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MEASURING WEALTH WITH SURVEY DATA: AN EVALUATION OF THE 1983 SURVEY OF CONSUMER FINANCES

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Because wealth estimates from survey data have usually fallen substantially short of independent aggregate estimates, survey data have not been seen as adequate for assessing questions dependent on a good representation of the entire distribution of wealth, such as estimates of wealth concentration. The 1983 Survey of Consumer Finances (SCF), which contains a supplementary sample of very high income households drawn from a tax-file sample frame, is the first U.S. survey since the 1963 Survey of Financial Characteristics of Consumers that offers hope of accurately measuring the entire wealth distribution. In this paper, we discuss the design of the survey, the critical issue of proper weighting to merge the supplementary sample with an area probability sample, and the role of imputation. We show that the use of ordinary area probability samples alone leads to probable bias in the measurement of highly concentrated assets such as stocks and bonds. We compare the SCF data with aggregates derived from the flow-of-funds accounts of the Federal Reserve Board. While methodological issues cloud exact comparisons, it appears overall that the SCF estimates are at least as credible as other aggregate measurements. Finally, we use the data to assess the change in concentration of wealth from 1963 to 1983. We estimate that the concentration of wealth in terms of households did not change significantly over this period.

I. INTRODUCTION

Historically, household wealth estimates based on consumer survey data have been substantially lower than independent, institution-based, estimates. This relative understatement of wealth in consumer surveys has been attributed mainly to an undersampling of wealthy households, which are believed to hold highly disproportionate shares of many types of assets. As a consequence, population estimates of statistics such as means and Lorenz curves from ordinary cross-section data may be biased. Some would argue that such consumer survey data on wealth are appropriate only for estimation of statistics such as medians and size distributions, which are less dependent on complete distributions of population characteristics.

The 1983 Survey of Consumer Finances provides the best opportunity since the 1963 Survey of Financial Characteristics of Consumers (Projector and Weiss, 1966) for studying the composition and distribution of household wealth. As part of the 1983 survey, a special sample of high-income households was obtained from Federal income tax files. This sample oversamples the number of households

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in the top half-percent of the income distribution at a rate fifteen times greater than a simple random cross-section of households. Preliminary evidence (Avery and Elliehausen 1986) indicates that inclusion of the high-income sample, appropriately weighted, significantly reduces differences between survey-based and flow-of-funds account estimates of some wealth aggregates. This suggests that, unlike most other consumer surveys, data from the 1983 survey may generate adequately representative dollar distributions of household wealth.

This paper assesses the accuracy of household wealth estimates from the 1983 Survey of Consumer Finances and investigates the adequacy of the data for measuring the composition and distribution of household wealth. The paper is organized as follows: In section II we briefly describe the design of the 1983 survey and discuss its comparability with other sources of data on household wealth. In section III we present a detailed reconciliation of survey results with estimates from the household sector of the flow-of-funds accounts. Specific issues related to measurement of the concentration of wealth are explored in section IV. As part of this examination, estimates of the size and shape of the extreme upper tail of the wealth distribution derived from the 1983 survey are compared with estimates derived from Federal estate tax returns. Throughout the paper, comparisons are also made with the 1963 Survey of Financial Characteristics of Consumers. In section V we provide a summary and conclusions.

II. The 1983 Survey of Consumer Finances

A. *Survey Design*

In the 1983 Survey of Consumer Finances (SCF), conducted by the Survey Research Center (SRC) of the University of Michigan, detailed information on the assets and liabilities of a sample of U.S. households was collected.[1,2] Within each household the "economically dominant" (primary) family (or individual) was interviewed.[3] Interviewing for the survey was done in person between the months of February and August of 1983. The survey sample consists of a nationally representative area probability cross-section sample and a supplementary representative high-income sample drawn from Federal tax files.

Standard SRC area probability methods were used to draw the cross-section sample. A total of 5,396 households were selected for this sample, of whom 3,824 (71 percent) participated in the survey.[4] The supplemental high-income sample

[1]A more detailed description of the survey can be found in Avery *et al.* (1984a, 1984b), and Avery and Elliehausen (1986, 1987).

[2]In order to have a broad picture of household assets, extensive data were obtained on pension and social security entitlements. In addition, a separate survey was also conducted with the employers of approximately 75 percent of those households reporting pension benefits to assess the value of private pensions (see Curtin, 1986). A follow-up survey of most respondents was also conducted in the summer of 1986 and is currently being processed.

[3]This definition of family differs from that of the Census Bureau, which excludes single individuals. Because some persons within a household—those not related to the primary family—were not interviewed by the SRC, wealth figures will understate the U.S. household total. We estimate, however, that the understatement is only about 0.4 percent. Because the number of primary families and households is the same, we use the terms interchangeably in this paper.

[4]Observations selected for the 1983 SCF were drawn from 75 primary sampling units in 37 states and the District of Columbia. For a further discussion of the SRC sampling procedures, see Kish (1965), Lansing and Morgan (1971), and Hess (1985).

was drawn from a large sample of 1980 Federal tax returns by the Statistics of Income Division (SOI) of the Internal Revenue Service (IRS). Using multifaceted sampling criteria, the SOI selected about 5,000 returns of high-income taxpayers who resided in the sampling areas of the cross-section sample and were estimated to have large amounts of wealth.[5] The Comptroller of the Currency sent letters to the individuals in the high-income sample requesting participation in the survey. Names and addresses of individuals that agreed to participate were forwarded to the SRC. Of the 459 households of the group that agreed to participate, 438 households ultimately completed interviews.[6]

The same questionnaire was used to interview respondents in both the cross-section and high-income samples, and field interviewers were not told which households were part of the high-income sample. The average length of an interview was 74 minutes in the cross-section and 87 minutes in the high-income sample.

Because observations for the 1983 SCF were drawn from two different sampling frames, construction of appropriate sample weights is a particularly important issue. Relative weights for the cross-section sample were constructed to compensate for differential non-response rates across the survey's 75 primary sampling units. Those weights were further post-stratified by region and degree of urbanization to reflect population estimates from the March 1983 Current Population Survey (CPS).

Construction of weights for the full 1983 sample, including both the cross-section and high-income sub-samples, posed a more difficult problem. Full information on the high-income sampling procedure is not available. Moreover, the information collected from survey respondents is not sufficient to construct a fully accurate measure of the income concepts that the IRS is likely to have used in drawing the sample. Additional complications stem from the fact that the high-income observations were drawn from a 1980 sampling frame (but reported data as of 1983) and the fact that the reporting basis for tax files (individuals or married couples) is not always the same as the survey (families).

Faced with these problems, it was decided to construct sampling weights for the high-income sample (and cross-section observations with income above a certain level) using a post-stratification scheme based on control totals for an "extended" income measure constructed from the 1982 Tax Model File (TMF) of the IRS. The TMF is a stratified sample of 88,218 individual tax returns with a significant over-sampling of high incomes (see Strudler, 1983). This income measure, which was constructed for all survey households using reported 1982 income data, is roughly comparable to the IRS measure of adjusted gross income plus excluded realized capital gains. Despite the fairly detailed income questions in the SCF, it is clear that the survey measure of business income almost surely overstates the TMF measure. It appears likely that survey respondents often

[5]For a general description of the sample from which the survey sample was drawn, see Internal Revenue Service (1984). Unfortunately, because of legal restrictions, knowledge of the exact sampling procedure is restricted to employees of the IRS. The drawn sample appears to roughly coincide with individuals with an "extended" income of $100,000 or more in 1980.

[6]Under these procedures, the IRS never knew the names of the final respondents. The SRC did not know the names of high-income individuals who were not willing to participate in the survey, nor did they have access to tax data for survey participants.

report something much closer to a cash-flow concept of income rather than income method of expenses and depreciation. Unfortunately, there is not sufficient information in either the SCF or the TMF to make a precise compensating adjustment. A gross adjustment for the aggregate difference between the survey and TMF business income totals was made in constructing the survey measure of extended income. However, the potential for distortion at the individual level remains, with weights for households with business income particularly suspect.[7]

Post-stratification cells were defined by the seven categories of extended income shown in Table 1. For each of the top six income cells (above $80,000),

TABLE 1

WEIGHTING CONTROL TOTALS

Household Extended income (dollars)	Number of Cross-section Cases	Number of High-income Cases	TMF Control Totals of Households	Average Weight Assigned
Under $80,000	3,579	49	82,364,760	22,703
$80,000-89,999	22	11	356,324	10,798
$90,000-99,999	13	16	250,746	8,646
$100,000-124,999	23	40	362,022	5,746
$125,000-199,999	16	92	356,386	3,300
$200,000-499,999	11	148	182,424	1,147
$500,000 and over	1	82	45,338	546
All cases	3,665	438	83,918,000	20,453

equal weights were determined so that the weighted number of survey observations equaled the TMF totals. The original weights of the cross-section observations with income below $80,000 were adjusted so that the weighted number of SCF households equaled the population estimated from the CPS. High-income sample observations with income below $80,000 were arbitrarily assigned the same weight as observations in the $80,000 to $90,000 group.[8]

B. *Non-response and Imputation of Missing Data*

In any household survey, some responses to survey questions will be missing due to respondents' lack of knowledge or unwillingness to answer. In keeping with most comparable surveys, extensive steps were undertaken to impute missing data for the SCF. The size and complexity of the SCF made imputation difficult. The sample was too small to impute missing values with "hot deck" or matching techniques used by the Census Bureau. On the other hand, the comprehensiveness

[7]Because the reporting units in the survey and the TMF differ, we adjusted the TMF data in order to estimate income on a family basis. Married couples filing separately were "aggregated" into households by assuming that separate filers were all married to people with the same income (weights for such observations were halved). The final weight is only slightly affected by variations in this adjustment.

[8]The SRC also constructed weights using a mesh based on unadjusted income and a relative weight constructed by the IRS. This weight has been used for most work on the SCF reported to date. Aggregate wealth estimates constructed using the SRC weight are about 5.0 percent higher than those estimated in this paper. Aggregate income estimates are 3.6 percent higher.

of the questionnaire offered opportunities for inference not found with shorter surveys. Consequently, a number of different methods for imputation were employed.

Three basic methods were used to impute missing data.[9] The first method computed missing values by formulas based on respondent information that was closely related to the missing items.[10] The second method, used primarily to impute missing values for variables with discrete values, assigned missing values on the basis of random draws from conditional frequency distributions. The third method, used to estimate most missing dollar amounts, estimated missing values by regression. Missing values were assigned the value predicted by the regression plus a random disturbance term, which was generally assumed to be a truncated log-normal variable with the same variance as the residual term of the regression. Income and asset regression imputations were done simultaneously, using an iterative technique in order to preserve second moments.[11]

The cross-section and high-income samples were handled separately. Missing values for all observations in the high-income sample were imputed. In the cross-section sample, however, 159 of the original 3,824 cross-section observations were discarded because virtually all dollar amounts for income and assets were missing.[12] All missing values for the remaining observations were imputed.

C. *Comparability with Other Survey Data*

The 1983 SCF is the most recent survey in a series of wealth surveys conducted by the SRC. Surveys of Consumer Finances were conducted annually from 1946 to 1970 and again in 1977. The same basic methods were used in all these surveys. Nationally representative samples of households were selected, with the family being the unit of analysis. Minor changes in sampling and interviewing procedures, however, were introduced from time to time to improve survey results.

The Survey of Financial Characteristics of Consumers (SFCC) was a wealth survey conducted for the Federal Reserve Board in 1963 (Projector and Weiss, 1966). Methodological work for this survey was conducted by the SRC, and interviewing was performed by the Bureau of the Census. Like the 1983 SCF, the 1963 SFCC collected a more detailed inventory of assets and liabilities than is customary in other consumer surveys. The 1963 survey also used Federal tax information to oversample high-income households. For the 1963 survey, a sample of housing units stratified by income reported in the 1960 Decennial Census was

[9]For a complete description of imputation methods see Avery and Elliehausen (1987).

[10]For example, missing earned income could be imputed from reported wage rates, hours worked, and work history. Asset income could be inferred using average rates of return if asset values were given. Similarity, asset values could be estimated from reported asset income. Length of unemployment coupled with the appropriate state benefit formula could be used to impute unemployment income; and work history and Social Security benefit formulas could be used to impute Social Security income.

[11]Wolff and Marley (1987) used different imputation procedures in conducting an evaluation of the SCF similar to the one in this paper. Their wealth and income estimates were somewhat lower than ours, suggesting that some conclusions are not robust to the imputation process used.

[12]The determination to discard certain observations was made strictly from rules based on the percentage of information missing. The area probability and full sample weights were adjusted using a probit function to predict sample inclusion on the basis of demographic and ownership information (which was given for virtually all observations).

selected to represent households with incomes below $50,000. Households with incomes of $50,000 or more were selected from a sample of 1960 Federal income tax returns. Although this sample selection procedure is not exactly the same as that used for the 1983 survey, it produced a heavy over-sampling of households in the upper end of the income distribution, making the 1963 sample the only household survey sample that is comparable to the full sample from the 1983 SCF. Direct comparisons between the 1983 SCF and the SFCC are presented in the next two sections.

The Survey of Income and Program Participation (SIPP) also provides information on the composition of household wealth (U.S. Bureau of the Census, 1986). The initial panel was a random cross-section of about 21,000 households selected by procedures similar to those used to select the cross-section sample for the 1983 SCF. Net worth information was collected between September and December 1984.[13] Aggregate wealth estimates from the earlier Surveys of Consumer Finances and SIPP are generally comparable to those from the cross-section sample of the 1983 SCF in their understatement of aggregate wealth relative estimates from independent sources. Using comparably defined categories, we estimate an aggregate net worth for the SCF cross-section of $8,293 billion versus a $7,740 billion total for the SIPP sample.[14] The difference derives primarily from a smaller estimate of small business assets in the SIPP. The full sample SCF estimate of the same net wealth concept is $9,615 billion. Thus, it appears that the major difference between the two surveys arises from the inclusion of the high-income sample in the SCF.

The annual March Current Population Survey is perhaps the most comprehensive U.S. household economic survey, soliciting economic information from approximately 59,000 households (U.S. Bureau of the Census, 1984). The CPS does not collect wealth data comparable to the SCF. However, detailed household money income, by source, is available from both the CPS and SCF. A comparison of 1982 U.S. household totals for a number of income categories measured by both the SCF and the March 1983 CPS is displayed in Table 2. The CPS totals are adjusted to exclude income for secondary families and unrelated individuals, who would not have been included in the SCF. We also show a comparison of the SCF income data with aggregate 1982 household income compiled by the IRS from tax return data (Epstein, 1984). A selection of cases was made from the SCF to represent the population of households that would normally file tax returns. Non-taxable income was deleted for these calculations. 1962 IRS data (Paris and Hilgert, 1984) and aggregate 1962 household income compiled from the SFCC are also given in Table 2.

The 1983 SCF overstates comparable CPS income by about 10 percent. Most of this overstatement stems from business income and income from dividends, trusts, and real estate. Interestingly, in a comparison of data with an "independent

[13]McNeil and Lamas (1987) provide a brief comparison of SIPP estimates of aggregate wealth totals with the Federal Reserve Board flow-of-funds (FOF) figures. Wealth were also gathered for SIPP respondents in 1985.

[14]See Curtin, Juster, and Morgan (1987) for a comprehensive comparison of SIPP and SCF wealth estimates. They also compare both surveys with estimates constructed from a supplemental wealth survey conducted with respondents to the Panel Study of Income Dynamics in 1984.

TABLE 2

SURVEY INCOME COMPARISONS

(CURRENT $S)

	1982 Income 1983 SCF ($B)	1982 Income C.P.S. ($B)	1982 Income 1983 SCF Taxable Income ($B)	1982 Income I.R.S. Data ($B)	1962 Income 1963 SFCC ($B)	1962 Income I.R.S. Data ($B)
Salaries and Wages	1,398.1	1,443.5	1,390.6	1,564.6	277.3	283.4
Business or Farm Income	292.8	110.5	291.9	53.7	41.9	33.3
Taxable Interest Income	98.4	95.1	95.5	157.2	6.4	7.2
Dividend Income	—	—	47.0	54.2	6.7	10.6
Net Gains From Stocks	—	—	50.9	24.3	5.4	5.8
Rental or Trust Income	—	—	55.0	−2.1	8.8	—
Dividends/Trust/Rental Total	103.5	47.3	—	—	—	—
Welfare or Public Assistance	23.3	17.4	—	—	—	—
Unemployment or Workmans Comp	20.7	32.8	—	—	—	—
Alimony or Child Support	35.6	21.4	—	—	—	—
Retirement Income	194.7	204.3	98.4	59.9	19.7	—
Category Totals	2,167.1	1,972.3	2,029.2	1,911.8	366.2	340.3

source" in 1983, the Census Bureau concluded that CPS data "underreported by about 10 percent" (U.S. Bureau of the Census, 1985, p. 218). The SCF also overstates IRS household income by about 6 percent. However, much of the discrepancy can be explained by failure to find significant business, rental, and security losses in the SCF's data. As noted earlier, this may stem from households earning real economic profits, but accruing tax losses on investments. The 1963 SFCC household data matched up much more closely with IRS data.

III. A Comparison of Flow-of-Funds and SCF Aggregates

This section compares the aggregates of various components of wealth implied by the 1963 SFCC and the 1983 SCF with estimates of the Flow-of-Funds (FOF) Section of the Federal Reserve Board. The FOF accounts are widely regarded as a reliable source of aggregate data on the composition of national wealth and its allocation across sectors of the economy. In principle, FOF figures are intended to describe the replacement value of tangible assets and the market values of financial assets held within the United States.[15] The data used to calculate the FOF accounts are taken from numerous sources, none of which were specifically designed for that purpose. These sometimes inconsistent data are combined in a series of complex calculations to produce an integrated set of accounts for the entire economy. For this reason, the FOF figures, as well as survey estimates, are best interpreted as point estimates of widely varying precision.[16]

In Table 3 we present estimates of household wealth calculated from FOF and survey data for 1963 and 1983. All values in the table are given in current dollars. Because the 1963 SFCC and 1983 SCF used in these calculations were conducted early in 1963 and 1983, respectively, we have chosen to compare the survey aggregates with the end-of-year FOF figures for the previous years.[17] Because the FOF concepts sometimes differ from the taxonomy used elsewhere in this paper, the survey variables were combined to correspond as closely as possible to FOF measures. The specific content of each line item is discussed in detail below and in the notes to the table.

The survey estimates given are weighted sums of the various asset types using the appropriate statistical sampling weights. Also listed is an estimate of the standard error due to sampling for the survey-based numbers. These figures were computed by calculating the sampling variance of each item within each sampling unit (e.g. the PSU's for 1983 cross-sectional observations) and computing a weighted sum for the overall variance.

[15]In practice, many of these calculations for the U.S. household sector are contaminated by data for Puerto Rico and U.S. territories. This is particularly true of stocks, bonds, and banking data. Indirectly, items derived from Balance of Payments and unified Federal budget data flows are also affected.

[16]For more detailed discussion of the construction of the FOF accounts, see Board of Governors of the Federal Reserve System (1971) and Wilson *et al.* (1987).

[17]The 1963 SFCC data used in this paper are taken from the edited data set used by Projector and Weiss (1968) with minor changes. Additional imputations were made in valuing business assets and the cash value of life insurance.

For the 1983 SCF, figures are given for both the full sample and the cross-section sample alone in order to illustrate the importance of the high-income supplement. Note that the addition of the high-income sample substantially increases many of the survey totals, particularly those asset types widely believed to be highly concentrated, such as stocks and bonds. Somewhat surprisingly, however, inclusion of the high-income sample actually decreases the estimate of aggregate non-corporate business equity.

Two types of FOF estimates are given for each year. The first is the official estimate of wealth of the household sector, which includes "real" households as well as charitable and other non-profit organizations, personal trusts, and estates. The second is an estimate of the holdings of real households alone, based on calculations made by Frederick Yohn and others in the FOF Section of the Federal Reserve Board using special tabulations provided by the IRS.[18] The 1982 figures represent the benchmark year calculations. Unfortunately, there were not sufficient data to extend the real household series before 1975 directly. The assumption adopted to make the separation of sectoral holdings in 1962 is that the proportion of sectoral assets held by real households in 1962 is the same as it was in 1975. As is evident from the table, there is a substantial difference between the two estimates of some categories. Except where noted, all further comparisons made in this section refer to the real household figures for the FOF and, for the 1983 comparisons, to the full sample for the 1983 SCF.

Netting all the asset and debt types shown in Table 3, the 1963 SFCC captures 75.0 percent, the 1983 SCF cross-section sample 100.1 percent, and the 1983 SCF full sample 110.5 percent of the FOF value for real households. However, there is great variation in correspondence over asset classes, some of which is the result of a degree of mismatch in definitions.

A. *Assets*

While the SFCC measure of currency and checkable deposits is only 35 percent of the FOF measure in 1963, the SCF is 89 percent of the FOF in 1983. However, differences in the construction of survey and FOF measures and in the concepts they are intended to measure are sufficiently large that a meaningful comparison may not be possible. Because currency and checkable deposits are the usual media for the transfer of wealth from one asset type to another, they reflect the volatility of all other assets. For this reason, timing differences in measurement may cause large distortions in comparisons of the two measures. In addition, there are at least four other important sources of discrepancy between the FOF and survey measures.

First, none of the survey figures include currency. However, by construction, the FOF implicitly attributes to households the entire stock of outstanding U.S. currency except that held by firms. Thus, to make a comparison with the survey data, it is necessary to subtract all non-business currency from the FOF figures. While there were no data on household holdings of currency solicited by either

[18]Ruggles and Ruggles (1982) construct measures of most of the same household wealth categories using adjustments to the FOF data and data from other sources. Unfortunately, their published data end in 1980. Their estimates are very similar to the estimates of real households reported here for 1962.

TABLE 3

COMPARISON OF IMPLIED 1963 SFCC AND 1983 SCF AGGREGATES WITH FLOW OF FUNDS ESTIMATES OF COMPONENTS OF HOUSEHOLD WEALTH, (BILLIONS OF CURRENT DOLLARS)

	1963 SFCC		1962 Flow of Funds		1983 SCF Full Sample		1983 SCF Cross-Section Sample		1982 Flow of Funds	
	Sum ($B)	Std. Err. ($B)	HH Sector ($B)	Real HH ($B)	Sum ($B)	Std. Err. ($B)	Sum ($B)	Std. Err. ($B)	HH Sector ($B)	Real HH ($B)
Asset Totals	1,249.5	41.7	1,686.5	1,671.5	9,196.9	362.2	8,414.5	644.8	9,223.1	8,567.5
Currency and Checkable Deposits	23.7	1.6	71.4	68.6	270.4	18.2	253.3	16.7	322.6	304.6
Savings Accounts	104.8	5.9	208.3	207.3	637.2	32.0	647.6	34.9	1,461.0	1,321.3
MMMF Shares	—	—	—	—	125.3	12.9	73.9	8.9	206.6	206.6
Savings Bonds	26.6	2.6	47.0	47.0	27.3	3.0	26.3	2.8	68.3	66.8
Other Federal Obligations	6.7	2.6	28.6	19.1	115.0	25.1	84.1	17.7	292.1	238.3
State and Local Obligations	12.7	2.6	31.5	22.4	204.6	40.9	96.8	34.1	123.9	89.0
Corporate and Foreign Bonds	5.9	1.4	9.5	5.2	47.4	10.7	44.0	11.9	54.8	—
Mortgage Assets	23.5	4.5	38.8	29.6	211.4	21.8	172.1	19.8	144.8	103.4
Corporate Stock	197.1	21.9	416.2	349.9	931.4	175.0	548.3	119.9	1,175.7	968.2
Mutual Funds	24.9	5.7	21.3	16.1	128.1	19.3	107.1	22.4	90.0	76.0
Insurance Reserves	60.6	2.5	92.4	92.4	368.8	20.3	321.6	17.7	232.8	232.8
Owner-Occupied Real Estate	474.0	11.7	403.8	403.8	4,276.4	109.2	4,109.7	118.7	2,703.4	2,703.4
Non-Corporate Businesses	289.1	21.3	410.1	410.1	1,852.8	221.2	1,929.6	547.4	2,347.1	2,347.1
Debt Totals	190.3	6.5	268.5	259.8	1,276.2	48.0	1,233.7	41.4	1,581.1	1,400.0
Home Mortgages	146.5	5.8	163.7	163.7	995.4	34.2	975.1	35.5	1,064.6	1,064.6
Instalment Credit	27.7	1.2	51.0	51.0	224.9	18.0	220.2	11.1	335.0	261.4*
Other Debt	16.1	2.0	53.8	45.1	56.2	18.4	38.4	8.2	181.5	73.9
IRA'S/Keoghs at Banks/S&L	—	—	—	—	55.8	6.8	36.7	4.0	51.0	51.0

Note: Adjusted data (see table 4).

Currency and Checkable Deposits: All accounts with banks, thrifts or credit unions with check-writing privileges. The 1983 SCF figure includes all Money Market Deposit Accounts (MMDA's).

Savings Accounts: All non-checkable deposits at banks, thrifts and credit unions, including small and large time deposits, Certificates of Deposit (CD's), and Individual Retirement Account (IRA) and Keoghs at depository institutions (except MMDA accounts).

MMMF Shares: All Money Market Mutual Fund accounts (MMMF's) held outside of banks, thrifts and credit unions. In 1983 this includes broker call accounts and IRA's and Keogh's at brokerages.

Savings Bonds: Face value of all U.S. Government Savings Bonds.

Other Federal Obligations: All other U.S. Government notes, bills and bonds valued at face.

State and Local Obligations: All bills, notes and bonds of state and local governments valued at face.

Corporate and Foreign Bonds: All other bonds valued at face.

Mortgage Assets: Outstanding principal on all mortgage assets, including land contracts, notes, and business notes owed to households.

Corporate Stock: Market value of all publicly traded stocks and amount in investment clubs.

Mutual Funds: Market value of all holdings of mutual funds.

Insurance Reserves: Cash value of whole life insurance policies and IRA's held with insurance companies.

Owner-Occupied Real Estate: Market value of principal and secondary residences and other small residential properties.

Non-Corporate Businesses: Market value of equity share of all non-farm sole-proprietorships and partnerships. For the 1963 SFCC this variable also includes the net equity in investment real estate and the value of all farm businesses. For the 1983 SCF this variable includes net equity in apartment buildings, raw land, farms and non-corporate farm businesses.

Home Mortgages: Principal outstanding on mortgages against all properties reported above as "Owner-Occupied Real Estate" except those owed to individuals.

Installment Credit: The outstanding principal on all consumer debts on which regular payments are due excluding mortgages and debts owed to individuals.

Other Debt: The outstanding principal on all other household loans except mortgages or that owed to individuals.

IRA's and Keogh's: The value of all IRA- and Keogh-type accounts. Note that this value is also included in various other asset categories above.

of the surveys discussed here, there is independent survey evidence which suggests that only about 12 percent of the aggregate stock of currency can be accounted for by reported holdings of households (see Avery *et al.*, 1986, 1987). There is no direct measure of business holdings of currency; however, if we assume that firms hold as much currency as households, this implies an adjusted FOF real household measure of checkable deposits excluding currency of $43.5 billion in 1962 and $190.5 billion in 1982. Given this adjustment, the survey figure for 1963 is still only half of the FOF figure while the 1983 survey figure actually overstates the FOF figure by 42 percent.

Second, the introduction of money market deposit accounts (MMDA's) in late 1982 complicates the comparison for that year. MMDA's had only been legally in existence for two weeks when the FOF figures were measured, but had grown rapidly in use by the time the survey was conducted. Reflecting this growth, MMDA accounts totaling $151.0 billion are included in the full-sample SCF estimates as checkable deposits, while the FOF aggregate stock held by all sectors was only $43.2 billion at the end of 1982. Since much of this growth involved shifts from savings accounts, it is likely that the mismatch of checkable deposits is probably understated and the mismatch of savings accounts is overstated.[19]

Third, the difference between the survey and FOF measurements of checking account balances may be distorted by check float. Aggregate checking account measurements are determined by the balance sheets of banks. This means that checks that have been deposited but not yet been debited from the checkwriter's account, are in effect counted twice. If survey respondents report the amount in their checkbook register—subtracting checks written but not yet debited—it will differ from the amount shown by their bank for their account. The difference in these measures can be large. Measured float within the banking system (cash items in the process of collection) is typically about one-fourth of total checking account balances. Because this figure does not include "mail float"—checks written but not deposited in a bank—the true double counting is larger. Since even the approximate size of mail float is unknown, it is not possible to determine how much of the difference in survey and FOF checking account measures should be attributed to it. However, any such adjustment we might make would increase the survey measure (or decrease the aggregate) and, very likely, by a sizable amount.

A final problem in comparison of the FOF and survey measures of checkable deposits stems from the way that the FOF household accounts are constructed. In the FOF, household holdings are computed as a residual from the aggregate stock of currency and checkable deposits, given the combined holdings of currency and checkable deposits held by other sectors as determined from banking statistics and financial statements of firms. Because very little data exist on the cash holdings of closely-held corporations, there is a strong reason to suspect that the household residual is overstated and is likely to include some business accounts. Because the FOF measure of savings accounts is also computed as a residual, the com-

[19]A direct comparison can be made of estimates of checking accounts alone. Using data from a periodic Federal Reserve Board survey of account ownership, we estimate that banks and savings and loans had approximately $166.6 billion in consumer checking accounts as of March 1983. The SCF estimate for consumer checking accounts is $119.4 billion.

parison of survey and FOF measures of these accounts, which differ by a factor of 100 percent in both 1963 and 1983, is similarly clouded. Note, as well, the comparison of savings account measures for 1983 is further complicated by the timing problems induced by the introduction of MMDA's, as discussed above. Earlier studies have suggested that surveys tend to understate savings accounts in general.[20]

For the remaining financial assets, only corporate stocks are within 10 percent of the FOF figures. However, there are important conceptual differences in the quantities measured and in how assets are allocated among categories. For example, the distinction between mutual funds and money market mutual fund shares (MMMF's) may have been drawn differently by respondents and the FOF. Note that the sum of the two categories matches much more closely than the individual items. Similarly, it appears that the total value of bonds matches the FOF figures much more closely than the individual components do, suggesting that survey respondents may not know the precise type of bonds they own. Moreover, while bond values for both sources are intended to measure book or face values, it is likely that some of the survey data reflect market values. Note, as well, that bond holdings of households are computed as a residual of the known stock of bonds issued less retirements and amounts held by other sectors, as determined from balance sheet data. This residual is likely to be even noisier than is the case for savings accounts and currency and checkable deposits, since the aggregate holdings of all sectors are not as precisely measured. While the issuance of bonds is a clear matter of record, the retirements are substantially less well documented.

Measurement of life insurance is more seriously affected by conceptual mismatches in the survey and FOF data. While the surveys measure the cash value of life insurance and individual retirement accounts (IRAs) at insurance companies, the FOF measures insurance reserves.

In principle, the FOF measure of corporate equities includes all corporate equities. However, in practice, only publicly traded equities are captured in the data used to construct this figure. Almost all holdings of small, closely-held corporations, except those allocated to other categories such as real estate, are missed. Thus, for comparability, the survey figures constructed here also specifically exclude closely-held corporate stock (totaling 97.7 and 891.0 billion dollars in 1963 and 1983, respectively). The adjusted corporate equity figures reported in Table 3 match very closely in 1983.

In the case of real estate, the survey and FOF measures have serious conceptual differences. The FOF accounts derive the value of residential land from assessed values in the Census of Governments and the value of structures cumulated as a perpetual inventory, using valuation methods that attempt to measure reproduction costs. Because of limitations in these primary data, it is not possible to distinguish between principal residences, secondary residences,

[20]Findings of validation studies suggest that consumer reports of savings account holdings understate actual balances substantially. This understatement resulted primarily from failure to report account ownership rather than from inaccurate responses. In contrast, consumer reports of checking account balances appeared to be reasonably accurate. See Ferber (1965, 1966a, 1966b), Ferber *et al.* (1969), Mandell and Lundsten (1978), and Maynes (1965). Although most of these studies are over 20 years old, the findings are probably still valid today.

or other types of rental properties in the FOF accounts. The closest feasible survey measure is the reported market value of principal and secondary residences and, in the case of the 1983 SCF, some other relatively small amounts of properties. While the survey figure overstated the FOF amount by only about 17 percent in 1963, the overstatement is over 50 percent in 1983. Because the procedures used to determine the replacement value of structures appear to be plausible, our strong suspicion is that the major difference is made by the use of assessed values of land. The rise of such initiatives as Propositions 13 and $2\frac{1}{2}$ over the last decade very likely cause serious distortions in the computation of land values in the FOF accounts on the basis of assessed valuation.

Perhaps a more meaningful comparison to the survey figures on owner-occupied housing might be the data on the market value of housing gathered by the Census Bureau in the 20 percent sample of the Decennial Census, though this figure, like those reported from the surveys examined here, also may suffer from problems of self-valuation by households. Unfortunately, only the median value of owner-occupied housing is available from the Census in published form. According to their figures, the median U.S. owner-occupied house rose in value 397 percent from 1960 to 1980. This compares to the 429 percent rise in the median value of household principal residences, as measured by the 1963 and 1983 surveys.

As another check on the survey respondents' valuation of housing, we compared the appreciation rates implied by their current valuation and reported home purchase price with the changes in regional housing price indices. The mean survey and index appreciation rates were virtually identical (the mean ratio of appreciation rates was 1.01, which was not significantly different from unity), although older homeowners tended to underestimate appreciation and newer homeowners to overestimate. The fact that the outstanding stock of household mortgages corresponding to the constructed survey measure of owner-occupied real estate is within 10 percent of the aggregate FOF measure in both 1963 and 1983 gives us additional confidence in the survey figure.[21]

The valuation of non-corporate farms, sole-proprietorships, and partnerships is, perhaps, the most complicated measurement problem of all. Across any of the types of national accounts, this is the category that is least well understood. It is particularly important to note that in both surveys, an attempt was made to separate those assets owned by families for business purposes from other family assets. However, it is clear that the finances of many such organizations are co-mingled with those of their owners, and respondents may have differed in how they drew lines between them. Moreover, it is similarly unclear what is an appropriate valuation method for businesses in which a large element of the reported valuation may derive from something very close to the human capital of its owners.[22] In the FOF accounts, this item is estimated as a perpetual inventory

[21]Validation studies comparing owners' estimates of house values and professional appraisals provide further support for survey estimates. These studies indicate that while errors are quite large for individual properties, the errors there are largely offsetting in reasonably large samples. See Kish and Lansing (1954) and Kain and Quigley (1972).

[22]We estimate that almost 74 percent of the non-corporate farms, sole-proprietorships, and partnerships reported in the 1983 SCF were the principal place of employment for at least one household member.

of the residual necessary to create a balance of flows in the non-corporate sector. While this seems a reasonable approach, given the paucity of other data, it is also subject to substantial potential errors of measurement. The corresponding survey measures are constructed from the reported market values of all non-corporate businesses and, in the case of 1963, all farm businesses, as well. The survey figures for 1963 and 1983 are about 11 and 21 percent below the FOF calculations, respectively.[23] Given the usual suspicion of overvaluation of small businesses in survey data, this is rather surprisingly close agreement.[24] However, this area needs intensive methodological work before we can hope to develop a sufficient framework for future scientific measurement.

Survey and FOF figures for trusts are not given in the table. Trusts, which are treated in the FOF accounts as a subsector of the household sector, were estimated by the FOF accounts to be $238.7 billion at the end of 1982. The 1983 SCF measure, which is contaminated by managed investment accounts, is $309.4 billion. In addition to the managed investment accounts, the survey figure very likely also includes informal trusts. Comparable figures for 1963 are $54.3 billion for the SFCC and $47.1 billion for the FOF accounts, using an estimation procedure comparable to that used for the real household figures given in Table 3. Because, in the case of the 1983 data, nothing is known about the composition of the holdings of these accounts, it is not possible to allocate "excess" holdings across other categories.

B. *Debts*

Most debts for the household sector are directly measured by FOF from financial institution data and should, therefore, be relatively reliable. Only the comparatively small part of the household debts not mediated through a financial or government institution is missed in the FOF accounting. Survey debt owed to other individuals was, therefore, excluded in computing the figures in Table 3.

The amount of mortgages outstanding measured by the surveys is 93 percent of the comparable FOF estimate. This is a number that it is very reasonable to suppose would be well measured in either framework. Institutions are able to separate mortgages owned by households from those owned by businesses, and most households appeared to be able to report mortgage terms accurately.[25]

Nonmortgage household debts in the FOF accounts consist of installment and non-installment consumer credit and other debts. Installment credit covers most credit scheduled to be repaid in two or more installments that is extended to individuals by financial institutions and retailers. Other credit consists of

[23]However, if closely-held corporate businesses are included in the survey measures, they overstate the 1983 FOF figures by 16.9 percent and understate the 1963 FOF figures by only 5.7 percent.

[24]The 1983 SCF totals for small business income overstate IRS estimates. The total 1982 non-farm sole-proprietorship income given by SCF respondents was $72.4 billion, compared to $53.1 billion reported by the IRS (Wolfe, 1984). However, survey estimates of gross receipts for the same firms, understates the IRS total of $433.7 billion by $66.3 billion.

[25]Estimates of mortgage debt could also be obtained by asking respondents to report dollar amounts of mortgage debt outstanding. Creditors issue statements of outstanding mortgage balances to borrowers for tax purposes, but it is not clear how accurately respondents would recall figures from these records. Limited evidence from validation studies (Broida, 1962 and Ferber, 1966) suggests that respondent reports of loan terms are reliable.

single-payment loans, charge accounts, and service credit owed to financial institutions and to a variety of establishments and professional practitioners, all other bank loans to individuals, loans from the U.S. government, and life insurance policy loans.[26] While the survey variables were constructed to correspond as closely as possible to the FOF measure, several adjustments to the FOF are required to make the figures comparable (see Table 4).

First, FOF figures contain an undetermined amount of personal borrowing for business purposes, but survey respondents were instructed to exclude such borrowing. Before 1978, personal borrowing for business purposes was subtracted from the FOF consumer credit statistics, but the basis for those adjustments was data collected during the 1950's. Lacking current data, we used the pre-1978 adjustments.[27]

A second adjustment was required to remove precomputed interest charges, the interest portion of future contracted installment debt payments, from closed-end installment credit estimates in the FOF. Finance companies typically include precomputed finance charges, and retailers are believed to include them in reported totals. Although commercial banks are instructed to report consumer credit holdings net of precomputed interest charges, a small amount of such interest may be reported. Thrift institutions, however, report only principal amounts outstanding. We estimated precomputed finance charges from the SCF assuming that all finance companies and retailers included precomputed charges in the reported figures and that all banks and thrift institutions did not.

Third, FOF estimates of the revolving component of installment credit include current charges as well as balances financed; SCF estimates include only the financed portion of revolving credit outstanding. While direct statistics are not available on the amount of revolving credit used as a substitute for cash and paid in full at the end of each month, according to one estimate (Bank for International Settlements, 1985, p. 262), about 37 percent of outstanding balances represent current charges that are repaid in full. More recent evidence (Avery *et al.*, 1987) suggests that the proportion representing current charges may have increased. In Table 4 we assume that 45 percent of outstanding balances are current charges.

Finally, items that were not included on the SCF were deducted from FOF statistics. "Bank loans n.e.c." is a catchall category which is not supposed to include consumer credit and therefore is likely to be mostly business and non-profit borrowing (we assume it all is). Retail charge accounts were not solicited in the survey and federal financing programs are largely channeled through non-profit institutions; thus both are excluded. With these adjustments, the SCF installment credit is 86 percent of the FOF estimate and the SCF other debt estimate is 79 percent of the FOF figure.

[26]See Board of Governors (1976, section 16; 1978 and 1980) for a more detailed description of these types of credit.

[27]Five percent of automobile debts, 10 percent of other installment debts, and 50 percent of single payment loans were estimated to be borrowed for business purposes.

TABLE 4

RECONCILIATION OF FLOW-OF-FUNDS AND SURVEY BASED ESTIMATES OF NON-MORTGAGE CREDIT

(BILLIONS OF DOLLARS)

Type of Debt	Published FOF[1]	Non-sampled Items	Current Charges	Pre-computed Finance Charges	Business Use	Adjusted FOF	1983 SCF[2]
Installment							
Automobile	126.2	—	—	9.0	6.3	110.9	108.3
Mobile Home	22.4	—	—	3.4	—	19.0	18.6
Revolving	69.6	—	31.3	0	—	38.3	34.4
Other	116.7	—	—	11.7	11.7	93.3	63.7
Other debt							
Single-payment	47.1	—	—	—	23.6	23.6	34.1
Retail charge and service credit	38.8	38.8	—	—	—	0	0
Bank loans n.e.c.	37.9	37.9	—	—	—	0	0
U.S. government	7.1	—	—	—	—	7.1	4.7
Life insurance policy loans	43.2	—	—	—	—	43.2	17.4
Federal finance programs	9.9	9.9	—	—	—	0	0
Total	519.0	86.6	31.3	24.1	41.6	335.4	281.1

[1]Total household sector

[2]Closed-end debt is distributed among categories according to terms and purposes supplied by respondents. Open-end debt, where such information was not given, was assumed to be installment debt and assigned to categories in the same proportion as closed-end installment debt.

IV. Wealth Concentration

A. *Concentration and Precision of Survey Estimates of Concentration*

One area of inquiry crucially dependent upon high-quality micro data is the examination of the concentration of wealth. Such study requires adequate representation from the entire wealth distribution. Comparisons based on data that failed to capture a significant proportion of household assets would be critically flawed. Moreover, comparisons across different surveys further require consistent treatment of sample designs and definitions of assets and liabilities. Thus, for example, it would probably be inappropriate to compare measures of concentration across previous Surveys of Consumer Finances, which did not oversample wealthy households. Because of the paucity of appropriate data, there have been very few studies of trends in wealth concentration in the U.S. in recent years. The comparability of the 1983 SCF and the 1963 SFCC, however, affords the potential to examine this issue in a more consistent manner. In this section, we examine this question and the related data quality issues.

In Tables 5 and 6 we present the distribution of household wealth as measured by the full 1983 SCF and the 1963 SFCC samples respectively. The data in these tables reflect the broadest possible definition of wealth possible with the survey data (the only significant omissions are pensions and non-auto durables). The share of wealth and various assets and liabilities held by four sub-groups is given for each sample: the top one-half percent of the distribution; the second one-half percent; the next nine percent; and the bottom 90 percent. The 1963 figures are given in 1983 dollars. Despite the twenty-year gap between them, there is a remarkable similarity in the distributions generated by the two surveys. The percentage of wealth held by the top one-half percent changed only slightly from 24.6 percent in 1963 to 24.3 percent in 1983. Comparable figures for the top one percent are 31.8 percent and 31.5 percent.[28]

The necessity of comparability in sample designs is apparent in comparison of the full sample and 1983 cross-section sample (not shown in the tables). If only the cross-section sample had been used, only 18.5 percent of the wealth would have been estimated to have been held by the top one-half percent and only 24.8 percent by the top one percent.

The analytic estimates of the precision of net worth estimates such as those given in Table 3 are inadequate for measuring the precision of concentration estimates because they cannot take into account variation in the rank order of observations by wealth. As an alternative, bootstrap procedures were employed. These were computed by assuming a distribution of wealth within each PSU which was log-normal or Pareto.[29] Fifty random samples of the same size as the

[28]Concentration levels determined by gross income have also not changed substantially. The top one-half percent of the income distribution held 19.2 percent of household wealth in 1963 and 18.9 percent in 1983. The top 1 percent held 25.8 percent in both years.

[29]Because a significant number of observations had zero or negative wealth, a two-variable distribution was actually assumed. Those with positive wealth were determined first by a draw from a Bernoulli trial, and conditional on positive wealth, the amount was determined by a draw from a log-normal distribution. For the Pareto distribution, only those observations above the PSU median wealth were assumed to be Pareto distributed. Those below the median were assumed to follow a log-normal distribution.

SCF (or SFCC) were drawn from distributions fit for each PSU, and concentration measures computed for each draw.

The bootstrap estimates show a consistent pattern. While they replicate the means of the actual samples fairly well, in each case they overestimate the wealth held by households in the 90 to 99th percentiles. The standard errors on total net worth are also larger than the analytic standard errors. In each case the standard errors of the concentration measures—ranging from 1.3 to 2.6 percent for the percentage share of wealth held by the top one-half percent—are quite small. This suggests that these numbers are quite accurately measured, and imply that the change in the concentration of wealth held by the top one-half percent from 1963 to 1983 was not statistically significant.[30]

There is some reason for caution in interpreting these measures of precision.[31] Both the analytic and bootstrap standard error calculations assume that the surveys pick up the entire upper tail of the wealth distribution. Yet despite their high-income augmentation, there is reason to believe that both surveys still miss households at the very top. The largest wealth-holder in the 1983 survey reported holding $86,000,000 while only five respondents reported more than $50,000,000. In the 1963 survey, the largest survey wealth-holder reported holding $76,000,000 (in 1983 dollars). Yet Forbes magazine (fall 1983) reported that 400 individuals held more than $125,000,000 apiece in 1983. Moreover, the Forbes figures suggest that the wealth of these individuals totaled $118 billion. If these published descriptions are true, then none of the Forbes 400 were captured in the 1983 Survey.

The omission of these individual's households alone would still not significantly affect measures of wealth concentration since their total estimated wealth is only 1.2 percent of the U.S. household total. However, the failure to interview households between $75,000,000 and $125,000,000 and the potential under-sampling of wealthy households below that level may be more troublesome. To illuminate this potential bias, it was assumed that wealth-holders above $10,000,000 in 1983 and 1963 (measured in 1983 dollars) were distributed with a Pareto distribution. Moreover, it was assumed that the surveys represented truncated samples from this distribution, with the truncation occurring at

[30]The change in the percentage of wealth held by the top 1 percent of wealth-holders from 1963 to 1983 was also not statistically significant. However, the increase in the percentage held by top 10 percent (2.7 percentage points) is statistically significant at the 5 percent level.

[31]Another reason for caution was dramatically illustrated following preliminary release of a study of concentration based on the 1983 SCF (Smith, 1986). One individual in the high-income sample reported a business worth $200 million. Unfortunately, he had one of the highest of the high-income sample weights—5,000—thus he represented $1 trillion, or about 10 percent of total wealth. Although the observation was thoroughly reviewed prior to the availability of the high-income weights, its overall quality was sufficient to preclude any alteration of the data. However, a reinterview of the respondent as part of the 1986 survey follow-up indicated that the proper number should have been $2 million, and that the incorrect amount had been inadvertently recorded by the interviewer. The effect of this change reduced the percentage held by the top one-half percent by 8 percentage points.

As it currently stands, the sample has no such extreme outliers. The largest weighted wealth-holder represents 2.5 percent of total U.S. wealth, and two more represent more than 1 percent. This is consistent with the 1963 SFCC, where three households also each represent over 1 percent of U.S. wealth with the largest representing 1.7 percent. Recalculations showed that when the largest five weighted wealth-holders were dropped from each sample, wealth concentration in the top one-half percent decreased by only 1.5 percentage points from 1963 to 1983 versus the full sample figure of 0.5 percentage points.

TABLE 5

CONCENTRATION OF WEALTH, 1983 SCF

	All Households		Percentile of Net Worth: 0 to 90th%		90 to 99th%		2nd 1/2%		Upper 1/2%	
	Amount ($B)	% of Gross Assets	Amount ($B)	% of All HH	Amount ($B)	% of All HH	Amount ($B)	% of All HH	Amount ($B)	% of All HH
Gross Assets	11,562.0	100.0%	4,380.9	37.9%	3,826.2	33.1%	784.0	6.8%	2,570.9	22.2%
Principal Residence	3,746.0	32.4%	2,446.5	65.3%	986.8	26.3%	140.6	3.8%	172.1	4.6%
Other Real Estate (Gross)	1,687.5	14.6%	399.5	23.7%	676.1	40.1%	112.9	6.7%	499.1	29.6%
Public Stock	1,041.1	9.0%	104.5	10.0%	334.7	32.1%	87.3	8.4%	514.7	49.4%
Bonds and Trusts	676.4	5.9%	45.3	6.7%	239.3	35.4%	46.1	6.8%	345.6	51.1%
Checking Accounts	119.4	1.0%	65.3	54.7%	37.6	31.5%	6.6	5.6%	9.9	8.3%
Savings, CD's, Money Market	1,049.1	9.1%	518.3	49.4%	383.7	36.6%	45.9	4.4%	101.2	9.6%
Life Insurance Cash Value	284.7	2.5%	176.1	61.8%	61.3	21.5%	13.1	4.6%	34.2	12.0%
Business Assets (Net)	2,284.3	19.8%	212.1	9.3%	911.9	39.9%	309.8	13.6%	850.5	37.2%
Automobiles	373.3	3.2%	295.8	79.2%	65.2	17.5%	5.7	1.5%	6.6	1.8%
Miscellaneous	300.1	2.6%	117.4	39.1%	129.7	43.2%	16.0	5.3%	37.0	12.3%
Debt	1,507.6	13.0%	1,024.4	67.9%	299.0	19.8%	60.0	4.0%	124.2	8.2%
Consumer Debt	318.9	2.8%	221.0	69.3%	48.8	17.5%	22.1	6.9%	27.0	8.5%
Principal Residence Debt	864.6	7.5%	689.0	79.7%	140.2	16.2%	21.3	2.5%	14.1	1.6%
Other Real Estate Debt	324.1	2.8%	114.5	35.3%	109.9	33.9%	16.5	5.1%	83.1	25.7%
Net Worth	10,054.4	87.0%	3,356.5	33.4%	3,527.2	35.1%	724.0	7.2%	2,446.7	24.3%
Income (Gross)	2,254.1	19.5%	1,632.8	72.4%	430.9	19.1%	59.8	2.7%	130.7	5.8%
Number of Observations		4,103		3,341		478		82		202
Number of Households		83,917,968		75,530,720		7,546,222		421,200		419,827
Minimum Wealth ($'s)		−73,400		−73,400		215,522		1,376,195		2,295,392
Maximum Wealth ($'s)		86,852,000		215,425		1,373,405		2,292,381		86,852,000

The following definitions apply to entries in Tables 5 and 6.

Principal Residence: The market value of the household's principal residence as reported directly by respondent. For farms it should include only the value of the house.

Other Real Estate: The summed market value of all other real estate owned by the household including secondary homes, rental property, and land as reported by respondent for up to three items. This total probably includes some property held as part of partnerships, farms, and small corporations, although respondents were asked to include business property in the business section.

Public Stock: Market value of holdings in all publicly traded companies. Respondent gave separate totals for non-taxable and other mutual fund holdings, holdings in the firm where employed (if publicly traded), stock owned as part of an investment club, and all other holdings of publicly traded stock. Stock held as part of a trust is not included.

Bonds and Trusts: Face value of holdings of bonds (except U.S. savings bonds). Separate totals were given for U.S. Government notes, bills and bonds; all bills, notes and bonds of state and local governments; and corporate, and foreign bonds and notes, and other bonds. This variable also includes the value of assets held in trusts, which was asked separately.

Checking Accounts: All accounts with banks, thrifts or credit unions with check writing privileges (except MMDA accounts in 1983). Values were asked for up to 5 accounts.

Savings, CD's, Money Market: Includes the sum of assets in five categories—(1) MMDA's and MMMF's (values for up to 3 accounts), or broker call accounts; (2) savings accounts or other small time deposits at depository institutions (values for up to 5 accounts); (3) CD's and other large time deposits at depository institutions including separate totals for all-saver accounts, short-term CD's and repurchase agreements, and long term CD's; (4) IRA and Keogh accounts (separate totals for each); and (5) U.S. government savings bonds (face value).

Life Insurance Cash Value: Cash value of whole life insurance policies as given by respondent (both face value and cash value were asked).

Business Assets (net): Net market value of household share of all sole-proprietorships, partnerships, and non-publicly traded corporate assets not reported elsewhere. The value was determined by subtracting debts owed to and adding debts from the business to the household to the respondent's assessment of the market value of their share of up to two businesses in which they held a management interest. A separate total was solicited for the net value of all business holdings in which there was no management interest. Some business holdings, particularly farms, will be reported under "Other Real Estate."

Automobiles: The market value of all vehicles. For 1983, the National Automobile Dealers Association average retail "blue book" value was calculated from model and year information supplied by respondent for up to 3 vehicles. The question was asked directly in 1963.

Miscellaneous: Outstanding principal on all notes or mortgages owed to the household (up to 3), plus the present value of the payments stream of up to 3 land contracts owed (calculated from the contract terms), plus gas leases and patents. For 1983, the withdrawal value of employee thrift, profit sharing, stock option, and 401K plan accounts was also included. Only profit sharing was included in 1963.

Consumer Debt: Outstanding principal of all household debt except mortgage debt. In 1983 this was calculated from reported loan terms (amount borrowed, interest rate, and payment size, frequency, and duration) for up to 3 home improvement loans, 3 automobile loans, 3 other loans with regular payments, and 3 loans without regular payments.

Principal Residence Debt: Outstanding principal of first and second mortgages on the principal residence. Calculated from reported loan terms for the first and second mortgage separately.

Other Real Estate Debt: Outstanding principal of mortgages on all other real estate owned by the household. Calculated from reported loan terms. This applies to mortgages against the 3 properties listed under "Other Real Estate," not business properties.

TABLE 6

CONCENTRATION OF WEALTH, 1963 SFCC

(IN 1983 DOLLARS)

	All Households		Percentile of Net Worth: 0 to 99th%		90 to 99th%		2nd 1/2%		Upper 1/2%	
	Amount ($B)	% of Gross Assets	Amount ($B)	% of All HH	Amount ($B)	% of All HH	Amount ($B)	% of All HH	Amount ($B)	% of All HH
Gross Assets	4,942.5	100.0%	2,081.6	42.1%	1,460.6	29.6%	318.9	6.5%	1,081.3	21.9%
Principal Residence	1,494.2	30.2%	1,134.7	75.9%	287.7	19.3%	29.8	2.0%	42.0	2.8%
Other Real Estate (Gross)	416.5	8.4%	115.0	27.6%	192.3	46.2%	27.7	6.7%	81.4	19.5%
Public Stock	721.0	14.6%	62.1	8.6%	210.4	29.2%	112.2	15.6%	336.3	46.6%
Bonds and Trusts	295.6	6.0%	21.4	7.2%	38.7	13.1%	10.5	3.5%	225.1	76.1%
Checking Accounts	76.9	1.6%	36.3	47.2%	22.6	29.4%	3.8	5.0%	14.2	18.5%
Savings, CD's, Money Market	428.3	8.7%	228.8	53.4%	159.8	37.3%	11.0	2.6%	28.7	6.7%
Life Insurance Cash Value	193.3	3.9%	106.9	55.3%	58.7	30.4%	10.3	5.3%	17.4	9.0%
Business Assets (Net)	978.3	19.8%	187.9	19.2%	398.9	40.8%	86.0	8.8%	305.5	31.2%
Automobiles	178.6	3.6%	142.3	79.7%	30.7	17.2%	3.0	1.7%	2.6	1.4%
Miscellaneous	159.9	3.2%	46.3	28.9%	60.7	38.0%	24.6	15.4%	28.2	17.7%
Debt	721.2	14.6%	556.3	77.1%	108.4	15.0%	15.4	2.1%	41.2	5.7%
Consumer Debt	169.6	3.5%	119.1	70.2%	22.5	13.3%	7.0	4.1%	21.0	12.4%
Principal Residence Debt	466.9	9.4%	409.6	87.7%	49.7	10.7%	4.8	1.0%	2.7	0.6%
Other Real Estate Debt	84.7	1.7%	27.5	32.4%	36.1	42.6%	3.7	4.3%	17.5	20.7%
Net Worth	4,221.2	85.4%	1,525.4	36.1%	1,352.2	32.0%	303.5	7.2%	1,040.1	24.6%
Income (Gross)	1,217.4	24.6%	927.6	76.2%	205.0	16.8%	21.7	1.8%	63.1	5.2%
Number of Observations		2,557		1,730		444		95		288
Number of Households		57,926,992		52,143,969		5,202,442		288,998		291,845
Minimum Wealth ($'s)		−62,889		−62,889		138,212		816,731		1,390,218
Maximum Wealth ($'s)		76,169,104		138,063		814,614		1,387,081		76,169,104

$60,000,000. Under these assumptions, the parameters of the distribution were estimated for each year from the truncated samples, and an estimate of the missing wealth was calculated. For 1983 it was estimated that there were 6,010 "missing" households with wealth between 60 and 125 million dollars totaling 499 billion dollars.[32] In 1963 there were estimated to be 2,200 "missing" households totaling 186 billion dollars (measured in 1983 dollars). If accurate, these estimates would imply an increase of the percentage of wealth held by the top one-half percent of households of slightly less than 5 percentage points over the raw survey estimates in each year.

B. *Comparison With Estate Tax Data Measures of Concentration*

Data tabulated by the IRS from estate tax returns offer another approach to estimating wealth held by the top U.S. wealth-holders. These estimates are made by assuming that estate tax returns represent a random draw from the living U.S. population with marginal selection probabilities determined from special "high-income" mortality tables stratified by age and sex (see Schwartz, 1983, 1985). Periodic estimates of the wealth held by the top U.S. wealth-holders have been made using this method, including, conveniently, estimates in 1963 and 1982. The 1982 estimates use returns filled during 1983 for individuals who died in 1982. In principle, if the proper extrapolation to the living population can be made, this represents a very attractive means of estimating the distribution of the top wealth-holders, as it should be based on almost the entire sample of deceased wealthy individuals. These estimates depend critically on the choice of appropriate mortality probabilities. Unfortunately, there are very little data with which to evaluate these probabilities.

Several adjustments have to be made before a direct comparison can be made of population estimates from estate tax data and from household surveys. First, reporting requirements for Federal estate tax forms and incentives for estate planning have changed significantly over the years (see Bentz, 1984). In 1963 only those with gross assets of $60,000 or more were required to file; in 1983 the cutoff had risen to $300,000. Second, the estate tax data reflect individual wealth, whereas figures for most surveys are given for households. Finally, a number of assets are likely to have different values for living individuals than would be reported at their death. Trusts, for example, may pass on directly to the next generation without being included in an estate. A number of businesses, such as professional practices, may have value only as long as an individual runs them. Heirs may have an incentive to minimize the reported value of assets. In addition, tax legislation in 1976 and 1981 permitted small businesses and farms to be filed at less than market value if used by the decedent's family for some number of years after his death.

A number of assumptions were made to adjust the 1963 and 1983 survey data to correspond to the conceptual framework of the estate tax-based estimates.

[32]In 1983 these numbers may be overstated. The fitted Pareto distribution implied that there should have been 3,000 individuals with over $125 million in wealth holding in aggregate over $750 billion. These numbers significantly overstate the Forbes count, and were quite robust to changes in the lower and upper bounds assumed for the truncated Pareto.

To allow for the growing discrepancy between the figures that might be reported in estate tax returns and on surveys, the 1983 data were adjusted for several assets including trusts, pensions and thrift accounts, and some sole-proprietorships and partnerships. A judgment was made based on the form of each of these assets to value it at zero or 50 percent of the reported survey value.

In order to measure wealth on an individual basis, two alternative methods were used to divide wealth among household members. First, all members over 18 years of age were assigned an equal fraction of household wealth (rule 1). Second, limited information was given in 1963 on individual ownership of some financial assets. These data were used to compute the average share of these assets owned by the husband, wife, and other family members in multi-person households. In the SFCC, all assets except principal residences and their associated mortgages were divided in the same proportion as the assets for which the intrafamily ownership was known (chiefly savings accounts). Averages of these proportions in the 1963 data (computed separately for wealthy and other households) were used to allocate all 1983 assets and liabilities except the residential assets, which were divided equally between husband and wife (rule 2).

Estimates of U.S. household wealth for top individual wealth-holders computed by these rules are given in Tables 7 and 8 for 1983 and 1963 respectively. Each table also gives comparable figures computed from the estate tax data. The totals for 1963 match up fairly closely, particularly under rule 2. Totals for corporate stock and real estate differ somewhat, although this may reflect decisions by filers to report corporate real estate holdings as stock.

The 1983 figures present a different picture. Gross assets measured by either rule are almost 50 percent larger than those given by the estate tax data. Moreover, even if within-household assets are allocated to minimize the number of individuals with assets of over $500,000 (not shown in the tables) survey-based net worth in this category is still over $2,435 billion. This discrepancy does not appear to stem from the number of large wealth-holders so much as the values these households report, particularly for corporate stock and real estate holdings. The survey and estate tax calculations of wealth holdings have very different implications for estimates of wealth concentration. The estate tax estimates imply that 19.7 percent of U.S. household wealth was held by the top one percent of individuals in 1983. This contrasts with a figure of 27.1 percent implied by rule 1 with the 1983 survey data.[33]

There are no ready explanations of the differences between the survey and estate tax data for 1983. If anything, one might have expected the estate tax data to be overstated relative to the survey data due to undersampling of very high wealth households in the 1983 survey. However, some factors do point in the other direction. The estate tax figures are "pre-audit". There are obvious incentives for filers to understate asset values, particularly in the initial filing. This is likely to be most problematic for those assets where there are no ready market values,

[33]This figure, computed under the assumption of the most even distribution of wealth within households, is similar to the 28.5 percent of total wealth estimated to be held by the top 1 percent of households when the same definition of net worth is used. Even when wealth is allocated within households to maximize the concentration of wealth in the top 1 percent of individuals, their holding is only 30.1 percent of total wealth.

particularly real estate and closely-held businesses. If filers tend to price such assets on a book or cost basis, the value reported on the estate tax form may understate market value significantly in 1983 given the inflation of the 1970's. However, preliminary work at the IRS indicates that overall differences in pre-audit and post-audit returns is of a much smaller order of magnitude than the differences in the survey and estate tax figures compared here.

Preliminary work by Scheuren and McCubbin (1987) at the IRS shows promise in clarifying the comparisons of the two sources of data. Abstracting from questions of total amounts held by the upper tail of the wealth distribution, they find great similarity in the shapes of some of the components of the upper tail of the wealth distribution as measured by the 1983 SCF and by the estate tax data. This alignment is particularly good for corporate equities. However, large differences remain in comparison of both real estate and non-corporate businesses. More work will have to be done to determine whether these differences arise from conceptual differences or differences in sampling characteristics.

V. Conclusions

It is difficult to give an overall assessment of the "quality" of the 1983 SCF wealth data. In many ways, this paper does not address the most important quality issue in consumer surveys—the quality of correlations and measurement at the household level. Unfortunately, it is almost impossible to make general assessments of this sort since such evaluations must inherently be model-specific. However, we believe that the more limited evaluations presented in this paper may be indicators of a deeper level of quality. Our findings can be grouped into two major areas. The first is the impact of the survey's high-income sub-sample; and the second is the overall "fit" of survey-based aggregates with estimates from other sources.

One of the major advantages of micro data is that it can provide extra "degrees of freedom" with which to understand macroeconomic changes. In many instances it need not be the case that micro data is more "accurate" than macro data as it is used for different, complementary, purposes. It is clear that for many such purposes the cross-section sample in the 1983 SCF would have been more than adequate. For example, inferences about asset and debt ownership rates and "typical" or "median" behavior are virtually the same whether the entire sample is used or just the cross-section. This conclusion is comforting in light of the considerable costs and ethical questions involved in drawing respondents from tax files.

The evidence is much less comforting with respect to aggregate or mean asset holdings or questions related to the concentration of wealth. It is clear that the inclusion of the high-income sample dramatically alters the survey-based assessment of aggregate household wealth. The full-sample estimate of household net worth is over fifteen percent higher than the estimate using the cross-section sample alone. Differences between the samples also vary considerably from asset to asset. Thus, inferences on the importance of various assets in the household portfolio depend critically on the sample used. Stocks, bonds, and trusts, for example, constitute 14.9 percent of household assets when measured in the full

TABLE 7

ESTATE TAX MULTIPLIER DATA, 1983

	Gross Asset Holding (1000's $)					
	$300–$500	>$500	$300–$500	>$500	$300–$500	>$500
	SCF Rule 1		SCF Rule 2		Estate Tax Data	
	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)
Gross Assets	912.3	2,997.8	880.1	3,209.0	757.2	2,140.0
Cash	99.4	200.9	100.0	224.1	—	166.8
Corporate Equity	194.3	1,071.8	160.4	1,117.9	—	530.5
Bonds	46.4	215.9	31.0	228.1	—	128.3
Life Insurance Cash Value	15.2	48.5	12.1	53.5	—	25.6
Mortgage Assets	15.9	65.1	17.6	66.1	—	96.8
Real Estate	451.8	1,191.6	483.2	1,295.9	—	674.5
Noncorporate Business Assets	33.9	131.5	35.4	131.9	—	181.1
Other Assets	55.3	72.4	40.4	91.6	—	336.3
Debt	73.2	238.2	84.7	240.9	99.5	374.6
Net Worth	839.1	2,759.5	795.5	2,968.1	657.7	1,765.4
Number of Persons	2,381,207	2,394,086	2,307,570	2,512,193	2,412,800	1,965,100

Note: Filers were only required to list gross assets and debts for estates with gross assets between $300,000 and $500,000 in 1983.

Definitions are given for entries in Tables 7 and 8.

Cash: All accounts at depository institutions and money market mutual funds, including checking accounts, MMDA's and money market accounts, savings accounts, CD's, broker call accounts, and IRA/Keogh accounts.

Corporate Equity: Market value of holdings in all corporate equities, including mutual fund holdings, and stock owned as part of an investment club. Stock held as part of a trust is not included. Net equity in closely-held corporations (including farms) is also included. However, in 1983, interests in direct sales, professional practices, entertainment and consulting services were valued at zero. Interests in restaurants, repair, real estate and insurance brokerages, and beauty shops were valued at 50 percent of their reported value.

Bonds: All U.S. Government notes, bills and bonds including U.S. savings bonds, all bills, notes and bonds of state and local governments, corporate and foreign bonds and notes, and all other bonds. Bonds values are face or par value.

Life Insurance Cash Value: Cash value of whole life insurance policies.

Mortgage Assets: Outstanding principal on all mortgage assets, including land contracts (the calculated present value of the payments stream), and all notes owed to the household (including those from their businesses).

Real Estate: The market value of the household's principal residence and all other real estate owned by the household including secondary homes, rental property, and land. Non-corporate farm business holdings are included here.

Non-Corporate Business Assets (*equity*): Net market value of household's equity share of all sole-proprietorships and partnerships (except farms) not reported elsewhere. Interests in direct sales, professional practices, entertainment and consulting services were valued at zero. Interests in restaurants, repair, real estate and insurance brokerages, and beauty shops were valued at 50 percent of their reported value. This value is zero for 1963 to correspond to the estate tax data (where non-corporate business assets are included in other assets).

Other Assets: This includes gas and oil leases, automobiles, profit sharing and employee thrift accounts. For 1983 it also includes some antique and jewelry holdings. In 1963 it includes all closely-held business interests.

Debts: All household debts valued at amount outstanding, as calculated from loan terms, including debts owed by the household to their businesses.

TABLE 8

ESTATE TAX MULTIPLIER DATA, 1963

(IN 1983 DOLLARS)

	Gross Asset Holding (1000's $)					
	$195-$325	>$325	$195-$325	>$325	$195-$325	>$325
	SFCC Rule 1		SFCC Rule 2		Estate Tax Data	
	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)	Amount ($B)
Gross Assets	441.1	1,356.0	664.1	1,655.6	411.8	1,852.9
Cash	40.0	75.1	41.7	91.8	60.1	155.9
Corporate Equity	94.8	621.7	93.2	648.4	101.3	932.0
Bonds	16.5	69.9	19.5	71.1	18.5	134.1
Life Insurance Cash Value	18.4	38.5	23.0	43.7	10.7	25.3
Mortgage Assets	15.5	53.8	17.8	57.1	22.7	71.4
Real Estate	179.4	364.3	396.2	576.0	152.9	373.1
Noncorporate Business Assets	—	—	—	—	—	—
Other Assets	76.4	132.8	72.7	167.5	45.5	161.1
Debt	38.2	75.3	62.2	93.4	44.5	148.4
Net Worth	402.9	1,280.7	601.9	1,562.2	657.7	1,704.5
Number of persons	1,747,907	1,517,796	2,689,972	2,050,460	1,455,000	1,799,000

sample, but only 9.7 percent when only the cross-section is used. Moreover, it is not clear that the cross-sectional sample can be simply reweighted to compensate for these differences. Assuming the response rate of the combined samples, approximately 36 cross-sectional respondents should have reported a net worth of more than 1.5 million dollars (the top 1 percent, according to the full sample); in fact, only 22 did. But even if these individuals are reweighted to represent their "true" proportion, the cross-section based wealth aggregates understate the full-sample estimates by over one trillion dollars. This occurs because cross-sectional observations are even more sparsely represented in the top one-half percent of wealth-holders (7 respondents instead of the expected 18). In principle, these observations could be given even higher weights. However, this raises serious questions about precision and efficiency. One would feel very uncomfortable drawing inferences about the estimated one-fourth of U.S. household wealth held by the top one-half percent of households based on a sample of seven.

A more adequate area-probability sample would be expensive. Assuming the same cross-sectional response rates, it would have required an area-probability sample of almost 200,000 to achieve the same representation of the top one-half percent as in the full sample SCF. However, before concluding that tax-file-augmented samples are the best solution to these problems, a more careful examination of the sampling frame has to be made. Only ten percent of the original high-income sample solicited by mail agreed to participate in the survey. Further work needs to be done to determine if this group is indeed representative.

In general, evidence presented here comparing SCF aggregate estimates with those from flow-of-funds accounts is encouraging. Estimates of aggregate household holdings of most financial assets and debts computed from the full SCF sample compare very closely with estimates from the FOF. Publicly traded stock and bond estimates, for example, are within two percent of the FOF totals. Mutual fund shares, home mortgages, and installment debts also compare very closely. Areas of disagreement are checking and savings accounts, real estate, businesses, and other debt. It is not clear that the source of these differences can be automatically traced to flaws in the SCF. As argued earlier, FOF data on household deposit holdings may be seriously contaminated by assets that, in fact, are owned by businesses. FOF estimates of other household debts also appear to have significant problems. It may be the case that survey estimates of household holdings are more accurate for these items.

We are less optimistic that there is an easy resolution of the differences between survey and FOF estimates of businesses and real estate. Both estimation methods appear to have significant problems. Unlike most other items in the household balance sheet, these assets generally will not have an easily obtained and universally agreed upon market value. Survey respondents, for example, may be inconsistent in how they treat their human capital in valuing a small business. Unfortunately, FOF estimates of these two assets also have significant problems. Real estate land values are based on assessed values—a method which may be particularly trouble-prone in an era of changing assessment procedures and legislative restrictions. Aggregate information on closely-held businesses is virtually non-existent. Much needs to be done in improving both sets of estimates before either can be used in confidence as estimates of aggregates.

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