
Distribution of Family Income: Improved Estimates

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This article describes the results of research to improve estimates of the distribution of family income. In this research, a microdata file was constructed for 1972 using several data sources. The data obtained from these sources were combined and adjusted to produce more precise estimates. Current Population Survey estimates were then evaluated using these improved estimates. Using the improved estimates increased 1972 mean income for all units by 11 percent. The income share of the top 5 percent of the distribution increased substantially. Property income increased and wage and salary income decreased in relative importance. The mean income of family units headed by persons aged 65 or older increased by about 40 percent, by far the largest rise for any group examined; the increase was far lower for low-income family units in that age group. A simple update of mean incomes to 1979 showed no substantial changes from the 1972 pattern of adjustments.

The most important source of data on the distribution of income has been the Current Population Survey (CPS), a household survey conducted by the Bureau of the Census. Income data from household surveys, however, contain substantial response error (the respondents do not know, remember incorrectly, or refuse to answer).¹ These errors usually produce underestimates of average income for all units surveyed, and distort the relative income positions of various socioeconomic groups.

In the mid-1970's the Office of Research and Statistics began a program of research to improve income data bases, using the CPS. In part, this work was a cooperative undertaking with the Bureau of the Census and the Bureau of Economic Analysis, Department of Commerce. In this research a microdata file was constructed for 1972 using several data sources—the CPS, Social Security records, and Federal individual income tax returns.² The data obtained from these sources were combined and adjusted to produce more precise estimates. The CPS estimates were then evaluated using these improved estimates.

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¹ Sampling error, of course, can also be important, but this article deals primarily with systematic response error and its effect on CPS estimates.

² See the Technical Note for a detailed description of the microdata file and methodology.

The goals of this research were

- To assess the size and nature of the errors in CPS income data, both for total income and for specific types of income.
- To construct improved estimates of the distribution of income for 1 year, 1972.
- To examine how improving the estimates of income affects the income of different groups, such as the aged.

This article reports on the results of this research, with the emphasis on the improved estimates for 1972 and the effects of the improvements on estimated income for different groups. In addition, a crude method for adjusting CPS mean incomes for more recent years, which was developed in the course of this research, is applied to CPS data for 1979.

The principal effects of moving from the CPS estimates to the improved estimates were

- Mean income for all units increased 11 percent; mean income increased for all parts of the distribution.
- The income share of the top 5 percent of the distribution increased substantially.
- Property income increased and wage and salary income decreased in relative importance.

- The mean income of family units headed by persons aged 65 or older increased by about 40 percent, by far the largest rise for any group examined; the increase was far lower for low-income family units in that age group.
- A simple update of mean incomes to 1979 showed no substantial changes from the 1972 pattern of adjustments.

Effects of Adjusted Estimates

This section examines how estimates of the distribution of annual family unit money income are affected by adjusting the income amounts obtained from the Current Population Survey. A family unit is defined here as either (1) a family, a group of two or more persons related by blood, marriage, or adoption and residing together or (2) an unrelated individual, a person 14 years old or over who is not living with any relatives. The income concept used is total money income received in 1972.³

One indication of the nature and magnitude of the error in CPS income data is shown in table 1.⁴ This table compares CPS income aggregates by type of income with the adjusted income aggregates. Property income increased the most, both as a percent of the CPS aggregate (137 percent) and in terms of aggregate income (\$46 billion). Wages and salaries and Social Security and Railroad Retirement benefits increased by the smallest percentage (5 percent). Although the increases in self-employment income and "other" income were large (21 percent and 35 percent, respectively), they were far below the property income increase. In terms of aggregates, wages and salaries increased \$28 billion, self-employment rose \$13 billion, and other income increased \$14 billion. Income from Social Security and Railroad Retirement increased only \$2 billion. Thus, property income accounted for 44 percent of the increase in total income, wages and salaries accounted for 27 percent, other income for 14 percent, self-employment income for 13 percent, and Social Security and Railroad Retirement for 2 percent.

All Family Units

Mean adjusted income for all family units was \$12,081, which was 11 percent higher than the CPS mean of \$10,853 (table 2). Median income increased 8 percent, from \$9,130 to \$9,839. The distribution of

³ For complete definitions and explanation of terms, see Bureau of the Census, "Money Income in 1972 of Families and Persons in the United States," *Current Population Reports* (Series P-60, No. 90), December 1973, page 12.

⁴ A minor source of difference between the CPS and adjusted estimates is that the two estimates use different sample weights; the adjusted estimates use sample weights developed for the Exact Match file. (See the Technical Note at the end of this article.)

Table 1.—Comparison of CPS income totals and adjusted estimates, by type of income, 1972

[Dollars in billions]

Type of income	Income totals		Adjusted ÷ CPS
	CPS	Adjusted ¹	
Total	\$773.0	\$877.2	1.13
Wage and salary	597.2	625.6	1.05
Self-employment	64.7	78.2	1.21
Nonfarm	54.1	60.4	1.12
Farm	10.6	17.9	1.69
Property ²	33.8	80.0	2.37
Social Security and			
Railroad Retirement	37.1	39.0	1.05
Other	40.2	54.3	1.35
Public assistance	7.7	10.7	1.39
Other government transfers ³	18.5	27.8	1.50
Private pensions, annuities, and miscellaneous ⁴	14.0	5 15.8	1.13

¹ These aggregates are equal to the control aggregates except for wage and salary income and Social Security benefits. The adjusted wage and salary aggregate exceeded the control by \$4 billion; possible explanations for this excess include inaccuracies in the statistical matching, sampling error, and inaccuracies in the control. The adjusted Social Security benefit aggregate was below the control by \$0.7 billion. This difference is probably due to sampling error. The control aggregate for total income is \$873.9 billion.

² Interest, dividends, rent, royalties, and estate and trust incomes.

³ Unemployment compensation, workers' compensation, veterans' payments, and government pensions.

⁴ Miscellaneous includes alimony, contributions from outside the household, and child support.

⁵ Most of the miscellaneous category was not adjusted. Amounts of veterans' life insurance dividends were assigned.

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

total income showed increases in the percent of units in all classes above \$13,999 and decreases in all (positive) classes below \$12,000. The percentage of family units reporting income of \$50,000 or more increased roughly 80 percent.

When family units are ranked by size of total income and separated into percentile groups, the shares of total income received by various percentiles can be tabulated (table 3). Changes in these shares show how the adjustments affected various parts of the distribution. It is important to note that the relative shares of adjusted income shown in this article are based on reranked distributions. Thus, the change in any share reflects reranking of observations as well as adjustment of a specific set of CPS observations.

Changes in the shares also show changes in the inequality of the distribution. For example, a decrease in the share of the bottom 10 percent along with an increase in the share of the top 5 percent and no change in other groups would mean an increase in inequality.

The most important change in income shares was the substantial increase in the share of the top 5 percent. That share rose by 1.9 percentage points, an increase of 11 percent. The bottom two deciles showed no change, the next seven deciles showed increasingly large declines, and the 91st through 95th percentile group

Table 2.—Percentage distribution of total income of all family units, by CPS estimates and adjusted estimates, 1972

Size of total income	CPS	Adjusted
Total	100.0	100.0
Negative	.2	.2
\$0	.8	.6
\$1-\$1,999	8.2	7.2
\$2,000-\$3,999	12.6	11.7
\$4,000-\$5,999	11.1	10.8
\$6,000-\$7,999	10.7	10.2
\$8,000-\$9,999	10.4	10.1
\$10,000-\$11,999	9.9	9.3
\$12,000-\$13,999	8.5	8.5
\$14,000-\$15,999	7.1	7.2
\$16,000-\$17,999	5.1	5.6
\$18,000-\$19,999	3.9	4.3
\$20,000-\$24,999	5.6	6.7
\$25,000-\$29,999	2.7	3.2
\$30,000-\$49,999	2.5	3.4
\$50,000 or more	.7	1.2
Mean	\$10,853	\$12,081
Median	9,130	9,839

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

showed no change. Thus, the top 5-percent group showed the only increase. Those changes produced an increase in inequality. In general, the top of the distribution showed the largest increase in mean income, the bottom of the distribution showed the next largest increase, and the middle of the distribution showed the smallest increase. The small increase for the middle is explained by that group's heavy reliance on wage and salary income, which is the most accurately reported income type. It should be noted that, despite decreases in income shares for some deciles, the mean income of each decile increased.

The composition of total income by type of income is shown in table 4. Wages and salaries fell as a share of

Table 3.—Percentage distribution of total income for all family units, 1972

Percentiles	Income share	
	CPS	Adjusted
Total	100.0	100.0
1-10	1.0	1.0
11-20	2.6	2.6
21-30	4.2	4.1
31-40	5.8	5.7
41-50	7.6	7.3
51-60	9.3	9.0
61-70	11.2	10.9
71-80	13.5	13.1
81-90	16.8	16.4
91-100	28.0	29.9
91-95	10.6	10.6
96-100	17.4	19.3

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

total income in all income classes above \$3,999, with a large decrease in the \$50,000 or more class. Property income rose in all classes above \$3,999, with the share in the top class more than doubled. Those two changes clearly reflect the small overall adjustment to wages and salaries and the large overall adjustment to property income mentioned earlier. The share of income from Social Security and Railroad Retirement fell slightly at the bottom, and rose a small amount elsewhere. The share of other income increased slightly in all classes except \$50,000 or more, while the share of self-employment income rose slightly at the bottom and at the top, and in general fell slightly in between.

When the composition by income type of specific parts of the distribution was examined, a large shift toward property income and away from wages and salaries at the top was found. The bottom showed a small

Table 4.—Composition of CPS total income and adjusted total income, by type and size of income, 1972

Size of total income	[In percents]					
	Total	Wage and salary	Self-employment	Property	Social Security and Railroad Retirement	Other ¹
CPS total income						
Total ²	100	77	8	4	5	5
\$1-\$1,999	100	23	3 ⁰	5	45	27
\$2,000-\$3,999	100	34	3	6	35	22
\$4,000-\$5,999	100	56	5	6	19	14
\$6,000-\$7,999	100	71	6	4	9	9
\$8,000-\$9,999	100	79	7	4	5	6
\$10,000-\$11,999	100	84	6	3	3	5
\$12,000-\$13,999	100	87	5	3	2	4
\$14,000-\$15,999	100	87	6	3	2	3
\$16,000-\$17,999	100	86	7	3	1	3
\$18,000-\$19,999	100	86	6	3	1	3
\$20,000-\$24,999	100	84	8	4	1	3
\$25,000-\$29,999	100	81	11	4	1	2
\$30,000-\$49,999	100	69	20	8	1	2
\$50,000 or more	100	54	28	15	3 ⁰	2
Adjusted total income						
Total ²	100	71	9	9	4	6
\$1-\$1,999	100	25	2	5	40	29
\$2,000-\$3,999	100	35	4	6	29	26
\$4,000-\$5,999	100	54	5	7	16	17
\$6,000-\$7,999	100	67	5	7	10	11
\$8,000-\$9,999	100	74	5	6	6	8
\$10,000-\$11,999	100	80	4	6	4	6
\$12,000-\$13,999	100	83	4	5	3	5
\$14,000-\$15,999	100	84	4	5	2	5
\$16,000-\$17,999	100	83	5	6	2	4
\$18,000-\$19,999	100	81	7	6	2	4
\$20,000-\$24,999	100	79	8	7	2	4
\$25,000-\$29,999	100	76	11	8	2	4
\$30,000-\$49,999	100	62	20	14	1	3
\$50,000 or more	100	36	30	31	1	2

¹ Includes public assistance, other government transfer payments, private pensions, annuities, and miscellaneous income.

² Total percents include income of units with negative total income.

³ Estimate rounds to zero.

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

shift from Social Security and Railroad Retirement to other income, while the middle showed a small shift from wages and salaries that was distributed among all other types of income except self-employment.

Income by Selected Family Unit Characteristics

Mean income. The adjustments to income would be expected to affect different groups differently, at least in part because the composition of income differs among groups. In general, it would be expected that groups that receive mostly wage and salary income would have relatively small increases in mean income, while groups that receive substantial amounts of property income would have relatively large increases.

Mean income increased somewhat more for unrelated individuals than for families—16 percent, compared with 12 percent (table 5).⁵ The largest increases by type of family unit and sex were shown by the categories female unrelated individuals (24 percent) and female heads (22 percent), followed by male heads (16 percent). The smallest increases were seen in families headed by husband-wife couples (12 percent) and male unrelated individuals (8 percent). This pattern is generally consistent with the generalization that groups with the least dependence on income from wages show the largest increases and groups with the greatest dependence on wage income show the smallest increases. The mean income for both race groups increased by 12 percent.

Table 5.—Mean income of family units, by selected characteristics, 1972

Characteristic	Mean income		Adjusted ÷ CPS
	CPS	Adjusted	
All family units	\$10,853	\$12,081	1.11
Type of family unit and sex of head:			
Families	12,625	14,125	1.12
Headed by:			
Husband-wife couple	13,477	15,061	1.12
Men ¹	11,657	13,549	1.16
Women ¹	6,861	8,388	1.22
Unrelated individuals	5,138	5,983	1.16
Men	6,619	7,173	1.08
Women	4,157	5,155	1.24
Race:			
White or other than black	11,282	12,622	1.12
Black	7,096	7,914	1.12
Age of head:			
14-24	6,439	6,097	.95
25-34	11,078	11,094	1.00
35-44	13,741	14,667	1.07
45-54	14,443	16,063	1.11
55-64	11,681	13,496	1.16
65 or older	6,150	8,658	1.41

¹ No spouse present in household.

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

The most striking adjustments to mean income were in age-of-head groups, where a clear pattern emerged: the older the age group, the larger the increase. The oldest group, aged 65 or older, showed by far the largest increase in mean income—41 percent. (The median for the group rose 28 percent.) This increase was more than double the 16-percent increase of the 55-64 age group. The 14-24 age group showed a 5-percent decrease. The decline in the mean for the 14-24 age group was primarily due to reweighting of sample observations, although several incorrect large amounts in the CPS data that apparently resulted from CPS processing errors also played a role. Several of these observations were male unrelated individuals, which helps to explain the small increase for that group.

One way of looking at the differential change by age is to note that the mean for the 14-24 age group fell from 59 percent of the overall mean in the CPS estimates to 50 percent in the adjusted estimates, while the mean for the age 65 or older group rose from 57 percent to 72 percent of the overall mean.

Table 6 presents in more detail the distribution of the large increase of mean income for the aged-65-or-older group. This group showed large differences by decile. The increase in the bottom decile was extremely low because of an increase in negative income.⁶ The adjustment rose with each decile, with a sharp rise in the top decile and the top 5 percent. Thus, the adjustment for the aged-65-or-older group was very unequally distributed, with relatively high-income units receiving a far greater adjustment than relatively low-income units.

The size of total income that corresponds to the deciles for the aged-65-or-older group is also shown in table 6. For example, the bottom two deciles, which had relatively low adjustments, consisted of units with CPS income below \$2,004. The third decile, which had a moderate adjustment, contained units with CPS income of \$2,004-\$2,540; and the top decile, which had a very large adjustment, contained units with CPS income of \$12,851 or more.

Income shares. The general pattern of change in the distribution of income shares is a decrease in the bottom 40 percent share and the next 40 percent, and an increase in the top 20 percent share (table 7).⁷ However, several groups showed different patterns. Blacks showed an opposite pattern—an increase in the share of the two bottom 40 percent income classes and a decrease

⁵ The pattern of change in median incomes for most family groups is similar to the pattern for means, but in general the changes for the medians are not as large as those for the means.

⁶ Net losses reported in tax return data are usually larger than negative income reported in survey data. Tax return data replaced survey data for several types of income in constructing the improved estimates, as described in the Technical Note.

⁷ It should be noted that a given percentile group represents different income classes for different family groups.

Table 6.—Percent change in decile mean income, CPS to adjusted, for family units headed by persons aged 65 or older, 1972

Percentile	Percent change ¹	Lowest CPS income amount in the percentile group
Total.....	41
1-10.....	2
11-20.....	10	\$1,452
21-30.....	14	2,004
31-40.....	20	2,541
41-50.....	26	3,162
51-60.....	31	4,000
61-70.....	35	5,000
71-80.....	37	6,427
81-90.....	40	8,562
91-100.....	58	12,851
96-100.....	68	18,000

¹ These percentages are based on a reranked adjusted distribution.
Source: Derived from March 1973 CPS and 1972 Statistical Match file.

in the share of the top 20 percent. Male unrelated individuals, the age 14-24 group, and female heads showed increases in the share of the bottom 40 percent. Female heads also showed a decrease in the top 20 percent share. All other groups shown here conformed to the general pattern of change mentioned above, although the size of the change differed among groups. The aged-65-or-older and female unrelated individual groups showed the largest changes in income shares.

Composition of income by type. The most important change in composition of income by type was the in-

crease in the importance of property income. As expected, the share of property income rose for all groups that received substantial property income (table 8). The share of wages and salaries fell for all groups, the shares of self-employment and Social Security and Railroad Retirement showed little change for most groups, and the share of other income rose slightly for most groups.

Table 9 presents in more detail the change in the composition of income for family units headed by persons aged 65 or older. Although the mean amounts for all types of income except Social Security and Railroad Retirement increased in moving from the CPS estimates to the adjusted estimates, the size of the increases differed greatly. Mean property income increased 165 percent, self-employment income 43 percent, other income 28 percent, and wages and salaries 22 percent. Income from Social Security and Railroad Retirement decreased 1 percent. This decrease was primarily the result of the reweighting of sample observations. Two-thirds of the increase in total income was from property income, wages and salaries contributed 16 percent, other income 10 percent, and self-employment income 7 percent.

These changes imply changes in the share of total income accounted for by each type of income for the aged-65-or-older group (table 8). Social Security and Railroad Retirement fell from 32 percent of total income to 22 percent, wages and salaries decreased from 30 percent to 26 percent, other money income dropped from 15 percent to 13 percent, while property income rose sharply from 17 percent to 31 percent.

Table 7.—Percentage distribution of total income for family units, by selected characteristics, 1972

Characteristic	CPS total income				Adjusted total income			
	Total	Percentile			Total	Percentile		
		1-40	41-80	81-100		1-40	41-80	81-100
All family units.....	100.0	13.7	41.6	44.8	100.0	13.4	40.3	46.3
Type of family unit and sex of head:								
Families.....	100.0	17.3	41.4	41.4	100.0	17.0	40.0	43.0
Headed by:								
Husband-wife couple.....	100.0	18.8	41.1	40.2	100.0	18.1	39.8	42.1
Men ¹	100.0	16.7	41.5	41.8	100.0	16.6	40.1	43.4
Women ¹	100.0	14.3	39.7	46.0	100.0	15.5	39.5	45.0
Unrelated individuals.....	100.0	11.4	37.7	50.9	100.0	10.9	36.8	52.2
Men.....	100.0	11.7	39.0	49.3	100.0	11.9	38.5	49.6
Women.....	100.0	12.6	37.5	50.0	100.0	11.0	35.7	53.3
Race:								
White or other than black.....	100.0	14.2	41.6	44.2	100.0	13.8	40.2	46.0
Black.....	100.0	12.2	40.3	47.5	100.0	12.8	41.4	45.7
Age of head:								
14-24.....	100.0	13.8	43.4	42.9	100.0	13.9	43.0	43.1
25-34.....	100.0	19.6	43.1	27.4	100.0	19.3	42.8	37.9
35-44.....	100.0	18.6	41.7	39.7	100.0	18.0	40.9	41.1
45-54.....	100.0	16.8	41.6	41.5	100.0	16.5	41.0	42.6
55-64.....	100.0	13.6	40.7	45.6	100.0	13.4	39.8	46.7
65 or older.....	100.0	12.7	34.4	53.0	100.0	10.2	32.4	57.3

¹ No spouse present in household.

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

Table 8.—Percentage composition of total money income of family units, by selected characteristics, 1972

Characteristic	CPS total income						Adjusted total income					
	Total	Wage and salary	Self-employment	Property	Social Security and Railroad Retirement	Other ¹	Total	Wage and salary	Self-employment	Property	Social Security and Railroad Retirement	Other ¹
All family units . . .	100	77	8	4	5	5	100	71	9	9	4	6
Type of family unit and sex of head:												
Families	100	79	9	4	4	5	100	73	10	8	4	6
Headed by:												
Husband-wife couple	100	80	9	4	3	4	100	75	10	8	3	5
Men ²	100	72	9	5	7	7	100	66	9	10	7	8
Women ²	100	64	3	5	11	18	100	58	3	10	10	19
Unrelated individuals	100	65	5	10	12	9	100	59	5	18	9	9
Men	100	74	7	5	6	7	100	71	6	10	5	8
Women	100	56	3	14	18	10	100	47	3	26	13	10
Race:												
White or other than black	100	77	9	5	5	5	100	71	9	10	4	6
Black	100	82	3	1	5	9	100	80	3	1	5	11
Age of head:												
14-24	100	90	3	1	3	6	100	88	3	1	1	8
25-34	100	89	5	1	1	4	100	87	6	2	1	5
35-44	100	84	10	2	1	3	100	81	10	4	1	4
45-54	100	81	10	3	1	4	100	77	11	6	1	5
55-64	100	75	10	6	4	6	100	67	11	11	3	7
65 or older	100	30	7	17	32	15	100	26	7	31	22	13

¹ Includes public assistance, other government transfer payments, private pensions, annuities, and miscellaneous income.

² No spouse present in household.

³ Estimate rounds to zero.

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

Table 9.—Composition of total money income of family units headed by persons aged 65 or older, 1972

Type of income	Mean income		Adjusted ÷ CPS	Percent of total increase
	CPS	Adjusted		
Total	\$6,150	\$8,658	1.41	100
Wage and salary	1,867	2,273	1.22	16
Self-employment	425	606	1.43	7
Property	1,018	2,696	2.65	67
Social Security and Railroad Retirement	1,941	1,928	.99	...
Other money income	900	1,155	1.28	10

Source: CPS data derived from March 1973 CPS. Adjusted data derived from 1972 Statistical Match file.

Updating Adjusted Mean Incomes

A 1979 estimate of mean income by seven income types for selected family groups was constructed by adjusting the 1979 CPS mean income estimates. The adjustments were done so that the total adjusted amount of each income type (for all units) was equal to the independently derived total. The adjusted mean incomes for each type of income were summed to obtain adjusted total income for selected family groups.

Essentially this updating technique modified the 1972

adjustment results to take into account two factors: (1) Changes between 1972 and 1979 in CPS underreporting of each income type (for all units taken together) and (2) changes between 1972 and 1979 in the composition of income by type for the selected group. Otherwise, the 1972 adjustment percentages were assumed to remain unchanged.

For example, if an income type was reported better in 1979 than in 1972, then the 1979 adjustment of that income type would be lower than the 1972 adjustment. Also, for a selected group, if a relatively well-reported income type was a more important source in 1979 than in 1972, then the adjustment of total income for that group would tend to be lower in 1979 than in 1972. A more detailed description of the updating methodology appears in the Technical Note.

The update of mean incomes shows the same general pattern found in the 1972 estimates (table 10). At first glance, the biggest difference is that the mean income for all family units rose 15 percent in 1979, compared with an 11-percent rise in 1972. However, because of the preliminary nature of the 1979 control aggregates used, this difference may not be significant.⁸ The pattern of differential increases among selected family groups for

⁸ Several differences between the March 1973 CPS and March 1980 CPS could also affect comparisons between the 2 years. One important difference is that the 1979 estimates use characteristics (for example, age) of the "householder," while the 1972 estimates use characteristics of the family head.

Table 10.—Mean income of family units, by selected characteristics, 1979

Characteristic	Mean income		Updated adjusted ÷ CPS
	CPS	Updated adjusted	
All family units	\$18,182	\$20,940	1.15
Type of family unit and sex of head:			
Families	21,873	25,212	1.15
Headed by:			
Husband-wife couple	23,791	27,240	1.14
Men ¹	19,580	22,720	1.16
Women ¹	11,854	14,650	1.24
Unrelated individuals	9,707	11,136	1.15
Men	12,029	13,010	1.08
Women	7,827	9,610	1.23
Race:			
White or other than black	18,919	21,800	1.15
Black	12,158	13,910	1.14
Age of head:			
14-24	10,511	10,300	.98
25-34	17,953	18,530	1.03
35-44	23,220	25,670	1.11
45-54	24,664	28,460	1.15
55-64	20,809	25,280	1.21
65 or older	10,837	15,860	1.46

¹ No spouse present in household.

Source: CPS data derived from March 1980 CPS. Adjusted data derived from 1972 Statistical Match file.

1979 was similar to the 1972 pattern. Aside from age groups, the categories female heads and female unrelated individuals still showed the largest increases, while male unrelated individuals showed the smallest increases. However, families and unrelated individuals showed the same percentage increase in 1979; the 1972 estimates had shown a higher increase for unrelated individuals.

The increases for age-of-head groups still showed the same pattern—the older the age group, the larger the increase. Although the increase for each age group was slightly higher for 1979 than for 1972, the appropriate conclusion, based on this crude evidence, is that there has been essentially no change in the adjustment by age of head between 1972 and 1979. This means that changes in the overall net underreporting of each income type and changes in the reported composition of total income for each age-of-head group had no significant net effect on the adjustments to mean income between 1972 and 1979.

Summary

It is well-known that estimates of the size distribution of annual family money income obtained from household surveys contain substantial error, particularly response error. This article has described the effects on estimates of the distribution of family unit money income produced by adjusting Current Population Survey estimates for 1972. Those adjustments were made by

combining several other data sources, primarily tax return data, with the CPS data and altering the income estimates on an individual observation basis so that the estimates were consistent with independently derived control totals.

These adjustments produced several important effects. Mean income for all units rose 11 percent. The income share of the top 5 percent increased substantially, while the shares of the 3rd through 9th deciles fell. In general, property income increased and wage and salary income decreased in relative importance. Self-employment income and income from transfer payments other than Social Security and Railroad Retirement also increased somewhat in relative importance.

When the mean incomes of selected family groups were examined, several important shifts were found. The most striking differences were by age of family head. Family units headed by persons aged 65 or older showed a large increase in mean income (41 percent), while units headed by persons aged 14-24 showed a 5-percent decrease. In general, the adjustment rose as age increased. Further examination of the results for the aged-65-or-older group showed that the adjustment was much larger for the higher income units and that the lower deciles of that age group showed only modest increases in mean income. Female unrelated individuals also showed a large increase in mean income; a substantial proportion of that group consisted of persons aged 65 or older. Changes in income shares in general showed a decrease in the bottom 40 percent and the next 40 percent of the distribution, and an increase in the share of the top 20 percent.

A simple update to 1979 of the adjustment of mean incomes of selected family groups showed no significant changes from the 1972 adjustments. The clearest pattern was still that the adjustment increased with the age of the family head, with the aged-65-or-older group showing the largest increase of any of the family groups examined.

Detailed estimates for 1964 based on the March 1965 CPS showed the same general patterns of adjustment for mean incomes as the 1972 detailed estimates and the 1979 update.⁹ Thus, the following patterns of adjustment have been stable over time. Mean income rises. In general, groups that do not rely as heavily on wage and salary income and have substantial property income show the largest increases in mean income; groups that rely primarily on wage and salary income show the smallest increases in mean income. This is because ordinarily wage and salary income is reported relatively well and property income is reported relatively poorly.

⁹ Edward C. Budd, Daniel B. Radner, and John C. Hinrichs, *Size Distribution of Family Personal Income: Methodology and Estimates for 1964* (Staff Paper No. 21), Bureau of Economic Analysis, Department of Commerce, 1973.

Technical Note

Microdata File, 1972

The adjusted income estimates for 1972 were tabulated from a computer tape file, in which the income estimates were adjusted to be consistent with independently derived control totals.¹⁰ These income totals were derived by the Bureau of Economic Analysis from the National Income and Product Account estimates.

An Exact Match (EM) file was constructed by the Social Security Administration (SSA) and the Bureau of the Census.¹¹ Persons who responded to the March 1973 Current Population Survey had their survey data matched with their earnings and benefit information in SSA administrative records and with selected items from their 1972 Federal individual income tax returns. These "exact matches" were performed using Social Security numbers, with other personal identifying information for validation. This matching was performed in a way that ensured confidentiality.

In order to add to the information in the Exact Match file, a statistical match was carried out between the Exact Match file and a second file, the Augmentation File (AF), which contained comprehensive, detailed Federal individual income tax return information. In a statistical match, the information brought together from the different files ordinarily is not for the same person, but is for a similar person; the match is made on the basis of similar characteristics. In contrast, in an exact match, the information matched is for the same person.

The starting point for the construction of the Augmentation File was a subsample of the 1972 Statistics of Income (SOI) sample of Federal individual income tax returns. The SOI subsample was then combined with SSA records containing earnings and demographic data in an exact match, using Social Security numbers. The SSA information was added to the Augmentation File primarily to improve the quality of the statistical match between the Exact Match file and Augmentation File that was to follow.

The EM-AF statistical match consisted of three parts, each of which was a statistical match: The initial match, the rematch, and the high-income match. The initial match and rematch were basically similar matches that focused on adding more accurate tax return income data to the Exact Match file. The high-income match was different—it focused on adding more high-income Augmentation File returns to the statistically matched file to

¹⁰ Daniel B. Radner, *Adjusted Estimates of the Size Distribution of Family Money Income for 1972* (ORS Working Paper No. 24), Office of Research and Statistics, Office of Policy, Social Security Administration, 1981.

¹¹ Beth Kilss and Frederick J. Scheuren, "The 1973 CPS-IRS-SSA Exact Match Study," *Social Security Bulletin*, October 1978, pages 14-22.

improve the estimates for high-income family units. Approximately 42,000 Exact Match records and 95,000 Augmentation File records were used in the overall statistical match. For each Exact Match observation, the Augmentation File was searched for the observation that most closely resembled the Exact Match observation. The similar information compared in carrying out the match included adjusted gross income (AGI), interest, dividends in AGI, Social Security taxable earnings, sex, race, age, number of tax return exemptions, and the presence of various tax return schedules.

After the statistical match was completed, additional steps were performed to make the income estimates conform to the independent control totals. This adjustment to controls included audit correction of tax return income types, addition of recipients for some income types, and inflating of amounts for some income types. Income amounts in the tax return data were adjusted for audit using information from the 1973 Taxpayer Compliance Measurement Program. Even after the audit correction, all income types except wages and salaries fell short of independent control totals. Income types that appeared on tax returns were adjusted by inflating the after-audit amounts (losses were decreased). Simple inflation factors were used for some types of income, while procedures that involved adding a constant term as well as multiplying the amount by a factor were used for other types of income. Most types of transfer income were adjusted to total income and recipient control totals primarily (and for some types exclusively) by adding more recipients.¹²

In the adjusted estimates for filers of tax returns, tax return amounts replaced CPS amounts for wages and salaries, self-employment income, and property income. SSA administrative record amounts were used for Social Security benefits. CPS amounts were used as the basis for all other types of income, including most transfer payments. However, the estimates were adjusted substantially for almost all of the CPS income types used.

Updating Procedure, 1979

In effect, the 1972 adjustment of a given income type was factored into two parts: (1) A simple inflating to control totals where the percentage increase was the same for all family groups, and (2) based on the 1972 results, an adjustment to the inflated amount that differed by family group. In updating to 1979, the simple inflating was performed (using 1979 factors); then the 1972 final adjustment for the group ((2) above) was applied without change.

In the adjusting procedure, for each of the seven income types for each family group a "simple inflated

¹² For a more detailed description of these adjustments, see Daniel B. Radner, *Adjusted Estimates of the Size Distribution of Family Money Income for 1972*, op. cit.

mean” was constructed by inflating the CPS mean by the ratio of the control total to the CPS total for that income type and year (for all units).¹³ An “adjustment factor” was then computed for each income type and family group for 1972 as the ratio of the final 1972 mean to the simple inflated mean for that income type and family group. The adjustment factor was then applied to the 1979 simple inflated mean for the appropriate income type and family group to obtain the preliminary 1979 adjusted mean. The total amount implied by those means was then compared with the 1979 control total for that income type, and the means for all family groups were then adjusted upward or downward by the same percentage so that the control was met. This final step was needed because shifts in the sample weights between 1972 and 1979 for selected family groups meant that the adjustment factors were not constrained to produce the overall control totals.

¹³ The seven income types were wages and salaries, nonfarm self-employment, farm self-employment, property, Social Security and Railroad Retirement benefits, public assistance, and all other types.

A simple hypothetical example using one family group (the aged) and one income type (property income) will be used to clarify the procedure. Assume that the 1972 CPS total of property income for all groups was one-half of the control total. This assumption implies an inflating factor of 2.00 to bring the total up to the control. Also assume that 1972 mean CPS property income for the aged was \$1,000. The simple inflated 1972 mean was thus \$2,000 ($\$1,000 \times 2.00$). Assume that the mean from the final 1972 estimate, however, was \$2,200. Thus, the adjustment factor would be 1.10 ($\$2,200 \div \$2,000$). Looking at 1979, assume the CPS mean was \$2,500 and the simple inflating factor was 1.80. This implies that the simple inflated mean was \$4,500 ($\$2,500 \times 1.80$). The preliminary adjusted mean was then \$4,950 ($\$4,500 \times 1.10$). Assume that the total amount implied by the preliminary adjusted means was 1.03 times the control total. The preliminary adjusted mean would then be divided by 1.03 to obtain the final adjusted 1979 mean. Thus, the final adjusted mean would be \$4,806 ($\$4,950 \div 1.03$).