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# **After-Tax Money Income Estimates of Households: 1982**

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# After-Tax Money Income Estimates of Households: 1982

by  
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## SYMBOLS USED IN TABLES

- 
- Represents zero or rounds to zero.
  - B Base less than 75,000.
  - X Not applicable.
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# After-Tax Money Income Estimates of Households: 1982

## INTRODUCTION

This report presents estimates of after-tax household income and taxes paid by households in 1982. Data from the Annual Housing Survey, the Income Survey Development Program, and the Internal Revenue Service were combined with the March 1983 Current Population Survey (CPS) data to simulate taxes paid. The main purpose of this report is to provide a better measure of year-to-year changes in household purchasing power and of differences in purchasing power between subgroups of the population. Four types of taxes were simulated and subsequently deducted from the total money income received by households in order to estimate after-tax income: Federal individual income taxes, State individual income taxes, FICA and Federal retirement payroll taxes, and property taxes on owner-occupied housing. A discussion of the important limitations of the simulation procedures and underreporting of income in the CPS is contained in the limitations section. A detailed description of the tax simulation methodology can be found in appendix A, along with comparisons of the results of the tax simulation with data from the Internal Revenue Service and other administrative sources. Previous special studies released by the Census Bureau have contained comparable estimates of after-tax household income for 1974, 1980, and 1981.

## HIGHLIGHTS

- Mean household income after taxes was \$18,910 in 1982, up by 1.7 percent over the 1981 figure after accounting for the 6.1 percent rise in consumer prices.
  - Mean household income before taxes (\$24,310) showed no statistically significant change between 1981 and 1982.
  - Taxes absorbed about 22 percent of the total money income received by households, down slightly from 23 percent in 1981.
  - Households paid an average of \$5,890 in taxes in 1982, about \$180 lower than 1981 after adjusting for price change.
  - White households posted a 1.7 percent real increase in mean after-tax income while Black and Spanish-origin households showed no statistically significant change.
- The mean after-tax income of households in the Northeast and South Regions increased in 1982. Households in the North Central and West showed no statistically significant increases in after-tax income.
  - Female family households without a husband present had a 3.8 percent decline in real after-tax income.
  - Married couples without children recorded a real increase of 2.3 percent in their mean after-tax incomes.
  - Those households with a householder age 65 years or older had a 5.2 percent real increase in mean household income after taxes.

## AFTER-TAX INCOME

After accounting for taxes and the 6.1-percent increase in consumer prices, average household income rose by about 1.7 percent in 1982. The average for 1982 was \$18,910 compared to \$18,580 in 1981. This increase was clearly associated with the reduction in Federal income tax rates as household income before taxes failed to show any statistically significant change and average amounts of State income taxes and payroll taxes were higher in 1982. The increase in average household income after taxes in 1982 followed a 2.6 percent decline in real terms recorded for 1981.

The after-tax income of White households (\$19,610) increased by 1.7 percent in 1982. The averages for Black households (\$12,960) and Spanish-origin households (\$15,300) showed no statistically significant change from 1981 (table A).

After-tax incomes of households in the Northeast (\$18,920) and South (\$18,400) Regions were higher in 1982. No significant increases occurred for the average incomes of households in the North Central (\$18,750) and West (\$19,950) Regions.<sup>1</sup>

The average after-tax household income for female family households with no husband present (\$10,870) declined by about 3.8 percent in 1982. A decline of 3.8 percent in average household income before taxes was also noted for this group.

<sup>1</sup>Mean after-tax incomes in the Northeast and North Central Regions are not significantly different from one another.

**Table A. Comparisons of Mean After-Tax Household Income, by Selected Characteristics: 1982 and 1981**

(In 1982 dollars)

Characteristic	1982	1981	Percent change
All households.....	\$18,906	\$18,582	*1.7
RACE OR SPANISH ORIGIN			
White.....	19,606	19,272	*1.7
Black.....	12,955	12,856	0.8
Spanish origin <sup>1</sup> .....	15,297	15,757	-2.9
REGION			
Northeast.....	18,915	18,561	*1.9
North Central.....	18,754	18,577	1.0
South.....	18,399	17,963	*2.4
West.....	19,953	19,671	1.4
TYPE OF FAMILY HOUSEHOLD			
Married couples with children.....	23,307	23,125	0.8
Married couples without children.....	22,934	22,416	*2.3
Female householder, no husband present, with related children.....	10,868	11,295	*-3.8
AGE OF HOUSEHOLDER			
Under 65 years.....	20,277	20,020	*1.3
65 years and over.....	13,767	13,083	*5.2

\*Significant at the 95-percent confidence level.

<sup>1</sup>Persons of Spanish origin may be of any race.

Households with a householder age 65 and over had a 5.2 percent increase in their average after-tax household income in 1982, about the same as the 5.0-percent increase before taxes. A slowing of inflation during 1982 and indexed Social Security payments appear to have played a major role in this increase for the elderly.

The payment of taxes reduced the income available to households for spending by about \$455 billion in 1982. This decrease in income is illustrated in tables B and C by comparisons of the distribution of household income before and after taxes. Following the payment of taxes, the number of households with incomes of \$50,000 or more fell from about 7.4 million to 2.5 million. In contrast, the number of households with incomes less than \$15,000 increased from 31.4 million before taxes to 37.8 million after taxes.

## TAXES AND THE POVERTY POPULATION

In 1982, about 64 percent of households with incomes below the poverty level paid one of the four taxes covered in this study. (See table D.) The taxes paid by poverty

households amounted to about 8 percent of their before-tax money incomes. The payment of taxes resulted in a decrease in the mean income of poverty households from \$4,330 to \$4,060.

The most common type of tax paid by households below the poverty level was FICA payroll taxes: 43 percent paid this type of tax in 1982. Seven percent of all poverty households paid Federal income taxes in 1982, while 13 percent paid State income taxes. Eighty-five percent of the 4.9 million poverty households living in owner-occupied housing paid property taxes in 1982. While there were no significant differences between 1981 and 1982 in the percentages of households paying Federal income taxes, State income taxes, or FICA payroll taxes, there was a significant increase (from 83 to 85 percent) in the percentage of owner-occupied poverty households paying property taxes.

## DISTRIBUTION OF TAXES AND TAXES PAID

Ninety-two percent of U.S. households paid one or more of the taxes covered in this study in 1982 (table E). This proportion showed a slight decline from 1981. In 1982, about

**Table B. Number and Percentage of Households, by Before- and After-Tax Income: 1982**

(Numbers in thousands)

Household income	Before taxes		After taxes	
	Number	Percent distribution	Number	Percent distribution
Total.....	83,918	100.0	83,918	100.0
Under \$5,000.....	8,081	9.6	8,977	10.7
\$5,000 to \$7,499.....	6,536	7.8	7,244	8.6
\$7,500 to \$9,999.....	5,464	6.5	7,050	8.4
\$10,000 to \$12,499.....	6,048	7.2	7,314	8.7
\$12,500 to \$14,999.....	5,262	6.3	7,177	8.6
\$15,000 to \$17,499.....	5,398	6.4	6,959	8.3
\$17,500 to \$19,999.....	4,814	5.7	6,551	7.8
\$20,000 to \$22,499.....	5,207	6.2	5,991	7.1
\$22,500 to \$24,999.....	4,394	5.2	4,918	5.9
\$25,000 to \$27,499.....	4,438	5.3	4,177	5.0
\$27,500 to \$29,999.....	3,409	4.1	3,456	4.1
\$30,000 to \$32,499.....	3,655	4.4	2,835	3.4
\$32,500 to \$34,999.....	2,719	3.2	2,342	2.8
\$35,000 to \$37,499.....	2,716	3.2	1,825	2.2
\$37,500 to \$39,999.....	2,054	2.4	1,419	1.7
\$40,000 to \$44,999.....	3,644	4.3	2,017	2.4
\$45,000 to \$49,999.....	2,631	3.1	1,202	1.4
\$50,000 and over.....	7,447	8.9	2,462	2.9
Median income.....	\$20,171	(X)	\$16,508	(X)
Mean income.....	\$24,309	(X)	\$18,906	(X)
Income per household member.....	\$8,901	(X)	\$6,923	(X)
Index of income concentration.....	.406	(X)	.371	(X)

X Not applicable.

**Table C. Percent Share of Aggregate Income Received by Each Fifth of Households, Before and After Taxes: 1982**

Fifth	Before taxes		After taxes	
	Lower limit	Percent share of aggregate income	Lower limit	Percent share of aggregate income
Lowest fifth.....	(X)	4.0	(X)	4.7
Second fifth.....	8,490	9.9	7,698	11.2
Third fifth.....	16,007	16.5	13,537	17.5
Fourth fifth.....	24,467	24.6	19,596	24.8
Highest fifth.....	36,505	45.0	27,996	41.8

X Not applicable.

**Table D. Comparisons of Households Below the Poverty Level Paying Taxes: 1982 and 1981**

(Numbers in thousands)

Characteristic	1982	1981	Difference 1982-1981
Number below the poverty level <sup>1</sup> .....	11,535	11,057	*478
Percent of before-tax money income paid in taxes.....	7.6	7.2	0.4
Percent paying Federal income taxes.....	7.4	6.5	0.9
Percent paying State income taxes.....	13.1	12.5	0.6
Percent paying FICA payroll taxes.....	42.7	42.0	0.7
Percent paying property taxes on their own home <sup>2</sup> .....	85.0	82.9	*2.1

\*Significant at the 95-percent confidence level.

<sup>1</sup>These poverty figures differ slightly from those previously published. For further details, see appendix B.

<sup>2</sup>Based on owner-occupied households.

75 percent of all households paid Federal income taxes, 63 percent paid State income taxes, and 74 percent paid FICA payroll taxes. The proportion of households paying Federal income taxes and State income taxes showed no significant change between 1981 and 1982, while there was some evidence of a decline in the proportion of households paying FICA payroll taxes. The proportion of owner-occupied households paying property taxes (94 percent) remained unchanged from 1981.

The mean amount of taxes paid in 1982 (\$5,890) was about \$180 lower than in 1981, after adjustment for inflation. Mean Federal income taxes (\$4,270) declined by \$330 between 1981 and 1982. In contrast, State income taxes (\$970) and FICA payroll taxes (\$1,470) were higher in 1982 than in 1981.

The proportion of before-tax income paid in taxes averaged about 23 percent in 1982 for households paying at least one of the four types of taxes. The average for households paying Federal income taxes was about 14 percent, compared with only about 3 percent for State income taxes. Among households paying FICA payroll taxes, the average was about 5 percent of before-tax income and for property taxes about 3 percent.

Fifty-nine percent of the \$455 billion in taxes paid in 1982 were Federal income taxes. FICA payroll taxes accounted for another 20 percent of the tax burden. State taxes and homeowner property taxes made up 11 and 8 percent of the total, respectively.

The after-tax income data also provide information on the average amount of taxes paid and the percentage of income paid in taxes for households at different positions along the income distribution. The percentage of average income paid in taxes, as shown in table F, gives a good approximation of the effective average tax rates by income interval.

Generally, the proportion of income paid in taxes in 1982 was slightly lower than that paid in 1981. The overall tax rate decreased by about 4 percent, as shown in table F.

Households in all income categories except "Under \$10,000" experienced a statistically significant decline in the percent of income paid in taxes. The apparent difference of 4 percent (about \$20) for the "Under \$10,000" group was not statistically significant.

## LIMITATIONS ON THE ESTIMATES OF AFTER-TAX INCOME

The estimates of after-tax income shown in this report were derived by simulating the amount of taxes paid by sample households on the March Current Population Survey (CPS) data file. The tax simulation procedures were based on a "statistical" combination of data from the Internal Revenue Service (IRS), summary of State individual income tax regulations, data on the characteristics of persons paying FICA payroll taxes from the Social Security Administration, property tax information from the Annual Housing Survey (AHS), and the March CPS microdata file. In order to combine these data sets in the estimation process, important assumptions were made that may have affected the after-tax income estimates. In addition, the general sampling and nonsampling errors associated with survey data, especially the underreporting of income, must always be kept in mind. Following is a brief discussion of some of the more important limitations on the estimates and the estimation process.

The first limitation that should be mentioned is the difference between CPS and IRS income concepts. One phase of the tax estimation process is the calculation of adjusted gross income (AGI) based on the CPS income. The CPS excludes capital gains (or losses) while AGI for tax purposes includes income from this source. Amounts of capital gains were simulated for the CPS in the tax estimation procedure. (See details in appendix A of this report.) The computation of AGI on Federal individual income tax returns allows "adjustments" and various exclusions from total income. These include Individual Retirement Accounts, interest and dividend

**Table E. Comparisons of Percentage of Households Paying Taxes, Mean Taxes Paid, Percentage of Before-Tax Money Income Paid in Taxes, and Percentage of Taxes Paid, by Type of Tax: 1982 and 1981**

(In 1982 dollars)

Type of tax	1982	1981	Difference 1982-81
<b>PERCENTAGE OF HOUSEHOLDS PAYING SPECIFIED TAX</b>			
One or more taxes.....	92.1	92.6	*-0.5
Federal income taxes.....	75.2	74.9	0.3
State income taxes.....	63.0	63.0	-
FICA payroll taxes.....	74.4	74.8	-0.4
Property taxes on own home <sup>1</sup> .....	93.9	93.8	0.1
<b>MEAN AMOUNT OF TAXES PAID</b>			
One or more taxes.....	\$5,886	\$6,069	*-\$183
Federal income taxes.....	4,266	4,598	*-332
State income taxes.....	967	939	*28
FICA payroll taxes.....	1,472	1,454	*18
Property taxes on own home <sup>2</sup> .....	737	689	48
<b>MEAN AMOUNT OF TAXES PAID AS A PERCENT OF MEAN TOTAL MONEY INCOME</b>			
One or more taxes.....	22.7	23.6	*-0.9
Federal income taxes.....	14.2	15.4	*-1.2
State income taxes.....	3.3	3.2	*0.1
FICA payroll taxes.....	5.2	5.2	-
Property taxes on own home <sup>2</sup> .....	2.6	2.4	0.2
Total amount of taxes (billions).....	\$454.7	\$469.1	*-\$14.4
<b>PERCENTAGE OF TAXES PAID BY TYPE OF TAX</b>			
One or more taxes.....	100.0	100.0	(X)
Federal income taxes.....	59.2	61.3	-2.1
State income taxes.....	11.2	10.5	*0.7
FICA payroll taxes.....	20.2	19.3	*0.9
Property taxes on own home <sup>2</sup> .....	8.3	7.8	0.5

\* Significant at the 95-percent confidence level.

X Not applicable.

<sup>1</sup>Based on owner-occupied households.

<sup>2</sup>Estimates of property taxes for 1982 and 1981 are not directly comparable because of differences in the methods of computation. See appendix A for details, as well as a discussion of differences between simulated property tax amounts and those reported on the Annual Housing Survey (AHS).

exclusions, moving expenses, disability income exclusion, alimony paid, and employee business expenses. A simulation of the Individual Retirement Accounts was made using IRS statistics and data reported in the May 1983 CPS supplement. In addition, deductions were simulated for married-couple tax-filing units in which both spouses had earnings. Simulations for the other adjustments were not made. Had these adjustments been simulated, the estimated AGI levels from the

CPS would have been lower resulting in slightly higher after-tax incomes. While, overall, the CPS estimated AGI was about the same as the IRS figure for 1982, the CPS and IRS amounts differ considerably by income type as discussed later.

Second, an initial step in the tax simulation process is the formation of tax filing units using the survey information on household relationship, marital status, and dependency rules based on income. The CPS records this information for each

**Table F. Mean Amount of Taxes Paid as a Percentage of Mean Total Money Income: 1982 and 1981**

Before-tax money income	1982	1981	Percent change
Total.....	22.7	23.6	*-3.8
Under \$10,000.....	10.0	9.6	4.2
\$10,000 to \$14,999..	12.2	12.8	*-4.7
\$15,000 to \$19,999..	15.6	16.7	*-6.6
\$20,000 to \$24,999..	18.5	19.9	*-7.0
\$25,000 to \$29,999..	20.7	22.3	*-7.2
\$30,000 to \$34,999..	22.3	23.9	*-6.7
\$35,000 to \$39,999..	23.3	25.2	*-7.5
\$40,000 to \$44,999..	24.5	26.5	*-7.5
\$45,000 to \$49,999..	25.6	27.5	*-6.9
\$50,000 and over....	31.0	33.4	*-7.2

\*Significant at the 95-percent confidence level.

“permanent” household member as of the time of interview in March. The simulation of tax filing units does not, therefore, account for differences in household composition that may have existed during the year for which taxes were simulated. Because of the CPS household definition, it was also not possible to simulate dependents living outside the household. The exact effect of these limitations is difficult to estimate since some simulated tax units will have too few dependents (exemptions) and some will have too many. It seems likely that, overall, too few exemptions would be simulated. This situation probably results in a slight underestimate of after-tax income levels because all exemptions have not been accounted for.

The combination of IRS tax return statistics with the March CPS income data may have also affected the final estimates to a small degree because the IRS returns include units which are not contained in the CPS universe. These include 1) prior year delinquent returns, 2) returns of Armed Forces members living overseas or on base *without families*, and 3) returns of decedents.

The procedures for simulating Federal and State individual income taxes tend to underestimate the actual variation in taxes paid by AGI level and, therefore, may tend to underestimate the variation in after-tax incomes. This occurs

because the simulation procedures used, in some cases, averages within AGI level to assign statuses and amounts to CPS tax filing units. For example, the amount of deductions for units assigned itemizing status were simulated using the IRS average proportion within AGI levels. The true variation in deductions was not simulated since all units within a specified AGI level were assigned the same proportion of their AGI as deductions. The net effect of this aspect of the simulation procedure on the final after-tax income estimates is not known.

Calculation of each household’s itemized amount of deductions was independent of the calculation of State income taxes and property taxes for homeowners. This procedure may have introduced some additional variation. The assignment of itemized amounts while controlling on the household AGI level, did not account for differences in other household characteristics, such as age of members, number of members, etc. If itemized deductions vary greatly by these characteristics for households with similar AGI levels, comparisons between different subgroups of the population will be biased.

Comparisons of the distribution of AGI derived from the March CPS with that based directly on tax returns indicate significant differences and year-to-year variation in these differences. These differences for 1982 can be examined in table A-4 of appendix A. Year-to-year variations can be examined by referring to similar tables in previous reports. Of note is the change in the relationship between simulated and IRS data for the “\$75,000 and over” category. In 1980, the simulated estimate for number of taxable returns in this AGI interval was 17 percent below the IRS figure. For 1982 the simulated number is 5 percent higher. This change along with others that have occurred from year to year may affect comparisons of after-tax data between years. The effect of these changes on the after-tax income estimates is not known.

Finally, another important limitation is the underreporting of money income in the survey. This is a common problem encountered in household surveys that attempt to collect income data. Underreporting results in a downward bias in the estimates of income from the March CPS. While income underreporting is a serious problem in household surveys such as the March CPS, its effect on measures of year-to-year change in levels of income and poverty is much less important because year-to-year variations in underreporting are relatively small. Estimates of underreporting are contained in appendix D.



**Table 1. All Households, Aggregate Income, Mean Income, Income per Household Member (Before and After Taxes), and Number of Persons in Households, by Before-Tax Money Income Levels and Selected Characteristics: 1982—Con.**

(Households as of March 1983. For meaning of symbols, see text)

Before-tax money income level and characteristic	All households		Before taxes					After taxes					Total number of persons in households (thous.)
	Number (thous.)	Percent distribution	Aggregate income		Mean income		Income per household member (dol.)	Aggregate income		Mean income		Income per household member (dol.)	
			Amount (bil. of dol.)	Percent distribution	Value (dol.)	Standard error (dol.)		Amount (bil. of dol.)	Percent distribution	Value (dol.)	Standard error (dol.)		
<b>RACE AND SPANISH ORIGIN OF HOUSEHOLDER—CON.</b>													
<b>Spanish Origin<sup>1</sup></b>													
Total .....	4 085	100.0	76.5	100.0	18 732	380	5 380	62.5	100.0	15 297	270	4 394	14 223
Under \$2,500 .....	174	4.2	.2	.2	901	182	346	.1	.2	796	191	307	452
\$2,500 to \$4,999 .....	354	8.7	1.4	1.8	3 847	60	1 619	1.3	2.1	3 789	61	1 586	841
\$5,000 to \$7,499 .....	473	11.6	2.9	3.8	6 192	53	2 029	2.8	4.5	5 999	55	1 986	1 445
\$7,500 to \$9,999 .....	353	8.6	3.0	4.0	8 606	57	2 506	2.8	4.5	7 997	66	2 331	1 211
\$10,000 to \$12,499 .....	368	9.0	4.1	5.3	11 127	62	3 175	3.6	5.8	9 903	73	2 626	1 288
\$12,500 to \$14,999 .....	299	7.3	4.1	5.3	13 687	67	3 843	3.6	5.6	12 135	96	3 407	1 065
\$15,000 to \$17,499 .....	314	7.7	5.1	6.6	16 151	70	4 589	4.4	7.0	13 683	104	3 945	1 105
\$17,500 to \$19,999 .....	245	6.0	4.6	6.0	18 737	68	5 185	3.9	6.2	15 783	121	4 367	886
\$20,000 to \$22,499 .....	251	6.1	5.3	6.9	21 015	78	5 706	4.4	7.0	17 553	133	4 766	924
\$22,500 to \$24,999 .....	189	4.6	4.5	5.8	23 668	60	5 879	3.7	5.9	19 637	176	4 878	761
\$25,000 to \$27,499 .....	179	4.4	4.7	6.1	26 043	89	7 359	3.7	6.0	20 897	167	5 905	632
\$27,500 to \$29,999 .....	145	3.5	4.1	5.4	28 613	91	7 060	3.3	5.3	22 845	215	5 637	567
\$30,000 to \$32,499 .....	144	3.5	4.5	5.9	31 188	104	8 361	3.6	5.7	24 706	229	6 627	537
\$32,500 to \$34,999 .....	84	2.0	2.8	3.7	33 800	123	8 329	2.2	3.5	26 370	295	6 536	437
\$35,000 to \$37,499 .....	102	2.5	3.7	4.8	36 154	119	9 189	2.9	4.6	28 418	302	7 223	300
\$37,500 to \$39,999 .....	82	1.5	2.4	3.1	(B)	(B)	(B)	1.9	3.0	(B)	(B)	(B)	273
\$40,000 to \$44,999 .....	122	3.0	5.1	6.7	42 183	205	9 772	4.0	8.4	32 678	321	7 570	527
\$45,000 to \$49,999 .....	84	2.1	4.0	5.2	47 299	215	11 276	3.0	4.9	36 379	432	8 673	351
\$50,000 to \$59,999 .....	67	1.6	3.6	4.7	(B)	(B)	(B)	2.7	4.2	(B)	(B)	(B)	267
\$60,000 to \$74,999 .....	35	.9	2.4	3.1	(B)	(B)	(B)	1.7	2.7	(B)	(B)	(B)	159
\$75,000 and over .....	43	1.1	4.2	5.5	(B)	(B)	(B)	2.8	4.4	(B)	(B)	(B)	177
Median income .....	15 178	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	401	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
<b>REGION</b>													
<b>Northeast</b>													
Total .....	17 926	100.0	443.3	100.0	24 732	192	9 051	339.1	100.0	18 915	129	6 922	48 961
Under \$2,500 .....	428	2.4	.4	.1	888	82	459	.2	.1	494	99	255	829
\$2,500 to \$4,999 .....	1 123	6.3	4.5	1.0	3 975	25	2 235	4.2	1.2	3 723	30	2 093	1 996
\$5,000 to \$7,499 .....	1 555	8.7	9.6	2.2	6 187	25	3 141	8.9	2.6	5 724	31	2 918	3 052
\$7,500 to \$9,999 .....	1 176	6.6	10.2	2.3	8 674	28	4 225	9.3	2.7	7 866	38	3 833	2 415
\$10,000 to \$12,499 .....	1 295	7.1	14.1	3.2	11 187	28	4 941	12.3	3.6	9 729	43	4 304	2 858
\$12,500 to \$14,999 .....	986	5.5	13.5	3.0	13 667	29	5 583	11.6	3.4	11 786	52	4 606	2 413
\$15,000 to \$17,499 .....	1 054	5.9	17.0	3.8	16 170	30	6 645	14.3	4.2	13 533	57	5 561	2 564
\$17,500 to \$19,999 .....	1 047	5.8	19.5	4.4	18 679	29	7 043	16.1	4.7	15 341	61	5 284	2 776
\$20,000 to \$22,499 .....	1 185	6.5	24.5	5.5	21 049	30	7 752	19.7	5.8	16 883	62	6 218	3 164
\$22,500 to \$24,999 .....	856	4.8	20.2	4.6	23 686	31	8 477	16.1	4.7	18 814	76	6 733	2 388
\$25,000 to \$27,499 .....	983	5.5	25.7	5.8	26 151	32	8 730	20.0	5.9	20 385	76	6 805	2 944
\$27,500 to \$29,999 .....	741	4.1	21.2	4.8	28 623	34	9 021	16.4	4.8	22 069	87	6 955	2 352
\$30,000 to \$32,499 .....	780	4.2	23.6	5.3	31 085	36	9 786	18.1	5.4	23 871	94	7 501	2 418
\$32,500 to \$34,999 .....	637	3.6	21.4	4.8	33 642	36	10 509	16.3	4.8	25 595	101	7 996	2 038
\$35,000 to \$37,499 .....	605	3.4	21.9	4.9	36 119	40	10 920	16.5	4.9	27 278	119	8 247	2 001
\$37,500 to \$39,999 .....	443	2.5	17.1	3.9	38 654	44	11 384	12.9	3.8	29 195	157	8 598	1 505
\$40,000 to \$44,999 .....	840	4.7	35.4	8.0	42 178	63	11 786	26.5	7.8	31 576	125	8 824	3 006
\$45,000 to \$49,999 .....	617	3.4	29.1	6.6	47 196	75	13 148	21.3	6.3	34 608	156	9 841	2 214
\$50,000 to \$59,999 .....	709	4.0	38.4	8.7	54 159	142	14 907	27.6	8.1	38 937	197	10 717	2 574
\$60,000 to \$74,999 .....	492	2.7	32.5	7.3	66 081	251	17 793	22.8	6.7	48 397	278	12 497	1 828
\$75,000 and over .....	445	2.5	43.3	9.8	97 367	1 480	26 429	28.0	8.2	62 811	903	17 049	1 640
Median income .....	20 707	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	187	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
<b>North Central</b>													
Total .....	21 331	100.0	515.4	100.0	24 181	171	8 858	400.1	100.0	18 754	115	6 875	58 187
Under \$2,500 .....	599	2.8	.1	-	125	148	57	-1	-	193	153	-89	1 299
\$2,500 to \$4,999 .....	1 430	8.7	5.5	1.1	3 864	24	2 117	5.2	1.3	3 840	27	1 966	2 610
\$5,000 to \$7,499 .....	1 554	7.3	9.6	1.9	6 180	23	3 130	9.0	2.2	5 774	29	2 925	3 068
\$7,500 to \$9,999 .....	1 346	6.3	11.7	2.3	8 891	26	4 018	10.8	2.7	8 047	32	3 720	2 912
\$10,000 to \$12,499 .....	1 487	7.0	16.7	3.2	11 205	26	4 831	14.9	3.7	10 012	37	4 316	3 448
\$12,500 to \$14,999 .....	1 254	5.9	17.2	3.3	13 700	26	5 869	14.9	3.7	11 892	48	5 111	2 917
\$15,000 to \$17,499 .....	1 347	6.3	21.8	4.2	16 180	27	6 515	18.5	4.6	13 753	49	5 538	3 346
\$17,500 to \$19,999 .....	1 215	5.7	22.7	4.4	18 657	27	6 872	18.9	4.7	15 585	56	5 740	3 299
\$20,000 to \$22,499 .....	1 320	6.2	27.9	5.4	21 168	27	7 718	22.8	5.7	17 307	60	6 310	3 620
\$22,500 to \$24,999 .....	1 237	5.8	29.3	5.7	23 708	26	8 419	23.5	5.9	18 959	60	6 733	3 484
\$25,000 to \$27,499 .....	1 175	5.5	30.8	6.0	26 171	29	8 844	24.4	6.1	20 762	84	7 018	3 478
\$27,500 to \$29,999 .....	983	4.5	27.6	5.4	28 675	31	9 044	21.6	5.4	22 445	80	7 079	3 053
\$30,000 to \$32,499 .....	1 005	4.7	31.3	6.1	31 165	32	10 004	24.2	6.0	24 035	67	7 715	3 132
\$32,500 to \$34,999 .....	737	3.5	24.8	4.8	33 578	34	10 596	19.0	4.7	25 755	92	8 129	2 336
\$35,000 to \$37,499 .....	796	3.5	26.6	5.2	36 128	37	10 814	20.3	5.1	27 553	99	8 247	2 460
\$37,500 to \$39,999 .....	596	2.8	28.9	4.4	38 667	38	11 307	17.3	4.3	29 448	125	8 607	2 019
\$40,000 to \$44,999 .....	944	4.4	39.9	7.7	42 276	63	12 500	29.9	7.5	31 651	97	9 358	3 194
\$45,000 to \$49,999 .....	881	3.2	43.0	6.2	47 319	74	14 026	23.9	6.0	35 078	144	10 397	2 296
\$50,000 to \$59,999 .....	784	3.7	43.0	8.3	54 170	132	14 964	31.4	7.9	39 548	180	10 839	2 872
\$60,000 to \$74,999 .....	500	2.3	33.0	6.4	65 927	248	18 018	23.3	5.8	48 512	273	12 712	1 829
\$75,000 and over .....	416	2.0	40.9	7.9	98 366	1 843	26 980	26.4	6.6	63 344	983	17 371	1 518
Median income .....	20 820	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	183	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)

<sup>1</sup>Persons of Spanish origin may be of any race.





















**Table 2. All Households, Aggregate Income, Mean Income, Income per Household Member (After Taxes), and Number of Persons in Households, by After-Tax Money Income Levels and Selected Characteristics: 1982—Con.**

(Households as of March 1983. For meaning of symbols, see text)

After-tax money income level and characteristic	All households		Aggregate income		Mean income		Income per household member (dollars)	Total number of persons in households (thousands)
	Number (thousands)	Percent distribution	Amount (billions of dollars)	Percent distribution	Value (dollars)	Standard error (dollars)		
<b>RACE AND SPANISH ORIGIN OF HOUSEHOLDER—CON.</b>								
<b>Spanish Origin<sup>1</sup></b>								
Total .....	4 085	100.0	62.5	100.0	15 297	270	4 394	14 223
Under \$2,500 .....	184	4.5	.2	.3	887	185	345	475
\$2,500 to \$4,999 .....	372	9.1	1.4	2.3	3 869	57	1 659	867
\$5,000 to \$7,499 .....	528	12.9	3.3	5.3	6 233	49	2 098	1 570
\$7,500 to \$9,999 .....	470	11.5	4.1	6.5	8 713	52	2 457	1 665
\$10,000 to \$12,499 .....	392	9.6	4.4	7.0	11 193	58	3 296	1 332
\$12,500 to \$14,999 .....	414	10.1	5.7	9.1	13 759	57	3 855	1 476
\$15,000 to \$17,499 .....	343	8.4	5.6	8.9	16 285	59	4 437	1 258
\$17,500 to \$19,999 .....	280	6.9	5.2	8.4	18 653	66	5 109	1 023
\$20,000 to \$22,499 .....	248	6.1	5.2	8.4	21 117	70	5 483	854
\$22,500 to \$24,999 .....	200	4.9	4.7	7.6	23 659	81	5 806	816
\$25,000 to \$27,499 .....	153	3.7	4.0	6.4	26 214	91	6 560	611
\$27,500 to \$29,999 .....	110	2.7	3.2	5.1	28 768	110	7 171	441
\$30,000 to \$32,499 .....	87	2.1	2.7	4.4	31 230	119	7 431	368
\$32,500 to \$34,999 .....	83	2.0	2.8	4.5	33 688	134	7 333	381
\$35,000 to \$37,499 .....	62	1.5	2.2	3.6	(B)	(B)	(B)	263
\$37,500 to \$39,999 .....	41	1.0	1.6	2.6	(B)	(B)	(B)	190
\$40,000 to \$44,999 .....	46	1.1	1.9	3.1	(B)	(B)	(B)	213
\$45,000 to \$49,999 .....	18	.4	.8	1.3	(B)	(B)	(B)	81
\$50,000 to \$59,999 .....	28	.7	1.5	2.4	(B)	(B)	(B)	127
\$60,000 to \$74,999 .....	17	.4	1.1	1.8	(B)	(B)	(B)	81
\$75,000 and over .....	8	.2	.7	1.1	(B)	(B)	(B)	31
Median income .....	13 080	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	301	(X)	(X)	(X)	(X)	(X)	(X)	(X)
<b>REGION</b>								
<b>Northeast</b>								
Total .....	17 926	100.0	339.1	100.0	18 915	129	6 922	48 981
Under \$2,500 .....	495	2.8	.3	.1	696	91	371	931
\$2,500 to \$4,999 .....	1 349	7.5	5.3	1.6	3 948	24	2 203	2 418
\$5,000 to \$7,499 .....	1 729	9.6	10.8	3.2	6 251	23	3 208	3 370
\$7,500 to \$9,999 .....	1 476	8.2	12.9	3.8	8 748	24	4 158	3 106
\$10,000 to \$12,499 .....	1 481	8.3	16.6	4.9	11 224	25	4 761	3 492
\$12,500 to \$14,999 .....	1 470	8.2	20.3	6.0	13 772	25	5 652	3 583
\$15,000 to \$17,499 .....	1 572	8.8	25.5	7.5	16 219	24	5 899	4 323
\$17,500 to \$19,999 .....	1 345	7.5	25.2	7.4	18 734	26	6 508	3 870
\$20,000 to \$22,499 .....	1 293	7.2	27.5	8.1	21 234	26	7 103	3 867
\$22,500 to \$24,999 .....	1 027	5.7	24.4	7.2	23 728	30	7 539	3 233
\$25,000 to \$27,499 .....	899	5.0	23.6	7.0	26 226	32	7 839	3 007
\$27,500 to \$29,999 .....	741	4.1	21.3	6.3	28 745	34	8 660	2 458
\$30,000 to \$32,499 .....	627	3.5	19.6	5.8	31 193	37	9 130	2 142
\$32,500 to \$34,999 .....	520	2.9	17.5	5.2	33 654	43	8 879	1 949
\$35,000 to \$37,499 .....	414	2.3	15.0	4.4	36 256	43	9 501	1 580
\$37,500 to \$39,999 .....	285	1.6	11.0	3.2	38 642	55	10 700	1 029
\$40,000 to \$44,999 .....	410	2.3	17.4	5.1	42 376	90	11 312	1 537
\$45,000 to \$49,999 .....	289	1.6	13.7	4.0	47 334	108	11 782	1 162
\$50,000 to \$59,999 .....	294	1.6	16.0	4.7	54 357	222	14 175	1 128
\$60,000 to \$74,999 .....	145	.8	9.6	2.8	66 028	429	16 664	573
\$75,000 and over .....	63	.4	5.7	1.7	(B)	(B)	(B)	224
Median income .....	16 529	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	139	(X)	(X)	(X)	(X)	(X)	(X)	(X)
<b>North Central</b>								
Total .....	21 331	100.0	400.1	100.0	18 754	115	6 875	58 187
Under \$2,500 .....	689	3.2	.1	-	100	139	46	1 498
\$2,500 to \$4,999 .....	1 578	7.4	6.1	1.5	3 846	23	2 133	2 845
\$5,000 to \$7,499 .....	1 702	8.0	10.6	2.7	6 235	24	3 174	3 344
\$7,500 to \$9,999 .....	1 748	8.2	15.3	3.8	8 778	22	4 040	3 798
\$10,000 to \$12,499 .....	1 823	8.5	20.5	5.1	11 245	22	4 839	4 238
\$12,500 to \$14,999 .....	1 773	8.3	24.4	6.1	13 766	23	5 567	4 383
\$15,000 to \$17,499 .....	1 756	8.2	28.5	7.1	16 245	23	6 032	4 730
\$17,500 to \$19,999 .....	1 806	8.5	33.8	8.5	18 724	22	6 513	5 192
\$20,000 to \$22,499 .....	1 641	7.7	34.8	8.7	21 219	24	7 075	4 823
\$22,500 to \$24,999 .....	1 375	6.4	32.6	8.1	23 705	25	7 592	4 292
\$25,000 to \$27,499 .....	1 141	5.3	30.0	7.5	26 264	29	7 983	3 755
\$27,500 to \$29,999 .....	904	4.2	26.0	6.5	28 762	32	8 685	2 993
\$30,000 to \$32,499 .....	740	3.5	23.1	5.8	31 223	35	9 019	2 583
\$32,500 to \$34,999 .....	600	2.8	20.2	5.1	33 714	41	9 956	2 032
\$35,000 to \$37,499 .....	454	2.1	16.4	4.1	36 209	51	10 241	1 606
\$37,500 to \$39,999 .....	330	1.5	12.8	3.2	38 608	51	10 441	1 222
\$40,000 to \$44,999 .....	498	2.3	21.1	5.3	42 225	83	11 389	1 850
\$45,000 to \$49,999 .....	292	1.3	13.3	3.3	47 253	118	12 460	1 068
\$50,000 to \$59,999 .....	273	1.3	14.8	3.7	54 029	219	14 698	1 005
\$60,000 to \$74,999 .....	160	.8	10.5	2.6	65 537	436	17 477	600
\$75,000 and over .....	55	.3	5.1	1.3	(B)	(B)	(B)	250
Median income .....	16 925	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Standard error .....	138	(X)	(X)	(X)	(X)	(X)	(X)	(X)

<sup>1</sup>Persons of Spanish origin may be of any race.



















**Table 3. Mean Income of Households and Income per Household Member (Before and After Taxes), by Selected Characteristics: 1982 and 1981**

(In 1982 dollars. Households as of March of the following year. An asterisk (\*) preceding percent change indicates a statistically significant change at the 95-percent confidence level. For meaning of symbols, see text)

Characteristic	Mean income						Income per household member					
	Before taxes			After taxes			Before taxes			After taxes		
	1982 (dol.)	1981 (dol.)	Percent change	1982 (dol.)	1981 (dol.)	Percent change	1982 (dol.)	1981 (dol.)	Percent change	1982 (dol.)	1981 (dol.)	Percent change
All households .....	24 309	24 184	.5	18 906	18 582	*1.7	8 901	8 903	-	6 923	6 841	*1.2
<b>RACE AND SPANISH ORIGIN OF HOUSEHOLDER</b>												
White .....	25 311	25 198	.4	19 606	19 272	*1.7	9 452	9 442	-.1	7 322	7 221	*1.4
Black .....	15 747	15 767	-.1	12 955	12 856	.8	5 174	5 280	-2.0	4 257	4 305	-1.1
Spanish origin <sup>1</sup> .....	18 732	19 499	*-3.9	15 297	15 757	-2.9	5 380	5 589	-3.7	4 394	4 516	-2.7
<b>REGION</b>												
Northeast .....	24 732	24 612	.5	18 915	18 561	*1.9	9 051	9 063	-.1	6 922	6 835	1.3
North Central .....	24 181	24 207	-.2	18 754	18 577	1.0	8 858	8 853	.1	6 875	6 794	1.2
South .....	23 207	22 928	1.2	18 399	17 963	*2.4	8 444	8 428	-.2	6 694	6 603	1.4
West .....	25 919	25 829	.3	19 953	19 671	1.4	9 584	9 612	-.3	7 380	7 321	.8
<b>TYPE OF HOUSEHOLD</b>												
Family households .....	27 563	27 598	-.1	21 393	21 149	*1.2	8 369	8 412	-.5	6 496	6 446	.8
Married-couple families:												
With no related children under 18 .....	29 729	29 509	.7	22 934	22 416	*2.3	12 462	12 544	-.7	9 614	9 528	.9
With related children under 18 .....	30 367	30 535	-.6	23 307	23 125	.8	7 101	7 153	-.7	5 450	5 412	.6
Female householder, no husband present, with related children under 18 .....	12 572	13 065	*-3.8	10 868	11 295	*-3.8	3 671	3 834	*-4.3	3 174	3 315	*-4.3
All other family households .....	21 997	22 192	-.9	17 657	17 704	-.3	8 335	8 432	-1.2	6 691	6 700	-.5
Nonfamily households .....	15 440	14 928	*3.4	12 128	11 625	*4.3	12 886	12 587	2.4	10 122	9 902	*3.3
<b>AGE OF HOUSEHOLDER</b>												
15 to 24 years .....	15 940	15 998	-.4	12 982	12 946	.3	6 841	6 989	-2.1	5 401	5 656	-1.5
25 to 29 years .....	21 626	21 504	.6	16 936	16 628	*1.9	8 163	8 217	-.7	6 403	6 354	.6
30 to 34 years .....	25 207	25 399	-.8	19 336	19 267	.4	8 027	8 051	-.3	6 568	6 107	.8
35 to 39 years .....	28 120	28 431	-1.1	21 307	21 215	.4	8 004	8 036	-.4	6 365	5 996	1.2
40 to 44 years .....	30 840	31 474	-2.0	23 298	23 375	-.5	8 446	8 581	-1.6	6 372	6 373	-.
45 to 49 years .....	32 082	32 024	.2	24 173	23 809	1.5	9 115	9 206	-1.0	6 666	6 844	-.3
50 to 54 years .....	31 792	31 849	-.2	23 618	23 585	1.0	10 392	10 250	1.4	7 786	7 590	2.6
55 to 59 years .....	30 042	29 876	.6	22 407	22 026	1.7	11 529	11 725	-1.7	8 589	8 644	-.5
60 to 64 years .....	24 427	24 144	1.2	18 978	18 506	2.6	10 948	11 019	-.6	8 505	8 446	-.7
65 years and over .....	15 869	15 119	*5.0	13 767	13 063	*5.2	9 043	8 705	*3.0	7 845	7 532	*4.2
<b>SIZE OF HOUSEHOLD</b>												
One person .....	13 343	13 062	*2.2	10 548	10 206	*3.3	13 343	13 062	2.2	10 500	10 208	*3.3
Two persons .....	24 550	24 277	1.1	19 138	18 710	*2.3	12 175	12 029	1.2	9 271	9 270	*2.4
Three persons .....	27 699	28 166	-1.7	21 440	21 433	-.	9 105	9 282	*-1.9	7 303	7 063	-.2
Four persons .....	30 933	30 811	.4	23 657	23 285	*1.8	7 868	7 680	-.2	5 865	5 804	1.1
Five persons .....	30 878	30 837	.5	24 057	23 702	1.5	6 143	6 145	-.	4 771	4 723	1.0
Six persons .....	31 410	31 778	-1.2	24 763	24 907	-.8	5 180	5 284	-2.0	4 084	4 141	-1.4
Seven persons or more .....	29 564	30 260	-2.3	24 138	24 501	-1.5	3 785	3 902	-3.0	3 090	3 159	-2.2
<b>TENURE</b>												
Owner occupied .....	28 207	27 724	*1.7	21 594	20 976	*2.9	9 692	9 633	.6	7 420	7 288	*1.8
Renter occupied, including no cash rent .....	17 090	16 867	1.4	13 926	13 629	*2.2	7 124	7 078	.6	5 806	5 722	1.5

<sup>1</sup>Persons of Spanish origin may be of any race.

**Table 4. Number of Poverty Households, Mean Household Income (Before and After Taxes), and Percent of Households Paying Specified Taxes: 1982**

(Households as of March 1983. For meaning of symbols, see text)

Characteristic	Number <sup>1</sup> (thousands)	Mean household income		Taxes as a percent of total money income	Percent of households paying—					
		Before taxes (dollars)	After taxes (dollars)		One or more taxes	Federal income taxes	State income taxes	FICA payroll taxes	Federal retirement taxes	Property taxes
Total .....	11 535	4 325	4 084	7.6	64.2	7.4	13.1	42.7	1.1	35.7
<b>RACE AND SPANISH ORIGIN OF HOUSEHOLDER</b>										
White .....	8 294	4 200	3 900	8.6	67.6	7.8	13.4	43.4	.7	40.4
Black .....	2 940	4 575	4 423	4.8	54.6	5.8	11.6	39.8	1.7	23.5
Spanish origin <sup>2</sup> .....	1 097	5 479	5 262	5.7	58.7	11.0	5.9	50.8	.5	20.1
<b>TYPE OF HOUSEHOLD</b>										
Family households .....	7 338	5 080	4 759	8.0	70.5	7.0	15.1	54.0	1.5	36.6
Married-couple families:										
With no related children under 18 .....	1 304	3 695	3 293	11.3	78.0	4.3	8.6	37.5	.9	60.3
With related children under 18 .....	2 455	6 380	5 929	9.9	67.1	12.5	22.2	77.5	1.7	44.4
Female householder, no husband present, with related children under 18 .....	2 955	4 753	4 619	4.6	52.4	3.3	11.9	42.7	1.4	18.3
All other family households .....	624	4 167	3 878	8.0	74.6	8.6	16.2	49.9	2.0	43.6
Nonfamily households .....	4 197	3 041	2 848	6.4	53.3	8.0	9.6	22.8	.4	34.1
<b>AGE OF HOUSEHOLDER</b>										
15 to 24 years .....	1 223	3 983	3 839	5.1	63.1	9.6	17.6	59.1	.9	8.2
25 to 29 years .....	1 335	4 511	4 344	6.0	62.2	8.4	17.1	55.5	1.3	16.4
30 to 34 years .....	1 198	4 904	4 663	7.3	65.2	8.6	17.1	60.2	1.5	24.2
35 to 39 years .....	1 126	5 119	4 776	9.1	73.6	9.8	18.3	62.5	2.5	35.9
40 to 44 years .....	836	5 151	4 727	10.3	77.6	10.2	19.8	65.5	1.4	42.3
45 to 49 years .....	650	5 075	4 639	10.3	74.2	13.7	19.0	60.0	1.7	44.2
50 to 54 years .....	658	3 990	3 647	10.1	71.4	8.5	16.1	51.0	.7	44.8
55 to 59 years .....	684	3 896	3 509	10.8	72.0	12.7	18.0	44.5	1.0	49.6
60 to 64 years .....	853	3 874	3 525	9.5	69.2	8.6	11.8	27.6	.4	55.9
65 years and over .....	2 971	3 766	3 579	5.0	49.6	.6	1.3	7.4	.3	45.6
<b>NUMBER OF EARNERS</b>										
No earners .....	6 065	3 655	3 506	4.1	34.8	.8	1.2	-	-	34.1
One earner .....	3 904	4 655	4 332	9.5	95.7	14.1	25.1	87.8	1.7	32.5
Two earners .....	1 259	5 702	5 206	11.9	99.5	13.9	26.6	94.8	3.6	48.0
Three earners .....	239	7 713	7 019	11.5	100.0	23.8	38.4	96.8	5.2	57.2
Four earners or more .....	68	(B)	(B)	(X)	100.0	20.4	44.9	100.0	1.4	65.4

<sup>1</sup>The household poverty figures differ slightly from those previously published. For further details, see appendix B.

<sup>2</sup>Persons of Spanish origin may be of any race.

**Table 5. Number and Percent of Households Paying Taxes, by Level of Before-Tax Money Income and Type of Tax: 1982**

(Numbers in thousands. Households as of March 1983)

Before-tax money income level	All households	Households paying—											
		One or more taxes		Federal income taxes		State income taxes		FICA payroll taxes		Federal retirement taxes		Property taxes	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total .....	83 918	77 250	92.1	63 089	75.2	52 895	63.0	62 472	74.4	3 132	3.7	51 151	61.0
Under \$5,000 <sup>1</sup> .....	8 081	4 528	56.0	315	3.9	577	7.1	2 343	29.0	59	.7	2 885	35.7
\$5,000 to \$7,499 .....	6 536	4 677	71.6	1 024	15.7	1 303	19.9	2 575	39.4	51	.8	2 791	42.7
\$7,500 to \$9,999 .....	5 464	4 784	87.2	2 133	39.0	2 226	40.7	3 099	56.7	53	1.0	2 576	47.2
\$10,000 to \$12,499 .....	6 048	5 713	94.5	4 050	67.0	3 379	55.9	4 061	67.1	86	1.4	2 952	48.8
\$12,500 to \$14,999 .....	5 262	5 144	97.8	4 187	79.6	3 264	62.0	3 925	74.6	94	1.8	2 783	52.9
\$15,000 to \$17,499 .....	5 398	5 343	99.0	4 787	88.7	3 768	69.8	4 202	77.8	162	3.0	2 987	55.0
\$17,500 to \$19,999 .....	4 814	4 793	99.6	4 526	94.0	3 668	76.2	3 957	82.2	135	2.8	2 813	58.4
\$20,000 to \$22,499 .....	5 207	5 196	99.8	5 071	97.4	4 040	77.6	4 411	84.7	213	4.1	3 192	61.3
\$22,500 to \$24,999 .....	4 394	4 386	99.8	4 348	98.9	3 546	80.7	3 739	85.1	228	5.2	2 822	64.2
\$25,000 to \$27,499 .....	4 438	4 437	100.0	4 420	99.6	3 595	81.0	3 899	87.8	228	5.1	2 983	67.2
\$27,500 to \$29,999 .....	3 409	3 409	100.0	3 392	99.5	2 820	82.7	3 097	90.9	155	4.5	2 405	70.5
\$30,000 to \$32,499 .....	3 655	3 655	100.0	3 644	99.7	3 004	82.2	3 317	90.7	228	6.2	2 603	71.2
\$32,500 to \$34,999 .....	2 719	2 718	100.0	2 709	99.7	2 244	82.5	2 498	91.9	147	5.4	2 093	77.0
\$35,000 to \$37,499 .....	2 716	2 715	99.9	2 715	99.9	2 272	83.6	2 516	92.6	161	5.9	2 088	76.9
\$37,500 to \$39,999 .....	2 064	2 064	100.0	2 052	99.9	1 739	84.7	1 996	92.3	131	6.4	1 600	77.9
\$40,000 to \$44,999 .....	3 644	3 644	100.0	3 640	99.9	3 049	83.7	3 430	94.1	266	7.3	2 943	80.8
\$45,000 to \$49,999 .....	2 631	2 631	100.0	2 631	100.0	2 213	84.1	2 491	94.7	180	6.8	2 181	82.9
\$50,000 and over .....	7 447	7 445	100.0	7 444	100.0	6 189	83.1	7 017	94.2	554	7.4	6 473	86.9

<sup>1</sup>Includes households with losses.

**Table 6. Mean Taxes Paid and Taxes Paid as a Percentage of Mean Before-Tax Income, by Level of Before-Tax Money Income and Type of Tax: 1982**

(For meaning of symbols, see text)

Before-tax money income level	One or more taxes		Federal income taxes		State income taxes		FICA payroll taxes		Federal retirement taxes		Property taxes	
	Mean tax (dollars)	Percent	Mean tax (dollars)	Percent	Mean tax (dollars)	Percent	Mean tax (dollars)	Percent	Mean tax (dollars)	Percent	Mean tax (dollars)	Percent
Total .....	5 886	22.7	4 268	14.2	967	3.3	1 472	5.2	1 531	4.4	737	2.6
Under \$5,000 <sup>1</sup> .....	398	14.5	130	3.4	36	1.1	162	5.9	(B)	(X)	468	18.2
\$5,000 to \$7,499 .....	554	8.9	280	4.5	64	1.0	309	4.9	(B)	(X)	504	8.1
\$7,500 to \$9,999 .....	821	9.4	451	5.1	108	1.2	454	5.2	(B)	(X)	499	5.7
\$10,000 to \$12,499 .....	1 295	11.6	653	5.8	161	1.4	621	5.6	526	4.7	558	5.0
\$12,500 to \$14,999 .....	1 756	12.8	924	6.7	228	1.7	745	5.4	582	4.2	517	3.8
\$15,000 to \$17,499 .....	2 403	14.9	1 288	8.0	303	1.9	911	5.6	747	4.6	535	3.3
\$17,500 to \$19,999 .....	3 061	16.4	1 605	8.6	377	2.0	1 057	5.7	837	5.0	612	3.3
\$20,000 to \$22,499 .....	3 804	18.0	2 008	9.5	468	2.3	1 226	5.8	1 042	4.9	621	2.9
\$22,500 to \$24,999 .....	4 503	19.0	2 406	10.1	587	2.5	1 338	5.6	1 285	5.4	678	2.9
\$25,000 to \$27,499 .....	5 330	20.4	2 891	11.1	710	2.7	1 529	5.9	1 363	5.2	685	2.6
\$27,500 to \$29,999 .....	6 052	21.1	3 313	11.6	817	2.9	1 841	5.7	1 358	4.7	745	2.6
\$30,000 to \$32,499 .....	6 897	22.2	3 840	12.3	948	3.0	1 822	5.9	1 539	4.9	759	2.4
\$32,500 to \$34,999 .....	7 557	22.5	4 255	12.6	1 073	3.2	1 896	5.6	1 587	4.7	782	2.3
\$35,000 to \$37,499 .....	8 387	23.2	4 765	13.2	1 158	3.2	2 026	5.6	1 692	4.7	851	2.4
\$37,500 to \$39,999 .....	9 080	23.5	5 220	13.5	1 244	3.2	2 192	5.7	1 609	4.2	881	2.3
\$40,000 to \$44,999 .....	10 338	24.5	6 095	14.4	1 468	3.5	2 308	5.5	1 825	4.3	888	2.1
\$45,000 to \$49,999 .....	12 108	25.6	7 323	15.5	1 710	3.6	2 498	5.3	2 001	4.2	1 020	2.2
\$50,000 and over .....	21 783	31.0	15 127	21.5	3 198	4.6	2 887	4.1	2 626	4.0	1 222	1.7

<sup>1</sup>Includes households with losses.

**Table 7. Total Taxes Paid and Percentage of Total Taxes Paid, by Level of Before-Tax Money Income and Type of Tax: 1982**

Before-tax money income level	Total taxes paid (bil. of dol.)	Percent of total taxes paid					
		Total	Federal income taxes	State income taxes	FICA payroll taxes	Federal retirement taxes	Property taxes
Total .....	454.7	100.0	59.2	11.2	20.2	1.1	8.3
Under \$5,000 <sup>1</sup> .....	1.8	100.0	2.3	1.2	21.1	.4	75.1
\$5,000 to \$7,499 .....	2.6	100.0	11.1	3.2	30.8	.6	54.4
\$7,500 to \$9,999 .....	3.9	100.0	24.6	6.1	35.9	.5	32.9
\$10,000 to \$12,499 .....	7.4	100.0	35.7	7.3	34.1	.6	22.2
\$12,500 to \$14,999 .....	9.0	100.0	42.9	8.3	32.4	.6	15.9
\$15,000 to \$17,499 .....	12.8	100.0	48.0	8.9	29.8	.9	12.4
\$17,500 to \$19,999 .....	14.7	100.0	49.5	9.4	28.5	.9	11.7
\$20,000 to \$22,499 .....	19.8	100.0	51.5	10.0	27.4	1.1	10.0
\$22,500 to \$24,999 .....	19.8	100.0	53.0	10.5	25.3	1.5	9.7
\$25,000 to \$27,499 .....	23.6	100.0	54.0	10.8	25.2	1.3	8.6
\$27,500 to \$29,999 .....	20.6	100.0	54.5	11.2	24.6	1.0	8.7
\$30,000 to \$32,499 .....	25.2	100.0	55.5	11.3	24.0	1.4	7.8
\$32,500 to \$34,999 .....	20.5	100.0	56.1	11.7	23.1	1.1	8.0
\$35,000 to \$37,499 .....	22.7	100.0	56.9	11.6	22.5	1.2	7.8
\$37,500 to \$39,999 .....	18.6	100.0	57.4	11.6	22.3	1.1	7.6
\$40,000 to \$44,999 .....	37.7	100.0	58.9	11.9	21.0	1.3	6.9
\$45,000 to \$49,999 .....	31.9	100.0	60.5	11.9	19.5	1.1	7.0
\$50,000 and over .....	162.0	100.0	69.5	12.2	12.5	.9	4.9

<sup>1</sup>Includes households with losses.

## Appendix A. Methodology and Procedures

### INTRODUCTION

This section describes the methodology and procedures which were developed to estimate taxes paid for the March 1983 CPS microdata files. In all, four types of taxes were simulated: 1) Federal individual income taxes, 2) State individual income taxes, 3) property taxes on owner-occupied housing, and 4) payroll taxes.

Development of the after-tax simulation procedures began with the March CPS annual demographic supplement. This microdata file contains demographic and economic information for approximately 59,000 sample households and the persons living in these households. It includes detailed information on household and family relationship; age; marital status; race and ethnicity; educational attainment; weeks and hours worked during the calendar year; occupation, industry, and class of worker of the job held longest during the calendar year; and income amounts for wages and salary, nonfarm and farm self-employment income, interest, dividends, rental income, estates and trusts, royalties, pension income, unemployment compensation, and sources of nontaxable income as described in appendix B.

The second major element in the simulation system were statistical summaries of individual income tax returns compiled by the Internal Revenue Service. These statistics are made available in the IRS publication series, Statistics of Income (SOI). Some unpublished statistical summaries from the IRS were also used to develop these procedures.

A third element was the 1981 Annual Housing Survey microdata file. This element was used to assign property taxes paid to the March CPS sample households residing in owner-occupied housing.

Finally, in order to estimate proportions of tax filers owning homes and itemizing deductions, tabulations were made from Interview No. 5 (6) of the 1979 Income Survey Development Program.

The system for estimating taxes paid and after-tax income created a modified March CPS microdata file. This file was formed by expanding the March CPS format to include variables relevant to the simulation of taxes paid. The detailed tables contained in this report were derived from this modified March CPS data file.

### Federal Income Taxes

Simulation of Federal income taxes required up to four separate operations. First was the formation and classifica-

tion of tax filing units using household relationship, marital status, and dependency rules. Second, was the calculation of adjusted gross income for each of those units. Third was the simulation of amount of Federal income taxes paid. Finally, the calculation of earned income tax credits was made, when applicable.

### Formation and classification of Federal income tax filing units.

A Federal tax filing "unit" was defined as any individual (or married couple) with either \$400 in self-employment income, \$1,000 in wages or salary, or a total of \$1,000 in interest, dividends, rents and royalties, estates and trusts, or pension income in 1982. These income levels were chosen because they either corresponded to tax laws or helped bring the estimated number of filing units on the CPS in line with 1982 IRS Statistics of Income (SOI) data.

The next step in the formation of Federal tax filing units was the assignment of dependency status. The algorithm for assigning dependency for each tax unit used the following rules:

- All filing primary family householders and spouses were included as dependents on their own tax returns.
- All children under age 15 who were members of the primary family were counted as dependents on the return of the family householder. Children aged 15 and over (except related subfamily members) with a total taxable income of less than \$1,000 were assigned dependency to the tax return of the primary family householder. Children aged 15 and over who were students were assigned dependency to the primary family householder regardless of income level.
- All other primary family members (except related subfamily members) with taxable income of less than \$1,000 were assigned as dependents on the tax return of the primary family householder.
- Related subfamilies having at least one Federal tax filing unit were treated separately in the same manner as primary families. Members of a related subfamily containing no Federal tax filing unit were assigned dependency to the tax return of the primary family householder.
- All unrelated subfamilies were treated in the same manner as primary families.

- Primary and secondary unrelated individuals age 15 and over were treated as dependents only on their own tax returns.

All simulated filing units were classified into one of three return types. Married couples and persons whose marital status was "married, spouse absent in Armed Forces" were assumed to file joint returns. Unmarried family householders with dependents were assumed to file head-of-household returns. All other persons classified as Federal tax filing units were assumed to file as single individuals.

**Computation of adjusted gross income.** Adjusted gross income (AGI) for each simulated tax filing unit was calculated by summing the income amounts from all taxable sources and an imputed amount for capital gains. The sources of CPS income included in AGI were wages and salaries, net farm and nonfarm self-employment income, net rental and royalty income, dividends, interest, estates and trusts, and income from private and government pensions.

Capital gains were imputed to tax filing units based on data obtained from Statistics of Income (SOI) reports summarizing information reported on Federal tax returns. These data provide estimates of the probability that a filing unit in a given AGI interval reported capital gains and the mean amount of capital gains for that interval. A Monte Carlo technique was used to randomly assign capital gains: a random number (between 0 and 1) was generated for each filing unit; if that number was less than or equal to the probability of filing units in that AGI interval reporting capital gains, the mean amount of capital gains, as computed above, was added to that unit's AGI. This procedure does not control on demographic and other characteristics which might affect the allocation of this source of income.

In the calculation of adjusted gross income, a portion of unemployment compensation was also included in AGI if the sum of AGI and unemployment compensation for that tax unit exceeded \$12,000 (\$18,000 for joint returns). In these cases, the lesser of 1) the amount of unemployment compensation or 2) one-half of the difference between the sum of AGI and unemployment compensation and the income limit was included in AGI.

In 1982, married-couple filing units in which both spouses had earnings were allowed to deduct 5 percent of the earned income of the lesser-earning spouse (to a maximum of \$1,500). This new adjustment is reflected in the 1982 tax model. In addition, payments to Individual Retirement Accounts (IRA) were simulated for the 1982 tax model. The May 1983 CPS pension supplement was used to estimate probabilities of tax-filing units contributing to IRA's and the average amounts contributed. These probabilities were then used to assign IRA contributions to individual tax-filing units on the CPS file. The IRA payments were deducted from the total income received by the tax-filing units in order to compute adjusted gross income.

**Computation of taxable income and taxes paid.** Taxable income was computed by subtracting the estimated allowable

deductions from AGI. The first step in this process consisted of predicting which filing units itemized deductions. Homeownership was determined to be the most important variable available from the CPS for assigning itemization status to tax filers. Outlined below is a step-by-step description of the procedures used to assign itemization status.

1. A statistical match was made of the March CPS and Annual Housing Survey (AHS) data files in order to assign a monthly mortgage amount and a property tax amount to each owner-occupied unit on the March CPS file.<sup>1</sup>
2. Probabilities of itemizing for homeowner, tax-filing units were computed by size of monthly mortgage payment from the 1979 Income Survey Development Program (ISDP) test panel. Probabilities for renters were computed by AGI level.
3. The probabilities described in step 2 were used to randomly assign itemization status within monthly mortgage (or AGI) intervals using the same Monte Carlo technique used in the assignment of capital gains.
4. The amount of itemized deductions for tax filing units was computed by multiplying AGI by the ratio of itemized deductions to AGI for all units in that AGI interval as reported by IRS. The ratios of itemized deductions to AGI levels were published in the 1982 SOI reports.

Next, a standard deduction was estimated for each tax filing unit by multiplying the number of exemptions by \$1,000. Taxable income was then estimated by subtracting the itemized and standard deductions from AGI. Tax liability was then computed using the appropriate tax schedule for that simulated return type.

The simulation procedures do not capture variations in proportions of income paid in taxes within AGI intervals. The proportion of income paid in taxes for households with similar AGI amounts may differ relative to factors such as race, age of household members, number of household members, marital status, etc. The extent to which these variations exist has not been measured, therefore, caution should be used when interpreting relatively small differences between the incomes of various subgroups of the population.

**Computation of the earned income tax credit.** Earned income tax credits were simulated for the 1982 tax model. These tax credits were used in the calculation of net Federal tax liability and computation of after-tax household income for filing units with one or more dependent children, less than \$10,000 in AGI, and earnings between \$1 and \$10,000.

## State Individual Income Taxes

There were 44 States that required payment of individual income taxes in 1982. For the purpose of this model, the definitions of tax filing units and AGI used for the estimation of Federal income taxes were also used for the simulation of State income taxes.

<sup>1</sup>A detailed description of the CPS-AHS statistical match can be found later in appendix B.

The amounts of State individual income taxes paid were computed by developing a model of each State's income tax regulations. Information on the State tax systems was obtained from a publication entitled, *State Tax Handbook*; October 1, 1982. While every detail of each State's income tax system was not simulated, most of the important aspects were accounted for.

### Property Taxes on Owner-Occupied Housing

In 1981, property taxes were estimated using a data file created by the statistical match of the March 1982 CPS and the 1981 AHS. In that statistical match, property tax amounts reported on the 1981 AHS for owner-occupied housing units were assigned to CPS households with similar characteristics (as defined by the matching variables). There was no comparable data file from the AHS for 1982. Property taxes in 1982 were estimated in a two-step process. First, the March 1982 and March 1983 CPS files were statistically matched. The March 1982 property tax amounts (those taken from the 1981 AHS) were then assigned to March 1983 CPS households.

Second, these 1981 amounts were increased based on the rate of increase between 1981 and 1982 in the Bureau of Economic Analysis's figures for residential property taxes adjusted to reflect the increase in the number of households. Property taxes paid on secondary residences such as vacation homes, could not be simulated. Also, the proportion of rent that pays the property taxes on renter-occupied housing units was not estimated.

The estimation procedures for property taxes paid by homeowners produces estimates that do not correspond precisely with those available from the AHS. These differences are mainly the result of differing universes and use of the statistical matching procedure. The published AHS estimate for property taxes is based on a universe that excludes condominiums, cooperatives, and mobile homes, the simulated universe includes these cases. In 1981, the published AHS estimate of property taxes was \$671 as compared with the \$649 estimate based on the March CPS simulation. Comparable data for 1982 are not available since a national AHS was not conducted in 1982.

### Payroll Taxes

The Social Security payroll tax (FICA) and the Federal Employee Retirement tax were simulated using occupation of longest job and earnings data reported on the CPS. Social Security payroll taxes were calculated directly from the reported CPS earnings using the Social Security payroll tax formula for 1982. For wages and salary, the tax rate used was 6.7 percent up to a maximum of \$32,400. The tax rate for self-employment was 9.35 percent of the amount between \$400 and \$32,400. Not all workers were assigned coverage under Social Security and, therefore, a small number were not subject to Social Security taxes. All Federal employees and specific proportions of workers in certain occupation groups were assigned noncovered status. Un-

published statistics supplied by the Social Security Administration were used to make these assignments.

Retirement taxes paid by each Federal employee were simulated by multiplying their wages and salary amount by the 7.0 percent tax rate. The identification of Federal employees was based on the class of worker of longest job as reported on the survey.<sup>2</sup>

## COMPARISON OF SIMULATION RESULTS WITH DATA FROM IRS AND OTHER INDEPENDENT SOURCES

The procedures described in the preceding section were translated into a computer simulation model. Tables A-1 through A-4 in this section provide a basic evaluation of the accuracy of this model by presenting comparison of the simulation results with data from independent sources.

### Number of Federal Tax Filing Units and Amount of Adjusted Gross Income

Shown in tables A-1 through A-3 are comparisons of IRS and CPS distributions of adjusted gross income and number of returns with specified income types. The 1982 CPS tax simulation yielded 94.5 million Federal tax filing units, about the same as the 1982 preliminary IRS Statistics of Income figure of 95.3 million. The CPS simulated aggregate adjusted gross income was \$1,833.2 billion. There is some evidence that this figure is 1 percent lower than the preliminary IRS figure of \$1,847.8 billion. While the CPS and IRS adjusted gross income amounts are slightly different, there are major differences in the components of total adjusted gross income. Although the IRS data indicate a larger amount of wages and salary income and property income than the CPS, the CPS recorded significantly larger amounts of self-employment and pension income.<sup>3</sup> Larger total amounts of self-employment income by the CPS can be attributed to the far fewer number of losses reported in the survey than on tax returns. The reasons for these differences are not fully understood. The larger amount of pension income from the CPS probably occurs because the IRS aggregate fully taxable amount of the pension while the CPS figure is based on the entire pension amount.

### Number of Federal Taxable Returns and Amount of Taxable Income

The 1982 CPS simulation estimated 77.0 million Federal tax filing units with taxable income (before accounting for

<sup>2</sup>According to the National Income and Product Accounts published by the Bureau of Economic Analysis (BEA), neither Social Security (FICA) nor Federal Employee Retirement payments are treated as taxes. Instead, they are both included under Federal Government receipts as "Contributions for Social Insurance." We have included them under the broad heading of taxes here for convenience as both are mandatory deductions from gross earnings.

<sup>3</sup>Property income includes interest, dividends, net rental income, income from estates and trusts, and net royalties.

**Table A-1. Comparison of IRS and CPS Simulated Number of Federal Individual Tax Returns, by Type of Return and Number of Exemptions: 1982**

(Numbers in thousands)

Type of return	Number of returns		Total exemptions	
	CPS	IRS	CPS	IRS
Total returns.....	94,541	95,298	224,240	233,123
Married returns, total.....	47,283	(NA)	159,873	(NA)
Married, filing jointly.....	47,283	(NA)	159,873	(NA)
Married, filing separately <sup>1</sup> .....	(NA)	(NA)	(NA)	(NA)
Head of household returns, total.....	6,817	(NA)	18,541	(NA)
Surviving spouse returns <sup>1</sup> .....	(NA)	(NA)	(NA)	(NA)
Other head of household returns.....	6,817	(NA)	18,541	(NA)
Single returns.....	40,442	(NA)	45,826	(NA)

NA Not available.

<sup>1</sup>Not a separate filing unit type in the CPS simulation model.

**Table A-2. Comparison of IRS and CPS Simulated Number of Federal Individual Income Tax Returns, by Adjusted Gross Income: 1982**

(Numbers in thousands)

Adjusted gross income	Number of returns		Percent difference
	CPS	IRS	
Total.....	94,541	95,298	-0.8
Under \$2,000.....	6,077	7,242	*-16.1
\$2,000 to \$3,999.....	8,678	7,255	* 19.6
\$4,000 to \$5,999.....	6,683	7,088	-5.7
\$6,000 to \$7,999.....	6,448	6,576	-1.9
\$8,000 to \$9,999.....	5,848	6,982	*-16.2
\$10,000 to \$11,999.....	6,051	6,086	-0.6
\$12,000 to \$14,999.....	7,677	8,157	*-5.9
\$15,000 to \$19,999.....	10,912	10,502	3.9
\$20,000 to \$24,999.....	9,343	8,766	*6.6
\$25,000 to \$29,999.....	7,476	7,590	-1.5
\$30,000 to \$39,999.....	9,704	9,810	-1.1
\$40,000 to \$49,999.....	4,649	4,692	-0.9
\$50,000 to \$74,999.....	3,503	3,104	*12.9
\$75,000 and over.....	1,492	1,448	3.0

\* Significant at the 95-percent confidence level.

**Table A-3. Comparison of IRS and CPS Simulated Number of Federal Individual Income Tax Returns and Aggregate Adjusted Gross Income, by Type of Income: 1982**

(Numbers in thousands and aggregate adjusted gross income in billions of dollars)

Type of income	Number of returns		Aggregate adjusted gross income			
	CPS	IRS	CPS		IRS	
			Amount	Percent distribution	Amount	Percent distribution
Total AGI.....	94,541	95,298	1,833.2	100.0	1,847.8	100.0
Wages and salary.....	80,667	83,110	1,514.1	82.6	1,564.6	84.7
Nonfarm self-employment.....	9,156	10,006	106.8	5.8	49.3	2.7
Farm self-employment.....	1,867	2,680	10.3	0.6	-9.2	-0.5
Interest.....	58,192	52,592	95.4	5.2	157.2	8.5
Dividends, rents, royalties, and estates or trusts.....	14,632	(NA)	47.4	2.6	58.4	3.2
Pensions.....	10,601 <sup>1</sup>	8,807	71.1 <sup>1</sup>	3.9	59.9	3.2
Other income minus adjustments.....	(NA)	(NA)	-11.9	-0.6	-32.4	-1.8

NA Not available.

<sup>1</sup>Includes nontaxable pensions or the nontaxable portions of pensions.

the earned income tax credit). This estimate is not significantly different from the IRS preliminary figure of 76.6 million. (See table A-4.)

While, overall, there are relatively small differences between the simulated CPS number of taxable returns, there are significant differences in many of the AGI intervals as shown in table A-4. The smaller number of returns in the "Under \$4,000" category for the CPS (about 43 percent less) results mainly because the procedures did not simulate tax returns for dependents specifically.

### Amount of Federal Income Taxes Paid (Net Tax Liability)

According to the CPS simulation, the total amount of Federal individual income taxes paid in 1982 was \$271.5 billion, about 15 percent of the estimated CPS adjusted gross income. (See table A-4.) There is some evidence that this estimate is lower than the IRS total of \$275.6 billion in net tax liability (after credits) for 1982. Overall, the IRS and CPS proportion of taxes paid by adjusted gross income level are quite similar as indicated in table A-4.

### State Income Taxes Paid

The CPS tax simulation yielded \$51.2 billion in State income taxes paid in 1982. According to the Bureau of the Census publication entitled *Quarterly Summary of State and Local Tax Revenue: October-December 1982*, the net amount of individual income taxes collected by the States during calendar year 1982 was \$47.3 billion. The overestimation of State

income taxes paid by the CPS tax simulation can be attributed to several factors. First, the simulation did not account for every detail of each State's income tax regulations. Second, the simulation did not include various State tax credits and exemptions which could not be computed from the data available on the March CPS file; these included credits for home energy-saving expenditures and charitable contributions.

### Payroll Taxes

According to the simulation, Social Security payroll taxes totaled \$91.9 billion in 1982. This estimate is not significantly different from the aggregate amount of \$92.7 billion according to figures from the Social Security Administration. Based on administrative statistics from the Office of Personnel Management, Federal retirement taxes totaled \$4.3 billion in 1982. The comparable figure from the tax simulation model was somewhat higher, \$4.8 billion. The higher estimate of Federal retirement tax may have occurred because the CPS wage and salary figure represents the amount received from all jobs, not just Federal employment. Also, there are a number of noncontributory retirement programs within the Federal system which could not be simulated and a small number of employees not covered by any Federal retirement program.

### Amount of Property Taxes

The simulation produced an estimated \$37.7 billion in property taxes for 1982. This compares with the \$34.4 billion figure published in the National Income Accounts by the Bureau of Economic Analysis (BEA).

**Table A-4. Comparison of IRS and CPS Simulated Number of Taxable Returns, Federal Income Tax, and Income Taxes Paid as a Percent of Adjusted Gross Income: 1982**

(Numbers in thousands and taxes in billions of dollars)

Adjusted gross income	Number of taxable returns			Federal income tax after credits		Federal income taxes as a percent of adjusted gross income	
	CPS	IRS	Percent difference	CPS	IRS	CPS	IRS
Total.....	76,989	76,644	0.5	271.5	275.6	14.8	14.9
Under \$4,000 <sup>1</sup> .....	1,164	2,052	*-43.3	-	.2	-	3.2
\$4,000 to \$5,999 <sup>1</sup> .....	4,416	4,792	*-7.8	.7	1.0	2.2	2.8
\$6,000 to \$7,999.....	5,203	4,512	*15.3	1.9	1.9	4.3	4.2
\$8,000 to \$9,999.....	5,494	6,113	*-10.1	3.1	3.8	6.0	6.2
\$10,000 to \$11,999.....	5,968	5,801	2.9	5.0	5.0	7.7	7.5
\$12,000 to \$14,999.....	7,665	7,931	-3.4	9.6	9.9	9.4	9.0
\$15,000 to \$19,999.....	10,912	10,340	*5.5	21.1	19.5	11.2	10.7
\$20,000 to \$24,999.....	9,343	8,665	*7.8	26.0	24.0	12.5	12.2
\$25,000 to \$29,999.....	7,476	7,543	-0.9	27.4	27.7	13.4	13.3
\$30,000 to \$39,999.....	9,704	9,762	-0.6	49.9	49.6	15.0	14.7
\$40,000 to \$49,999.....	4,649	4,666	-0.4	36.4	34.9	17.6	16.8
\$50,000 to \$74,999.....	3,503	3,046	*15.0	44.9	35.9	21.5	19.7
\$75,000 and over.....	1,492	1,422	4.9	45.5	62.3	29.1	29.9

\* Significant at the 95-percent confidence level.

<sup>1</sup>Single returns with AGI less than \$3,300 and joint returns with AGI less than \$5,400 were not considered taxable under the CPS simulation, even though a small percentage of those returns do incur a tax liability.

## Appendix B. Definitions and Explanations

**Population coverage.** This report includes the civilian noninstitutional population of the United States (the 50 States and the District of Columbia) and members of the Armed Forces living off post or with their families on post, but excludes all other members of the Armed Forces.

**Household.** A household consists of all the persons who occupy a housing unit. A house, an apartment or other group of rooms, or a single room is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure and there is either (1) direct access from the outside or through a common hall or (2) a kitchen of cooking equipment for the exclusive use of the occupants.

A household includes the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit or a group of unrelated persons sharing a housing unit as partners is also counted as a household. The count of households excludes group quarters.

**Money income before taxes.** The before-tax money income distributions and income summary measures (such as medians and means) shown in this report are limited to money income before payment of Federal, State, local, or Social Security (FICA) taxes and before any other types of deductions, such as union dues and Medicare premiums. Total money income before taxes is the sum of the amounts received from wages and salaries, self-employment income (including losses), Social Security, Supplemental Security Income, public assistance, interest, dividends, rent, royalties, estates or trusts, veterans' payments, unemployment and workers' compensations, private and government retirement and disability pensions, alimony, child support, and any other source of money income which was regularly received. Capital gains (or losses) and lump sum or one-time payments such as life insurance settlements are excluded.

**Money income after taxes.** To compute the after-tax money income distributions and summary measures shown in this report, simulated Federal and State income taxes, Social Security (FICA) taxes, and property taxes were deducted from total money income before taxes as defined above. Total money income after taxes also includes capital gains, which were imputed to some households during the Federal income tax simulation.

**Underreporting.** As in most household surveys, the estimates of the number of money income recipients and the total amount of money income derived from the March CPS are somewhat less than comparable estimates derived from independent sources, such as the Bureau of Economic Analysis, Social Security Administration, and Veterans Administration. The difference between the survey estimate and the independent estimate is generally termed "underreporting." Underreporting tends to be more pronounced for income sources such as public assistance and welfare, unemployment compensation, and property income (interest, dividends, and net rental income). Estimates of income from wages and salaries tend to have less underreporting than most income types. For 1982 (the latest year for which estimates of underreporting are available), underreporting of total money income was about 11 percent. For further details concerning the reporting of money income, see appendix D.

**Poverty definition.** Families and unrelated individuals are classified as being above or below the poverty level using the poverty index originated at the Social Security Administration in 1964 and revised by Federal Interagency Committees in 1969 and 1980. The poverty index is based solely on money income and does not reflect the fact that many low-income persons receive noncash benefits such as food stamps, Medicaid, and public housing. The index is based on the Department of Agriculture's 1961 Economy Food Plan and reflects the different consumption requirements of families based on their size and composition. It was determined from the Department of Agriculture's 1955 Survey of Food Consumption that families of three or more persons spend approximately one-third of their income on food; the poverty level for these families was, therefore, set at three times the cost of the economy food plan. For smaller families and persons living alone, the cost of the economy food plan was multiplied by factors that were slightly higher in order to compensate for the relatively larger fixed expenses of these smaller households. The poverty thresholds are updated every year to reflect changes in the Consumer Price Index (CPI). The average poverty threshold for a family of four was \$9,862 in 1982, about 6.2 percent higher than the comparable 1981 cutoff of \$9,287. Weighted average poverty thresholds by size of family are shown in table B-1. For further details, see Current Population Reports, Series P-60, No. 138.

**Differences in after-tax poverty concept.** In previous reports households have been classified according to the poverty

**Table B-1. Weighted Average Poverty Thresholds in 1982**

Size of family unit	Threshold
One person (unrelated individual)..	\$ 4,901
15 to 64 years.....	5,019
65 years and over.....	4,626
Two persons.....	6,281
Householder 15 to 64 years.....	6,487
Householder 65 years and over....	5,836
Three persons.....	7,693
Four persons.....	9,862
Five persons.....	11,684
Six persons.....	13,207
Seven persons.....	15,036
Eight persons.....	16,719
Nine persons or more.....	19,698

status of the household's primary family or individual. Using this method for determining poverty status, it is possible for households classified as below the poverty level to have total household incomes above the poverty level based on the inclusion of income received by unrelated subfamilies or secondary individuals. The presence of these high-income "poverty" households was thought to be inappropriate for the purpose of this study. Consequently, the poverty universe for this study was modified to exclude households in which the total household income exceeded the poverty threshold for the primary family or individual. This modification resulted in a decline in the number of poverty households from 12,161,000 to 11,535,000 for 1982.

**AHS-CPS statistical match.** In order to simulate property taxes for owner-occupied housing units, the March 1982 CPS simulation file was statistically matched to a file from the 1981 Annual Housing Survey (AHS). Since the AHS file contained responses to questions on annual property tax expenses the statistical match allowed the transfer of property tax amounts to CPS records when a CPS and AHS household were found to have similar characteristics. The group of variables used to match the two files were: age of householder, tenure, public or subsidized housing status, SMSA and central-city status of the household, household income, household size, number of living quarters, and the race, sex, and educational attainment of the householder. Using a very detailed combination of recodes based on the above variables, the two files were matched. If there was no AHS household

**Table B-2. Annual Average Consumer Price Index (CPI): 1947 to 1982**

(1977 = 100)

Year	CPI	Year	CPI
1947. . . . .	36.9	1965. . . . .	52.1
1948. . . . .	39.7	1966. . . . .	53.6
1949. . . . .	39.3	1967. . . . .	55.1
1950. . . . .	39.7	1968. . . . .	57.4
1951. . . . .	42.9	1969. . . . .	60.5
1952. . . . .	44.6	1970. . . . .	64.1
1953. . . . .	44.1	1971. . . . .	66.8
1954. . . . .	44.4	1972. . . . .	69.0
1955. . . . .	44.2	1973. . . . .	73.3
1956. . . . .	44.8	1974. . . . .	81.4
1957. . . . .	46.4	1975. . . . .	88.8
1958. . . . .	47.7	1976. . . . .	93.9
1959. . . . .	48.1	1977. . . . .	100.0
1960. . . . .	48.9	1978. . . . .	107.6
1961. . . . .	49.4	1979. . . . .	119.8
1962. . . . .	49.9	1980. . . . .	136.0
1963. . . . .	50.2	1981. . . . .	150.1
1964. . . . .	51.2	1982. . . . .	159.3

Source: Department of Labor, Bureau of Labor Statistics.

with the exact combination of characteristics as a particular CPS household, a match was then attempted at a new level that did not have quite as much detail. This was repeated until a match was found for every CPS household.

Households on the AHS file that did not answer the question dealing with property tax expenses were ineligible for the match. Since monthly mortgage expenses, which were used to simulate itemization status for Federal taxpayers, were also assigned to CPS households using this match, households that did not answer the AHS questions on that subject were similarly excluded from the match.

**Index of income concentration.** The index of income concentration (or Gini index) is a statistical measure of income inequality ranging from 0 to 1. A measure of 1 indicates perfect inequality, i.e., one person having all the wealth and the rest having none. A measure of 0 indicates perfect equality, i.e., all persons having equal shares of the wealth. For a more detailed discussion see Current Population Reports, Series P-60, No. 123.

## Appendix C. Source and Reliability of Estimates

### SOURCE OF DATA

Data from the Annual Housing Survey, the Income Survey Development Program, and the Internal Revenue Service were combined with the Current Population Survey (CPS) data to create simulations of taxes paid, number of tax filing units, adjusted gross income, and other tax characteristics for the March 1983 CPS. See the section of the report entitled "Methodology and Procedures" for more details. In addition, unpublished data from the Social Security Administration, administrative data from the Office of Personnel Management, data from the National Income Accounts prepared by the Bureau of Economic Analysis and Bureau of the Census publication entitled *State Government Tax Collections in 1982* have all been referenced. Following is a description of the sources of data from which the tax simulations were made. Except for the CPS, these descriptions are brief. Additional information about these data sources can be found in the reports referenced in the brief descriptions given below.

**Annual Housing Survey.** Housing data are collected by the Bureau of the Census acting as collecting agent for the Department of Housing and Urban Development. The population covered by the sample for the AHS are all housing units in the United States. A structure must meet specific criteria developed by the Bureau of the Census before it is termed a "housing unit." For a more detailed description of the sample design see Current Housing Reports, Series H-150-81, *Annual Housing Survey: 1981, Part C, Financial Characteristics of the Housing Inventory*. The AHS was not conducted in 1982; therefore, property tax estimates for 1982 are based on the 1981 AHS. A series of statistical matches were made and estimates were updated to reflect changes between 1981 and 1982. A more detailed description of this procedure can be found in appendix A. Since the procedures used to obtain estimates for 1981 and 1982 differ, caution should be used in comparing year-to-year changes in property taxes.

**Income Survey Development Program.** The Income Survey Development Program (ISDP) was the research and development phase for the Survey of Income and Program Participation (SIPP). The ISDP was intended to examine and resolve design, operational, and technical issues for SIPP. The household sample for the 1979 ISDP was a nationwide multiple-frame sample. The majority of sample households were drawn from addresses contacted in the 1976 Survey

of Income and Education. The remainder of sample households were drawn from a reserve file of sample cases maintained by the Census Bureau. For a more detailed description of this sample design, see Current Population Reports, Series P-23, No. 118, *Wage and Salary Data from the Income Survey Development Program: 1979 (Preliminary Data from Interview Period One)*.

**Internal Revenue Service Data.** Much of the Internal Revenue Service (IRS) data in this report comes from the Statistics of Income (SOI) series, in particular, SOI Bulletin: Winter 1983-84, *Individual Income Tax Returns, Preliminary Data: 1982*. This report, based on a sample drawn from all tax returns filed through September 1983, presents information on tax payers' income, exemptions, deductions, credits, and tax.

**Current Population Survey.** The CPS estimates in this report are based on data obtained in March 1983 from the Current Population Survey (CPS) of the Bureau of the Census and from supplementary questions to the CPS. The monthly CPS deals mainly with labor force data for the civilian noninstitutional population. Questions relating to labor force participation are asked about each member 14 years old and over in every sample household. In addition, supplementary questions are asked every March about money income and work experience for the previous year. In order to obtain more reliable data for the Spanish-origin population, the March CPS sample was enlarged to include all households from the previous November sample which contained at least one sample person of Spanish origin. For this report, persons in the Armed Forces living off post or with their families on post are included.

The present CPS sample was initially selected from the 1970 census files with coverage in all 50 States and the District of Columbia. The sample is continually updated to reflect new construction. The March 1983 CPS sample was located in 629 areas comprising 1,148 counties, independent cities, and minor civil divisions in the Nation. In this sample, approximately 61,500 occupied households were eligible for interview. Of this number, about 2,500 occupied units were visited but interviews were not obtained because the occupants were not found at home after repeated calls or were unavailable for some other reason.

The estimation procedure used in the CPS involves the inflation of the weighted sample results to independent

estimates of the total civilian noninstitutional population of the United States by age, race, and sex. The estimation procedure also involves a further adjustment so that the husband and wife of a household receive equal weights. These independent estimates are based on statistics from decennial censuses of population; statistics on births, deaths, immigration, and emigration; and statistics on the strength of the Armed Forces. The independent population estimates used in this report to obtain data for 1981 and 1982 are based on the 1980 decennial census. Simulation techniques were also used to obtain estimates of after-tax income based on CPS data. For more details on this procedure, see the section of this report entitled "Methodology and Procedures."

## RELIABILITY OF ESTIMATES

Estimates based on a sample may differ somewhat from the figures that would have been obtained if a complete census had been taken using the same questionnaire, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey: sampling and nonsampling. The standard errors provided for this report primarily indicate the magnitude of the sampling error. They also partially measure the effect of some nonsampling errors in response and enumeration, but do not measure any systematic biases in the data. The full extent of nonsampling error is unknown. Consequently, particular care should be exercised in the interpretation of figures based on a relatively small number of cases or on small differences between estimates.

In addition, these standard errors are not entirely applicable to estimates from the CPS simulation. These standard errors were computed from CPS data alone and do not reflect any sampling or nonsampling errors present in data from other sources or any other errors due to the simulation process. There is no data available on the size of these additional error sources. Thus, care must be used in interpreting estimates from the CPS simulation.

**Nonsampling variability.** Nonsampling error is present in both the CPS and other surveys mentioned in this report. The interaction of nonsampling errors when combining data from many surveys may result in an additional component of error. An unknown component is also introduced by the use of mathematical models. The total extent of these additional errors are unknown. Particular caution should be used in drawing conclusions based on small differences.

Nonsampling errors can be attributed to many sources, e.g., inability to obtain information about all cases in the sample, definitional difficulties, differences in the interpretation of questions, inability or unwillingness on the part of the respondents to provide correct information, errors made in collection such as in recording or coding the data, errors made in processing the data, errors made in estimating values for missing data, and failure to represent all units with the sample (undercoverage).

Undercoverage in the CPS results from missed housing units and missed persons within sample households. Overall undercoverage, as compared with the level of the 1980 decennial census, is about 7 percent. It is known that CPS undercoverage varies with age, sex, and race. Generally, undercoverage is larger for males than for females and larger for Black and other races combined than for Whites. Ratio estimation to independent age-sex-race population controls partially corrects for the bias resulting from survey undercoverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics than interviewed persons in the same age-sex-race group. Further, the independent population controls used have not been adjusted for undercoverage in the decennial census.

In most cases, the questionnaire entries for income are based on the memory or knowledge of one person, usually the wife. The memory factor in data derived from field surveys of income probably produces underestimates because the tendency is to forget minor or irregular sources of income. Other errors of reporting are due to misrepresentation or to misunderstanding as to the scope of the income concept. See also the section entitled "Underreporting of Income."

**Comparability with other data.** Data obtained from the CPS and other governmental sources are not entirely comparable. This is in large part due to differences in interviewer training and experience and in differing survey procedures. This is an additional component of error not reflected in the standard error tables. Also, because data from CPS simulations used in this report were derived using statistics from other governmental agencies, the standard error tables are analogously not entirely applicable to data from the CPS simulations. Therefore, caution should be used when using the standard error tables to compare data from the CPS or CPS simulation with data from other governmental agencies.

**Estimation of median incomes.** Median incomes have been estimated using either Pareto interpolation or linear interpolation. Pareto interpolation assumes a decreasing density of population within an income interval, whereas linear interpolation assumes a constant density of population within an income interval. Estimates of median income and their associated standard errors have been calculated using Pareto interpolation if the width of the income interval containing the estimate is greater than \$2,500. Otherwise, the computations have been done using linear interpolation.

**Sampling variability.** The standard errors given in tables C-1 through C-4 are primarily measures of sampling variability, that is, of the variation that occurred by chance because a sample rather than the entire population was surveyed. The sample estimate and its standard error enable one to construct confidence intervals, ranges that would include the average result of all possible samples with a known probability. For example, if all possible samples were selected, each of these being surveyed under essentially the same general conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then:

1. Approximately 68 percent of the intervals from one standard error below the estimate to one standard error above the estimate would include the average result of all possible samples.
2. Approximately 90 percent of the intervals from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate would include the average result of all possible samples.
3. Approximately 95 percent of the intervals from two standard errors below the estimate to two standard errors above the estimate would include the average result of all possible samples.

The average estimate derived from all possible samples is or is not contained in any particular computed interval. However, for a particular sample, one can say with a specified confidence that the average estimate derived from all possible samples is included in the confidence interval.

Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common types of hypotheses are 1) the population parameters are identical or 2) they are different. An example of this would be comparing the mean annual income of men versus the mean annual income of women. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the parameters are different when, in fact, they are identical. All statements of comparison in the text have passed a hypothesis test at the 0.10 level of significance or better, and most have passed a hypothesis test at the 0.05 level of significance or better. This means that, for most differences cited in the text, the estimated difference between parameters is greater than twice the standard error of the difference. For the other differences mentioned, the estimated difference between parameters is between 1.6 and 2.0 times the standard error of the difference. When this is the case, the statement of comparison will be qualified in some way; e.g., by use of the phrase "some evidence." Again, note that the standard errors used here are rough approximations, particularly on estimates involving sources of data other than the CPS. These standard errors do not account for sampling or nonsampling errors introduced by using the mathematical model.

**Note when using small estimates.** Summary measures, such as means, medians, and percent distributions, are shown when the base is 75,000 or greater. Because of the large standard errors involved, there is little chance that summary measures would reveal useful information when computed on a smaller base. Estimated numbers are shown, however, even though the relative standard errors of these numbers are larger than those for the corresponding percentages. These smaller estimates are provided primarily to permit such combinations of the categories as serve each user's needs.

**Standard errors for data based on surveys other than CPS.** To compute standard errors of data obtained from the 1982

SOI reports, see the report Internal Revenue Service Statistics of Income Bulletin: Winter 1983-84, Washington, D.C., 1984. To compute standard errors of data obtained from the 1981 Annual Housing Survey, see appendix B of the report, Series H-150-81, *Annual Housing Survey: 1981, Part C, Financial Characteristics of the Housing Inventory*.

**CPS standard error tables and their use.** In order to derive standard errors that would be applicable to a large number of estimates and could be prepared at a moderate cost, a number of approximations were required. Therefore, instead of providing an individual standard error for each estimate, generalized sets of standard errors are provided for various types of characteristics. As a result the sets of standard errors provided give an indication of the order of magnitude of the standard error of an estimate rather than the precise standard error.

The figures presented in tables C-1 through C-4 are approximations to standard errors of various estimates for households, families, unrelated individuals, and persons in the United States. Estimated standard errors for specific characteristics cannot be obtained from tables C-1 through C-4 without the use of the factors in table C-5. The factors in table C-5 must be applied to the generalized standard errors in order to adjust for the combined effect of sample design and estimating procedure on the value of the characteristic. Standard errors for intermediate values not shown in the generalized tables of standard errors may be approximated by linear interpolation. Standard errors of estimated means and medians are provided in the detailed tables.

Two parameters (denoted "a" and "b") are used to calculate standard errors for each type of characteristic; they are also presented in table C-5. These parameters were used to calculate the standard errors in tables C-1 through C-4 and to calculate the factors in table C-5. They also may be used to directly calculate the standard errors for estimated numbers and percentages. Methods for direct computation are given in the following sections.

**Standard errors of estimated numbers.** The approximate standard error,  $\sigma_x$ , of an estimated number can be obtained in two ways. It may be obtained by use of the formula

$$\sigma_x = f\sigma \quad (1)$$

where  $f$  is the appropriate factor from table C-5, and  $\sigma_x$  is the standard error on the estimate obtained by interpolation from tables C-1 or C-3. Alternatively, standard errors may be approximated by using formula (2), from which the standard errors were calculated in tables C-1 and C-3. Use of this formula will provide more accurate results than the use of formula (1).

$$\sigma_x = \sqrt{ax^2 + bx} \quad (2)$$

Here  $x$  is the size of the estimate and  $a$  and  $b$  are the parameters in table C-5 associated with the particular type of characteristic.

**Table C-1. Standard Errors of Estimated Numbers of Households, Families, Unrelated Individuals, and Persons, for 1981 and 1982 CPS and CPS Simulations—Total, White, or Spanish Origin**

(Numbers in thousands)

Size of estimate	Standard error <sup>1</sup>	Size of estimate	Standard error <sup>1</sup>
75.....	11	7,500.....	111
100.....	13	10,000.....	127
250.....	21	15,000.....	154
500.....	29	25,000.....	192
1,000.....	41	50,000.....	247
2,000.....	58	100,000.....	269
3,000.....	71	125,000.....	243
5,000.....	91	160,000.....	139

<sup>1</sup>These values must be multiplied by the appropriate factor in table C-5 to obtain the correct standard error.

**Standard errors of estimated percentages.** The reliability of an estimated percentage, computed using sample data for both numerator and denominator, depends upon both the size of the percentage and the size of the total upon which this percentage is based. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more. When the numerator and denominator of the percentage are in different categories, use the factor or parameters from table C-5 indicated by the numerator. The approximate standard error,  $\sigma_{(x,p)}$ , of an estimated percentage can be obtained by use of the formula

$$\sigma_{(x,p)} = f\sigma \quad (3)$$

In this formula,  $f$  is the appropriate factor from table C-5 and  $\sigma$  is the standard error on the estimate from table C-2 or C-4. Alternatively, standard errors may be approximated by using formula (4), from which the standard errors in tables C-2 and C-4 were calculated. Use of this formula will provide more accurate results than use of formula (3).

$$\sigma_{(x,p)} = \sqrt{\frac{b}{x} \cdot p(100-p)} \quad (4)$$

Here  $x$  is the size of the subclass of persons or families and unrelated individuals which is the base of the percentage,  $p$  is the percentage ( $0 < p < 100$ ), and  $b$  is the parameter in table C-5 associated with the particular type of characteristic in the numerator of the percentage.

**Illustrations of the use of standard error tables.** Table 1 of this report shows that there were 5,633,000 households in the United States with a before-tax income in the range of \$2,500 to \$4,999 in 1982. Table C-5 indicates that the appropriate  $a$  and  $b$  parameters to use in calculating a standard error for this estimate are  $a = 0.000076$  and  $b = 1,876$ . Note that poverty parameters are used because households in this

income range are considered to be in poverty. Using formula (2), the approximate standard error is

$$\sqrt{(0.000076)(5,633,000)^2 + 1,876(5,633,000)} \doteq 114,000^1$$

The 68-percent confidence interval as shown by the data is from 5,519,000 to 5,747,000. The 95-percent confidence interval is from 5,405,000 to 5,861,000 (using twice the standard error). Therefore, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 95 percent of all possible samples.

Table 1 also shows that 4.1 percent of the 83,918,000 households in the United States had before-tax incomes less than \$30,000 but greater than \$27,500 in 1982. Using formula (4) and the appropriate "b" parameter of 1,721 from table C-5, the standard error of 4.1 percent is given by

$$\sqrt{\frac{1,721}{83,918,000} \cdot 4.1(100.0-4.1)} = 0.09^2$$

Thus, rounded to one decimal place, the 68-percent confidence interval on the estimated percentage is from 4.0 to 4.2, and the 95-percent confidence interval is from 3.9 to 4.3.

**Standard error of a difference.** For a difference between two sample estimates, the standard error is approximately equal to

$$\sigma_{(x-y)} = \sqrt{\sigma_x^2 + \sigma_y^2 - 2\rho\sigma_x\sigma_y} \quad (5)$$

where  $\sigma_x$  and  $\sigma_y$  are the standard errors of the estimates  $x$  and  $y$  and  $\rho$  represents the correlation between the two estimates. The estimates can be of numbers, percents, ratios, etc. For differences between before- and after-tax income

<sup>1</sup>For this particular characteristic, the standard error must be calculated using formula (2).

<sup>2</sup>Using formula (3) with appropriate  $f = 1.0$  and  $\sigma = 0.09$  (from table C-2), the standard error of 4.1 percent is  $(1.0)(0.09) = 0.09$ .

estimates, assume a value of 0.7 for  $\rho$ . For differences between 1981 and 1982 estimates, use the value of  $\rho$  for the appropriate characteristic from table C-6. For all other differences,  $\rho$  should be assumed zero.

**Illustration of the computation of the standard error of a difference.** Table 1 of this report shows that the median before-tax 1982 income of owner-occupied households was \$24,148 and the median before-tax 1982 income of renter-occupied households was \$14,001. The published estimates of the standard errors of these medians are \$128 and \$125, respectively. Therefore, the standard error of the estimated difference of \$10,147 is

$$\sqrt{(128)^2 + (125)^2} = 179$$

This means that the 68-percent confidence interval on the difference of \$10,147 as shown by these data is from \$9,968 to \$10,326. The 95-percent confidence interval on the difference is from \$9,789 to \$10,505. Therefore, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 95 percent of all possible samples. Since this interval does not contain zero, we can conclude with 95-percent confidence that the 1982 median before-tax income for owner-occupied households was higher than the 1982 median before-tax income for renter-occupied households.

**Standard error of a ratio.** Certain mean values for persons in families or households shown in the tables were calculated as the ratio of two numbers. For example, the mean number of persons per family or household is calculated as

$$\frac{x}{y} = \frac{\text{total number of persons in families or households}}{\text{total number of families or households}}$$

Ratios of before- to after-tax estimates are also discussed in this report. For example, the ratio of mean household income before and after taxes is calculated as

$$\frac{x}{y} = \frac{\text{mean household income before taxes}}{\text{mean household income after taxes}}$$

Standard errors for these ratios may be approximated as shown below. There are three cases to consider. In the first two cases, the denominator  $y$  represents a count of families or households of a certain class, and the numerator  $x$  represents a count of persons with the characteristic under consideration who are members of these families or households. In the third case, the numerator  $x$  and denominator  $y$  represent before- and after-tax estimates.

Case 1: There is at least one person having the characteristic in every family or household of the class: for example, the mean number of persons per family or the mean number of persons per family with a male householder. For ratios of this kind, the standard errors are approximated by the following formula:

$$\frac{\sigma_x}{y} = \sqrt{\left(\frac{x}{y}\right)^2 \left[ \left(\frac{\sigma_y}{y}\right)^2 + \left(\frac{\sigma_x}{x}\right)^2 - 2\rho \left(\frac{\sigma_x}{x}\right) \left(\frac{\sigma_y}{y}\right) \right]} \quad (6)$$

**Table C-2. Standard Errors of Estimated Percentages of Households, Families, Unrelated Individuals, and Persons, for 1981 and 1982 CPS and CPS Simulations— Total, White, or Spanish Origin**

Base of estimated percentage (thousands)	Estimated percentage <sup>1</sup>				
	2 or 98	5 or 95	10 or 90	25 or 75	50
75.....	2.1	3.3	4.5	6.6	7.6
100.....	1.8	2.9	3.9	5.7	6.6
250.....	1.2	1.8	2.5	3.6	4.1
500.....	0.8	1.3	1.8	2.5	2.9
1,000.....	0.6	0.9	1.2	1.8	2.1
2,000.....	0.4	0.6	0.9	1.3	1.5
3,000.....	0.3	0.5	0.7	1.0	1.2
5,000.....	0.3	0.4	0.6	0.8	0.9
7,500.....	0.2	0.3	0.5	0.7	0.8
10,000.....	0.2	0.3	0.4	0.6	0.7
15,000.....	0.15	0.2	0.3	0.5	0.5
25,000.....	0.12	0.2	0.2	0.4	0.4
50,000.....	0.08	0.13	0.2	0.3	0.3
100,000.....	0.06	0.09	0.12	0.2	0.2
125,000.....	0.05	0.08	0.11	0.2	0.2
160,000.....	0.05	0.07	0.10	0.14	0.2

<sup>1</sup>These values must be multiplied by the appropriate factor in table C-5 to obtain the correct standard error.

**Table C-3. Standard Errors of Estimated Numbers of Households, Families, Unrelated Individuals, and Persons for 1981 and 1982 CPS and CPS Simulations—Black and/or Other Races**

(Numbers in thousands)

Size of estimate	Standard error <sup>1</sup>	Size of estimate	Standard error <sup>1</sup>
75.....	12	3,000.....	69
100.....	14	5,000.....	85
250.....	22	7,500.....	95
500.....	30	10,000.....	99
1,000.....	42	15,000.....	90
2,000.....	58	20,000.....	44

<sup>1</sup>These values must be multiplied by the appropriate factor in table C-5 to obtain the correct standard error.

The standard error of the estimated number of families or households,  $\sigma_y$ , and the standard error of the estimated number of persons with the characteristics in those families or households,  $\sigma_x$ , may be calculated by the methods described above. In formula (6),  $\rho$  represents the correlation coefficient between the numerator and the denominator of the estimate. In the above examples, and for other ratios of this kind use 0.7 as an estimate of  $\rho$ .

Case 2: The number of persons having the characteristic in a given family or household may be 0, 1, 2, 3, or more: for example, the mean number of persons under 18 years of age per household. For ratios of this kind the standard error is approximated by formula (6), but  $\rho$  is assumed to be zero. If  $\rho$  is actually positive (negative), then this procedure will provide an overestimate (underestimate) of the standard error of the ratio.

Case 3: The numerator and denominator represent before- and after-tax estimates. For example, the numerator may represent the number of families or households in a certain income category before taxes, and the denominator may represent the number of families or households in the same category after taxes. For ratios of this kind  $\sigma_x$  and  $\sigma_y$  represent the standard errors of before- and after-tax estimates, respectively. For ratios of this type,  $\rho$  is assumed to be 0.7 for before- and after-tax income estimates.

## STANDARD ERRORS OF ESTIMATED MEANS AND MEDIANS

Estimated standard errors are provided for the means and medians of the published income distributions, and do not need to be calculated by the user. However, because of the approximations used in developing the formula used to estimate the standard error of the mean, the standard error reported for this statistic will generally be an underestimate.

Since some users may wish to combine two or more income distributions and compute means and medians for the combined distribution, the following sections are provided to enable the user to calculate standard errors for these statistics.

**Estimating the standard error of the mean.** The standard error of a mean can be approximated by formula (7). Because of the approximations used in developing formula (7), an estimate of the standard error of the mean obtained from that formula will generally underestimate the true standard error. The formula used to estimate the standard error of a mean is

$$\sigma_x = \sqrt{\frac{b}{y}} s^2 \quad (7)$$

where  $y$  is the size of the base and  $b$  is a parameter which depends on the sample size, the sample design, the estimation procedure, and the type of characteristic. The  $b$  values are given in table C-5. The variance  $s^2$ , is given by formula (8):

$$s^2 = \sum_{i=1}^c p_i \bar{x}_i^2 - \bar{x}^2 \quad (8)$$

where  $\bar{x}$  is the mean of the distribution, defined by

$$\bar{x} = \sum_{i=1}^c p_i x_i$$

$c$  is the number of groups;  $i$  indicates a specific group, taking on values 1 through  $c$ .

$p_i$  is the estimated proportion of households, families, or persons whose values, for the characteristic ( $x$ -values) being considered, fall in group  $i$ .

$\bar{x}_i = (Z_{i-1} + Z_i)/2$  where  $Z_{i-1}$  and  $Z_i$  are the lower and upper interval boundaries, respectively, for group  $i$ .

$\bar{x}_i$  is assumed to be the most representative value for the characteristic for households, families, or persons in group i. Group c is open-ended, i.e., no upper interval boundary exists. For this group an approximate average value is  $\bar{x}_c = \frac{3}{2} Z_{c-1}$

When two or more distributions are combined, the mean of the combined distribution is

$$\bar{x} = \frac{1}{y} \sum_j \bar{x}_j y_j$$

where  $\bar{x}_j$  is the mean of the jth distribution,  $y_j$  is the base of the jth distribution, and  $y = \sum_j y_j$ . This mean must be computed by the user.

**Confidence interval and standard error of a median.** The sampling variability of an estimated median depends upon the form of the distribution as well as the size of its base. An approximate method for measuring the reliability of an estimated median is to determine a confidence interval about it. (See the section on sampling variability for a general discussion of confidence intervals.) The following procedure may be used to estimate the 68-percent confidence limits and hence the standard error of a median based on sample data.

1. Determine, x using the standard error tables and factors or formula (4), the standard error of the estimate of 50 percent from the distribution;
2. Add to and subtract from 50 percent the standard error determined in step (1);
3. Using the distribution of the characteristic, calculate the values from the distribution corresponding to the two points established in step (2). These values will be the limits for the 68-percent confidence interval;

4. Divide the difference between the two points determined in step (3) by two to obtain the standard error of the median.

For calculation of the confidence interval in step (3) use Pareto interpolation for any point in an income interval greater than \$2,500 in width, and linear interpolation otherwise. A 95-percent confidence interval may be determined by finding the values corresponding to 50 percent plus and minus twice the standard error determined in step (1).

The formulae used to implement step (3) for Pareto or linear interpolation are:

Pareto:

$$x_{pN} = A_1 \exp \left[ \frac{\ln \left( \frac{pN}{N_1} \right) \ln \left( \frac{A_2}{A_1} \right)}{\ln \left( \frac{N_2}{N_1} \right)} \right] \quad (9)$$

Linear:

$$x_{pN} = \frac{N_1 - pN}{N_1 - N_2} (A_2 - A_1) + A_1 \quad (10)$$

where N = total number of households, families, or persons in the distribution.

$x_{pN}$  = estimated income for which the number pN ( $0 < p < 1$ ) of households, families, or persons in the distribution have larger incomes. For the purposes of calculating the confidence interval, p takes on the two values in step (2). Note that the median can be approximated by using  $p = 0.50$  in the formulae.

$A_1$  and  $A_2$  = the estimated incomes which are the lower and upper bounds, respectively, on the interval in which  $x_{pN}$  falls.

**Table C-4. Standard Errors of Estimated Percentages of Households, Families, Unrelated Individuals, and Persons, for 1981 and 1982 CPS and CPS Simulations—Black and/or Other Races**

Base of estimated percentage (thousands)	Estimated percentage <sup>1</sup>				
	2 or 98	5 or 95	10 or 90	25 or 75	50
75.....	2.2	3.4	4.7	6.8	7.9
100.....	1.9	3.0	4.1	5.9	6.8
250.....	1.2	1.9	2.6	3.8	4.3
500.....	0.9	1.3	1.8	2.7	3.1
1,000.....	0.6	0.9	1.3	1.9	2.2
2,000.....	0.4	0.7	0.9	1.3	1.5
3,000.....	0.4	0.5	0.8	1.1	1.3
5,000.....	0.3	0.4	0.6	0.8	1.0
10,000.....	0.2	0.3	0.4	0.6	0.7
15,000.....	0.2	0.2	0.3	0.5	0.6
20,000.....	0.14	0.2	0.3	0.4	0.5

<sup>1</sup>These values must be multiplied by the appropriate factor in table C-5 to obtain the correct standard error.

**Table C-5. "a" and "b" Parameters and "f" Factors for Calculating Approximate Standard Errors of Estimated Numbers and Percentages of Households, Families, Unrelated Individuals, and Persons for 1981 and 1982 CPS and CPS Simulations**

Type of characteristic <sup>1</sup>	Parameter		f factor
	a	b	
<b>INCOME</b>			
Number of households, families, or unrelated individuals:			
Total or White.....	-0.000010	1,721	1.00
Black and/or other races.....	-0.000089	1,876	1.00
Spanish origin.....	-0.000014	2,420	1.19
Number of persons:			
Total or White.....	-0.000009	1,885	1.05
Black and/or other races.....	-0.000077	2,155	1.07
Spanish origin.....	-0.000020	3,000	1.32
<b>POVERTY</b>			
Number of households, families, or unrelated individuals:			
Total or White.....	0.000076	1,876	<sup>2</sup> 1.04
Black and/or other races.....	0.000076	1,876	<sup>2</sup> 1.00
Spanish origin.....	-0.000014	2,420	1.19
Number of persons:			
Total.....	-0.000031	7,946	2.15
<b>NONINCOME</b>			
Number of households, families, or unrelated individuals:			
Total or White.....	-0.000010	1,389	<sup>2</sup> 0.90
Black and/or other races.....	-0.000087	1,255	<sup>2</sup> 0.82
Spanish origin.....	-0.000020	1,422	0.91
Number of persons:			
Total or White.....	-0.000017	3,500	1.43
Black and/or other races.....	-0.000210	5,020	1.64
Spanish origin.....	-0.000026	4,432	1.60
Number of persons in households or families:			
All households or family members:			
Total or White.....	-0.000020	4,253	1.57
Black and/or other races.....	-0.000308	7,402	1.99
Spanish origin.....	-0.000441	8,917	2.28

<sup>1</sup>For nonmetropolitan areas, multiply the "a" and "b" parameters by 1.5.

<sup>2</sup>The "f" factor for these characteristics is to be used for calculating standard errors of percentages only. For standard errors of estimated numbers, the appropriate "a" and "b" parameters and formula (2) must be used.

$N_1$  and  $N_2$  = the estimated number of households, families, or persons with incomes greater than  $A_1$  and  $A_2$ , respectively.

exp = refers to the exponential function

ln = refers to the natural logarithm function.

It should be noted that a mathematically equivalent result is obtained by using common logarithms (base 10) and antilogarithms.

Since the new, more detailed income intervals used in this report have \$2,500 increments up to \$40,000 for households and families and since Pareto interpolation will only be used when a median income falls in an interval of width larger than \$2,500, this type of interpolation is needed very infrequently (i.e., only in cases where the estimated median income exceeds \$40,000 for households and families). For this reason an illustration of the use of

Pareto interpolation in computing a confidence interval for a median is not given here.

$$x_c = \frac{h_c m_c}{p_c}$$

**Illustration of the computation of a confidence interval and the standard error for a median computed using linear interpolation.** Table 1 of this report shows that the median before-tax income in 1982 for owner-occupied households in the United States is estimated to be \$24,148. Table 1 also shows that the base of the distribution from which this median was determined is 54,494,000.

where  $h_c$  = number of households in class  $c$ .  
 $m_c$  = mean income for households in class  $c$ .  
 $p_c$  = number of persons in households in class  $c$ .  
 $x_c$  = mean per capita income of persons in households in class  $c$ .

1. Using formula (4), the standard error of 50 percent on a base of 54,494,000 is about 0.3 percentage points.
2. To obtain a 68-percent confidence interval on the estimated median, add to and subtract from 50 percent the standard error found in step 1. This yields percent limits of 49.7 and 50.3.
3. From table 1, the 1982 before-tax income of 29,220,000 (53.6 percent) of all owner-occupied households was at least \$22,500, and the 1982 before-tax income of 26,228,000 (48.1 percent) of all owner-occupied households was at least \$25,000.

Standard errors for these means may be approximated using the following formula:

$$\sigma(x_c) = \sqrt{\left(\frac{h_c m_c}{p_c}\right)^2 \left[ \left(\frac{\sigma_{m_c}}{m_c}\right)^2 + \left(\frac{\sigma_{p_c}}{p_c}\right)^2 + \left(\frac{\sigma_{h_c}}{h_c}\right)^2 - 2\rho \left(\frac{\sigma_{p_c}}{p_c}\right) \left(\frac{\sigma_{h_c}}{h_c}\right) \right]}$$

In this formula,  $\rho$  represents the correlation between  $p_c$  and  $h_c$ . There are two cases to consider, depending on the nature of class  $c$ .

Thus, the entire 68-percent confidence interval falls in the income interval \$22,500 to \$24,999. Therefore, the median before-tax income and the upper and lower limits on the confidence interval are to be calculated using linear interpolation. Using formula (10), the lower limit on the estimate is found to be about

Case 1: Class  $c$  represents households containing a fixed number of persons. For example,  $h_c$  could be the number of 3 person households. In this case, there is an exact correlation between the number of persons in household and the number of households. Therefore,  $\rho=1$  for households of this type.

$$\frac{29,220,000 - (.503) (54,494,000)}{29,220,000 - 26,228,000} (\$24,999 - \$22,500) + \$22,500 = \$24,011$$

Case 2: Class  $c$  represents households of other demographic types, for example, households in distinct regions, households in which the householder is of a certain age group, and owner-occupied and renter-occupied households. In these examples and other classes in which there is not a perfect correlation between the number of persons in the household and the number of households, use 0.7 as an estimate of  $\rho$ .

Similarly, the upper limit is found by linear interpolation to be about

$$\frac{29,220,000 - (.497) (54,494,000)}{29,220,000 - 26,228,000} (\$24,999 - \$22,500) + \$22,500 = \$24,284$$

Thus, the 68-percent confidence interval on the estimated median is from \$24,011 to \$24,284.

4. The standard error of the median is, therefore,  $(\$24,284 - \$24,011)/2$ , i.e., \$137. (Note: Published standard errors are calculated by the same method as above. However, a different standard error may be obtained because of rounding-off errors; e.g., for the above illustration, table 1 gives a standard error of \$128.)

**Table C-6. Year-to-Year Correlation Coefficients for Income and Poverty Characteristics: 1982 and 1981**

**STANDARD ERROR OF PER CAPITA INCOME**

Certain mean values in this report represent the per capita income for households of a certain class. The mean per capita income is approximately equal to:

Characteristic	Households, families, or unrelated individuals	
	Income	Poverty
Total.....	.35	.35
White.....	.35	.30
Black and/or other races.	.35	.35
Spanish origin.....	.55	.55

## Appendix D. Underreporting of Income

This appendix discusses some important aspects of underreporting, its measurement, and presents some estimates of underreporting for the base year 1982. The general survey phenomenon that is commonly termed underreporting actually refers to the tendency of household surveys to underestimate the number of income recipients and/or the amount of income received. There are three main causes for underreporting: failure to report receipt of the income type, underreporting of the amount received, and misclassification of the income type received.

Accurately measuring the extent of underreporting of income is difficult for many of the income types. There are two main components of measuring underreporting: the number of income or recipients and the total amount of income received. Measuring the survey undercount of recipients for the March CPS is extremely difficult because independent estimates (benchmarks or controls) for the CPS noninstitutional, "ever-received during the year" recipient concept are

difficult to validate. In addition, some of the administrative sources required for the derivation of independent estimates have significant errors themselves.

The derivation of accurate underreporting estimates for amounts of income is easier but still not without similar problems. In general, better administrative data are available on the annual amount of benefits received, or income earned, than recipients. Some of the more important problems associated with development of the independent controls for amounts are adjusting independent estimates to the CPS noninstitutional population, significant differences between alternate sources of independent estimates, especially for self-employment income, interest, dividends, and rents, and periodic revisions to the sources of independent estimates that delay availability of data and significantly alter estimates of underreporting. Estimates of underreporting for amounts of money income for 1982 are shown in table D-1.

**Table D-1. Comparisons of CPS Aggregate Money Income in 1982 with Independently Derived Estimates, by Income Type**

(Billions of dollars)

Source of income	Independent estimate	CPS estimate	CPS as a percent of independent estimate
Total.....	2,273.5	2,029.1	89.2
Wages and salaries.....	1,542.3	1,516.9	98.4
Self-employment.....	99.6	115.6	116.1
Social Security <sup>1</sup> .....	145.2	135.1	93.1
Supplemental Security Income.....	8.5	6.6	77.6
Aid to Families with Dependent Children <sup>2</sup> .....	12.9	9.8	76.4
Interest, dividends, and rental income.....	314.1	139.0	44.3
Veterans payments.....	13.8	8.7	63.0
Unemployment compensation.....	25.4	20.0	78.5
Worker's compensation.....	13.4	5.9	44.2
Private, government, and military pensions.....	98.4	71.4	72.6

<sup>1</sup>Includes Railroad Retirement Benefits.

<sup>2</sup>Includes general assistance.

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