives adequately was not feasible within the time available. It appeared appropriate in a survey paper to give main emphasis to the second alternative. Nevertheless, some statistical estimates and comparisons have been prepared for this paper and these are discussed in Part I. Part II is devoted to a general description of the evolution of statistics and research on income size distribution in Canada.

I. SOME CHANGES IN EARNINGS FROM PAID EMPLOYMENT AND OTHER COMPARISONS

1. *Introduction*

The main purpose of this discussion is to make some tentative comparisons of the average level and distribution of earnings from paid employment of wage and salary earners between the years 1930–31 and 1951; these comparisons deal with *individual* wage and salary earners and wage and salary earning *families*.

[1] The statistical estimates and views expressed in this table are the personal responsibility of the authors.

This is followed by some general remarks on incomes other than wages and salaries and on changes for more recent years. The methods used in constructing the individual and family distributions of wages and salaries are described in the appendix to this part

The selection of years for the main statistical comparisons have been dictated by the availability of statistics. The 1931 census statistics (which refer to the twelve months ended 1st June 1931) lend themselves to comparisons with individual and family distributions constructed from data secured from a sample survey of incomes carried out in March 1952 and covering the calendar year 1951.[1] Since the 1931 census data are restricted to wage and salary earners the detailed analysis is confined to these earners, and even for these groups the statistical distributions cover earnings from paid employment only because the census did not collect data on income from other sources.

It should be noted that the present study involved some arbitrary assumptions which further investigation might show were not warranted and some of the provisional conclusions arrived at might have to be amended accordingly. However, as much as possible, an attempt has been made to build up series which are broadly comparable in concept and coverage for the years 1930–31 and 1951.

The most important adjustment made to the census statistics for 1930–31 was an adjustment for under-reporting of earnings. A special tabulation of the distribution of wages and salaries from the 1952 income survey was compared with the corresponding series from the 1951 census. This comparison indicated that the differences between the two series tend to be relatively greater at the upper income levels. Accordingly, the adjustments made to the 1930–31 distributions were increased with the income level, using the 1951 experience as a general guide: incomes below $450 were left as reported; incomes from $450 to $949 were increased by 5 per cent; those from $950 to $1,949 by 10 per cent; and those of $1,950 and over by 15 per cent. It is believed that these adjustments are reasonable in the light of the related information it was possible to study.

Aside from statistical problems there are difficulties of a more fundamental nature. Thus, the comparisons are made between two very unlike periods – a depression year and a prosperity

[1] See below, pp. 186–193.

year. When the census took place in June 1931 economic conditions had been deteriorating for some two years, though they had not yet reached the trough. The census data straddle the calendar years 1930 and 1931. In 1930, wages and salaries were 95 per cent of the 1929 peak, while by 1931 they had dropped to 82 per cent. The total number of wage-earners, at the census date, was nearly 2,570,000, of whom 470,000 were unemployed. In all, 29 per cent of all wage and salary earners had been jobless at some time during the year; and nearly one-half of all wage and salary earners reporting some unemployment were unemployed for at least half of the year. By contrast, the year 1951 was one of great prosperity and was preceded by a period of almost uninterrupted high-level activity. Three of the four quarters of 1951 showed less than 2 per cent of the labour force seeking jobs; the peak quarter of unemployment occurred in March 1951 when 169,000 persons were without jobs and seeking work; this number declined to 76,000 in August. The number of paid workers during the period ranged from 3.6 to 3.8 million.

During a depression many persons have lower than normal incomes because they can find work for only part of the year or only part-time work; this would tend to make the income distributions more unequal than they would be under conditions of prosperity when these individuals would work a longer period and when they would earn more. In prosperous periods when employment is easier to obtain, individuals on the fringe of the labour market, who command lower earnings, or do only temporary or part-time work, can move more freely into the labour market[1]; this would tend to accentuate relative earning differences.

There are other cyclical effects which would have to be considered, for example, the fact that income units may 'double up' during depressions. However, it is likely that further research will indicate that the declines in the inequality of income described later reflect, in part at least, longer-term tendencies:

[1] A question on the 1952 income survey directed to those who worked part of 1951, but not a full year, as to why they were unemployed part of the year, indicated that involuntary unemployment was the reason in only 35 per cent of all cases. Among those who had spent some time seeking employment, more than half worked at least 35 weeks of the year. While 56 per cent of males (age 14 and over) were, according to the labour force, employed as paid workers at the time of the survey, some 62 per cent of all males reported incomes which came from wages and salaries during the preceding year.

the shift of workers away from the farms and the trend toward greater industrialization, giving rise to a movement of workers from lower to higher paying jobs;[1] and the possibility that wage negotiations frequently result in less than proportionate, or relatively flat, increases in wage rates. Offsetting these influences, to a considerable extent, is the tendency for the proportion of women in the labour force to rise;[2] since the wage rates of women are relatively lower, and since part-year employment is more common among women, this would tend to render the distribution more unequal for the more recent years.

2. Some changes in wages and salaries of individual wage and salary earners

(a) Changes in current dollars

Between 1930–31 and 1951 average wages and salaries of wage and salary earners increased substantially: from $964 to $2,136. The increase in median income was from $728 to $2,028. In 1931, more than 1,500,000 persons, or nearly 63 per cent of wage and salary earners, had earnings below $1,000 in 1930–31, whereas in 1951, although nearly one million earners had current dollar earnings of less than $1,000, these represented less than 25 per cent of all wage earners. On the other hand, in 1931 only one-half of one per cent of all wage-earners had earnings above $5,000, while in 1951 this ratio had increased to 3.1 per cent.

These increases are illusory to the extent that they reflect price rises. Before calculating changes in real income, it is interesting to see what changes in the relative income distribution have accompanied the current dollar absolute changes. To study the changes in the relative income distribution, Lorenz curves were constructed by cumulating the percentage of income recipients and plotting these against the percentage of income received.

They indicate that a considerable decline occurred in income inequality. The declines in inequality are summarized in the table below which shows that the share of the upper quintile declined while the shares of the remainder increased

[1] A brief examination of the structure of the labour force revealed some striking changes between 1931 and 1951. To illustrate, in 1931 about 10 per cent of all male wage-earners were employed on the farm; in 1951 the ratio was 4 per cent, the number of agricultural wage-earners having declined by 70,000.

[2] For example, while the ratio of males, aged 14 and over, in the labour force declined 3½ per cent between 1931 and 1951, that of females rose 24 per cent. In 1931 women formed 17 per cent of the labour force and in 1951 22 per cent.

TABLE I

Distribution of Wages and Salaries of Individual Wage and Salary Earners by Size of Wages and Salaries

Income Group	Number of Persons	Aggregate Wages and Salaries	Number of Persons	Wages and Salaries
$		$000	%	%
(a) Year Ending 1st June 1931				
TOTAL[1] . . .	2,500,000	2,409,691	100.0	100.0
Under 950 .	1,564,000	721,909	62.6	30.0
950–1,949 .	708,000	976,071	28.3	40.5
1,950–2,949 .	154,000	368,228	6.3	15.3
2,950–4,949 .	60,000	228,748	2.4	9.5
4,950–9,949 .	11,000	76,731	0.4	3.2
9,950 and over .	3,000	38,004	0.1	1.6
(b) Year Ending 31st December 1951				
TOTAL . . .	4,164,000	8,893,200	100.0	100.0
Under 1,000 .	941,000	480,100	22.6	5.4
1,000–1,999 .	1,103,000	1,654,000	26.5	18.6
2,000–2,999 .	1,194,000	2,915,300	28.6	32.8
3,000–4,999 .	796,000	2,853,500	19.1	32.1
5,000–9,999 .	110,000	675,900	2.6	7.6
10,000 and over .	20,000	314,400	0.5	3.5

[1] In addition, 63,000 male wage-earners and 7,000 female wage-earners, a total of 70,000 persons, reported no wage or salary earnings during this period. In 1951 the number of persons in the labour force reporting no incomes was minor.

TABLE II

Distribution of Wages and Salaries Among Quintiles— Individual Wage and Salary Earners

	Lower Limit of Wages and Salaries		Average Wages and Salaries		Percentage share of Wages and Salaries	
	1930–31	1951	1930–31	1951	1930–31	1951
	$	$	$	$		
Lowest quintile .	—	—	100	416	2.1	3.9
Second quintile .	162	705	495	1,322	10.3	12.4
Third quintile .	583	1,685	755	2,008	15.7	18.8
Fourth quintile .	928	2,346	1,131	2,668	23.5	25.0
Highest quintile .	1,422	3,118	2,339	4,263	48.5	39.9

correspondingly. The ratio of wages and salaries accruing to the lowest two-fifths increased from around 12 per cent of aggregate wages and salaries between 1930–31 and 1951. In 1930–31 the share of the top quintile was over 48 per cent of the total; in 1951 this share was 40 per cent.

(b) *Changes in constant dollars*

To secure some measure of the change of real incomes between 1930–31 and 1951, the distribution for the earlier period was converted to 1951 dollars using the personal expenditure deflator of the National Accounts.[1] The limitations of this procedure must be kept in mind; it assumes that the price changes affected all income groups to the same extent; further, it applies a price index of consumer goods and services to income totals which include amounts spent on taxes and amounts saved. Statistics are not available to take account of these factors but there is no reason to believe that, if they could be considered, the general picture shown below would be substantially altered.

TABLE III

Distribution of 1930–31 *Wages and Salaries of Individual Wage and Salary Earners, by Size of Wages and Salaries, in* 1951 *Dollars*

Income Group	Number of persons	Aggregate Wages and Salaries	Number of Persons	Wages and Salaries
$		$000	%	%
TOTAL . . .	2,500,000	4,065,157	100.0	100.0
Under 950 .	879,000	402,067	35.2	9.9
950–1,949 .	819,000	1,067,850	32.9	26.3
1,950–2,949 .	503,000	1,179,196	20.1	29.0
2,950–4,949 .	225,000	836,588	9.0	20.6
4,950–9,949 .	62,000	399,647	2.4	9.8
9,950 and over .	12,000	179,809	0.5	4.4

Average Wages and Salaries .	$1,626
Median Wages and Salaries .	$1,219

[1] *National Accounts, Income and Expenditure* 1926–1950, Table 4; *National Accounts, Income and Expenditure* 1951–1954, Table 48, Dominion Bureau of Statistics, Ottawa.

Since the 1931 census data covered approximately one-half of the calendar years the deflator used was not a calendar year but an index midway between the 1930 and 1931 indexes. The 1951/1931 ratio of this deflator was 168.7.[1]

In general, although the constant dollar data do not show as pronounced changes as the current dollar series, they nevertheless show decided shifts. In 1951 a smaller proportion of wage and salary earners had wages and salaries below $2,000 and a higher proportion between $2,000 and $5,000; the proportion of wage and salary recipients above $5,000 showed little change, although the wage and salary share of this top 3 per cent declined. The figures also indicate that an increase of 31 per cent occurred in overall real earnings of wage and salary earners. If the 1931 averages are calculated inclusive of wage-earners receiving no income, the percentage increase in average real earnings was 35 per cent.[2]

An examination of the earnings for males and females separately in 1930–31 and 1951 suggests that the increase in real earnings of male wage and salary earners was substantially greater than the estimates shown above because the increase in real earnings of women was relatively small. This does not necessarily mean that women have not benefited in real terms; the explanation for a small increase might be that in 1931 a larger proportion of women workers were probably full-time employees compared with 1951 when many women included in the distribution would be working part-time to supplement family incomes.

3. *Some changes in wages and salaries of families whose head was a wage or salary earner*

(a) *Changes in current dollars*

A distribution of wages and salaries of families whose head was classified as a wage or salary earner was constructed for 1930–31 and compared with a similar distribution based on the

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[1] A constant dollar series was also estimated with the cost-of-living index. The ratio for the period was 158.4. On the whole, it appeared that the consumer expenditure deflator is the more appropriate one since the incomes covered by the cost-of-living index are much more restricted. On the other hand, the cost-of-living index is based on the expenditures of wage-earning families.

[2] Constant dollar estimates constructed with the cost-of-living index show an increase of 40 per cent in average real income; 44 per cent if the 1931 figures are calculated including wage-earners reporting no income.

statistics secured from the 1952 income survey. These estimates are for families of two or more persons.[1]

As was true in the case of the individual distributions, the family wage and salary distribution shows substantial increases

TABLE IV

Distribution of Wages and Salaries of Families Whose Head was Classified as a Wage and Salary Earner

Income Group	Number of Families	Wages and Salaries
$	%	%
(a) Year Ending 1st June 1931		
TOTAL	100.0	100.0
Under 950 . . .	35.2	13.4
950–1,949 . . .	41.6	39.7
1,950–2,949 . . .	15.4	24.2
2.950–4.949 . . .	6.3	15.4
4.950–9,949 . . .	1.1	5.2
9,950 and over . . .	0.2	2.3
(b) Year Ending 31st December 1951		
TOTAL	100.0	100.0
Under 1,000 . . .	4.7	0.9
1,000–1,999 . . .	15.0	6.8
2,000–2,999 . . .	29.2	21.5
3,000–4,999 . . .	36.7	40.7
5,000–9,999 . . .	13.5	25.4
10,000 and over . . .	1.1	4.5

in earnings in current dollars. Average earnings in 1930–31 were $1,489 and in 1951 $3,375; the median earnings were $1,293 and $3,037 respectively. In 1930–31 more than 35 per cent of all families had incomes below $1,000, while by 1951 this ratio was approximately 5 per cent; the ratio with incomes above $5,000 had risen from less than 1.5 per cent to nearly 15 per cent.

The increases in current dollar incomes were accompanied by a decline in the degree of income inequality. The share of the top

[1] For a definition of the family used see Part II, p. 194. Percentages only are shown as the absolute figures for 1951 may contain a substantial error because of defects in the weighting system that had to be used. The distribution of wage and salary earners for 1951 in Table IV are derived from the original survey estimates described in Part II.

quintile had diminished substantially while that of the fourth quintile moderately. The proportion received by the two lowest quintiles had increased. The shares, by quintiles, are shown below:

TABLE V

Distribution of Wages and Salaries Among Quintiles—
Wage and Salary Earning Families

	Lower Limit of Wages and Salaries		Average Wages and Salaries		Percentage Share of Wages and Salaries	
	1930–31	1951	1930–31	1951	1930–31	1951
	$	$	$	$		
Lowest quintile .	—	—	396	1,348	5.3	8.0
Second quintile .	616	2,010	841	2,353	11.3	13.9
Third quintile .	1,060	2,712	1,290	3,026	17.3	17.9
Fourth quintile .	1,529	3,387	1,751	3,814	23.5	22.6
Highest quintile .	2,157	4,452	3,171	6,333	42.6	37.5

(b) *Changes in constant dollars*

The family distribution for 1930–31 was adjusted to a constant dollar base, using the personal expenditure deflator of the National Accounts. The series are given below in percentage terms:

In real terms, there was an increase of 34 per cent in average

TABLE VI

Distribution of 1930–31 Wages and Salaries of Families Whose
Head was Classified as a Wage or Salary Earner, in 1951 Dollars

Income Groups	Families	Income
$	%	%
TOTAL	100.0	100.0
Under 950 . . .	13.1	2.9
950–1,949 . . .	30.2	16.4
1,950–2.949 . . .	29.8	29.2
2,950–4.949 . . .	19.2	28.7
4,950–9,949 . . .	6.8	17.3
9,950 and over . . .	0.9	5.6

Average Salaries and Wages . .	$2,512
Median Salaries and Wages . .	$2,174

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income between 1930–31 and 1951.[1] The ratio of families with earnings under $2,000 has declined by more than half; the proportion with incomes of $2,000 to $3,000 is similar in both periods, while the ratio with incomes above $3,000 had doubled. However, incomes in the highest bracket (above $10,000) show less change.

The decline in concentration of the distribution of family wages and salaries, referred to above, was due, to a considerable extent, to the more equal distribution of wages and salaries of heads of families in 1951 than in 1930–31. In addition, secondary earners (such as working wives, sons and daughters) made a more important relative contribution to family earnings, although the impact of this on the Lorenz curve is more difficult to determine. Examination of the data suggests that in 1951 a greater proportion of the earnings of secondary earners accrued to families where the earnings of the head were in the lower quintiles; this would exert an equalizing influence.[2]

It is also of interest to compare the size of the family of the various income groups. For 1931, statistics of family size are

TABLE VII

Wages and Salaries of Heads of Families of Two or More Persons

Income Group				Size of Family No. of Persons
$				
Under 450	.	.	.	3.7
450– 949	.	.	.	4.0
950–1,949	.	.	.	4.0
1,950–2,949	.	.	.	3.9
2,950 and over	.	.	.	3.8
All families	.	.	.	3.94

[1] The cost-of-living index is used to convert 1930–31 income into 1951 dollars, an increase of 40 per cent in average real earnings is indicated.

[2] The main effect of adding the income of secondary earners is, of course, to move families into income brackets higher than those of the heads. Apparently this was true to a greater extent in 1951 than in 1930–31. By income groups, the proportion of wages and salary-earning families with more than one earner in 1951 was as follows: for income groups under $1,000, 6.9 per cent; between $1,000 and $1,999, 18.5 per cent; between $2,000 and $2,999, 21.3 per cent; between $3,000 and $3,999, 37.6 per cent; between $4000 and $4,999, 61.2 per cent; between $5,000 and $9,999, 76.5 per cent; $10,000 and over, 60.5 per cent; total of all families, 36.1 per cent.

available by size of earnings of the head only, and these show smaller than average families at the lowest income level of the head, with families of the middle and upper brackets fairly similar in size.

For 1951, statistics of family size by total income (not just wages and salaries) of the whole family (not just the head) are available. The distribution was as follows:

TABLE VIII

Total Income of Wage and Salary Earning Families of Two or More Persons

Income Group	Size of Family No. of Persons
$	
Under 1,000 . . .	3.1
1,000–1,999 . . .	3.4
2,000–2,999 . . .	3.7
3,000–3,999 . . .	3,8
4,000–4,999 . . .	4.1
5,000–5,999 . . .	4.5
10,000 and over . . .	4.4
All Families . . .	3.87

In 1951, the average size of wage and salary earning families of two or more persons increased, in general, as income rose. Thus, in 1951, the lowest 15 per cent of wage and salary earning families of two or more persons contained only 13 per cent of persons in wage and salary earning families, while the top 18 per cent contained 21 per cent of the same population. If it is assumed that in 1931 a distribution of family income by size of family would have a pattern similar to that shown above for wages and salaries of heads of families then, if families were converted to a population basis, the resulting distribution on a per capita basis for 1931 would be somewhat more concentrated compared with that of 1951 than the one shown in Chart II.

4. *Miscellaneous remarks*

(a) *Personal income*

It is interesting to speculate what the effect would be if the income of wage and salary earners from other sources and incomes of other income recipients were included in the Lorenz

curves. The general indication is that the decline in inequality would be greater, both for wage-earners as well as for the total of all income receivers. This conclusion is suggested by an examination of the components of personal income in the two years.

During the period 1930–31 government social security payments had not, as yet, begun to make an important impact upon the income position of Canadians. In 1931, transfer payments made directly to persons amounted to $141 million, or 3.8 per cent of personal income. Most of these payments were made to persons who had demonstrated need and lacked regular income from other sources. It is likely that only a fraction of the transfer payments made directly to individuals, perhaps no more than $30 million, went to persons classified as wage and salary earners in the calculated earnings distribution. These supplementary incomes would be more important for families, but even for them might not be greater than $40 million. By contrast, in 1951 transfer payments made directly to persons were a considerably larger proportion of total personal income, and a larger proportion of the transfer payments were of a universal nature. Transfer payments made directly to persons amounted to $1,032 million, or 6.6 per cent of personal income. It is very likely that wage and salary earners have shared to a greater extent in transfer payments in 1951 than in 1930–31. Further, since transfer payments are relatively more important for the lower and middle income groups than the higher income groups their inclusion in the distribution would show an even greater reduction in actual[1] income inequality in 1951 relative to 1930–31.

In 1930–31, interest, dividends, and net rental income of persons were some 15 per cent of total personal income. By contrast, in 1951 the share was 9 per cent. Since it is known that investment income is much more unequally distributed than

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[1] It should be pointed out that an increase in the importance of transfer payments relative to other types of income could have a number of different effects on the statistical distributions. If the payments are made to persons in the lower or middle income brackets who are already in receipt of some income such payments will make the income distribution more equal. On the other hand, to the extent that the payments are made to persons with no other income receipts the result is the addition of new units (in the individual and also, possibly, the family distribution) at the lower end of the income distribution; this would have the apparent effect of making the income distribution more unequal. Examination of the statistics for the years under consideration indicates that the net effect of transfer payments was to render the distribution of income less concentrated.

wages and salaries, its inclusion would serve to reduce the inequality in 1951 relative to that of 1930–31, even if it is assumed that there has been no change in the distribution curve of investment income between these two years.

Net income of non-farm unincorporated business, which (like farm income) is also more unequally distributed than wages and salaries, was some 13 per cent in the earlier period and nearly 10 per cent in the later period. Reflecting the adverse conditions in the agricultural sector, net income of farm operators from farm production in 1930–31 was some 5 per cent of personal income; in 1951, it was 13 per cent. While the absolute number of farm operators declined between 1931 and 1951, cash farm income increased many times over; although net income from self-employment declined in relative importance, as just indicated, the number of self-employed in non-farm occupations did not increase significantly and their average earnings probably increased more substantially between 1931 and 1951 than did the earnings of wage and salary earners.[1] It is likely that the income distribution curves of the farm and non-farm self-employed have become more equal, in line with the relatively higher increase in the average of these incomes than that of wages and salaries. However, even if it is assumed that no change in the distribution curve of these incomes took place the net effect of all the changes mentioned above would probably be sufficient to accentuate the decline in the concentration of incomes between 1930–31 and 1951.

(b) *The influence of taxes*

One further factor which has not been considered so far but which would influence both the degree of change in average real income and the position of the Lorenz curves is the change in the personal tax structure and the level of personal taxes in the two periods. The *average* increase of personal disposable income was obviously smaller than of personal income before deduction of taxes, although it was nevertheless considerable. It was not possible to make calculations of the burden of taxes in the two years for the various income groups, but some general comparisons for wage and salary earners follow.

The tax exemptions in 1930 and 1931 were $3,000 for married

[1] In 1931 paid workers represented 65 per cent of the labour force; in 1951 approximately 77 per cent were paid workers.

couples and $1,500 for single persons; most employees would have incomes below the taxable limits. In 1930 and 1931 approximately 100,000 persons classified as employees paid income taxes. Total tax payments were $8 to $9 million; average tax payments were approximately $90. Somewhat less than 4 per cent of all wage and salary earners paid income taxes. These figures suggest that the effect of income taxes on the Lorenz curve for wage and salary earner incomes would be minor.

In 1951, on the other hand, 2,500,000 employees paid income tax; in percentage terms, approximately 60 per cent of all wage and salary earners paid income taxes. Aggregate taxes paid were approximately $560 million, while the average amount paid was nearly $230. Despite the higher price level, the absolute exemptions allowed in 1951 were substantially lower than in 1931 – exemptions for single persons were $1,000 and for married couples with no children $2,000.[1]

Examination of the figures on incidence of income taxes in 1951 indicates that the distribution of earnings of wage and salary earners after taxes would be more equal than the distribution before taxes, with the higher income groups paying a more than proportionate share of taxes (in relation to income). It follows that the decline in inequality between 1930–31 and 1951 would be greater on an after-tax basis than on the before-tax basis shown earlier.

(c) *Personal disposable income and national income*

For many types of analysis personal income after taxes is probably the most appropriate concept to use. On the other hand, if one is interested in the size distribution of income as it is generated by the productive process, prior to the direct intervention of governments (and corporations) in effecting transfers in the income stream, the national income is the more appropriate aggregate to use. Studies in the United States indicate that on a national income basis the decline in the share of the upper income groups 'between 1929 and 1935–36 was somewhat larger than that shown in the distribution of personal

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[1] In 1930 and 1931 returns from employees represented some two-thirds of all income tax returns filed although, proportionately, employees paid a smaller share of taxes. Total tax payments of employees were somewhat less than one-third of all income taxes paid. Similarly, in 1951, while 90 per cent of taxable returns were filed by employees, employees paid only 70 per cent of total taxes levied.

ncome. In contrast, there was no clearcut evidence of a further decline from 1935–36 to 1950'.[1] This would also probably be true for Canada. The reason for this result is that undistributed profits and corporate profits taxes are included in national income but not in personal income; the latter includes only dividends received by individuals. While undistributed profits before taxes were negative in 1930–31 they were nearly 13 per cent of national income in 1951;[2] dividends received by individuals declined from some 3 per cent of personal income in 1930–31 to 2 per cent in 1951. Further, since the national income excludes transfer payments the equalizing effect of these income payments is also eliminated. Thus, comparisons of income size are much affected by the concept of income used. They are also affected, of course, by the time period selected for comparison.

(d) *Period of income change*

In the United States the study made by the Department of Commerce suggests that the greatest changes in the United States income distribution occurred between 1935–36 and 1944, with perhaps somewhat more change between 1941 and 1944 than between 1935–36 and 1941. It was not possible to make an adequate analysis of the Canadian material for the more recent years but a cursory examination suggests that the pattern in Canada may have been similar.

Comparisons of the 1951 individual income distribution with the 1942 Read distribution are difficult since the Read study[3] excludes transfer payments and transfer payment recipients from the income distribution. Thus, comparisons cannot be made using equivalent concepts of total income in 1942 and 1951; however, a roughly comparable comparison can be made for earnings from employment (wages and salaries and net income from self-employment) and, on this basis, the 1951 distribution appears to be more equal. Similarly, because of conceptual and

[1] Selma Goldsmith, G. Jaszi, Hyman Kaitz, Maurice Liebenberg 'Size Distribution of Income since the Mid 'Thirties', *The Review of Economics and Statistics*, February 1954, p. 20.

[2] The national income rather than the domestic product or income appears to be the appropriate concept for the present purpose since we are interested in the distribution of Canadian residents only. Strictly speaking, undistributed profits should have been reduced to exclude net amounts accruing to non-residents. The national income excludes investment income paid abroad. To the extent that the national income includes income received from abroad the distribution generated directly by the domestic productive process is modified.

[3] See Part II.

statistical differences, comparisons between the 1948[1] and 1951 income distributions cannot be conclusive; however, the 1948 estimates show a more equal distribution for family income. Finally, a 'Kuznets type' of analysis applied to income-tax data for selected post-war years indicates that the share of the upper income groups of total income, as defined for tax purposes,[2] appears to have increased somewhat from 1946 to 1947, declined from 1947 to 1952, and then recovered somewhat from 1952 to 1954. The fluctuations were largely confined to the share of the top 1 per cent; the shares of the second to fifth percentiles show a stable pattern for both total income and disposable income. The figures are given below:

TABLE IX

Share of the Top Five Per Cent in Income
(as defined for Income Tax Purposes)

	1946	1947	1949	1952	1954
Top 1 per cent					
% of Total Income . .	6.6	7.3	6.6	6.1	6.2
% of Disposable Income .	4.5	5.4	5.3	4.6	NA
2nd per cent					
% of Total Income . .	3.0	3.0	2.9	2.9	3.1
% of Disposable Income .	2.5	2.6	2.7	2.5	NA
3rd per cent					
of Total Income . .	2.2	2.2	2.2	2.2	2.3
% of Disposable Income .	2.0	2.1	2.1	2.0	NA
4th per cent					
% of Total Income . .	1.9	2.1	1.9	1.8	1.9
% of Disposable Income .	1.8	1.8	1.8	1.7	NA
5th per cent					
% of Total Income . .	1.8	1.7	1.7	1.7	1.7
% of Disposable Income .	1.6	1.6	1.7	1.6	NA
The cumulative shares are:					
Top 1 Income Share . .	6.6	7.3	6.6	6.1	6.2
Disposable Income Share .	4.5	5.4	5.3	4.6	NA
Top 2 Income Share . .	9.6	10.3	9.5	9.0	9.3
Disposable Income Share .	7.0	8.0	8.0	7.1	NA
Top 3 Income Share . .	11.8	12.5	11.7	11.2	11.6
Disposable Income Share .	9.0	10.1	10.1	9.1	NA
Top 4 Income Share . .	13.7	14.6	13.6	13.0	13.5
Disposable Income Share .	10.8	11.9	11.9	10.8	NA
Top 5 Income Share . .	15.5	16.3	15.3	14.7	15.2
Disposable Income Share .	12.4	13.5	13.6	12.4	NA

[1] See Part II, pp. 182–6.
[2] See Part II, p. 178.

APPENDIX TO PART I

NOTES ON SOURCES AND METHODS

(A) Distribution of individual earnings, 1930–31

The distribution of the earnings of individual wage and salary earners for 1930–31 was built up by the following steps:

(1) 1931 census statistics made available the number of persons falling into various size groups of earnings. However, data were not published on the amount of earnings accruing to any one of these size groups although the aggregate earnings of all wage and salary earners were published. In addition, statistics were available on average earnings, by size of wage and salary earnings for heads of families (for example, in the interval $1,450 to $1,949, the average earnings of male heads of families were $1,655). It was assumed that, within each income interval the total of all individual wage and salary earners received average earnings corresponding to those of heads of families. The number of wage and salary earners within each income interval was multiplied by these averages to obtain estimates of total earnings for each class interval; when the totals obtained by this method were summed they corresponded almost exactly with the combined aggregate of wages and salaries reported by all wage and salary earners. This method of allocating aggregate earnings within intervals appeared to yield satisfactory results.

(2) A small fraction of wage and salary earners did not report the amount of earnings received during the previous year. It was assumed that this group represented a cross-section of wage and salary earners and these persons were pro-rated by income size groups on the basis of the known distributions; approximately 100,000 wage and salary earners out of a total of 2.6 million did not report the amount earned.

(3) The aggregate wages and salaries obtained from the above estimates totalled $2.2 billion; cash wages and salaries as estimated in the National Accounts for the years 1930 and 1931 indicated that total cash wages and salaries paid for the year ending 1st June 1931, was approximately $2.5 billion. It was assumed that wage and salary earners received approximately $2.4 billion and that the remainder was received by persons whose major source of income was other than wages and salaries. On this basis, an understatement of some 10 per cent was indicated in the aggregate amount of earnings reported on

the census. The distribution of earnings by size were adusted to take account of this undercoverage; greater adjustments were made at the lower than the upper income levels.

(4) The frequencies were rearranged between wages and salary size groups to take account of the increases in the aggregate wages and salaries assigned to different groups. The formula used for this purpose was that described in *Distribution of Non-Farm Incomes in Canada by Size*, 1951[1]. The distribution before these adjustments was as follows (it may be compared with the one shown in Table I of Part I):

Size Group				Number of Persons
$				
No income	.	.	.	68,000
Under 950	.	.	.	1,549,000
950–1,949	.	.	.	686,000
1,950–2,949	.	.	.	117,000
2,950–4,949	.	.	.	44,000
4,950–9,949	.	.	.	11,000
9,950 and over	.	.	.	2,000
Not stated	.	.	.	94,000
TOTAL	.	.	.	2,571,000

(5) The individual distribution of wage and salary earnings was converted to 1951 dollars by multiplying aggregate income by the deflator discussed before; the frequencies were then re-adjusted to take into account the upward shift into new income brackets resulting from the adjustment of aggregate income into 1951 dollars.

B. *Distribution of Individual Earnings*, 1951

The distribution of individual earnings for 1951 was derived from the statistics secured by the March 1952 survey discussed in Part II (before adjustment by income tax statistics). It should be noted that this distribution is not quite comparable with the one for 1930–31 described above. However, it is believed that if the resulting error could be eliminated the changes shown in Part I between 1930–31 and 1951 would be somewhat more pronounced.

The 1931 census data on wages and salaries were collected only from persons who were classified as wage and salary earners *at the*

[1] Reference Paper No. 52, Dominion Bureau of Statistics (Ottawa, 1954). See Part II below.

time the census was taken (whether or not they were unemployed); persons who had worked for wages and salaries during the previous year but had left the labour force by census time were excluded from the census statistics. By contrast, the 1952 income survey included not only persons who were wage and salary earners at the time the survey was taken (employed and unemployed) but also some persons who had left the labour force and had earned wages and salaries in the preceding calendar year.

C. Distribution of family earnings, 1930–31

(1) As indicated above, the 1931 census made available data on the number of wage and salary earning heads of families falling into various size intervals of earnings; average earnings for each of these size groups were also available. As a first step, the earnings of heads of families were adjusted in the same manner as the individual earnings described above. After these adjustments a new distribution was derived for heads of families.

(2) In cross-classifying the earnings of heads of families by size of earnings, census statistics supplied data on the average earnings of other family members within each of these intervals. These figures were used to calculate the aggregate earnings of members of the family other than the head, for each size interval of earnings of the head.

(3) The addition of earnings of other family members resulted in a shift of some families into income brackets higher than the income bracket into which the earnings of the head himself fell.

Income Group	Number of Families Classified by	
	(a) Earnings of Heads of Families (before adjustment)	(b) Earnings of all Members of Family (after adjustment)
$		
TOTAL	1,184,000	1,184,000
Under 450	233,000	147,000
450– 949	303,000	270,000
950–1,449	294,000	256,000
1,450–1,949	164,000	237,000
1,950–2,949	100,000	183,000
2,950–4,949	41,000	74,000
4,950–6,949	8,000	10,000
6,950–9,949	3,000	4,000
9,950 and over	2,000	3,000
Not stated	36,000	—

The change in the distribution of family frequencies resulting from adding other earnings to those of the head was calculated to derive the distribution of family earnings shown in Table IV. For comparative purposes, the original earnings distribution of heads of families is shown below, together with the estimated distribution of family earnings, after all adjustments.

(4) Constant dollar estimates of family earnings were prepared by the same methods as constant dollar estimates of individual earnings.

D. Distribution of family earnings, 1951

The family statistics shown in Part I apply to families of two or more and are based on data secured from the 1952 survey before adjustment by income tax data.

II. STATISTICS AND RESEARCH ON INCOME SIZE

GENERAL SOURCE MATERIAL

1. The census

As in many other countries the first statistics collected in Canada were censuses of population; the earliest census in the Canadian colonies of France took place in 1666, while regular decennial censuses were inaugurated in 1851.[1] The 1901 census was the first census to collect data on wages and salaries. Bulletin No. 1 'Wage Earners by Occupations' (King's Printer, 1907) contains statistics on average earnings and aggregate earnings by sex and occupation on a provincial basis. In addition, average and aggregate wages and salaries were published by sex and occupation. The census of 1911 also collected statistics on wages and salaries; all wage and salary earners were asked to report total wages and salaries earned during the year preceding the census. The information was not published in the 1911 census volumes but some of the figures were released for comparative purposes in later census volumes.

Some of the earnings information collected in the 1921 census was published in the census volumes of that year. Data were published on the total number of wage and salary earners,

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[1] In addition to decennial censuses, quinquennial censuses have been taken in Canada, since 1886, covering the three Prairie Provinces of Manitoba, Saskatchewan and Alberta. For 1956, instead of a full census of the three Prairie Provinces, it has been decided to take a restricted nation-wide population and agricultural census.

classified according to occupation, age and sex, showing total wages and salaries during the census year for cities of 30,000 and over. For these cities, wage and salary earning families were also classified according to the occupation of the head, showing wages and salaries of the head and of children in the family who earned income.

A notable feature of the 1921 census was the definition of the family employed. Previously, the Canadian census tabulated the statistics on a household basis only, no distinction having been made between the 'household' and the 'family'. In 1921, a twofold definition was adopted: the 'census family' or the household, and the 'private family'. The latter was defined as all individuals living together and related by blood, marriage, or adoption (including, for example, uncles, nieces, mothers-in-law, etc.). Individuals maintaining their own households were enumerated as one-person families.

The 1931 census retained this definition of the family. The data on wages and salaries collected in the 1931 census were published in great detail, in contrast with the previous two censuses. These statistics are the basis of the distributions for 1930–31 discussed in Part I. They are described in the Appendix to Part I.

Mainly to satisfy the requirements of demographic studies, the definition of the family used in the 1941 census was as follows:[1] (a) the family was strictly a husband and wife (with or without children) or a parent-child relationship.[2] Relatives of the head not part of the immediate family (e.g. uncles, nieces, brothers, etc.) were excluded whether or not they were dependent on the head; (b) children included in the family were restricted to unmarried sons and daughters of the head living at home; (c) a one-person household no longer constituted a family. A narrow definition of this type has advantages for demographic studies but for purposes of the study of the distribution of income by size the broader definition used in the 1931 census seems the more appropriate one.

While the 1941 census collected the same detail on wages and

[1] This definition was first used in the 1936 Quinquennial Census of the Prairie Provinces.

[2] Families where only one parent was present were classified as 'broken' families; 'normal' families were defined as those with a husband and wife living together with or without children. Data were compiled mainly for 'normal' families which comprised 88 per cent of all families; 'broken' families were excluded from most tabulations.

salaries as the 1931 census the published information did not provide for a nation-wide 'family' distribution of wages and salaries. However, for cities of 30,000 and over the census combined the wage and salary earnings of all family members to secure a family earnings distribution for wage and salary earning families. The statistics were published by size groups.

The 1951 census retained the family definition employed in the preceding census but the statistics on wages and salaries collected and tabulated were more limited. Individuals were asked to indicate the *range* within which their wages and salaries fell, instead of the actual amount of wages and salaries earned; this made it impossible to add together individual earnings for the purpose of constructing family distributions. Distributions of wages and salaries of all individuals and of heads of families were published.

The question on wages and salaries was altered in the 1951 census in order to facilitate the work of the census enumerator; further, it was hoped that asking for the range of earnings might improve the reporting on wages and salaries which tests had shown were significantly understated.[1] However, the statistics reported were still significantly lower compared with income tax and other data.

The observed understatement of census earnings may be due to many reasons. The census takes place on 1st June of the year and, in the absence of income tax or other records, respondents probably estimate their previous earnings. To a substantial extent census enumerators contact the housewife, rather than the actual earners in the family. Experience indicates that housewives often do not have an accurate knowledge of the earnings of the head of the family or of other working members; at any rate, they may be more inclined to think in terms of 'take-home pay' rather than gross earnings before income tax and other deductions. Furthermore, in 1931, 1941 and 1951, the census data have been collected only from persons who were classified as wage-earners *at the time the census was taken*. This automatically excluded, from the census statistics of earnings, the earnings of persons who worked for wages and salaries in the year before the census but who had ceased to be wage-

[1] Checks indicated that the errors of estimation were not self-cancelling but that the net result was an understatement of earnings; for 1951, comparison with income tax and survey data indicated that the highest income groups understated earnings to a greater degree than did the lower income groups.

earners at the time the census took place. This, of course, leads to an understatement of aggregate earnings received rather than to a downward bias in the earnings distribution itself.

With the development of alternative methods of collecting nation-wide income data, the question has been raised whether the census should continue to collect such statistics. The answer appears to be 'yes'. With all their shortcomings the census earnings data are indispensable for detailed analysis, and they are the only information available for longer-run historical studies of income size. Furthermore, as more experience is gained with the characteristics of the income distribution, methods might be devised for more satisfactory collection and adjustment of census data. However, to maintain the usefulness of census earnings statistics it is advisable to collect the actual earnings information, rather than class intervals of earnings, and to secure the statistics in a way as to permit tabulations of family size distributions on the basis of the definition used in the 1931 census and the 1952 income survey discussed later on.[1]

2. *Taxation statistics*

A second statistical series on income distribution emanates from the administration of the Income Tax Act of the Federal Government. This source is becoming increasingly useful and important.

In Canada, income taxes were first imposed in 1917 as a means of raising revenues to finance war expenditures and have been in force ever since. The first taxation statistics were published in the early 1920s but these contained only limited information on the income distribution; the statistics were confined to the number of returns and to very broad income groupings.[2] In 1929, these statistics were enlarged to give breakdowns by finer income groups and total income reported.

A major limitation of the income tax statistics prior to the

[1] For the 1956 Census it has been arranged to make possible tabulations on the basis of the narrow demographic definition of the family and also on the wider basis required for income size analysis.

[2] In 1922, for example, the only groupings available were $1,000 to $2,000, $2,000 to $6,000, $6,000 to $10,000, $10,000 to $200,00, $20,000 to $30,000, $30,000 to $50,000 and over $50,000. About 48,000 returns were in the $1,000 to $2,000 range. 116,000 had incomes of $2,000 to $6,000, 12,000 had incomes of $6,000 to $10,000, and 8,000 were over $10,000. See *Incomes Assessed for War Income Tax in Canada*, 1923–19 24, and subsequent years, Dominion Bureau of Statistics, Ottawa.

Second World War was the fact that exemption limits were such that tax coverage was relatively small and confined to the high income groups. In 1931, exemptions were $1,500 for single persons, $3,000 for married persons with no children. In 1932, this was changed to $1,200 and $2,400 but, at the prevailing income levels, most persons were still exempt from paying income tax. Between 1922 and 1927 the number of persons paying income tax dropped from 291,000 to 116,000; it then rose gradually, reaching 144,000 in 1931 and 237,000 in 1938. Since the total labour force was 4.1 million in 1931 and 4.5 million in 1938 it is clear that income tax statistics left out the bulk of income receivers.

The outbreak of World War II brought with it a substantial reduction in the exemption levels: income taxes were thus extended to the majority of income receivers in the population. Exemptions were lowered in 1939 to $750 for single persons and $1,500 for married persons with no children; they were lowered further in 1942 to $660 for single persons and for married persons $1,200. After the war the exemptions were raised again and at present they are $1,000 for single persons and $2,000 for married couples with no children.

			No. of Taxpayers	Total No. of Returns Filed	Civilian Labour Force
1939	.	.	257,186		4,598,000
1940	.	.	684,359	No	4,556,000
1941	.	.	871,484	informa-	4,417,000
1942	.	.	1,781,244	tion	4,519,000
1944	.	.	2,254,319		4,507,000
1946	.	.	2,353,122	3,162,032	4,829,000
1948	.	.	2,689,930	3,662,030	4,988,000
1950	.	.	2,374,240	3,866,160	5,163,000
1952	.	.	3,125,100	4,395,710	5,314,000

SOURCE: For 1939 and 1940, *Dominion Income Tax Statistics, Fiscal Year 1940–1941*, Dominion Bureau of Statistics (Ottawa, 1943). These figures are for the tax or calendar year, not the fiscal year. For all other years, *Taxation Statistics*, Department of National Revenue (respective years), Queen's Printer, Ottawa.

While no precise statistics are available a rough estimate suggests that perhaps 45 per cent of all income receivers in 1948 paid taxes and perhaps 60 per cent filed returns; in 1951 the ratios may have been about 45 and 70.

The data which have become available from this source have

been subjected to increasing analysis by the Department of National Revenue. In 1946 the Department began publication of an annual report called *Taxation Statistics*. Roughly half of this report is devoted to corporation statistics, the other half dealing with individual income statistics. The individual income statistics are based upon a randomly selected 10 per cent sample of all returns filed.[1]

3. *Other general sources*

For manufacturing, data on the size of weekly earnings of wage-earners have been collected since 1934 at irregular intervals.[2] Eight weekly earnings classes are distinguished and separate tabulations are available for male and female employees. Until 1950, the reference period for these statistics was the week of highest employment and all manufacturing establishments were covered. Since 1950, the reference period is the last pay period in October and the data apply to establishments employing fifteen or more persons. The statistics since 1950 are not strictly comparable, therefore, with those of the previous years. Furthermore, distributions based on a single week are not entirely suitable for comparison with the distribution based on a year, described elsewhere in this paper, because the degree of inequality of an income distribution is to some extent a function of the period of observation. However, the weekly data may be used as a rough check of time comparisons based on annual statistics.

The extension of social security measures has led to the evolution of a number of additional series which are useful as checks on certain components of the income distribution estimates. Among such data are tabulations on the number of families in receipt of family allowances classified by number of children under 16; statistics on the number of old-age pensioners; and information on payments of unemployment insurance, veterans' pensions and other pensions. The most

[1] Income as defined in tax statistics covers the following items: (*a*) salaries and wages; (*b*) net income of unincorporated business including net professional income; (*c*) net farm income excluding the value of change in farm inventories; (*d*) interest, dividends and net rentals received by persons; and (*e*) miscellaneous income, including old-age pensions, annuity income and estate income. Free room and board provided to employees is theoretically included but the amount actually reported is probably small. Capital gains and losses, net imputed rents and most transfer payments are excluded.

[2] *General Review of the Manufacturing Industries of Canada*, Dominion Bureau of Statistics (various years).

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important social security measures in Canada are federally implemented and administered and thus many of these statistics provide complete and accurate counts of the number and other characteristics of families and persons in receipt of social security. Two social security plans are universal – family allowances for children under 16 (introduced in 1944), and old-age pensions to persons over 70 (introduced in 1952).

Finally, two post-war developments of great importance to the collection and analysis of statistics of income by size may be mentioned here. First, the inauguration in 1945 of a regular labour force survey, using a 1 per cent probability area sample, by the Dominion Bureau of Statistics. The labour force organization is of great importance to the development of income size statistics not only in virtue of the fact that it makes available essential information on the number and characteristics of the adult population but also because it is used directly to conduct surveys on income and expenditure. Secondly, in the same year, the Bureau established a Research and Development Division which, among other things, was charged with the reorganization of Canada's national income statistics. This Division not only improved the aggregate statistics essential for the study of income size but provided a convenient medium for the eventual inauguration of a continuing programme of research in the distribution of incomes, in close co-operation with the Labour and Prices Division of the Dominion Bureau of Statistics which has had considerable experience in the conduct of household surveys to secure information on expenditure patterns for the consumer price index.

4. *Miscellaneous nation-wide surveys and research on income size distribution in Canada*

(a) *The Dominion Bureau of Statistics* 1937–1938 *Budget Study*

The first nation-wide sample survey on family income and expenditure in Canada was carried out in the fall of 1938 by the Dominion Bureau of Statistics. The survey was designed principally to secure data for the revision of the consumer price (cost-of-living) index, and it was limited to urban families, in twelve cities, whose expenditure patterns could be used for the construction of the index and for budget studies.[1] Within the

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[1] See *Family Income and Expenditure in Canada*, 1937–1938, Dominion Bureau of Statistics (Ottawa, 1941).

centres to be surveyed it was decided to select families possessing specified characteristics which appeared to be typical of urban households. The analysis of the survey results was confined to expenditure items, except for a limited income size distribution. This distribution showed the percentage of families falling into the following classes of income: (a) $400–$799; (b) $800–$1,599; (c) $1,600–$2,499, separately for each of the twelve cities surveyed.[1] However, because of the restrictions of the families selected, and because the relationship of the sample to the total population is not known, it is not possible to use the results for general analysis or for comparison with other distributions. The survey statistics are of historical interest only, as far as income size distribution is concerned.

(b) *The* 1942 *'Read Study'*

The first attempt at national estimates of income distribution in Canada was made by Lawrence M. Read in a study published by the Dominion Bureau of Statistics as an appendix to *National Accounts Income and Expenditure* 1938–1945.[2] Although these estimates were released in a government publication they were not regarded as official estimates.

The study made an analysis of the distribution of individual incomes by size of total income, by sex of recipient and by region for the year 1942. The type of income receipts covered were wages and salaries, non-farm entrepreneurial income and (to a limited extent) investment income. Farm income and transfer payments, such as old-age pensions and workmen's compensation, were excluded. Separate estimates were made for the income of the armed forces. The basic sources of information of this study were the decennial census of 1941, statistics on wage-earners and income tax statistics for the years 1941 and 1942. Income tax statistics were used for the upper levels of the income distribution and census data for the lower income groups. Although census statistics referred to the year 1941, the estimates were made for the year 1942 in order to take advantage of improved tabulations which were made available from income tax returns. The inadequacies of the census earnings data were recognized and adjustments were made for under-reporting. In

[1] Op. cit., pp. 9–15.
[2] *National Accounts, Income and Expenditure* 1938–1945, Dominion Bureau of Statistics (Ottawa, 1946).

addition, it was necessary to adjust for changes in income and employment between 1941 and 1942 and, at the time the study was made, only rough information was available on the amplitude of the changes. Further, as already indicated, census statistics refer only to wage and salary earners and wage and salary incomes; the only data on money income received from self-employment and investments were those contained in taxation statistics. At that time, Canadian taxation statistics contained less detail than at present and the allocation of these income receipts had to be made on relatively inadequate knowledge. Despite the careful work which went into the Read Study, an examination of the primary data suggests that the available statistics were inadequate for satisfactory estimates of income size distribution. Nevertheless, some rough comparisons can be made between the Read estimates and other distributions.

(c) *Dominion Bureau of Statistics* 1947–1948 *Budget Study*

In the fall of 1948, the Dominion Bureau of Statistics conducted a large-scale income and expenditure sample survey covering the whole population, both farm and nonfarm. It was the first of its kind in Canada and the experience gained in it greatly influenced the Bureau's future policy in regard to income and expenditure surveys. For these reasons it may be worthwhile to describe this survey in some detail.

The survey was conducted in October 1948, and the data were collected for the twelve-month period ending 31st August 1948. The sample selected in the urban areas included two-thirds of the households in the labour force one per cent sample, and in rural areas, one-third of the one per cent sample. Approximately 13,500 households were selected for interview.

The questionnaire consisted of twenty-one pages of questions and covered three aspects of the family's income and expenditure patterns: (a) annual expenditures of the family on shelter, food and other items; (b) income receipts of each family member; (c) family savings, obtained residually as well as through questions on changes in assets and debts. The information was collected in great detail and the scope of the survey can be envisaged from the fact that the questionnaire asked approximately 400 questions, many of which contained four or five sub-sections.

The population sampled was grouped into 'spending units'; a

spending unit was defined as a 'group of persons who meet expenses from a common income; or one person who is financially independent'. However, unmarried sons and daughters living in the household were in all cases considered to be part of their parents' spending unit. Married sons and daughters were considered part of their parents' spending units only if they pooled at least one half of their income with their parents. Lodging families were treated as separate spending units. The great majority of spending units consisted of two or more persons related by blood, marriage, or adoption; the private family and the spending unit were usually the same group of persons. However, spending units sometimes included persons who used their money to meet expenses jointly with the family, but who were not members of it.

Self-enumeration was used as extensively as possible. After explaining the purpose of the survey and sorting out the spending units in the households, the enumerator left the schedule, asking the persons in the units to fill it in. Missing information was added by the interview method when the enumerator called back for the record.

From the sample of 13,500 households, comprising an estimated 14,200 spending units, 6,100 schedules were collected. Of these, about 2,000 were rejected during the editing process at head office because of significant incompleteness or lack of balance between gross receipts and expenditures, on the one hand, and changes in debts and assets on the others. Schedules had to balance within 10 per cent to be acceptable; that is, a discrepancy of not more than 10 per cent was permitted between gross income and gross expenditure and savings totals.

There were 4,092 full-year spending unit schedules acceptable for tabulation. Of these 4,092 full-year records, 3,660 came from non-farm families and single-person spending units; the remaining 432 records came from farm operator spending units. These schedules were inflated to pre-calculated totals of spending units by spending unit size and by province to secure weighted estimates.

The expenditures data obtained from this survey were published in *Canadian Non-Farm Family Expenditures* 1947–1948.[1] Since the number of farm records obtained was very small, and

[1] *Canadian Non-Farm Family Expenditures* 1947–1948, Reference Paper No. 42, Dominion Bureau of Statistics (Ottawa, 1953).

did not appear representative, farm data were not published.

Although the income data were a by-product of this survey, it was hoped that they would be adequate for estimates of income distribution and it was decided to construct such a distribution. The original sample had been weighted by region and by size of family without regard to other family characteristics and the weighted data indicated an under-representation of the families of the self-employed and employer group with a corresponding over-representation of wage-earning families.

For this reason, the approach adopted was first to construct an individual income size distribution and then to convert this into a spending unit distribution. The individual income statistics collected in the survey along with income tax statistics, special analyses of labour force statistics and other data, were used to develop income distributions for wage and salary earners, farmers, the self-employed and a residual group whose income was derived from investments or transfer payments. Labour force data on employment provided control totals for further adjustment while national income figures were used to adjust some types of income receipts – mainly transfer payments. The final distributions obtained were converted to a spending unit income distribution by using information from the survey, cross-classifying individual incomes by spending unit incomes.[1]

The completion of the analysis of income and expenditure data from the survey was followed by a searching stock-taking of the Bureau's experience with the 1948 study. A number of points emerged:

(1) Self-enumeration is not a satisfactory method of collecting a *vast* amount of data from a family or household. The low response rate from the initial sample was probably due, to a considerable extent, to the fact that the burden of completing the forms fell upon the families, the majority of whom were not interested enough to stick with such a difficult task. This judgment is supported by more recent experience where a high response rate is being obtained by direct enumeration to collect family expenditures data in very great detail.

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[1] For a fuller description, see Appendix B, p. 37, *Distribution of Non-Farm Incomes in Canada by Size*, 1951. Reference Paper No. 52, Dominion Bureau of Statistics (Ottawa, 1954).

(2) The high rate of rejection of completed questionnaires because balance was not attained within a ten per cent limit raised great problems. It was impossible to determine whether the error in reporting occurred in income, expenditures or changes in assets and liabilities. No checks were available on the degree of reliability in reporting any of these items. Experience with census data suggested that incomes have a tendency to be under-reported when they are collected at mid-year periods; moreover, changes in assets and liabilities are also difficult to recollect and certain types of expenditures, such as food, may be over-estimated. The advisability of taking income surveys earlier in the year when personal income tax returns are normally filled out was indicated.

(3) Survey data were weighted by region and by size of family to secure national aggregates; this method of blow-up is more suitable for expenditures estimates since expenditures patterns are probably similar for families in the same area with the same size and age composition of a particular income level, regardless of the source of their income. However, the survey indicated variations in the response rates of different occupational groups so that for a more accurate picture of the *income distribution* and income aggregates a method of estimation which took into account occupational and other characteristics was needed.

(4) Both the income and expenditure data for farm families proved unsatisfactory; farm income appeared to be understated to a substantial degree in the weighted estimates and no improvements could be effected with adjustments from taxation statistics or other data.

This assessment of the 1948 Family Expenditures Survey led to the conclusion that a different method and approach should be used to collect income and expenditure data in the future. It seemed evident that elaborate and costly surveys of this type, taken between relatively long intervals, do not yield data which would be satisfactory simultaneously for consumer price index or income and savings analysis. The decision was therefore taken to inaugurate relatively small-scale but continuing programmes of research into family income and expenditure and to separate,

initially, the research into these two areas. The Labour and Prices Division of the Dominion Bureau of Statistics, which is responsible for the construction of the consumer price index, undertook the research on family expenditures; the Research and Development Division was given charge of research into income distribution and related fields.

(d) *The Canadian Sickness Survey*

Before discussing developments since income distribution became a separate field of investigation, reference should be made to the Canadian Sickness Survey. This survey collected income statistics as a by-product of a nation-wide Sickness Survey conducted jointly by the Dominion Bureau of Statistics and the Department of National Health and Welfare. The income statistics were for the 'family' unit, with 'family' defined in accordance with the 1951 census definition, but inclusive of single persons who maintained their own household. The exact amount of incomes was not collected but families were asked to indicate into which of five groups their family income fell. The estimated distribution was published in *Canadian Sickness Survey* 1950–1951, Special Compilation No. 2, 'Family Expenditures for Health Services by Income Groups', Dominion Bureau of Statistics, 1953.

5. *The 1952 Income Survey – survey procedure and methods of constructing distributions*

The plan to pursue a separate programme of data collection on income distribution was implemented early in 1952 when it was decided to carry out a limited survey of income. The results of the survey have been published in Reference Paper No. 52, *Distribution of Non-Farm Incomes in Canada, by Size*, Dominion Bureau of Statistics (Ottawa, 1954).

The design and procedures of the survey had to be determined in the light of certain restrictions, the most important of which was the cost factor. The availability of the labour force sample and field enumerators provided a ready organization on which to draw; one-quarter of the labour force sample was selected for the income survey. However, circumstances did not permit elaborate training of field staff for income surveys so that a comparatively simple questionnaire and interview procedure had to be used. The enumeration date for the income survey

was chosen to coincide with the March-April Labour Force Survey because the deadline for filing personal income tax in Canada is 30th April; in general, income taxes are paid on a calendar year basis and most households have completed their income tax records during the early spring.[1] The experience with the 1948 survey suggested that farm families presented special problems necessitating more comprehensive (and costly) procedures than could be undertaken at the moment. It was therefore decided to exclude farm families from the income survey.

(a) The Questionnaire

Two sets of questionnaires were designed. The first questionnaire was the control card, designed for the use of the enumerators. One control card was to be completed for each household, farm as well as non-farm. The questions listed on the control cards included: (a) identification of household (primary sampling unit, segment, household number); (b) identification of each individual (by a number and by relationship to the head of the household); (c) age; (d) sex; (e) marital status; and (f) question on whether net income from farm operations was the major source of income in 1951. If the answer to the last question was 'yes' the person was excluded from the survey. This, rather than residence or occupational status at the time of the survey, was the criterion used for defining a farmer. Thus, a person living on a farm who received the greater part of his income from non-farm sources was included in the survey; a person who lived off a farm but stated that he derived the greater part of his income from farming was excluded.

The second questionnaire was the income schedule; it asked for total cash receipts in 1951 of the following items: (a) wages and salaries (total wages and salaries earned before deductions from pensions, taxes, etc.); (b) military pay and allowances; (c) net income from self-employment; (d) investment income: bond interest, dividends, net rents, estate income, mortgage and bank interest; (e) government transfer payments – veterans' pensions, old-age pensions, unemployment insurance, veterans' bonuses, workmen's compensation and relief (family allowance receipts were calculated in the office from information reported on the ages and number of children); (f) other money income

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[1] Unincorporated businesses have to file returns by 30th April, but are allowed to use a fiscal year which must end during the preceding calendar year.

(retirement pensions, annuities, etc.). Individuals were instructed to exclude lump-sum receipts from insurance policies, income tax refunds, receipts from the sale of assets and income received in kind.[1]

(b) *Survey procedure*

When the enumerators called at each sample household to obtain labour force statistics they filled in information on the control card for each member of the household. Then, for each person aged 14 and over who was not a farmer (as defined above) the enumerator left a separate income questionnaire to be completed by each individual concerned. Each income questionnaire was marked with an identifying code which related the income questionnaire to the appropriate column on the control card. The enumerators obtained income data on the first call if it was volunteered but did not ask for it; call-backs were made a week later to pick up completed questionnaires. On this second call, households were given the option of mailing forms to the regional office if they did not wish to hand them directly to the enumerator. On completing their second calls enumerators returned to each regional office a list of non-co-operating households. These were contacted again by mail and given the opportunity of mailing completed forms to the regional office. This request brought in many further replies.

(c) *Response*

The original sample comprised some 7,500 households. A precise estimate of the number of families resident in these households is not available[2] but the number would probably be less than 9,000. Complete income statistics were obtained from 5,600 non-farm families and partial returns from another 750. These latter were partial in the sense that some, but not all, members of the family co-operated. In addition, background information was obtained from 1,150 farm families.[3]

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[1] In addition, each person was asked to report the number of weeks of full-time and part-time employment in 1951, and, if they did not work the full year, the reason why they were idle the remainder of the year.

[2] There was no means of estimating the number of families resident in nonco-operating or inaccessible households, and households where residents were absent.

[3] This was secured for weighting of families by an independent method which, however, had to be abandoned.

(d) *Method of blow-up of sample distributions to national aggregates*

Two sets of estimates were prepared: a distribution of individual income and a distribution of family income.

The labour force survey data were used to inflate sample individuals to national totals as follows: the income survey statistics for *individuals* were sorted, by province, into two groups – those in the labour force and those not in the labour force. The latter group, subdivided by age and sex, was inflated to national totals of persons not in the labour force as estimated from the labour force survey; those in the labour force were first separated by major occupational status (paid workers, own-account workers and employers) and subdivided by sex and by agricultural and non-agricultural status, and then inflated by the corresponding labour force categories.

After attempting, unsuccessfully, to aggregate the income survey families by an independent method it was finally decided to derive the family distribution as a by-product of the individual income distribution by a procedure described elsewhere[1]. The definition of the family adopted was the same as the one used in the Canadian 1931 census and in the United States Bureau of the Census; the information on the control card on each individual's relationship to the head of the household allowed a division of household members into families.[2]

(e) *Appraisal and adjustment of survey income figures*

(i) *Comparison with National Accounts aggregates*

After adjustment for some (but not all) conceptual differences the components of personal income of the National Accounts were compared with the corresponding income figures obtained from the survey. The comparisons are shown in the table on page 190.

The aggregate coverage on these preliminary estimates was 97 per cent for wages and salaries, 84 per cent for net income from unincorporated business, 51 per cent for interest, dividends

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[1] Reference Paper No. 52, *Distribution of Non-Farm Incomes in Canada by Size, 1951*, Dominion Bureau of Statistics (Ottawa, 1954).
[2] A household in the Canadian labour force and census statistics is defined as all individuals living in a self-contained dwelling unit. The latter is defined as a structurally separate set of living premises with a private entrance from outside the building, or from a common hallway or stairway inside.

and net rental income, and 82 per cent for transfer payments. The items of miscellaneous income were not conceptually comparable. The total income (exclusive of miscellaneous income) reported in the survey was approximately 91 per cent of the adjusted personal income estimates.

Aside from sampling and response errors in the survey, the two estimates could not be expected to coincide completely

	Adjusted Personal Income	Income Survey Aggregates
	($ million)	
Wages and Salaries	9,267.6	8,985.8
Net Income of Non-Farm Unincorporated Business	1,507.0	1,258.6
Interest, Dividends and Net Rental Income. .	809.8	411.7
Transfer Payments	726.5	592.1
Miscellaneous Income	39.9	135.7
TOTAL	12,350.8	11,383.9

(even after some adjustments) for several other reasons. First, the income survey excluded persons whose major source of income was farming; the total of net income of farm operators from farm production has therefore been excluded from the personal income total in the above comparison. Some of this net income is, however, included with the survey figures – to the extent that this type of income is received by persons whose major source of income is from activity other than farming. Probably much more than offsetting this is the fact that the farm sector is in receipt of non-farm income and this supplementary income is excluded from the survey figures but included in the personal income data. It is difficult to estimate the order of magnitude of this supplementary income of the farm sector. Income tax statistics indicate that farmers reported $20 million in off-farm earnings, and $16 million in investment income. Since less than one-half of all farmers file income tax returns and since there appears to be a tendency to omit smaller types of income receipts from income tax returns, the figures for supplementary income of the farm sector are probably much larger than those just cited.

The difference between the two estimates of transfer payments was undoubtedly due to the omission of farm families from the

income survey; the 1951 census indicated that farm families had more than one million children who were likely to be in receipt of family allowances. Total receipts of family allowances for these children would be nearly $100 million; this amount plus some other transfer payments receipts which are not included in the survey income figures (e.g. veterans' pensions and old-age pensions) would amount to well over $100 million.

It was not possible to reduce personal income figures in the above table for investment income accruing to trust funds, private pension funds, charitable organizations, university endowment funds, clubs and other non-commercial institutions. The income tax statistics for 1951 indicated that estates filing income tax returns reported income receipts of approximately $11 million, the bulk of it investment income. Finally, the personal income figures include, but the sample survey figures exclude, incomes received by persons deceased during the year. Tax returns filed on their behalf by executors showed a total income of some $25 million, of which $5 million was from investment income. Such fragmentary data as are available suggest that possibly as much as $100 million of the differences in the two series on investment income may be attributable to the differences in the universe covered by the two estimates.

(ii) *Comparison with income tax data and use of latter in the distribution*

The individual income statistics from the survey were tabulated in classifications identical to those used for tabulating and analyzing income tax returns, to permit comparisons. Specifically, individuals were classified into the following groups: those whose major source of income was from (*a*) wages and salaries; (*b*) net income from self-employment (that is net unincorporated business income) and net professional income; (*c*) investment income; and (*d*) miscellaneous income (largely pensions and annuities). This left a residual group from the survey – individuals whose main income came from government transfer payments and who did not file income tax returns.

This breakdown allowed for some interesting comparisons. The usual experience with income surveys is that an under-representation can be expected of the incomes of the upper income groups as it is in these groups that resistance to divulging income information may be expected to be greatest. However,

for the two largest groups of income receivers – wage and salary earners and the self-employed – the figures from the two sources were remarkably close, with the income survey data showing a somewhat higher number of income recipients and aggregate income for groups receiving $3,000 or more than did the income tax statistics (and income tax statistics in Canada may be assumed to have a complete coverage of income receivers above the $3,000 level).[1]

However, in the case of investment income the income tax figures were much more comprehensive than the survey figures. Taxation statistics showed approximately 25,000 persons receiving incomes above $3,000 compared with 21,000 persons in the survey. Aggregate income reported on the survey was substantially lower: approximately $178 million compared with $251 million on income tax returns. The use of taxation statistics for incomes above $3,000 obviously resulted in an improved estimate.[2]

(f) *Summary*

The effect of these various modifications was to bring the new aggregate into closer agreement with the Personal Income estimates of the National Accounts. In total, the new series showed:

	$ millions	Percentage of (adjusted) Personal Income Estimate
Wages and Salaries	9,051.9	98
Net Income from Self-Employment . . .	1,373.0	91
Investment Income	502.4	62
Transfer Payments	597.2	82
TOTAL[3]	11,524.5	94

[1] Tax exemptions for a single person are $1,000, for a married couple $2,000, and for each child under 16, $150. The income tax data have been adjusted, in part, for reassessment on the basis of a special tabulation supplied by the Department of National Revenue.

[2] These comparisons exclude miscellaneous income receipts.

[3] Another adjustment made to the survey figures was intended to take account of an obvious under-reporting of net income from roomers and boarders. The adjustment was based on data collected in the 1948 Survey and amounted to some one hundred million dollars in aggregate.

In the aggregate, then, the estimates were 94 per cent of the non-farm cash income components of the Personal Income series. If all transfer payments, investment income and other receipts accruing to the farm sector and other groups outside the scope of the study could be excluded from the accounts estimates, the survey incomes would probably correspond to at least 96 per cent of the accounts aggregates. This, of course, is due to the close agreement of the estimates of wages and salaries and transfer payments; a better reconciliation would still indicate substantial variation in the estimates on investment income.

After the various adjustments described above were made a new estimate of the individual size distribution was derived. The final step in the study was to convert the new distribution of individual incomes into family incomes; as already indicated, this was done by cross-classifying individual incomes by family income levels in the sample survey and applying this relationship to the new series of individual incomes.[1] In addition to these two main series, cross-classifications were published from the original (unadjusted) estimates. These give additional detail on the distributions of family incomes by regions, by age and sex of head, by size of family and by occupation of the head; similar analyses were made for individual incomes. These tables were published in percentage terms only.[2]

6. The 1952 Income survey – some conceptual and methodological problems

(a) Survey procedure employed – self-enumeration

As already indicated, the 1952 survey procedures employed were determined by the necessity to keep costs down to a minimum. Costs were kept low by carrying out the survey in conjunction with the Labour Force Survey, by using self-enumeration and a simplified questionnaire, and by confining the survey to the non-farm sector. The first visit to the household was made in conjunction with the Labour Force Survey and thus entailed little extra expense. The second and subsequent visits entailed

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[1] This method of conversion was similar to the one suggested by Mrs. Goldsmith in 'An Appraisal of Basic Data Available for Constructing Income Size Distributions', *Studies in Income and Wealth*, Volume 13, Section E, National Bureau of Economic Research (New York), 1951.

[2] See Reference Paper No. 52, *Distributions of Non-Farm Incomes in Canada by Size*, 1951, Dominion Bureau of Statistics (Ottawa, 1954).

additional enumerating expenses but the total cost was kept well within the limits envisaged.[1]

While self-enumeration was dictated by necessity, the 1952 experience appears to demonstrate that it is an adequate and economical procedure when a simple questionnaire is used.[2] Each adult receives a copy of the questionnaire and is asked to fill it in himself. To the extent that the information is secured directly from the income receiver it is likely that more accurate statistics are obtained.[3] It has to be emphasized, however, that the approach used in 1952 (and again in 1955) is essentially a by-product of the major labour force operation and is adequate only to the extent that a simple questionnaire can be used. On the other hand, for a more complicated survey, for example on assets and liabilities of households, self-enumeration would be inadequate; special instruction and the use of well-qualified enumerators would be required.

(b) *The household and the definition of the family*

Another feature of the 1952 practice which stemmed from necessity but which had incidental advantages was the fact that the basic information has been obtained on a *household* basis. Since the field staff carrying out the income surveys are responsible for other surveys it is important to maintain, as far as possible, the same definition in the basic reporting unit – that of the household; this avoids confusion and misunderstanding on the part of the enumerators. However, data collected on a household basis have the advantage of flexibility; they make possible the use of a number of definitions of the family in the final distributions.[4]

The family is regarded as the 'ultimate unit of classification appropriate for overall general purpose estimates of income size distribution. . . . We cannot dispense with it as the central point of reference in analysing the economic status of the population, and it constitutes the basic unit for the study of consumer

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[1] At the same time, the very favourable response rate dispelled fears that the income survey might react unfavourably on the Labour Force Survey.

[2] Another survey, carried out in 1955, yielded even better results.

[3] The questions on the control card ensured a complete account of all persons in the household and provided information, where income questionnaires were not returned, on whether omitted persons received income.

[4] To make this possible it is, of course, essential for the relationship of each household member to the head to be determined, as is the case on the control card employed.

behaviour as affecting the working of the economy.'[1] The question arises, however, what is meant by 'the family'. Kuznets suggested that 'the units for which incomes are recorded and grouped should be family expenditure units, properly adjusted for the number of persons in each – rather than recipients for whom the relations between the receipt and use of income can be widely diverse.'[2]

The definition employed in the 1952 income survey – a group of people living together and related by blood, marriage and adoption – appears to be a fairly adequate working definition. Although circumstances may exist which would make this definition too broad or too narrow, compared with the 'ideal', in practice it appears to satisfy the most important situations under normal conditions.

Theoretically, the definition of the family used in the 1952 income survey may be too broad because the criterion of relationship to the head of the household on which it is based does not necessarily give rise to a group of people whose economic behaviour is closely interdependent. In recognition of this an alternative definition has been devised – that of the spending unit. This definition of the 'family' classifies persons living together on the basis of pooling all or a proportion of their incomes rather than on the basis of their relationship to the head. The sharing of a common dwelling is used as one of the criteria by either of the two definitions of the family. This may be too narrow an approximation of the scope of expenditure of the group; an example is a person maintaining parents living else-where.

The degree of coincidence, at any particular point of time, between the two definitions depends on the degree of genuine economic independence of related individuals and unrelated persons who share accommodation. For example, if unrelated persons living together do not share expenses and if related persons living together share all expenses the number of family units in the two definitions is obviously the same. Information on the degree of economic independence of persons sharing accommodation is lacking but there is some evidence to suggest that the number of family units obtained on the basis of the

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[1] *Income Distribution in the United States,* United States Department of Commerce (Washington, 1953), p. 21.

[2] 'Economic Growth and Income Inequality', *The American Economic Review,* March 1955, p. 1.

definition used in the 1952 income survey does not differ substantially from the number obtained on the basis of the spending unit definition (as defined in Canada). Thus, an examination of nearly 400 households of five large urban centres indicates that they contained 450 units on the 1952 survey basis, and a possible maximum of 500 units, using the spending unit criterion as defined for the Dominion Bureau of Statistics' consumer expenditure surveys.

However, the extent to which comparability over time is impaired if either definition is used depends on the degree to which doubling up is involuntary at any point of time. If doubling up is compulsory as a result of shortages of housing, income difficulties or other reasons, either definition may give rise to a different number of 'family' units when the situation changes.

Aside from the points just discussed there are the practical problems of measurement.[1] The use of a spending unit definition of the family would necessitate either additional questions or, alternatively, detailed instructions to field enumerators to make basic decisions regarding family unit compositions. On the other hand, a great merit of the 1952 income survey definition is that it is relatively simple and clear-cut; it is easy to combine in the office the various persons of a household on the basis of this definition if the relationship of all members of the household to the head is specified on the questionnaire.[2]

(c) *The definition and adjustment of income*

There are two problems regarding the income estimates used in the distribution which require further comment.

The basic definition used is a narrow one being defined to cover cash items only; it was designed to coincide substantially with what may be considered the layman's view of income. Thus it differs from the personal income concept used in the National Accounts,[3] not only because it does not cover non-commercial

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[1] See the clear discussion of the issues discussed above in *Income Distribution in the United States*, United States Department of Commerce (Washington, 1953), pp. 21–23.

[2] The conventions established for the labour force survey were used in the income survey in regard to persons related to the head and normally resident in the household but who were temporarily resident elsewhere; for example, students resident at universities were classified with their parents' household.

[3] A *fortiori* it differs from *national* income or *disposable* income which for some purposes are the appropriate definitions. See Part I.

institutions and private trust and pension funds but also because it excludes imputed income;[1] and includes annuity income payments to life insurance beneficiaries as well as out-payments of private pension funds. Capital gains and losses have been excluded; even if it were desirable to include them, this could not be done because statistics of this sort are not available in Canada and it would not be feasible to secure them in a simple survey. Lump-sum payments of life insurance beneficiaries were excluded as capital transfers.[2]

In selecting this definition of income no commitment has been made to retain it in the future; some of the required information to convert it to some other definition, say personal income used in the National Accounts adjusted to include households only, is available. Its simplicity had great appeal during the experimental stage of size distribution research.

Similarly, the decision has been made not to adjust, for the time being, the survey income components to corresponding aggregates of the personal income series of the National Accounts. Such adjustments are usually based on the implicit assumption that the shape of the distribution of the missing incomes are the same as those of the covered incomes and it appeared advisable to postpone such assumptions until more experience has been accumulated with the income data.

The most important problem in this connection is presented by investment income. It is likely that memory bias as well as tax evasion are responsible for the observed discrepancies between the survey figures (adjusted by taxation statistics) and the national income aggregates. In the case of deposit interest lack of awareness of the accrual of this income may also be a factor.

It should be noted, however, that if further research would suggest that the distributions of missing incomes is significantly unlike the distributions of the covered income it might still be choosing the lesser evil to adjust the survey (and taxation) statistics to the predetermined National Accounts totals. The shape of the distributions of the various major income components – investment income, wages and salaries, and so on – differs markedly. Further, the degree of under-estimation differs

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[1] That is, farm products produced and consumed on the farm, payments in kind to employees, imputed rents and imputed interest.

[2] The questionnaire was ambiguous regarding inter-personal gifts; although they were supposed to be excluded it is believed that they were included in the miscellaneous items.

substantially for the various income components, as indicated above. Thus, it is possible that the relative error resulting from inadequate representation in the total distribution of the various components is larger than the error resulting from assuming that the distribution of the missing incomes of the components is the same as that of the covered incomes.

(d) *Exclusion of military and farm sector*

The exclusion of military personnel from the final estimates was not too serious a matter for 1951. In that year the armed services numbered approximately 100,000; some of these would be living in barracks and were thus outside the universe sampled for labour force and income data. (The labour force survey does not sample the institutional population, military personnel living in barracks, and certain remote and inaccessible areas of Canada such as the Yukon and North-West Territories. However, permanent residents in hotels, motels, Y.M.C.A.s, etc., are covered.)

The omission of farm operators from the estimates is, however, much more serious. In 1951, somewhere between 400,000 and 500,000 of the population derived their main income as net income from farming. Nearly two million persons were members of farm families (as defined in the 1952 income survey). Although the farm sector is diminishing in relative importance in the Canadian economy, it is still a most important sector. Further, certain areas of the country are still predominantly agricultural and the omission of agricultural income from the income distribution series diminishes the value of the statistics for regional as well as aggregate analysis.

A special approach to the problem of farm income is needed. Self-enumeration is obviously inadequate; direct enumeration of relatively high order would be required. At present time, a master frame is being developed from which area samples could be selected for income surveys in the future.[1]

(e) *Changes in family composition*

The 1952 survey collected data from the family as it was constituted at the time of the survey. No attempt was made to

[1] Taxation statistics give an inadequate picture of farm income. In 1951, taxation statistics show that approximately 190,000 farmers filed income tax returns declaring approximately $350 million in cash farm income. The net cash income as estimated for the national accounts was about $1.5 billion.

reconstruct for changes in family membership or to adjust for part year family units. The effects on the distributions of not constructing for changes in family membership have been discussed ably elsewhere.[1] Changes in family structure can only be recognized by the addition of more questions on the income questionnaire and with more editing work at head office. The design of the 1952 income survey made such adjustments impossible; theoretically, the correct treatment, where persons move in or out of a family unit, is to allocate the income as between the various units of which the individual was part. In actual fact, of course, such adjustments present great difficulties; this is especially true where death, marriage or some other reason removes a family member during the earlier part of the time period. In a sample survey, remaining members may not be in a position to supply accurate information pertaining to departed members.

The problem must be considered a difficult one but the solution may not be attempted in Canada until more pressing problems have been solved.

(f) *Weighting and related problems*

In the 1951 estimates no adjustments were made for individuals from whom data were not collected, while the blow-up of family sample units to national aggregates could not be handled satisfactorily, as already intimated.

It is usually found that non-reporting and refusals occur more frequently among higher income groups than among lower income groups. A number of techniques have been used to deal with this problem; the Survey Research Center of the University of Michigan over-samples higher income groups and takes account of both the sampling and response ratios in weighting (blow-up). Other studies have either substituted new households in the sample for refusals or non-contacts or else used some other technique such as substituting the schedules of other families in the same residential area having possibly other characteristics in common. The evidence seems to suggest that, although the adjustments used in many of the surveys un-

[1] See Robert Wasson, Abner Hurwitz and Irving Schweiger, 'Field Surveys of Consumer Income: An Appraisal' *Studies in Income and Wealth*, Volume XIII, National Bureau of Economic Research (New York, 1951), p. 511, and *U.S. Dept. of Commerce, Income Distribution in the United States* (Washington, 1953), pp. 23–25.

doubtedly improve the quality of the estimates, the main part of the problem of non-reporting still remains.[1]

Wage-earning families show the greatest concentration of incomes in the middle ranges; the families of the aged and indigent tend to be found at the lower levels; the families of own-accounts, entrepreneurs and investors show the greatest income inequality. Although wage-earning families are numerically the most important they are, proportionally, less represented in the higher income brackets. Entrepreneurial families numbered ten per cent of wage-earning families; not only are they numerically much less significant but one might expect refusal rates to be higher among this group. The families living on investment income are even smaller in number and also less responsive to surveys than wage-earning families. Substitutions of other schedules or the addition of new households may not be a very satisfactory way to cope with non-reporting if it is more significant for the small but highly important groups of the entrepreneurs and investors.

To correlate family or individual incomes to family or individual characteristics requires the availability of reliable and adequate data on such characteristics estimated independently from other sources. The income survey sample itself is usually inadequate for the measurement of family characteristics for a self-weighting blow-up technique as the sample itself is usually too small. In Canada, the concurrent collection of labour force and income data made it possible to relate the *individual* income sample to the known labour force characteristics of the population and undoubtedly was an important factor in the quality of the estimates obtained. The availability of similar information on *family* characteristics would have made possible the inflation of the survey family figures to national totals instead of using the individual income size series to construct the family series.

7. *Future plans*

In looking into the future, many avenues of development are possible and needed but limited available resources will determine the actual directions of research. Publication of the first regular study in income size distribution has already made it evident that many users of income size data will want similar

[1] Wasson, Hurwitz and Schweiger: 'Field Surveys of Consumer Income: An Appraisal', *Studies in Income and Wealth*, Volume XIII, National Bureau of Economic Research (New York, 1951), p. 516.

and comparable statistical series through time. Much demand for information comes from business, marketing research agencies and other such groups. The need of other government departments for income data for specialized purposes has also made itself felt. Areas which concern other government agencies are farm family living standards, potential demands for housing, effects of social security payments on families, the relationship of family incomes to the participation of married women in the labour force, the economic position of the aged, to name only a few examples.

There is also a strong demand for data which are related to and affect the household's income position – data on assets, liabilities, net worth and the ownership of durable assets. Coupled with this is the need for information which will aid in the improvement of other statistical series such as direct estimates of the components of personal savings in the National Accounts and the separation of the savings of unincorporated business from the household sector in the Personal Income series in the National Accounts. And extending this list even further there is considerable interest in Canada in the pioneering research done on consumer attitudes and intentions as carried on at the Survey Research Center at the University of Michigan.

For the next few years it is planned to continue income surveys similar to that already conducted in 1952, and in 1956 to carry out a survey of assets and liabilities. A pre-test survey on income, assets and liabilities, was conducted in the fall of 1954 in two Canadian cities, using two methods – self-enumeration along the lines of the previous income survey and direct enumeration by enumerators. The results made it evident that the self-enumeration method which had been successful for income data alone was unsatisfactory for more detailed and more personal questions – the response was only fifty per cent. Direct enumeration proved the better of the two approaches with a 75 per cent response rate from sample households. This means that an expansion of the scope of inquiry in 1956 would involve a corresponding change in methods of data collection.

Another income survey on 1954 incomes similar to our 1951 income survey has been undertaken in the spring of 1955. The results are in process of tabulation. As in the earlier survey, that portion of the labour force sample which was being dropped from use was surveyed. As already intimated, it is also hoped to extend the surveys to cover the agricultural sector of the economy.