

Appendix C. Source and Reliability of Estimates

SOURCE OF DATA

The data were collected during the third and fourth interviews of the 1984 panel of the Survey of Income and Program Participation (SIPP) in a supplement to the standard questionnaire. The SIPP universe is the noninstitutionalized resident population living in the United States and at least 15 years of age.¹ However, supplement information collected from persons living in group quarters was not included in the tabulations shown in this report.

The 1984 panel SIPP sample is located in 174 areas comprising 450 counties (including one partial county) and independent cities. Within these areas, the bulk of the sample consisted of clusters of two to four living quarters (LQs), systematically selected from lists of addresses prepared for the 1970 decennial census. The sample was updated to reflect new construction.

Approximately 26,000 living quarters were designated for the sample. For Wave 1, interviews were obtained from the occupants of about 19,900 of the designated living quarters. Most of the remaining 6,100 living quarters were found to be vacant, demolished, converted to nonresidential use, or otherwise ineligible for the survey. However, approximately 1,000 of the 6,100 living quarters were not interviewed because the occupants refused to be interviewed, could not be found at home, were temporarily absent, or were otherwise unavailable. Thus, occupants of about 95 percent of all eligible living quarters participated in Wave 1 of the survey.

For the subsequent waves, only original sample persons (those interviewed in the first wave) and persons living with them were eligible to be interviewed. With certain restrictions, original sample persons were to be followed even if they moved to a new address. All noninterviewed households from Wave 1 were automatically designated as noninterviews for all subsequent waves. When original sample persons moved without leaving forwarding addresses or moved to extremely remote parts of the country, additional noninterviews resulted.

Noninterviews. Tabulations in this report were drawn from interviews conducted from September through December of

1984. Table C-1 summarizes information on nonresponse for the interview months in which the data used to produce this report were collected.

Some respondents don't respond to some of the questions. Therefore, the overall nonresponse rate for some items such as income and money related items is higher than the nonresponse rates in table C-1. (See appendix D.)

Estimation. The estimation procedure used to derive SIPP person weights involved several stages of weight adjustments. In the first wave, each person received a base weight equal to the inverse of his/her probability of selection. For each subsequent interview, each person received a base weight that accounted for following movers.

A noninterview adjustment factor was applied to the weight of every occupant of interviewed households to account for households which were eligible for the sample but were not interviewed. (Individual nonresponse within partially interviewed households was treated with imputation. No special adjustment was made for noninterviews in group quarters.) A factor was applied to each interviewed person's weight to account for the SIPP sample areas not having the same population distribution as the strata from which they were selected.

An additional stage of adjustment to persons' weights was performed to bring the sample estimates into agreement with independent monthly estimates of the civilian (and some military) noninstitutional population of the United States by age, race, and sex. These independent estimates were based on statistics from the 1980 Census of Population; statistics on births, deaths, immigration, and emigration; and statistics on the strength of the Armed Forces. To increase accuracy, weights were further adjusted in such a manner that SIPP sample estimates would closely agree with special Current Population Survey (CPS) estimates by type of householder (married, single with relatives or single without relatives by sex and race) and relationship to householder (spouse or other).² The estimation procedure for the data in the report also involved an adjustment so that the husband and wife of a household received the same weight.

RELIABILITY OF ESTIMATES

SIPP estimates in this report are based on a sample; they may differ somewhat from the figures that would have been

¹The noninstitutionalized resident population includes persons living in group quarters, such as dormitories, rooming houses, and religious group dwellings. Crew members of merchant vessels, Armed Forces personnel living in military barracks, and institutionalized persons, such as correctional facility inmates and nursing home residents, were not eligible to be in the survey. Similarly, United States citizens residing abroad were not eligible to be in the survey. With these qualifications, persons who were at least 15 years of age at the time of interview were eligible to be interviewed.

²These special CPS estimates are slightly different from the published monthly CPS estimates. The differences arise from forcing counts of husbands to agree with counts of wives.

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: nonsampling and sampling. We are able to provide estimates of the magnitude of SIPP sampling error, but this is not true of nonsampling error. Found below are descriptions of sources of SIPP nonsampling error, followed by a discussion of sampling error, its estimation, and its use in data analysis.

Nonsampling variability. 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, inability to recall 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, biases resulting from the differing recall periods caused by the rotation pattern and failure to represent all units within the universe (undercoverage). Quality control and edit procedures were used to reduce errors made by respondents, coders and interviewers.

Undercoverage in SIPP results from missed living quarters and missed persons within sample households. It is known that undercoverage varies with age, race, and sex. Generally, undercoverage is larger for males than for females and larger for blacks than for nonblacks. Ratio estimation to independent age-race-sex population controls partially corrects for the bias due to survey undercoverage. However, biases exist in the estimates to the extent that persons in missed households or missed persons in interviewed households have different characteristics than the interviewed persons in the same age-race-sex group. Further, the independent population controls used have not been adjusted for undercoverage in the decennial census.

The Bureau has also used complex techniques to adjust the weights for nonresponse, but the success of these techniques in avoiding bias is unknown.

Comparability with other statistics. Caution should be exercised when comparing data from this report with data from earlier SIPP publications or with data from other surveys. The comparability problems are caused by the seasonal patterns for many characteristics and by different nonsampling errors. In particular, this report includes data from the farm population which in the past has been excluded from Quarterly Reports. For further information about the farm population, see appendix B of any of the earlier quarterly reports such as P-70, No. 6, *Economic Characteristics of Households in United States: Fourth Quarter 1984*.

Sampling variability. Standard errors 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 standard errors for the most part measure the variations that oc-

curred 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 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 for hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common types of hypotheses tested are 1) the population parameters are identical versus 2) they are different. 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 report 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 report, the estimated absolute difference between parameters is greater than twice the standard error of the difference. If other differences have been mentioned, the estimated absolute difference between parameters is between 1.6 and 2.0 times the standard error of the difference. In such a case, the statement of comparison is qualified in some way (e.g., by use of the phrase "some evidence").

Note when using small estimates. Summary measures (such as means, medians, and percent distributions) are shown in the report only when the base is 200,000 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 per-

Table C-1. Sample Size, by Month and Interview Status

Month	Eligible	Inter- viewed	Noninter- viewed	Nonre- sponse rate (percent)
September 1984 . .	5,600	4,800	800	* 14
October 1984	5,600	4,800	800	15
November 1984 . . .	5,600	4,700	900	15
December 1984 . . .	5,600	4,700	900	17

*There are some inconsistencies due to rounding of all numbers at 100. The percentage was calculated using unrounded numbers.

mit such combinations of the categories as serve each user's needs. Also, care must be taken in the interpretation of small differences. For instance, in case of borderline difference, even a small amount of nonsampling error can lead to a wrong decision about the hypotheses, thus distorting a seemingly valid hypothesis test.

Standard error parameter tables and their use. To derive standard errors that would be applicable to a wide variety of statistics and could be prepared at a moderate cost, a number of approximations were required. Most of the SIPP statistics have greater variance than those obtained through a simple random sample of the same size because clusters of living quarters are sampled for SIPP. Two parameters (denoted "a" and "b") were developed to calculate variances for each type of characteristic.

The "a" and "b" parameters vary by subgroup. Table C-5 provides "a" and "b" parameters for Total or White Households and for Black Households. The "a" and "b" parameters may be used to directly calculate the standard error for estimated numbers and percentages. Because the actual variance behavior was not identical for all statistics within a group, the standard errors computed from parameters provide an indication of the order of magnitude of the standard error for any specific statistic.

For those users who wish further simplification, we have also provided general standard errors in tables C-3 and C-4. Note that these standard errors must be adjusted by an "f" factor from table C-5. The general standard errors are easier to use because there is no need to compute square roots, but they are slightly less accurate. Methods for using these parameters and tables for computation of standard errors are given in the following sections.

Table C-2. Distribution of Household Net Worth Among Households With Householders Less Than 35 Years of Age

	Total	Zero or Negative	\$1 to \$4,999	\$5,000 to \$9,999	\$10,000 to \$24,999	\$25,000 to \$49,999	\$50,000 to \$99,999	\$100,000 to \$249,999	\$250,000 or over
Thousands in interval . . .	25,730	4,889	7,436	2,830	4,426	3,062	2,110	746	231
Percent with at least as much as lower bound . .	(X)	100.0	81.0	52.1	41.1	23.9	12.0	3.8	0.9

Standard errors of estimated numbers of households. The approximate standard error, s_x , of an estimated number of households shown in this report can be obtained in two ways. Note that this method should not be applied to dollar values. It may be obtained by use of the formula

$$s_x = fs \quad (1)$$

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

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

Here x is the size of the estimate and "a" and "b" are the parameters associated with the particular type of characteristic being estimated.

Illustration of the computation of the standard error of an estimated number of households. SIPP estimates show that there were 8,916,000 households with a householder less than 35 years of age and where the monthly household income was \$900 to \$1,999. The appropriate "a" and "b" and "f" parameters from table C-5 and the appropriate general standard error from table C-3 are

$$a = -.0000764, b = 6,766, f = 1.00, s = 232,000$$

Using formula (1), the approximate standard error is

$$s_x = 1.00 \times 232,000 = 232,000$$

Using formula (2), the approximate standard error is

$$\sqrt{(-.0000764)(8,916,000)^2 + (6,766)(8,916,000)} = 233,000$$

The 95-percent confidence interval as shown by the data is from 8,450,000 to 9,382,000. 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 samples.

Standard errors of estimated percentages. The reliability of an estimated percentage, computed using sample data for

Table C-3. Standard Errors of Estimated Numbers of Households

(Numbers in thousands)

Size of estimate	Standard error	Size of estimate	Standard error
200	37	10,000	245
300	45	15,000	290
500	58	25,000	348
750	71	30,000	366
1,000	82	40,000	385
2,000	115	50,000	384
3,000	140	60,000	362
5,000	179	70,000	315
7,500	216	80,000	229

both numerator and denominator, depends upon both the size of the percentage and the size of the total upon which the percentage is based. When the numerator and denominator of the percentage have different parameters, use the parameter (or appropriate factor) of the numerator.

There are two types of percentages presented in this report. The first is the percentage of households with a particular characteristic such as the percent of households owning their own home. The second type is the percentage of net worth such as the percent of net worth of households that is held in vehicles. The percentage of net worth may be expressed as

$$\frac{\hat{P}_A \bar{X}_A}{\bar{X}_N} \quad (3)$$

where \hat{P}_A is the percentage of households holding a particular asset, \bar{X}_A is the mean value of holdings for a particular asset and \bar{X}_N is the mean value of net worth. Another example of the second type is the percent of net worth held by households with low income. In this case, \hat{P}_A is the percentage of all households that have low income, \bar{X}_A is the mean net worth of low income households and \bar{X}_N is the mean net worth of all households.

For the percentage of households, the approximate standard error, s_p , of the estimated percentage p can be obtained by the formula

$$s_p = fs \quad (4)$$

In this formula, f is the appropriate "f" factor from table C-5 and s is the standard error on the estimate from table C-4. Alternatively, it may be approximated by the following formula, (5), from which the standard errors in table C-4 were calculated. Use of this formula will give more accurate results than use of formula (4) above.

$$s_p = \sqrt{\left(\frac{b}{x}\right)} p (100-p) \quad (5)$$

Here x is the size of the subclass of households which is the base of the percentage, p is the percentage ($0 < p < 100$), and b is the parameter associated with the characteristics in the numerator.

For the percentage of net worth, the approximate standard error is given by

$$S_p = \sqrt{\left(\frac{\hat{P}_A \bar{X}_A}{\bar{X}_N}\right)^2 \left[\left(\frac{S_1}{\hat{P}_A}\right)^2 + \left(\frac{S_2}{\bar{X}_A}\right)^2 + \left(\frac{S_3}{\bar{X}_N}\right)^2 \right]} \quad (6)$$

where S_1 is the standard error of \hat{P}_A , S_2 is the standard error of \bar{X}_A and S_3 is the standard error of \bar{X}_N . (To calculate S_1 , use formula (5). The standard errors of \bar{X}_N and \bar{X}_A are given in table C-7.)

It should be noted that there is some correlation between \hat{P}_A and \bar{X}_N , and between \bar{X}_A and \bar{X}_N . In most cases, the above formula would give an overestimate of the standard error.

Illustration of the computation of the standard error of an estimated percentage of households. Of the 26,599,000 households with mean monthly household income of \$900

Table C-4. Standard Errors of Estimated Percentages of Households

Base of estimated percentage (thousands)	Estimated percentage					
	1 or 99	2 or 98	5 or 95	10 or 90	25 or 75	50
200	1.8	2.6	4.0	5.5	8.0	9.2
300	1.5	2.1	3.3	4.5	6.5	7.5
500	1.2	1.6	2.5	3.5	5.0	5.8
750	1.0	1.3	2.1	2.8	4.1	4.7
1,000	0.8	1.2	1.8	2.5	3.6	4.1
2,000	0.6	0.8	1.3	1.7	2.5	2.9
3,000	0.5	0.7	1.0	1.4	2.1	2.4
5,000	0.4	0.5	0.8	1.1	1.6	1.8
7,500	0.3	0.4	0.7	0.9	1.3	1.5
10,000	0.26	0.4	0.6	0.8	1.1	1.3
15,000	0.21	0.3	0.5	0.6	0.9	1.1
25,000	0.16	0.2	0.4	0.5	0.7	0.8
30,000	0.15	0.2	0.3	0.5	0.7	0.8
40,000	0.13	0.2	0.3	0.4	0.6	0.7
50,000	0.12	0.16	0.3	0.3	0.5	0.6
60,000	0.11	0.15	0.2	0.3	0.5	0.5
80,000	0.09	0.13	0.2	0.3	0.4	0.5

Table C-5. Generalized Variance Parameters

Households	a	b	f
Total or White	-0.0000764	6,766	1.00
Black	-0.0004661	4,675	0.83

to \$1,999, 11.3 percent were Black. Using formula (4) with the “f” factor from table C-5 and the appropriate standard error from table C-4, the approximate standard error is

$$S_p = 0.5 \times 0.83 = 0.42$$

Using formula (5) with the “b” parameter from table C-5, the approximate standard error is

$$S_p = \frac{4,675}{26,599,000} 11.3 (100-11.3) = 0.42$$

Consequently, the 95 percent confidence interval as shown by these data is from 10.5 to 12.1 percent.

Illustration of the computation of the standard error of an estimated percentage of net worth. Of all household assets, 6 percent was held in vehicles. The mean value of vehicles was \$5,516 and the mean value of net worth was \$78,734. The standard error of the 85.8 percent of households that own vehicles is 0.31 percent, the standard error of the mean value of vehicles owned by households is \$56, and the standard error of the mean value of net worth of households is \$1,953. Using the formula (6), the approximate standard error is

$$S_p = \sqrt{\left(\frac{(85.8)(5,516)}{78,734}\right)^2 \left[\left(\frac{0.031}{85.8}\right)^2 + \left(\frac{56}{5,516}\right)^2 + \left(\frac{1,953}{78,734}\right)^2\right]} = .16\%$$

Consequently, the 95 percent confidence interval as shown by these data is from 5.7 to 6.3 percent.

Standard error of a difference within this report. The standard error of a difference between two sample estimates is approximately equal to

$$S_{(x-y)} = \sqrt{S_x^2 + S_y^2} \tag{7}$$

where s_x and s_y are the standard errors of the estimates x and y .

The estimates can be numbers, percents, ratios, etc. The above formula assumes that the sample correlation coefficient, r , between the two estimates is zero. If r is really positive (negative), then this assumption will lead to overestimates (underestimates) of the true standard error.

Illustration of the computation of the standard error of a difference within this report. SIPP estimates show that the mean value of household wealth held in motor vehicles for White households is \$5,707 and the mean value of household wealth held in motor vehicles for black households is \$3,446. The

standard errors for these estimates are given in table C-7. They are \$61 and \$91, respectively. Assuming that these two estimates are not correlated, the standard error of the estimated difference of \$2,261 is

$$s_{(x-y)} = \sqrt{(61)^2 + (91)^2} = \$110$$

The 95-percent confidence interval is from \$2,041 to \$2,481. Since this interval does not contain zero, the data do show that there is a difference at the 5-percent significance level.

Standard error of a mean. A mean is defined here to be the average quantity of some item (other than persons, families, or households) per household. For example, it could be the average monthly household income of households with a householder aged less than 35 years. The standard errors of all means published in this report have been provided in Table C-7.

Standard error of a median. The median quantity of some item such as income for a given group of persons, families, or households is that quantity such that at least half the group have as much or more and at least half the group have as much or less. The sampling variability of an estimated median depends upon the form of the distribution of the item as well as the size of the group.

Note that the standard errors for all median values given in the report are given in tables C-6 and C-8 thru C-11. However, if the reader desires to calculate standard errors on medians for collapsed groups, the procedure described below may be used. Also note that the medians and their standard errors given in this report will be somewhat different from those calculated using this method since more interval breaks were used than shown. 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, using either formula (4) or formula (5), the standard error of an estimate of 50 percent of the group;
2. Add to and subtract from 50 percent the standard error determined in step (1);
3. Using the distribution of the item within the group, calculate the quantity of the item such that the percent of the group owning more is equal to the smaller percentage found in step (2). This quantity will be the upper limit for the 68-percent confidence interval. In a similar fashion, calculate the quantity of the item such that the percent of the group owning more is equal to the larger percentage found in step (2). This quantity will be the lower limit for the 68-percent confidence interval;
4. Divide the difference between the two quantities determined in step (3) by two to obtain the standard error of the median.

Table C-6. Standard Errors for the Median Value of Holdings of Asset Owners, by Selected Characteristics: 1984

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Net worth	Interest-earning deposits at financial institutions ¹	Other interest-earning assets ²	Regular checking accounts	Stock and mutual fund shares	Equity in own home
Total	\$683	\$92	\$873	\$9	\$210	\$441
Race and Spanish Origin of Householder						
White	794	112	667	10	218	453
Black	276	51	(B)	22	818	940
Spanish origin*	968	186	(B)	35	1,368	3,865
Age of Householder						
Less than 35 years	318	38	207	10	142	581
35 to 44 years	1,330	127	223	20	269	982
45 to 54 years	1,745	213	1,169	34	514	1,150
55 to 64 years	1,965	530	1,745	34	546	1,089
65 years and over	1,630	752	2,693	31	863	823
65 to 69 years	2,873	1,157	4,444	52	1,736	1,804
70 to 74 years	3,092	1,116	3,262	59	1,482	1,378
75 years and over	2,517	1,383	2,719	51	1,664	1,085
Education of Householder						
Less than 12 years	1,012	315	1,446	16	419	738
High school: 4 years	1,270	172	1,907	11	362	795
College: 1 to 3 years	1,372	130	2,244	18	371	1,057
4 or more years	2,393	203	928	28	390	1,313
Type of Household						
Married-couple households	1,072	109	971	11	288	534
Age of spouse:						
Less than 35 years	762	73	370	12	189	714
35 to 54 years	1,563	169	1,059	26	368	863
55 to 64 years	3,084	536	2,140	42	612	1,227
65 years and over	3,270	1,453	3,300	54	2,023	1,682
Other household type:						
Male householder	825	161	1,901	23	320	1,375
Less than 35 years	331	96	2,393	23	589	1,013
35 to 54 years	2,238	326	1,513	64	525	2,806
55 to 64 years	4,247	1,641	(B)	99	4,842	6,151
65 years and over	3,969	1,938	3,223	104	7,619	2,928
Female householder	998	240	1,142	14	191	1,028
Less than 35 years	169	82	696	16	272	2,067
35 to 54 years	1,346	190	958	24	408	1,914
55 to 64 years	2,721	997	3,378	35	217	2,938
65 years and over	2,365	783	2,673	41	697	1,092
Labor Force Activity of Householders Under 65 Years						
Total	755	59	534	10	184	555
With labor force activity	769	68	354	10	216	592
With job entire period	826	62	205	10	227	614
With job part of period	1,236	160	2,002	27	685	3,173
No job during period, spent time looking or on layoff	292	536	(B)	105	(B)	3,591
No labor force activity	2,879	482	2,439	24	884	1,382
Pension Plan Coverage of Employed Householders 25 Years and Over						
Total	807	64	202	11	235	632
Employer does not have plan	1,246	176	1,901	15	358	1,349
Employer has plan	923	68	239	13	222	726
Not covered by plan	1,637	268	2,342	32	695	2,218
Covered by plan	1,012	71	305	13	229	791
Not vested	1,316	160	840	24	300	1,071
Vested	1,417	171	514	15	319	822

See footnotes at end of table.

**Table C-6. Standard Errors for the Median Value of Holdings of Asset Owners, by Selected Characteristics:
1984—Continued**

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Rental property equity	Other real estate equity	Equity in business or profession	Equity in motor vehicles	U.S. savings bonds	IRA or KEOGH accounts	Other assets ³
Total	\$1,770	\$1,172	\$1,026	\$50	\$16	\$110	\$1,178
Race and Spanish Origin of Householder							
White	1,768	1,110	1,001	52	18	119	1,293
Black	9,023	230	739	92	39	394	(B)
Spanish origin ⁴	5,158	310	4,485	128	164	700	(B)
Age of Householder							
Less than 35 years	2,213	792	534	51	11	192	917
35 to 44 years	3,518	1,907	1,207	95	21	113	657
45 to 54 years	4,318	2,648	2,780	148	43	380	2,498
55 to 64 years	2,859	1,765	2,354	126	92	170	2,059
65 years and over	3,269	2,115	2,244	67	233	251	3,363
65 to 69 years	11,086	2,958	2,291	258	420	964	6,177
70 to 74 years	4,489	4,938	3,643	209	162	921	4,648
75 years and over	5,833	2,615	4,671	141	760	911	3,253
Education of Householder							
Less than 12 years	3,202	349	1,734	60	76	265	3,440
High school: 4 years	2,695	1,789	1,076	85	38	131	1,777
College: 1 to 3 years	3,956	1,560	1,546	100	24	126	1,163
4 or more years	2,852	2,727	2,301	116	19	292	1,887
Type of Household							
Married-couple households	2,044	1,117	1,039	56	18	222	1,327
Age of spouse:							
Less than 35 years	(B)	(B)	1,179	81	12	313	1,509
35 to 54 years	2,478	1,836	1,327	99	21	281	1,770
55 to 64 years	3,762	2,303	2,604	178	119	528	2,264
65 years and over	(B)	(B)	(B)	225	440	964	3,869
Other household type:							
Male householder	6,328	1,736	775	76	45	100	1,250
Less than 35 years	6,796	2,162	1,561	128	31	486	1,319
35 to 54 years	3,934	4,228	1,449	226	71	220	1,912
55 to 64 years	(B)	(B)	(B)	192	(B)	838	(B)
65 years and over	19,543	2,667	25,396	193	1,835	(B)	621
Female householder	2,571	1,248	891	58	48	336	1,139
Less than 35 years	(B)	(B)	1,066	133	27	384	2,778
35 to 54 years	5,567	9,735	1,310	99	46	158	1,521
55 to 64 years	12,839	3,067	6,536	115	262	154	(B)
65 years and over	2,839	1,667	(B)	236	312	281	(B)
Labor Force Activity of Householders Under 65 Years							
Total	1,921	1,217	1,114	52	12	113	922
With labor force activity	2,057	1,131	990	53	12	103	506
With job entire period	2,161	1,260	927	56	12	105	900
With job part of period	7,653	2,936	738	157	73	537	2,022
No job during period, spent time looking or on layoff	(B)	(B)	(B)	252	(B)	(B)	(B)
No labor force activity	6,316	4,258	1,827	161	202	499	2,207
Pension Plan Coverage of Employed Householders 25 Years and Over							
Total	2,086	1,008	288	56	13	70	425
Employer does not have plan	5,436	2,885	734	77	21	265	1,587
Employer has plan	2,149	769	306	65	16	67	833
Not covered by plan	4,289	6,358	803	110	42	144	5,122
Covered by plan	2,560	823	322	68	19	88	812
Not vested	2,420	1,518	380	117	30	369	664
Vested	2,894	1,178	571	94	28	170	1,538

See footnotes at end of table.

Table C-6. Standard Errors for the Median Value of Holdings of Asset Owners, by Selected Characteristics: 1984—Continued

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Net worth	Interest-earning deposits at financial institutions ¹	Other interest-earning assets ²	Regular checking accounts	Stock and mutual fund shares	Equity in own home
Monthly Household Income						
Less than \$900	\$322	\$173	\$1,963	\$16	\$603	\$769
\$900 to \$1,999	1,184	168	1,558	12	385	779
\$2,000 to \$3,999	1,345	125	588	13	238	677
\$4,000 and over	6,082	389	1,734	34	777	1,559
Tenure						
Owner	820	147	421	15	128	441
Renter	102	68	473	11	351	(X)
Region						
Northeast	1,857	285	1,484	23	400	1,043
Midwest	1,294	195	1,525	12	396	816
South	1,082	146	1,226	20	148	743
West	1,945	216	1,142	23	298	1,499

See footnotes at end of table.

**Table C-6. Standard Errors for the Median Value of Holdings of Asset Owners, by Selected Characteristics:
1984—Continued**

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Rental property equity	Other real estate equity	Equity in business or profession	Equity in motor vehicles	U.S. savings bonds	IRA or KEOGH accounts	Other assets ⁴
Monthly Household Income							
Less than \$900	\$3,704	\$384	\$1,185	\$83	\$68	\$208	\$1,615
\$900 to \$1,999	2,660	1,233	945	48	36	97	1,380
\$2,000 to \$3,999	3,052	1,394	866	79	17	72	1,083
\$4,000 and over	4,129	3,152	2,161	197	45	220	2,759
Tenure							
Owner	1,909	1,099	1,254	54	22	176	1,215
Renter	4,953	1,764	593	52	22	428	1,031
Region							
Northeast	2,489	3,737	1,501	125	47	258	920
Midwest	3,273	986	2,304	90	32	190	1,745
South	3,208	1,331	1,505	84	23	238	2,087
West	3,437	2,603	1,213	107	36	234	2,554

¹Includes passbook savings accounts, money market deposit accounts, certificates of deposit, and interest-earning checking account.

²Includes money market funds, U.S. Government securities, municipal and corporate bonds, and other interest-earning assets.

³Includes mortgages held from sale of real estate, amount due from sale of a business, unit trusts, and other financial investments.

⁴Persons of Spanish origin may be of any race.

Table C-7. Standard Errors for the Mean Value of Holdings of Asset Owners, by Selected Characteristics: 1984
(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Net worth	Interest-earning deposits at financial institutions ¹	Other interest-earning assets ²	Regular checking accounts	Stock and mutual fund shares	Equity in own home
Total	\$1,953	\$459	\$2,266	\$29	\$2,869	\$606
Race and Spanish Origin of Householder						
White	2,224	499	2,355	31	3,002	648
Black	1,010	398	1,995	37	289	959
Spanish origin ³	3,644	1,061	(B)	58	3,736	2,759
Age of Householder						
Less than 35 years	1,083	411	(B)	24	2,544	932
35 to 44 years	2,669	670	5,023	48	2,341	1,266
45 to 54 years	8,298	1,067	5,488	79	3,426	1,540
55 to 64 years	5,374	1,096	6,002	77	7,616	1,702
65 years and over	5,249	1,479	4,705	100	10,384	1,110
65 to 69 years	14,648	2,159	9,576	126	29,025	2,135
70 to 74 years	7,090	3,033	5,442	160	10,127	2,142
75 years and over	4,001	2,470	7,230	197	4,570	1,580
Education of Householder						
Less than 12 years	1,628	965	3,866	75	1,702	834
High School: 4 years	3,279	701	6,105	46	2,849	953
College: 1 to 3 years	5,917	947	5,307	49	9,572	1,306
4 or more years	5,206	1,095	2,963	61	4,272	1,793
Type of Household						
Married-couple households	3,177	562	2,610	40	3,919	768
Age of spouse:						
Less than 35 years	2,205	576	2,367	28	3,184	1,213
35 to 54 years	5,575	706	2,953	62	2,302	1,218
55 to 64 years	8,022	1,507	8,725	80	9,083	2,021
65 years and over	14,307	2,660	5,997	239	24,699	1,726
Other household type:						
Male householder	2,861	1,137	7,288	78	5,372	1,712
Less than 35 years	2,667	713	3,306	78	7,193	2,068
35 to 54 years	5,218	1,092	21,115	166	6,897	2,820
55 to 64 years	11,067	4,999	18,872	200	7,980	5,913
65 years and over	9,280	4,360	8,874	270	17,663	3,406
Female householder	1,501	1,052	5,314	37	1,832	1,089
Less than 35 years	1,432	348	5,739	31	1,457	2,129
35 to 54 years	2,959	1,976	12,208	46	6,424	2,198
55 to 64 years	4,655	1,898	15,834	88	2,738	2,619
65 years and over	2,912	2,164	7,520	87	1,847	1,617
Labor Force Activity of Householder Under 65 Years						
Total	2,037	385	2,522	26	2,217	715
With labor force activity	2,179	385	2,353	26	1,434	760
With job entire period	2,417	380	2,465	27	1,502	799
With job part of period	3,052	1,237	8,224	102	2,214	2,899
No job during period, spent time looking or on layoff	4,069	9,767	(B)	115	(B)	3,401
No labor force activity	5,741	1,719	12,301	149	19,708	2,112
Pension Plan Coverage of Employed Householders 25 Years and Over						
Total	2,227	360	2,752	22	3,886	718
Employer does not have plan	2,731	872	9,467	42	4,619	1,175
Employer has plan	2,939	383	2,398	27	4,665	873
Not covered by plan	3,107	883	4,461	62	5,400	3,183
Covered by plan	3,378	419	2,614	29	5,091	903
Not vested	2,086	496	1,634	44	3,408	1,560
Vested	4,721	552	3,294	37	6,599	1,079

Table C-7. Standard Errors for the Mean Value of Holdings of Asset Owners, by Selected Characteristics: 1984—Continued

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Rental property equity	Other real estate equity	Equity in business or profession	Equity in motor vehicles	U.S. savings bonds	IRA or KEOGH accounts	Other assets ³
Total	\$ 3,951	\$ 2,044	\$ 5,663	\$ 56	\$ 295	\$ 426	\$ 11,488
Race and Spanish Origin of Householder							
White	4,217	2,129	5,931	61	317	447	11,943
Black	3,259	2,189	15,134	91	93	441	2,247
Spanish origin ²	16,055	4,653	20,746	172	301	537	25,950
Age of Householder							
Less than 35 years	(B)	(B)	6,681	69	46	237	2,159
35 to 44 years	5,321	5,156	7,761	112	80	364	6,034
45 to 54 years	11,227	3,680	17,042	186	1,345	808	54,611
55 to 64 years	8,920	4,708	9,028	171	757	800	10,692
65 years and over	8,379	5,397	33,616	126	752	3,056	10,270
65 to 69 years	16,198	10,062	72,050	231	1,223	4,696	8,420
70 to 74 years	17,018	9,601	27,566	216	892	1,806	32,696
75 years and over	10,989	5,476	37,657	191	1,546	754	6,189
Education of Householder							
Less than 12 years	5,010	1,740	9,652	90	358	2,061	7,656
High School: 4 years	7,964	3,847	7,514	92	362	508	28,463
College: 1 to 3 years	10,794	4,431	18,133	116	340	585	26,335
4 or more years	7,344	4,407	9,491	150	892	744	16,923
Type of Household							
Married-couple households	5,039	2,507	6,818	75	234	559	15,057
Age of spouse:							
Less than 35 years	5,277	4,257	9,204	86	56	322	2,933
35 to 54 years	7,077	3,473	9,685	138	334	556	33,078
55 to 64 years	12,448	6,630	12,429	202	872	1,109	12,487
65 years and over	17,091	7,661	64,421	214	994	6,885	18,981
Other household type:							
Male householder	11,171	4,475	11,452	119	2,308	455	2,966
Less than 35 years	(B)	(B)	22,028	167	101	305	1,241
35 to 54 years	14,677	6,831	12,412	231	6,771	654	2,970
55 to 64 years	38,910	11,518	18,780	317	2,536	1,063	18,113
65 years and over	(B)	(B)	(B)	357	2,786	3,249	8,190
Female householder	6,383	3,519	9,137	85	411	328	2,582
Less than 35 years	(B)	(B)	35,090	113	78	278	2,249
35 to 54 years	12,680	5,915	10,707	143	196	422	4,805
55 to 64 years	10,783	9,649	12,604	357	496	762	6,274
65 years and over	10,409	5,934	(B)	143	1,204	999	5,092
Labor Force Activity of Householders Under 65 Years							
Total	4,477	2,196	5,378	62	318	352	14,400
With labor force activity	4,454	2,358	5,501	65	332	322	16,225
With job entire period	4,680	2,469	5,718	69	350	336	17,328
With job part of period	16,767	5,719	5,469	188	1,035	843	9,733
No job during period, spent time looking or on layoff	(B)	(B)	(B)	245	(B)	(B)	4,078
No labor force activity	19,076	5,940	21,018	222	1,085	2,462	10,996
Pension Plan Coverage of Employed Householders 25 Years and Over							
Total	4,058	1,991	10,212	65	386	301	11,899
Employer does not have plan	7,258	6,447	16,023	110	323	638	16,882
Employer has plan	4,846	1,779	12,746	80	462	341	14,717
Not covered by plan	9,899	5,542	7,115	171	1,045	2,128	10,163
Covered by plan	5,270	1,874	14,837	88	495	316	16,956
Not vested	4,038	2,363	9,498	119	102	326	5,873
Vested	6,806	2,351	20,363	113	682	395	21,702

**Table C-7. Standard Errors for the Mean Value of Holdings of Asset Owners, by Selected Characteristics:
1984—Continued**

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Net worth	Interest- earning deposits at financial institutions ¹	Other interest- earning assets ²	Regular checking accounts	Stock and mutual fund shares	Equity in own home
Monthly Household Income						
Less than \$900	\$ 1,149	\$ 404	\$ 2,704	\$ 97	\$ 2,816	\$ 1,253
\$900 to \$1,999	1,366	526	2,581	36	880	799
\$2,000 to \$3,999	1,957	673	2,609	38	1,526	816
\$4,000 and over	13,691	2,117	5,845	90	9,091	2,277
Tenure						
Owner	2,924	590	2,663	37	3,409	606
Renter	897	601	3,386	38	1,930	(X)
Net Worth of Households						
Negative or zero	326	125	1,515	30	917	2,345
\$1 to \$4,999	32	43	414	16	163	261
\$5,000 to \$9,999	52	111	380	37	260	284
\$10,000 to \$24,999	111	146	486	43	313	220
\$25,000 to \$49,999	167	277	697	47	290	269
\$50,000 to \$99,999	280	325	941	56	446	393
\$100,000 to \$249,999	915	809	1,559	98	871	906
\$250,000 to \$499,999	2,982	3,573	4,519	290	4,167	3,645
\$500,000 and over	71,447	12,324	19,389	454	41,956	11,538
Region						
Northeast	2,888	925	6,356	66	3,820	1,365
Midwest	4,424	799	4,040	51	8,595	1,015
South	2,551	955	3,840	56	4,712	915
West	6,168	940	3,915	48	2,919	1,819

See footnotes at end of table.

Table C-7. Standard Errors for the Mean Value of Holdings of Asset Owners, by Selected Characteristics: 1984—Continued

(Excludes persons in group quarters. For meaning of symbols, see text)

Characteristic	Rental property equity	Other real estate equity	Equity in business or profession	Equity in motor vehicles	U.S. savings bonds	IRA or KEOGH accounts	Other assets ³
Monthly Household Income							
Less than \$900	\$ 4,232	\$ 3,770	\$ 6,346	\$ 81	\$ 520	\$ 748	\$ 3,275
\$900 to \$1,999	4,643	2,943	6,015	73	402	523	3,228
\$2,000 to \$3,999	5,432	3,303	5,996	83	236	662	2,227
\$4,000 and over	11,093	5,155	19,640	240	1,135	898	38,323
Tenure							
Owner	4,321	2,310	6,799	73	365	498	14,016
Renter	7,270	4,068	7,921	65	332	362	3,199
Net Worth of Households							
Negative or zero	15,608	5,226	5,434	89	132	799	3,350
\$1 to \$4,999	4,280	459	744	41	47	189	403
\$5,000 to \$9,999	951	1,008	584	98	107	229	754
\$10,000 to \$24,999	2,362	760	1,888	95	115	280	638
\$25,000 to \$49,999	1,097	1,001	763	92	155	270	1,047
\$50,000 to \$99,999	1,348	965	1,189	101	176	209	1,410
\$100,000 to \$249,999	1,774	1,637	2,368	160	552	409	1,845
\$250,000 to \$499,999	6,331	5,418	8,263	487	1,267	1,688	6,071
\$500,000 and over	28,690	22,332	61,874	981	9,660	6,407	106,096
Region							
Northeast	6,627	5,896	8,388	118	354	600	7,601
Midwest	6,513	4,367	13,549	99	471	1,228	8,186
South	5,043	2,741	6,941	98	864	620	16,464
West	12,390	4,675	15,524	141	213	722	35,482

¹Includes passbook savings accounts, money market deposit accounts, certificates of deposit, and interest-earning checking account.

²Includes money market funds, U.S. Government securities, municipal and corporate bonds, and other interest-earning assets.

³Includes mortgages held from sale of real estate, amount due from sale of a business, unit trusts, and other financial investments.

*Persons of Spanish origin may be of any race.

Table C-8. Standard Errors of Median Net Worth, by Age of the Householder and Monthly Household Income
(Excludes group quarters)

Monthly household income	Less than 35 years	35 to 44 years	45 to 54 years	55 to 64 years	65 years and over			
					Total	65 to 69 years	70 to 74 years	75 years and over
All households:								
Median income	\$26	\$35	\$49	\$44	\$21	\$43	\$36	\$23
Median net worth	318	1,330	1,745	1,965	1,630	2,873	3,092	2,517
Excluding home equity	113	348	804	1,194	997	2,326	2,075	1,648
Net worth by income—								
Less than \$900:								
Median net worth	85	684	2,126	3,608	1,514	3,381	2,330	2,304
Excluding home equity	80	148	235	521	480	526	868	599
\$900 to \$1,999:								
Median net worth	343	2,207	3,372	3,656	1,973	3,371	3,136	3,751
Excluding home equity	146	392	893	1,610	1,719	2,525	2,681	3,377
\$2,000 to \$3,999:								
Median net worth	848	1,714	2,505	3,534	8,251	12,677	18,251	13,461
Excluding home equity	272	489	962	2,439	4,668	7,156	9,639	16,868
\$4,000 or more:								
Median net worth	5,465	6,029	9,916	11,483	53,963	61,600	86,431	(B)
Excluding home equity	1,720	2,940	3,208	9,002	36,412	54,720	93,342	(B)

B Base less than 200,000.

To perform step (3), it will be necessary to interpolate. Different methods of interpolation may be used. The most common are simple linear interpolation and Pareto interpolation.

Table C-9. Standard Errors of Median Net Worth, by Race and Spanish Origin of Householder and Monthly Household Income
(Excludes group quarters)

Monthly household income	Total	White	Black	Spanish origin ¹
All households:				
Median income	\$17	\$18	\$31	\$53
Median net worth	683	794	276	968
Net Worth by Income				
Less than \$900:				
Median net worth	322	844	138	245
\$900 to \$1,999:				
Median net worth	1,184	1,292	644	861
\$2,000 to \$3,999:				
Median net worth	1,345	1,338	2,201	5,115
\$4,000 or more:				
Median net worth	6,082	6,226	8,620	40,306
Type of Household				
Married-couple household:				
Median net worth	1,072	1,039	1,333	1,975
Female householder:				
Median net worth	998	1,277	155	348
Male householder:				
Median net worth	825	922	429	968

¹Persons of Spanish origin may be of any race.

The appropriateness of the method depends on the form of the distribution around the median. For this report, we recommend linear interpolation. Interpolation is used as follows. The quantity of the item such that "p" percent own more is

$$X_{pN} = \frac{N_1 - pN}{N_1 - N_2}(A_2 - A_1) + A_1 \quad (8)$$

where N is size of the group,

A1 and A2 are the lower and upper bounds, respectively, of the interval in which X_{pN} falls,

N1 and N2 are the estimated number of group members owning more than A1 and A2, respectively,

Illustration of the computation of a confidence interval and the standard error for a median. To illustrate the calculations for the sampling error on a median, we refer to table C-2.

The median net worth for this group is \$5,764. The size of the group is 25,730,000.

- Using formula (5), the standard error of 50 percent on a base of 25,730,000 is about 0.8 percentage points.
- Following step (2), the two percentages of interest are 49.2 and 50.8.
- By examining table C-2, we see that the percentage 49.2 falls in the income interval from \$5,000 to \$9,999. Thus $A_1 = \$5,000$, $A_2 = \$9,999$, $N_1 = 13,405,000$, and $N_2 = 10,575,000$.

Therefore, the upper bound of a 68-percent confidence interval for the median is

$$\frac{13,405,000 - (.492)(25,730,000)}{13,405,000 - 10,575,000} (\$9,999 - \$5,000) + \$5,000 = \$6,318$$

Also by examining table C-2, we see that the percentage of 50.8 falls in the same income interval. Thus, A₁, A₂, N₁, and N₂ are the same. So the lower bound of a 68-percent confidence interval for the median is

$$\frac{13,405,000 - (.508)(25,730,000)}{13,405,000 - 10,575,000} (\$9,999 - \$5,000) + \$5,000 = \$5,590$$

Thus, the 68-percent confidence interval on the estimated median is from \$5,590 to \$6,318. An approximate standard error is

$$\frac{\$6,318 - \$5,590}{2} = \$364$$

Standard errors of ratios of means and medians. The standard error for a ratio of means or medians is approximated by:

$$S_{x/y} = \frac{x}{y} \sqrt{\left(\frac{S_y}{y}\right)^2 + \left(\frac{S_x}{x}\right)^2} \quad (9)$$

where x and y are the means or medians, and s_x and s_y are their associated standard errors. Formula (9) assumes that the means or medians are not correlated. If the correlation between

Table C-10. Standard Errors of Median Net Worth and Income, by Type of Household and Age of Householder

(Excludes group quarters)

Type of household	Median net worth		
	Median monthly household income	Total	Excluding equity in own home
Married-couple households	\$ 20	\$ 1,072	\$321
Spouse—			
Less than 35 years	30	762	179
35 to 54 years	34	1,563	752
55 to 64 years	54	3,084	1,907
65 and over	34	3,270	2,749
Female householders	16	998	159
Less than 35 years	39	169	108
35 to 54 years	44	1,346	301
55 to 64 years	49	2,721	1,130
65 and over	22	2,365	835
Male householders	34	825	286
Less than 35 years	52	331	194
35 to 54 years	77	2,238	895
55 to 64 years	110	4,247	2,144
65 and over	38	3,969	2,309

the two means or medians is actually positive (negative), then this procedure will provide an overestimate (underestimate) of the standard error for the ratio of means and medians.

Table C-11. Standard Errors of Median Net Worth, by Pension Plan Coverage of Employed Householders and Monthly Household Income

(Householders 25 years and over. Excludes group quarters)

Monthly household income			Employer has a plan						
			Total	Employer does not have plan	Total	Not covered by plan	Covered by plan		
							Total	Not vested	Vested
All households:									
Median income	\$20	\$35	\$23	\$54	\$26	\$43	\$30		
Median net worth	807	1,246	923	1,637	1,012	1,316	1,417		
Net worth by income of—									
Less than \$900:									
Median net worth	287	472	560	423	961	1,501	1,533		
\$900 to \$1,999:									
Median net worth	626	1,257	890	1,739	1,210	1,194	1,957		
\$2,000 to \$3,999:									
Median net worth	1,063	2,674	1,208	4,360	1,316	1,361	1,738		
\$4,000 or more:									
Median net worth	3,565	11,639	3,886	10,230	3,980	5,493	7,620		