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LONG-TERM TRENDS IN U.S.  
WEALTH INEQUALITY:  
METHODOLOGICAL ISSUES AND RESULTS

by

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Long-Term Trends in U.S. Wealth Inequality:  
Methodological Issues and Results

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However, the trend in wealth inequality remains very similar among different choices of adjustment procedures and of wealth concepts.

The remainder of the paper is divided into five sections. In the next section, we discuss alternative concepts of household wealth. The traditional concept of household wealth includes only assets (and liabilities) that are fungible and that have a readily available market value. In this section, we broaden the concept of wealth to include not only traditional components but also claims against future income streams. Such claims include pension and social security entitlements as well as trust income. We also argue that, because of data limitations, empirical measures of household wealth often do not correspond precisely to those implied by theoretical models of household wealth. In this section we discuss the correspondence between such empirical measures and those implied from behavioral models, such as the life-cycle or liquidity constraint model.

In the third part, we present new estimates of aggregate household balance sheet data for the period from 1922 to 1983. Our estimates are based on figures compiled by Goldsmith et al, Ruggles and Ruggles, the Department of Commerce (principally, Musgrave's data on household durables and housing), and the Federal Reserve Board (flow of funds data). These sources are not entirely consistent in their wealth concept, asset definitions or methodology. We have made adjustments to the published data where possible to improve comparability. In this section we also present estimates of net worth and gross assets based on alternative wealth definitions. A detailed description of the adjustments made for each asset category is given in Appendix I. Our adjusted aggregate household balance sheet data are available for the years: 1922, 1929, 1929, 1945, 1949, 1953, 1962, 1969, 1972, 1979, 1981 and 1983.

These correspond to the years for which distribution data are available. In addition we have included Goldsmith's aggregate estimates for the years 1900, 1912 and 1933.

In the fourth part of the paper, we develop a time-series of wealth concentration estimates for the years indicated above. We compare our adjusted concentration estimates for top-wealthholders from estate tax data with other sources such as surveys and synthetic data bases. Our data sources are as follows: (i) 1922-1953, selected years: Lampman's estimates of the wealth of the top wealthholders based on estate tax return records; (ii) 1958-1976, selected years: Smith's estimates of the wealth of the top percentiles based on estate tax returns; (iii) 1981: Schwartz's estimates of top wealthholders' wealth based on estate tax returns; (iv) 1962: Survey of Financial Characteristics of Consumers (SFCC), based on our own computations; (v) 1969: the MESP database, based on our own calculations; (vi) 1983: Survey of Consumer Finances (SCF), based on our calculations; (vii) 1979: the ISDP database based on published results and the 1979 Pension Survey based on published results; (viii) 1984: the Survey of Income and Program Participation (SIPP) based on published sources; and (ix) 1972-1973: Greenwood's calculations based on a synthetic database of her creation.

As with the aggregate data, we made several transformations and adjustments to the distribution data in order to increase consistency within the estate data estimates and to compare estimates from different data sources. In this section we summarize the data adjustments and report different series on the shares of the top percentile of wealthholders. A more detailed explanation of the adjustments and imputations made to the distribution data is given in Appendix II. In order to explore the accuracy

and potential bounds of the estimated concentration levels as well as trends, we have analyzed the effect of different wealth definitions and imputation procedures on Lampman's and Smith's estimates as well as on the survey data.

Several comparisons are undertaken. First, we compare concentration estimates based on different wealth concepts, such as traditional wealth and broader measures which include retirement wealth, for both the estate data estimates and adjusted survey estimates. Second, we transform the Lampman's estate data estimates for 1922 to 1953 to represent the top percentile and half percentile of the population in order to compare the results with Smith's estimates. Third, our adjusted estimates are then compared with the original published estimates. Fourth, as a test of the reliability of the reported trends in concentration, we transform the estate data from a population base to a household base and compare the resulting concentration figures with those based on survey data. Fifth, for each adjustment or transformation of the data, we estimate upper and lower bounds on wealth concentration to test how sensitive the results are to the different assumptions made and to the various wealth definitions used.

In the fifth section, we concentrate on distributional estimates for 1962 and 1983 based on the Survey of Financial Characteristics of Consumers (SFCC) and the Survey of Consumer Finances (SCF), respectively. Our major purpose is to determine how sensitive estimates of overall wealth inequality, as measured by the Gini coefficient and the shares of top wealth holders, are to varying ways of correcting for missing values in the survey data and underreporting. We present three alternative sets of estimates: (i) distributions based only on families without missing values; (ii) distributions, where overall mean values for assets and liabilities are imputed to missing values; and (iii)

distributions, where missing values are imputed on the basis of crosstabulations of asset and liability values by income, age, and other demographic characteristics.

We base the underreporting correction on a comparison of totals for the two surveys and the respective household balance sheet totals. An asset by asset comparison provides an index of underreporting. Three alternative series are developed to correct for underreporting. (i) Proportional adjustment of each asset and liability in the microdata to correspond to the aggregate balance sheet total. (ii) Correction for zero entries by a comparison with IRS income tax return data. (iii) Correction for zero entries and non-proportional adjustment of entries based on IRS income tax return data.

We also consider the effects of including measures of pension and social security wealth in the household portfolio on the inequality of household wealth. For 1962 and 1983, we provide detailed estimates of the distribution of retirement wealth and augmented household wealth based on the microdata for these years. Alternative estimates of retirement wealth and the distribution of augmented household wealth are devised, according to alternative assumptions about the future growth in pension and social security benefits.

In the last part of the paper, we consider two general issues. First, how sensitive are time trends in household wealth inequality to alternative imputation, correction, and adjustment procedures? Second, how do time trends differ depending on alternative definitions of household wealth, particularly with regard to the inclusion of social security and pension wealth?

## II. ALTERNATIVE DEFINITIONS OF HOUSEHOLD WEALTH

As with other economic concepts, there is no single measure of household wealth which can fulfill all possible uses of the concept. In this section, we develop five alternative operational measures of household wealth. The first of these, W1, is defined as the cash surrender value of tangible and financial assets (less liabilities). The assets and liabilities that are included vary by data source and are described in full below. The second measure, W2, is a slightly broader concept and is defined as W1 less the cash surrender or actuarial value of trusts plus the full reserve value of trusts. As is apparent, the difference between W1 and W2 is in the treatment of trusts. W1 measures trusts at their actuarial or cash surrender value, while W2 assigns the full value of trusts to their beneficiaries. In the case of trusts over which the beneficiary has complete control, the cash surrender value is identical to the full equity value of the trust. However, in the case of second or third party trusts, in which the beneficiary and owner are different, the trust has no cash surrender value to the beneficiary. In this case, the beneficiary is assigned the so-called "actuarial" value of the trust, which is defined as its full value discounted over the expected lifetime of the second and/or third parties. This approach is used in Smith's work on estate tax data. The actuarial value is included in W1, while the full trust equity is included in W2.

Both W1 and W2 measure pensions at their cash surrender value, which has historically been very small. Our third measure, W3, is defined as W2 less the cash surrender value of pensions plus the total value of pension reserves. In W3, pension reserves are imputed to both current and future beneficiaries, and thus pension reserves are treated in analogous fashion to trust equity. Our fourth measure, W4, is defined as W3 plus the expected present value of

future social security benefits. Our last measure, W5, is defined as W4 less the reserve value of pension wealth plus the present value of future expected pension benefits.

Measures W1, W2, and W3 are all based on actual accumulations of wealth. The difference among them is in the alternative treatment of accumulated assets over which individuals do not have full control. Aggregate household balance sheet data differ in their treatment of these assets. The flow of funds data and Goldsmith's estimates include the full value of both trusts and pension funds, our W3. On the other hand, Ruggles and Ruggles' estimates include only the cash surrender value of pensions but the full value of household trusts, our W2. Our measures W4 and W5 differ from the first three measures by imputing to households wealth which does not correspond to any accumulated reserves. These measures are useful insofar as household behavior may be affected by perceived social security or pension wealth.

All five measures of household wealth are operational in that they can be estimated from available data. However, the relationship of these measures and the wealth concepts implied by the behavioral models is not always delineated clearly. A narrow cash surrender wealth concept such as W1 is the appropriate one for analyzing behavior if there are significant liquidity constraints or if there is a very short planning horizon by households. Some researchers have used a liquid asset concept, which is defined as either total financial wealth or some subset such as saving and checking accounts. The rationale for this even more narrow wealth concept is not clear. While it is true that tangible assets are not perfect substitutes for financial assets, the ease and frequency with which home-owners use the equity in their homes to finance purchases suggest that home equity also has a high degree of liquidity.



There is no behavioral model of which we are aware which corresponds to our W3 measure. If we include pension reserves, then we should include some form of expected social security payments, even though social security does not represent a stock of savings as does pensions. We have introduced W3 in order to separate out the effects of pensions on both aggregate wealth and the concentration of household wealth.

The most common model used for analyzing savings behavior is the life-cycle model, where household accumulation is viewed as primarily for retirement and the planning horizon is one's lifetime. A life-cycle wealth variant should include all expected transfers, social security as well as pensions. Empirical proxies to life-cycle wealth have often been constructed by adding expected discounted retirement wealth to one of the balance sheet wealth concepts. For example, Feldstein (1974) added a measure of expected discounted social security wealth to the balance sheet wealth estimates for his consumption studies. Our W4 measure falls into this category. We use a corrected version of Feldstein's aggregate series as our estimate of social security wealth in W4.<sup>1</sup>

Another concept motivated by the life-cycle model is  $W_{LC}$ , defined as the expected discounted value of marketable (fungible) household wealth. Corresponding to this is augmented life-cycle wealth,  $AW_{LC}$ , defined as the sum of  $W_{LC}$  and the expected discounted present value of retirement wealth. The motivation for this becomes clear when we consider Feldstein's (1974) algorithm for calculating social security wealth which we call life-cycle social security wealth  $SS_{LC}$ . Assume for simplicity that everyone retires at age 65.<sup>2</sup> Then, for a worker of age  $a$ :

1Our wealth measure is from Leimer and Lesnoy's (1982) correction to Feldstein's series. We used their fixed ratio version since it yields the smallest social security series among the alternatives.

2Also, for simplicity, we shall ignore pension wealth.

$$SS_{LC} = e^{-d(65-a)} SS_{65,a}$$

where  $d$  is the discount rate and  $SS_{65,a}$  is the stream of expected social security benefits discounted to age 65 (and also discounted on the basis of survival probabilities). The equivalent Life-cycle fungible wealth concept is:

$$W_{LC} = e^{-d(65-a)} EW_{65,a}$$

where  $EW_{65,a}$  is the expected fungible wealth at age 65 for someone currently of age  $a$ .

With a few simplifying assumptions  $W_{LC}$  can be represented as:

$$W_{LC} = \alpha Y_a \int_a^{65} e^{(r^* + g^* - d)t} dt + W_a e^{(r^* - d)(65 - a)}$$

where  $\alpha$  is the savings rate (assumed to be constant over the period),  $Y_a$  is income at current age  $a$ ,  $r^*$  is the expected annual return to wealth (assumed to be constant over the period),  $W_a$  is current fungible wealth, and  $g^*$  is the expected annual growth rate of income (also assumed to be constant).

The difference between  $AW_{LC}$  and our  $W4$  measure is the given by:

$$AW_{LC} - W4 = W_{LC} - W_a = \alpha Y_a \int_a^{65} e^{(r^* + g^* - d)t} dt > 0.$$

The magnitude of the above difference can be significant. For example let us assume the following values for a representative household:  $a=50$ ,  $Y_a=\$20,000$ ,  $g^*-r^*-d=.03$ ,  $\alpha=.05$  and  $W_a=\$50,000$ . Then the difference between  $AW_{LC}$  and  $W4$  is  $\$13,000$  or 26 percent of  $W_a$ . This difference increases inversely with age.

From the above discussion, it is clear that adding a life-cycle retirement wealth concept to a current balance sheet wealth measure yields a total wealth measure that is smaller than the measure  $AW_{LC}$ . In addition, estimates of inequality based on  $W4$  will likely show less inequality than those based on  $AW_{LC}$ . The reason is that social security wealth is distributed more equally than fungible wealth, as we shall see below, and  $W_a$  is smaller

than  $W_{LC}$ . Though estimates for  $AW_{LC}$  do not exist, this concept would, in theory, be more meaningful than  $W4$  or  $W5$ .

## II. AGGREGATE HOUSEHOLD BALANCE SHEETS FOR SELECTED YEARS, 1922-1983

There are several historical time-series available on aggregate household wealth, but to our knowledge none of them covers the entire period from 1922 to 1983. The reason is that the pre-war source (Goldsmith, 1963) is not completely consistent with the post-war sources. In order to create a more consistent household balance sheet, we made several adjustments to the original estimates. These adjustments are explained in detail in Appendix 1. For financial assets we used Goldsmith's data for years prior to 1949 and flow of funds accounts (FOFA) as well as Ruggles and Ruggles' (RR) data for succeeding years. The Ruggles and Ruggles series ends in 1980. As a result, for the 1981 and 1983 estimates, we relied directly on FOFA for financial data and Musgrave's figures for tangible assets. Our general approach was to realign Goldsmith's data to be consistent with the FOFA's or RR's methodology. For many financial categories, RR's data corresponds to the FOFA balance sheet except that the latter include trusts and nonprofit organizations together with the household sector. For tangible assets, outside of land, both RR and the FOFA rely on Musgrave's figures.

For three years, 1949, 1953 and 1958, we have available complete balance sheet data from all sources: Goldsmith, RR and FOFA. After comparing Goldsmith's data with either RR or the FOFA for these years, it was obvious that there were major differences between Goldsmith and the other two sources for most categories of assets. In appendix I we explain the procedures used to modify and adjust the aggregate estimates in order to

reconcile these differences as much as possible. A more detailed description of our adjustments is available from the authors. For the overlapping years (1949, 1953 and 1958) we relied on RR, FOFA, and Musgrave for our own balance sheet estimates, shown in Table I.1.

There were two types of adjustments made to the original sources. The first was to correct for definitional differences between the asset categories in the original sources and our own classifications. We divided our broad asset categories into three groups: tangible, financial fixed claim, and equities. Liabilities were divided into mortgage debt, consumer debt and other debt. This corresponds to Wolff's (forthcoming) categories and it represents only a slight aggregation of the RR classification scheme. However, some substantial realignment of Goldsmith's categories was required.

The second task was to correct for differences in approach between Goldsmith on the one hand and RR and FOFA on the other, especially with respect to what should be included in each asset category. Before our adjustments, there were large discrepancies between Goldsmith and the other two with regard to the following asset categories: real estate, consumer durables, farm equity, unincorporated business equity, trusts, insurance, and pensions. In addition, RR included household inventories in their tangible asset category, which consists of semidurables such as clothing, food and other items. The value of these inventory assets in 1983 was roughly 253.8 billion out of total household assets worth 11.8 trillion or roughly 2 percent. We have eliminated the household inventory category from our final balance sheet, since it is not available for the early years and does not represent fungible wealth.

The accuracy of our aggregate estimates depends on both the reasonableness of our assumptions in realigning Goldsmith's data with RR and

the FOFA and in the accuracy of the original sources. We have assumed, in general, that the values and assumptions made in the FOFA balance sheet data, Musgrave's estimates and the RR data are accurate. For one important category, owner-occupied housing and land, we did some comparisons using micro surveys. These were based on the 1962 SFCC and 1983 SCF and U.S. Census surveys for 1950, 1960, 1970, and 1980.. We estimated an aggregate value of owner-occupied housing for each of these years by fitting a Pareto distribution to the upper tails of the distribution of housing values to obtain the mean for the open-ended category and then aggregating across each distribution. The estimates from the surveys are compared to our balance sheet estimates in Table 1 below. The estimated aggregates from the microdata are quite close to the FOFA totals, except for 1950. Unfortunately the same technique is not suitable for financial assets due to the extreme underreporting in the upper tail of these assets in the survey data.<sup>3</sup>

<sup>3</sup>The two asset categories which show the greatest differences between Goldsmith and RR are pensions and trusts. In both cases, Goldsmith's figures are considerably higher than RR's. We are not sure what the reason for this is.

TABLE 1

Value of Owner-Occupied Housing and Land:  
A Comparison of Aggregate Values Derived from Micro Data  
With Aggregate Balance Sheet Estimates.

<u>YEAR</u>	<u>Survey Data</u> <u>Estimates</u>	<u>FOFA Balance</u> <u>Sheet Data</u>	<u>Percentage</u> <u>Difference</u>
1950	130.8	177.0	30.0 %
1960	353.4	372.9	5.4
1962	473.9	403.8	-16.0
1970	626.8	689.9	9.6
1980	2,234.3	2,568.9	13.9
1983	3,363.2	3,060.0	-9.4

Sources: 1950, 1960, 1970 and 1980 survey values were computed from the corresponding decennial Census data. The 1963 estimates are based on the SFCC and the 1983 values are based on the SCF. The FOFA balance sheet data are drawn from their 1986 publication.

Results from our balance sheet estimates are presented below in Tables 2 and 3 and in the accompanying graphs.<sup>4</sup> Table 2 shows our adjusted net worth and total asset estimates for wealth measures W1, W2, W3, and W4 for selected years.<sup>5</sup> The estimates in Table 2 are in nominal values. In Table 3 we standardize the values using the GNP deflator. Table 3 reports the growth rate of per-capita "real" net worth for W1, W2, and W3 over the periods 1929-83 and 1945-83 and W4 for the 1945-1976 period. Growth rates in per-capita real GNP and real disposable income are listed for comparison.

From these tables, it is clear that while pension wealth grew over the period, it was social security wealth that made a significant difference to total wealth. The percentage change between the net worth values of W3 and W4 in 1976 was 51 percent, compared with 2 percent between W1 and W2 and 9 percent between W2 and W3 for the same year. More interesting is the post-war per-capita increase in wealth compared to the increase in GNP or disposable income, reported in Table 3. From 1929 through 1945 real wealth declined while real GNP increased. However, since the War, wealth has outpaced GNP growth. Even excluding all retirement wealth, the growth rate of W1 from 1949 to 1983 was slightly greater than output growth. The growth of W3 and W4 was substantially higher than GNP over the post-war period.

Graphs 2-4 show the percentage of total household assets represented by each asset category over the period 1900-1983 for the W3 wealth variant.

The results are consistent with other published sources and are generally known. As one would expect, the proportion of real estate in total assets

<sup>4</sup>Complete balance sheet data for our wealth measure W3 is provided in Table 1.1 of Appendix I.

<sup>5</sup>The W4 measure is based on the Leimer and Lesnoy social security series, which ends in 1978. Our 1981 and 1983 estimates of social security wealth were estimated using regression analysis. The variables used are explained in Appendix 1.

Table 2

A Comparison of Our Adjusted Aggregate Household Net Worth and Total Asset Levels for Wealth Definitions W1 through W4

	1922		1929	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	309.3	292.5	465.5	425.7
W2	315.4	298.6	475.7	435.9
W3	315.7	298.9	477.2	437.4
W4	315.7	298.9	477.2	437.4
	1939		1945	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	370.3	342.2	637.2	608.3
W2	382.2	354.1	652.6	623.7
W3	387.6	359.5	663.3	634.4
W4	434.0	405.9	856.5	827.6
	1949		1953	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	854.4	793.0	1140.8	1033.7
W2	866.8	805.4	1159.2	1052.1
W3	886.1	824.7	1194.8	1087.7
W4	1125.5	1064.1	1600.8	1493.7
	1958		1962	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	1632.9	1454.3	1927.8	1671.8
W2	1662.6	1484.0	1967.8	1711.8
W3	1731.7	1553.1	2071.6	1815.6
W4	2317.8	2139.2	2811.5	2555.5



Table 2 continued

	1965		1969	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	2381.2	2039.2	3104.2	2649.3
W2	2428.6	2086.6	3158.9	2704.0
W3	2575.7	2233.7	3366.3	2911.4
W4	3250.0	3183.0	4727.2	4272.3
	1972		1976	
	Total Assets	New Worth	Total Assets	Net Worth
Wealth Version:				
W1	3907.8	3314.9	5550.2	4687.9
W2	3983.2	3390.3	5629.6	4767.3
W3	4293.3	3700.4	6073.4	5211.1
W4	6055.6	5462.7	8748.9	7886.6
	1981		1983	
	Total Assets	Net Worth	Total Assets	Net Worth
Wealth Version:				
W1	9996.4	8422.6	11547.7	9698.2
W2	10118.2	8544.4	11691.1	9841.6
W3	11012.2	9438.4	12941.7	11092.2
W4	15873.0*	14299.2*	18945.4*	17095.9*

\* The 1981 and 1983 social security estimates in W4 were estimated based on the trend from 1937 through 1978. See Appendix I, Social Security, for further explanation.

Sources and Notes: These numbers are from our adjusted national balance sheet files. The adjustments are discussed in Appendix I.

Table 3

"REAL" HOUSEHOLD WEALTH GROWTH  
Selected Years

(A) Per Capita "Real" Wealth for Selected Years,  
Wealth Variants W1-W4\*

Year	1922	1929	1949	1969	1983
W1	\$ 7,550.5	9,738.2	9,525.9	14,786.8	19,362.2
W2	\$ 7,707.9	9,971.6	9,674.8	15,092.1	19,648.5
W3	\$ 7,707.9	10,008.2	9,906.7	16,249.7	22,145.3
Year	1922	1929	1949	1969	1976**
W4	\$ 7,715.7	10,005.9	12,782.5	23,845.4	27,464.9

(B) Growth Rates in "Real" Wealth, Real GNP  
and Real Disposable Income

(i) "Real" Wealth  
Percentage Change

Period	1922-83	1929-83	1949-83
W1	156.4 %	98.8 %	103.3 %
W2	154.9	97.0	103.1
W3	187.3	121.3	123.5
Period	1922-76**	1929-76**	1949-76**
W4	256.0 %	174.5 %	114.9 %

(ii) Real GNP  
Percentage Change

1929-83	1949-83
152.4 %	98.4 %

(iii) Real Disposable Income  
Percentage Change

1929-83	1949-83
148.0 %	106.9 %

\* Real in this table represents nominal wealth divided by the GNP deflator. It measures the purchasing power of wealth in terms of goods and services.

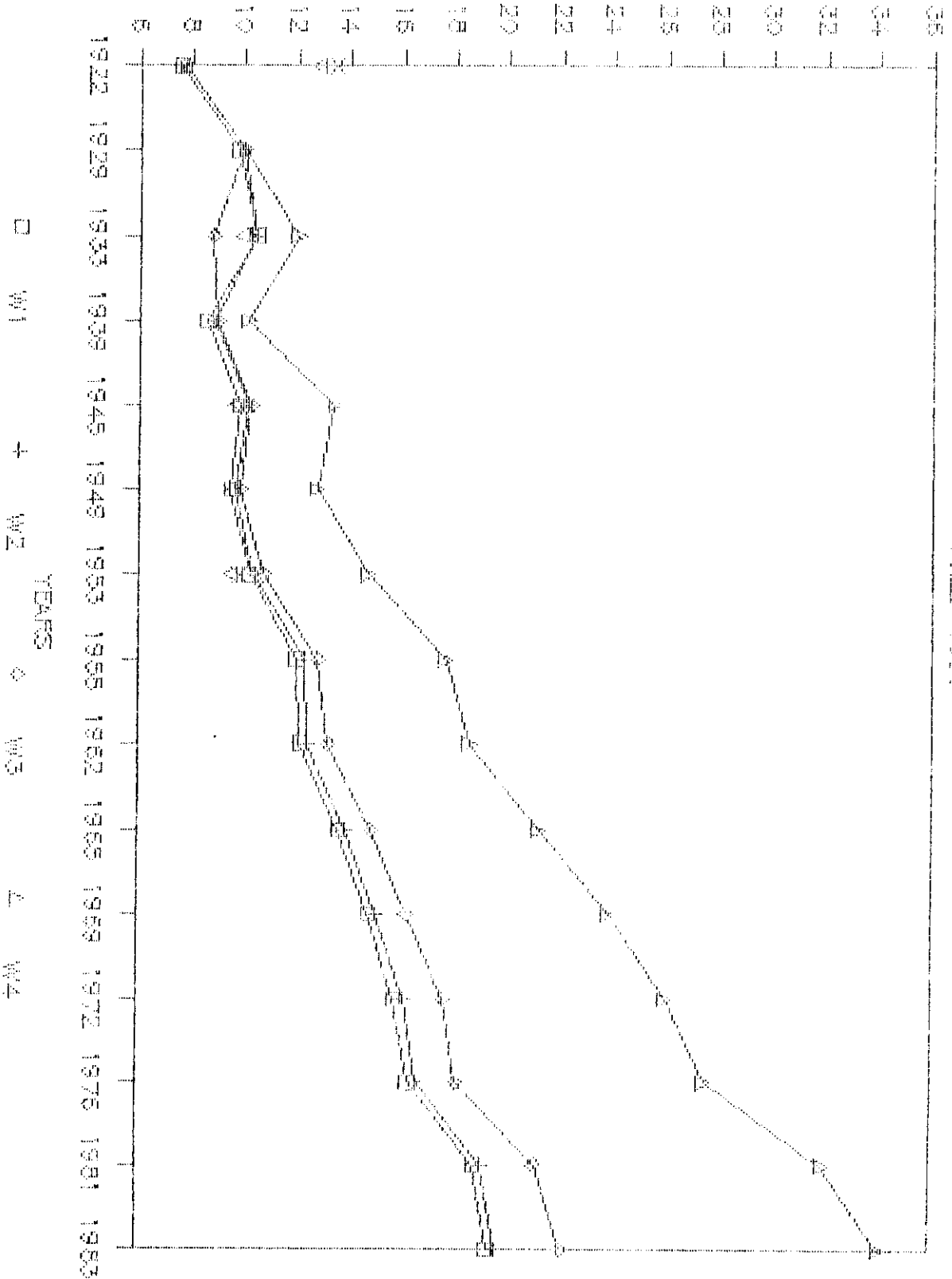
\*\*The social security series for W4 was available only through 1978. The 1981 and 1983 values in Table 3 were estimated by the authors.

Sources: Table 3, the 1986 Report of the President, Appendix B, and the Historical Statistics of the United States, Colonial Times to 1970.

WEALTH VERSION  
(Thousands)

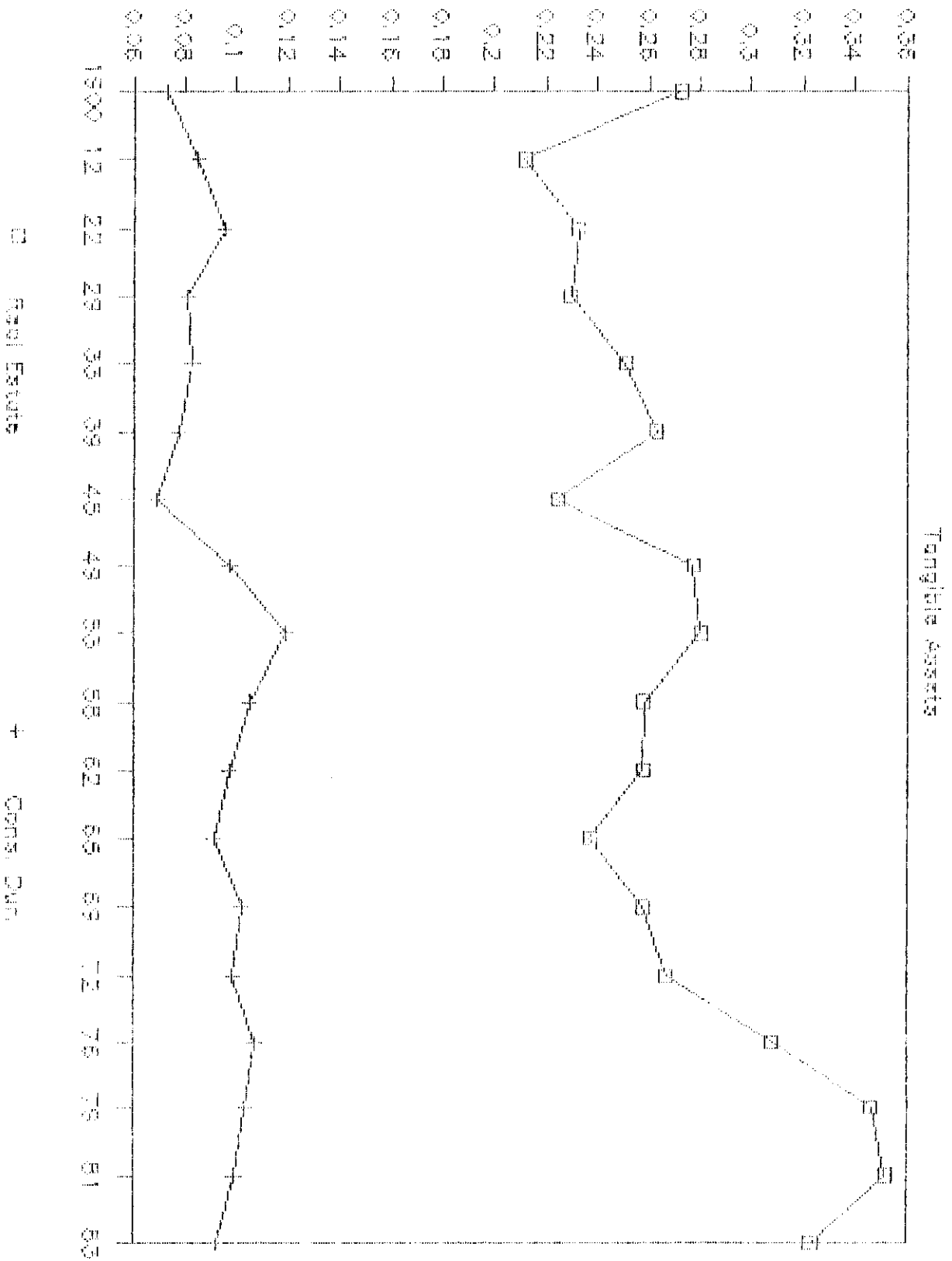
Real Per-Capita Wealth  
1922-1983

GRAPH 1



# Percentage of Total Assets 1900-1983

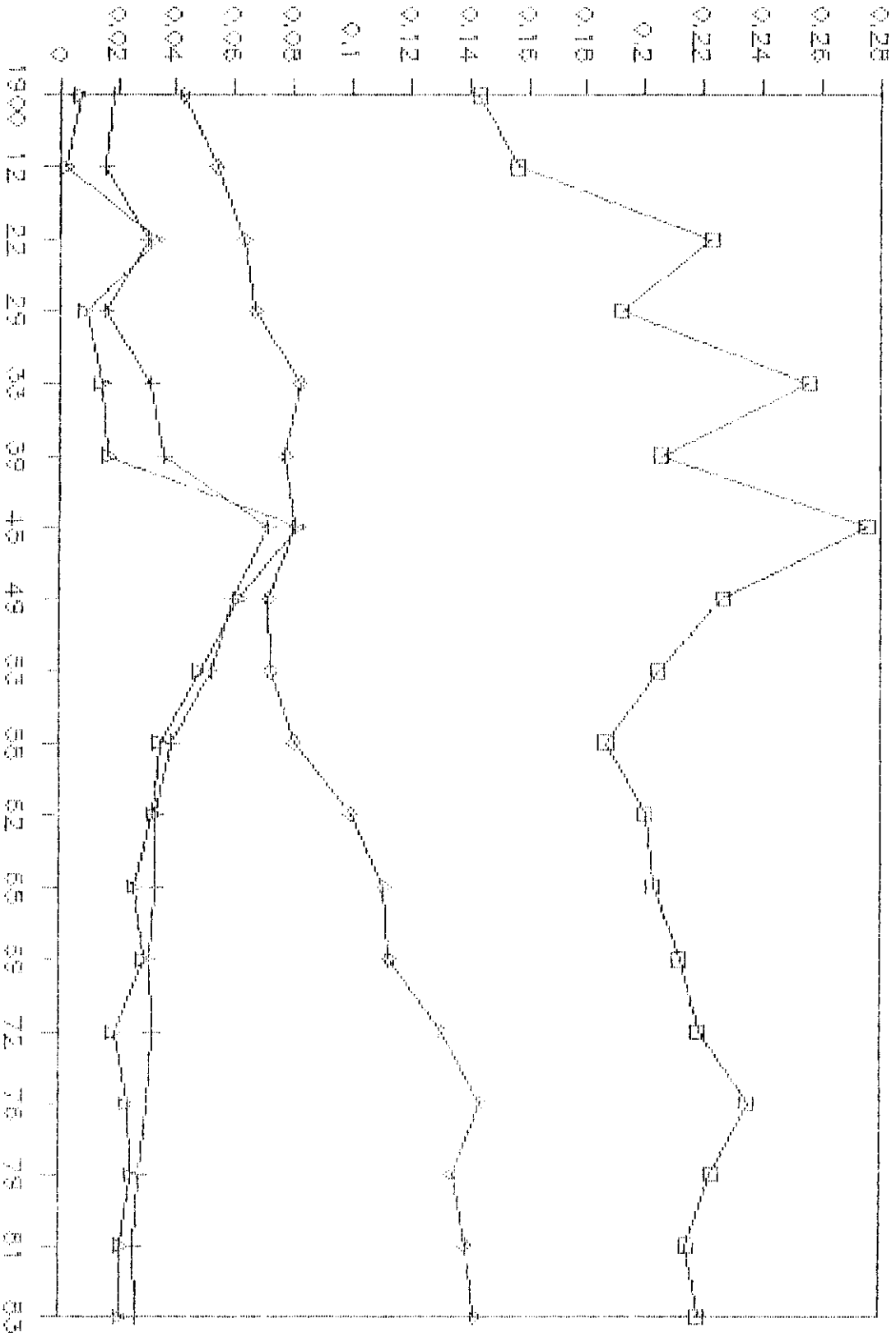
GRAPH 2



# Percentage of Total Assets 1900-1983

GRAPH 3

Financial Fixed Assets

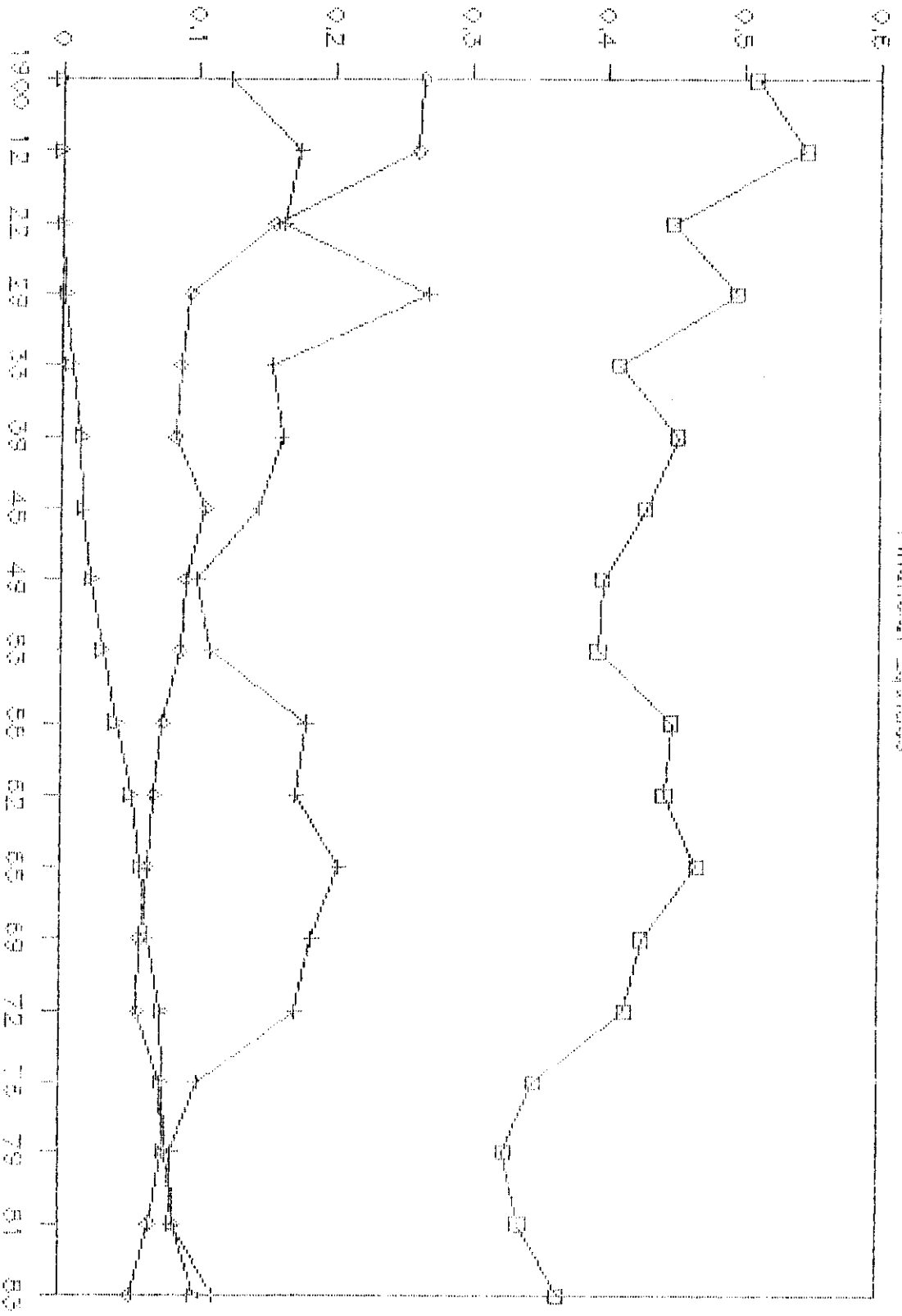


Legend:  
TFFA: Total Financial Fixed Assets  
DD: Demand Deposits  
SD: Savings and Other Financial Deposits  
FB: Federal Bonds

# Percentage of Total Assets 1900-1983

GRAPH 4

Financial Equities



TEQ: Total Financial Equities

FEQ: Farm Equity

CS: Corporate Stock

PF: Pension Funds

increased over the period (climbing from 27% in 1922 to over 33% in 83). Even after correcting for an increase in the share of mortgages, real estate net worth increased as a percentage of total net worth. The proportion of consumer durables reached a high after the war in 1953 (12%) and then declined. The proportion of total financial assets declined over the entire period. The share of fixed claim securities, which includes such assets as demand deposits and government and corporate bonds, reached a peak in 1945, due to the surge in liquid assets and government bonds, and then declined. The only fixed claim asset whose share rose over the period was deposits in other financial institutions. The proportion of corporate stock reached a historical high of 27% in 1929, rose after the depression to a second peak of 20% in 1965, declined sharply in the 1970's (below 9%), and then recovered by 1983 to 12% of total assets. The share of pension wealth increased over the entire period, and that of farm equity declined.

The aggregate results reported in Tables 2 and 3 indicate that the per-capita real wealth increase was substantial over the period, and the effect of social security and pension wealth was significant in raising aggregate wealth. This suggests that further empirical work on wealth inequality and household balance sheets should pay particular attention to the effects of expected social security benefits. There was considerable realignment in asset composition over the period with real estate and retirement wealth increasing. Whether this wealth growth also increased the national well-being depends on how it was distributed.

### III. THE CONCENTRATION OF WEALTH 1922-1983

Information available on household wealth distribution for the 20th century is based on estate data for the very wealthy collected from national

estate tax records for selected years between 1922 and 1982 and cross-sectional surveys for selected years starting in 1953. In addition, synthetic data bases, such as Wolff's 1969 sample and Greenwood's 1973 sample, have been constructed using income tax data merged with Census files, estate files, and other sources. In Table 4 and Graph 5, we report Lampman and Smith's original concentration estimates for the top 0.5 percent of the population from 1922 through 1976.<sup>6</sup> These estimates show a high concentration of wealth throughout the period. Over 20 percent of total wealth was owned by the top 0.5 percent in every year except 1949 and 1976. However, Table 4 also indicates a significant decline in concentration over the century, from a maximum share of 32.4% in 1929 to 14.3% in 1976. In particular there was a substantial decline in the top wealthholders' share during World War II and another large fall in the mid-seventies, as indicated in Smith's results. This section explores the sensitivity of the concentration results in Table 4 to the following factors: (1) inconsistencies between Smith's and Lampman's imputation assumptions; (2) changes in the number of household units and the composition of wealth between household members; (3) adjustments to the aggregate wealth series; (4) the addition of retirement wealth (W3 and W4); and finally (5) the data and methodology used (a comparison of survey estimates with the estate data).

The wealth estimates for the living population are derived using the estate multiplier method which divides the population by age and sex and weights the deceased in each group by the reciprocal of the survival probability for each group. The survival probabilities used are higher than  
<sup>6</sup>The estate estimates provide information only for the top-wealthholders. There is no an exact mapping between these estimates and more inclusive inequality measures.



Table 4  
Published Lampman and Smith Concentration Results  
Based on Uncorrected Aggregate Data

Percentage of Net Worth held by the  
Top 0.5 Percent of the Population

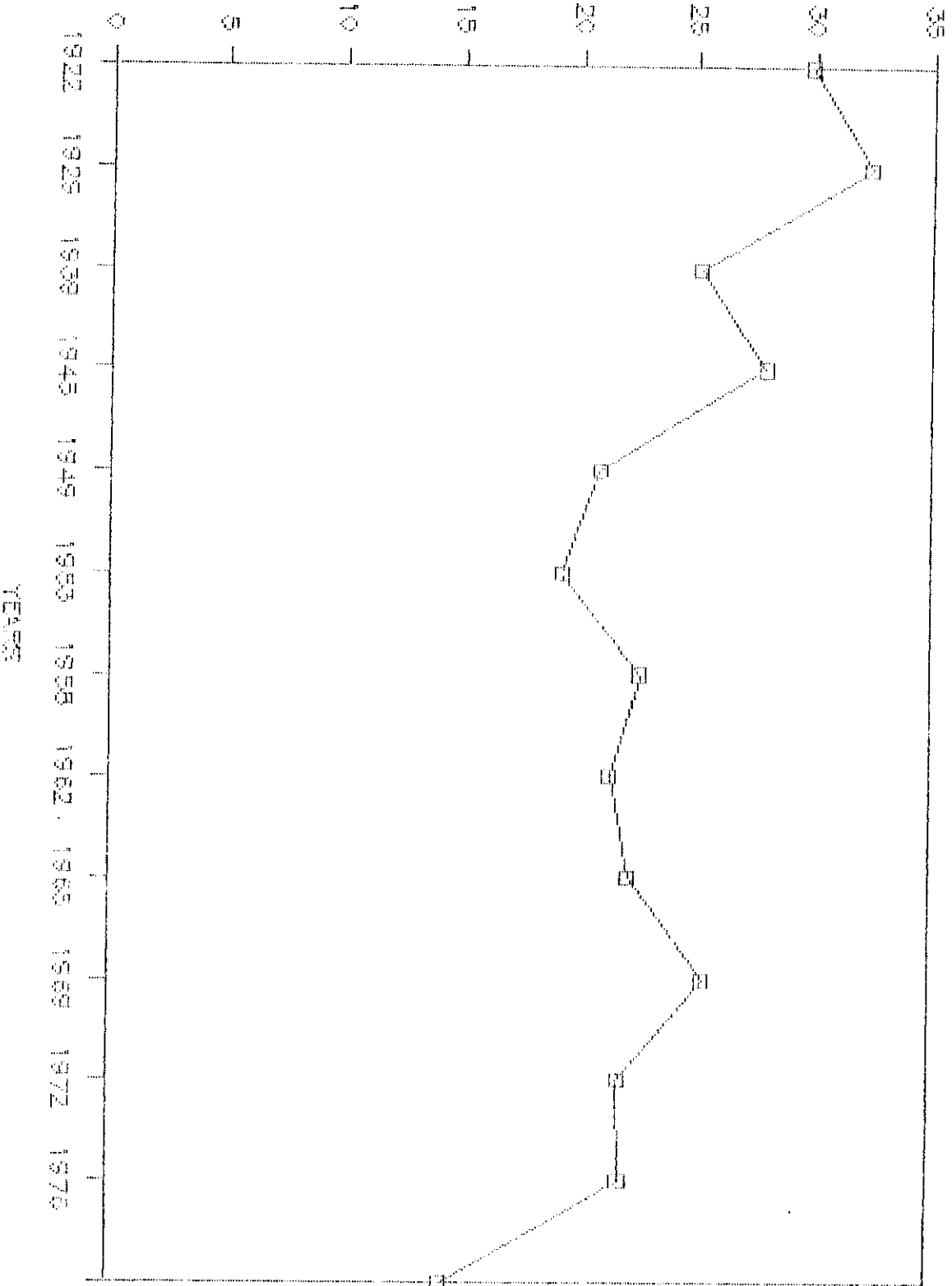
	1922	1929	1933	1939	1945	1949	1953
Top 0.5%	29.8	32.4	25.2	28.0	20.9	19.3	22.7
	1958	1962	1965	1969	1972	1976	
Top 0.5%	21.4	22.2	25.4	21.8	21.9	14.3	

\*For Lampman years, 1922-53, net worth data are from  
the basic variant

Sources: 1922-53, Lampman (1962), p. 202.  
1958-76, Smith (1984) p. 422.

SHARE TOP 0.5 %

GRAPH 5  
Uncorrected Concentration Series  
Table 4, Top 0.5% Pop.



those for the population at large, due to the longer expected life span of the wealthy. This method represents a point estimate which can have a very large variance, particularly for the young, since there are very few in the sample. In fact, the multipliers for those under 50 approach 2,000. Estate estimates have been criticized by Shorrocks (forthcoming) and Atkinson (1975) as overestimating the decline in inequality. This is because estate estimates are based on the individual rather than the household unit and over the century customs have changed. Married women now inherit more wealth and have higher wealth levels than they did in 1900 or 1930. This reduces individual concentration even if household wealth inequality does not change. For example, between 1929 and 1953, Lampman reported that the percentage of married women among top-wealthholders increased from 8.5% to 18%.

The estate files used by Lampman, Smith and Schwartz, do not include all assets. For example, retirement streams are included only at their cash surrender value. A large percentage of trusts, those that are not directly under the control of the deceased, are left out. These trusts, if they are included at all, are measured at their actuarial value. Also life insurance values are overstated in the estate files, a problem that both Lampman and Smith recognized and made adjustments for. However, for these assets, Lampman and Smith made different assumptions concerning the top-wealthholders' holdings. Lampman used a wealth variant that included the full value of pensions as well as trusts. Smith used a narrower wealth definition corresponding to "available" wealth. He included only the "actuarial" value of trusts reported in the estate file and the cash surrender value of pensions. Because of the fraction of trusts not included, Smith's reported concentration estimates are biased downward compared to Lampman's.

Table 5  
A Comparison of Top Wealthholders' Share of Net Worth  
and Gross Assets Under Different Wealth Definitions  
Our Adjusted Series

Estate Data						
	1922	1929	1939	1945	1949	1953
% of Population	0.5%	0.3%	0.6%	0.7%	0.8%	1.0%
% of Net Worth						
Wealth Def:						
W1	26.8	27.3	27.2	22.3	21.9	26.6
W2	28.4	29.1	29.8	24.4	23.2	28.4
W3	28.0	28.5	28.8	23.7	22.6	27.4
W4	28.0	28.5	25.9	18.9	18.4	21.3
% of Total Assets						
Wealth Def:						
W1	28.9	29.1	28.9	23.5	21.2	26.5
W2	30.3	30.7	31.3	25.5	23.8	28.1
W3	29.9	30.2	30.4	24.8	23.2	27.3
W4	29.9	30.2	27.5	19.9	19.1	21.6
1958						
1962						
1965						
% of Population	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
% of Net Worth						
Wealth Def:						
W1	20.8	25.9	23.1	29.1	25.4	31.3
W2	22.7	27.7	25.0	31.1	27.7	33.6
W3	21.5	26.6	23.4	29.5	25.7	31.5
W4	16.4	20.7	17.5	22.4	18.9	23.6
% of Total Assets						
Wealth Def:						
W1	20.3	25.4	20.3	25.4	21.7	27.3
W2	22.0	27.0	24.2	30.2	26.2	31.9
W3	21.0	26.0	22.8	28.8	24.5	30.2
W4	16.4	20.7	17.6	22.5	18.7	23.4
1969						
1972						
1976						
% of Population	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
% of Net Worth						
Wealth Def:						
W1	22.5	28.2	21.8	27.6	12.6	17.3
W2	24.5	30.2	24.0	29.8	14.6	19.1
W3	23.2	28.9	21.9	27.6	13.2	17.8
W4	16.6	21.1	15.8	20.3	9.8	13.4
% of Total Assets						
Wealth Def:						
W1	21.7	27.3	21.0	26.8	12.8	17.3
W2	23.4	29.0	23.0	28.6	14.4	18.9
W3	22.3	28.0	21.2	26.8	13.3	17.7
W4	16.6	21.2	15.9	20.5	10.1	13.8

Table 5 continued

1981		
% of Population	0.08%	2.0%
% of Net Worth		
Wealth Def:		
W1	19.7	28.4
W2	21.2	29.7
W3	19.5	27.8
W4	14.0	20.4
% of Total Assets		
Wealth Def:		
W1	19.6	28.1
W2	20.8	29.3
W3	19.4	27.6
W4	14.5	21.0

Survey Data				
Top 1 and .5% of Households				
	1962		1983	
% of Total Households	0.5%	1.0%	0.5%	1.0%
% of Net Worth				
Wealth Def:				
W1	25.2	36.0	22.9	33.3
W2	27.5	38.1	24.5	34.8
W3	25.7	36.1	21.9	31.5
W4	19.1	27.1	14.9	21.7
% of Total Assets				
Wealth Def:				
W1	22.6	32.4	20.2	29.2
W2	24.7	34.3	21.5	30.5
W3	23.3	32.7	19.6	28.2
W4	17.9	25.4	14.0	20.4

Sources: The estate sources were: 1. 1922-53: Lampman (1962); 2. 1953-1976: estate series, Smith (1984, 1986); 3. 1981: Schwartz (1984). The adjustments and imputations to these sources is explained in Appendix II.

Survey data sources were: 1. 1962: SFCC database 2. 1983: SCF database. The concentration estimates are from our calculations. The adjustments and procedures are explained Section IV.

In addition, Lampman's concentration estimates reported in Table 4 are based on Goldsmith's estimate of aggregate household wealth. Smith's estimates are based on Ruggles and Ruggles' mid-year household estimates.<sup>7</sup>

The reported estimated wealth of the top wealthholders was divided by our adjusted aggregate data to derive our "corrected" concentration series. These values correspond to W1 in Tables 5 and 6. In addition, imputation assumptions were made concerning the assets that were left out of the estate files. For these assets, trusts, pensions and social security, we tried several alternatives, creating upper and lower bounds for the top-wealthholders' holdings in each asset category. These imputation assumptions and results are discussed in Appendix II. In the tables in this section, we report only selected concentration results from the alternative scenarios that we tried. The other assumptions yielded estimates that were either insignificantly different from the reported versions in Table 5 or the concentration estimates fell in between the results that are reported.

Table 5 lists our "corrected" concentration series for the top individual wealthholders from the estate estimates under each wealth variant, W1 through W4, and the concentration estimates for the top 1 % of households from the adjusted survey data. In addition to the Lampman and Smith data we added Schwartz's (1981) estimates. The Lampman data, 1922-53, represented a different proportion of the population for each year. His sample was all wealthholders with total assets above 60,000. Thus the percent of population represented varied over the period from 0.3 percent in 1929 to to 1.0 percent in 1958. The fraction of the population is reported in row 1 of Table 5 and 7 Although we tried several alternative groupings, we could not reproduce exactly Smith's reported aggregate numbers using R & R's published numbers. The largest discrepancy was in his miscellaneous asset category.

the concentration data reported in rows 2-5 is for the population percentages in row 1.

The first question that can be answered by the estimates in Table 5, is the degree to which different imputation assumptions change the estimated shares of top-wealthholders. The difference between alternative trust assumptions is the difference between the rows W2 and W1. W2 represents an upper bound for trust holdings, since for its calculation it is assumed that the top 1% owned 100% of total trust assets, while W1 represents a reasonable lower bound, since it evaluates trusts at their much lower "actuarial" value and assumes that all of the trust holdings of the wealthy were included in the estate file<sup>8</sup>. In comparison, Lampman assumed that only 10 percent of total trusts were included in the basic estate data and Smith estimated it at 54 percent of the total balance sheet value of trusts. W1 corresponds to the wealth definition used by Smith. W2 represents the wealth version with the maximum concentration ratio. This is due to the 100% assumption on trusts and the exclusion of retirement wealth except for the cash surrender value of pensions, which is essentially zero. The results from Table 5 show that the effect on the wealthy's percentage share from alternative assumptions concerning trusts is approximately 2 percentage points.

The second question that can be partially answered by the percentages in Table 5 is the extent to which wealth concentration is diluted when we add retirement wealth. W3 adds full pension reserves which are reported in the aggregate data sources. The difficulty is that there is very little data on pension reserves. Smith reported this as the "actuarial" value. However some trusts were not included at all in the estate files. Thus these numbers are below the "true" actuarial values.

little information concerning the percentage of total pensions owned by the top-wealthholders. We tried alternative assumptions from a maximum of 15 percent to a minimum of 2 percent. The different assumptions had little effect on total concentration. In the estimates reported in this section, we used a slightly declining proportion based on the growth of pensions over the period. The addition of pension wealth has had a minor effect on concentration, due to its small relative size in relationship to total assets. On the other hand, the addition of social security wealth (W4) significantly lowered the degree of inequality as measured by the concentration of wealth of the top percentile. Wealth share estimates for top wealthholders dropped an average of 10% from W3 to W4.

In order to analyze the series across time and evaluate the degree of inequality in each year, we have standardized the results from Table 5 to the top 1 percent of the population using the Pareto distribution. This technique assumes that the Pareto distribution is representative of the wealth distribution at the upper tail for each year. The technique and assumptions are explained in Appendix II under transformations to the Distribution Data. These results are reported in Table 6 below and illustrated in Graph 6.

The difference between our W1 estimates for the top 0.5 percent and those reported in Table 4 represent the differences between our adjusted aggregate series and the Goldsmith and RR series.<sup>9</sup> Our concentration estimates for W1 (for the top 0.5%) are lower than Lampman's and closer to Smith's estimates. Our adjusted concentration estimates based on Smith's data are higher than his original estimates in some years and lower in others. A comparison across the wealth variants confirms the results from Table 5. While Table 6 reports concentration figures for total assets, while Table 4 reports them for net worth.



Table 6

Estimated Shares of Wealth, 1922-81,  
of the Top 0.5 and 1.0% of the Total Population  
for Different Definitions of Wealth\*

Proportion of Total Assets

% of Population	1922		1929		1939	
	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Wealth Def:						
W1	28.8	37.1	31.7	35.8	26.7	35.9
W2	30.3	38.3	33.2	37.2	29.1	38.1
W3	29.9	37.9	32.7	36.7	28.3	37.1
W4	29.9	37.9	32.7	36.7	25.6	33.4

% of Population	1945		1949		1953	
	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Wealth Def:						
W1	20.6	27.0	18.2	23.9	21.2	26.5
W2	22.6	28.9	20.2	25.7	22.9	28.1
W3	21.9	28.1	19.6	25.0	22.2	27.3
W4	17.7	22.4	16.3	20.5	17.9	21.6

% of Population	1958		1962		1965	
	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Wealth Def:						
W1	20.3	25.4	20.3	25.4	21.7	27.3
W2	22.0	27.0	24.2	30.2	26.2	31.9
W3	21.0	26.0	22.8	28.8	24.5	30.2
W4	16.4	20.7	17.6	22.5	18.7	23.4

% of Population	1969		1972		1976	
	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Wealth Def:						
W1	21.7	27.3	21.0	26.8	12.8	17.3
W2	23.4	29.0	23.0	28.6	14.4	18.9
W3	22.3	28.0	21.2	26.8	13.3	17.7
W4	16.6	21.2	15.9	20.5	10.1	13.8

% of Population	1981**	
	0.5%	1.0%
Wealth Def:		
W1	16.0	22.0

\*For Lampman and Schwartz estate data: 1922, 29, 39, 45, 49, 53 and 81, we estimated the top 0.5 and 1.0% using the Pareto distribution. The technique is explained in Appendix II.

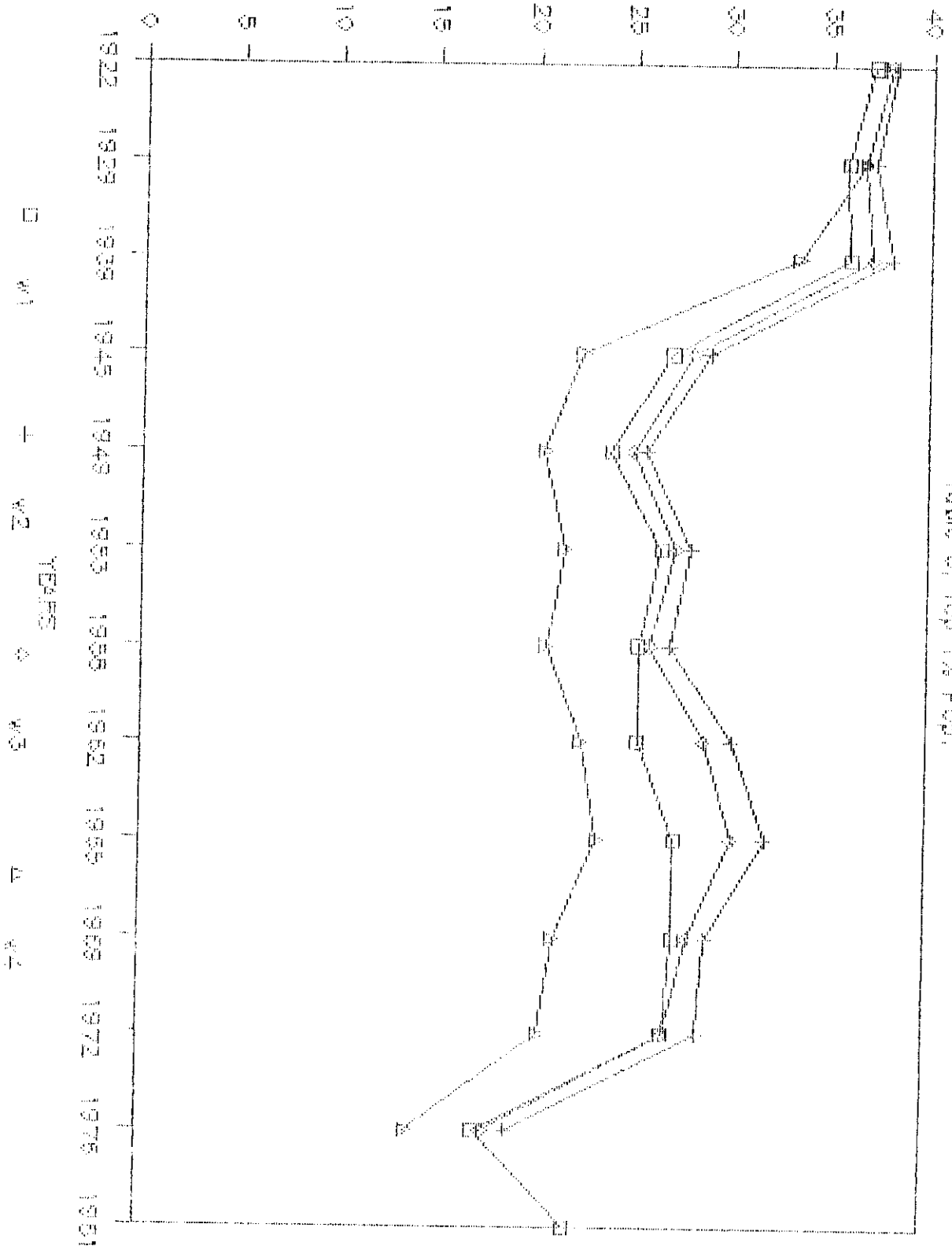
\*\*For 1981 only the W1 estimates have been calculated.

SHARE TOP 1.0%

GRAPH 6

Concentration of Wealth 1922-1981

Table 6, Top 1% Pop.



retirement wealth reduces concentration, the effect of adding pension wealth is not significant and the effect of social security is significant and relatively constant since its introduction.<sup>10</sup> Our adjustments to the estate estimates did not account for underreporting of assets or nonfiling in the estate data. Both would bias the results downward. The extent of this bias is discussed below, under comparisons between estate and survey data in Tables 8 and 9.

The previous adjustments examined the sensitivity of the level of concentration, as measured in the estate data, to different wealth aggregates and assumptions concerning the trust holdings of the wealthy. These adjustments will not significantly effect the trends in concentration. The estate data indicates that concentration was at a peak during the period from 1922 through 1939, declined significantly during World War II, then increased between 1949 and 1965, declined slightly in 1972, and then fell in 1976 to a record low which was only partially recovered by 1981. These trends in concentration, as shown in Graph 6, follow the turns in the stock market, illustrated in Graph 3.

The major decline in concentration of the last decade is not substantiated in the survey data, reported in Table 5. A comparison of the 1962 and 1983 survey data for the top 1 percent of households indicates a rather stable distribution over the period. Secondly, as mentioned above, the increased tendency to divide wealth equally between household members will reduce the estate concentration estimates without changing household wealth concentration. In Table 7 and Graph 7 we examine the sensitivity of the trends in concentration to changes in the unit of account. The reported  
10 It should be noted that the W4F shares reported in Tables 5 and 6 represent the maximum reduction of concentration from adding social security.

concentration estimates in Table 7 represent the estimated top 1.0 percent of households rather than the top 1.0 percent of the population reported in Table 6.

In order to calculate the values in Table 7 we used "assumption 1" to estimate the number of households represented in the top-wealthholders for the Lampman years. In "assumption 1" we assumed that all married women in the sample married wealthy men in the sample. The remaining married men (married men represented from 54.5% -59% of the sample while married woman represented between 8.5 and 18%) married women with zero wealth. While this represents the lowest number of households and the maximum household concentration in regard to married women, it is a conservative or lower bound estimate of the total wealth held by the top 1.0 percent of households. This is because it assumes that the remaining 30% of married men in the sample married women with zero wealth. The method is explained in detail along with other plausible transformation assumptions Appendix II.

The results from Table 7 and Graph 7 based on Lampman's data indicate that a significant proportion of the 1922-1953 decline in concentration was due to changes in the wealth of married women. The share of the top one percent of households declined four percentage points between these two years. The years 1922 and 1949 appear to be outliers, with 1929 a peak and 1949 a trough. This is based on a conservative estimate of the average household wealth. The decline in concentration from 1922 to 1953 would have been even less with other assumptions. During the period 1958 to 1976, we estimated that, based on Smith's data, the percent of married women among the wealthy remained relatively constant at 18 percent.<sup>11</sup> Thus there is 11This conclusion is from a comparison of Lampman's 1953 results and Schwartz's 1976 and 1981 estimates. In 1953, married women represented 18 percent of the sample. In 1976 they represent 16.8% and in 1981 they represented 18 percent.

Table 7

Preliminary Estimates of the Shares of Wealth, 1922-1976,  
Of the Top 1.0% of Total Households  
for Alternative Definitions of Wealth\*

Proportion of Total Assets

Wealth Definition:	1922	1929	1939	1945	1949	1953
W1	24.0	29.1	22.7	18.6	16.8	20.0
W2	25.5	30.7	25.3	20.7	18.8	21.7
W3	25.2	30.2	24.5	20.1	18.3	21.1
W4	25.2	30.2	22.2	16.2	15.2	17.0

Wealth Definition:	1958	1962	1965	1969	1972	1976
W1	18.5	20.5	22.1	20.0	18.5	11.3
W2	20.0	22.1	23.9	21.6	20.2	12.7
W3	19.1	20.9	22.4	20.7	18.6	11.7
W4	15.0	16.1	17.1	15.4	14.0	9.0

\*The estimated shares reported in this table depend on the assumptions made in estimating the number and wealth of the households that correspond to the individual estate shares. The assumptions used to construct the above reported shares are explained in Appendix II, (B) Transformations to the Top-wealthholders Estimates, (ii) Individual to Household Unit.

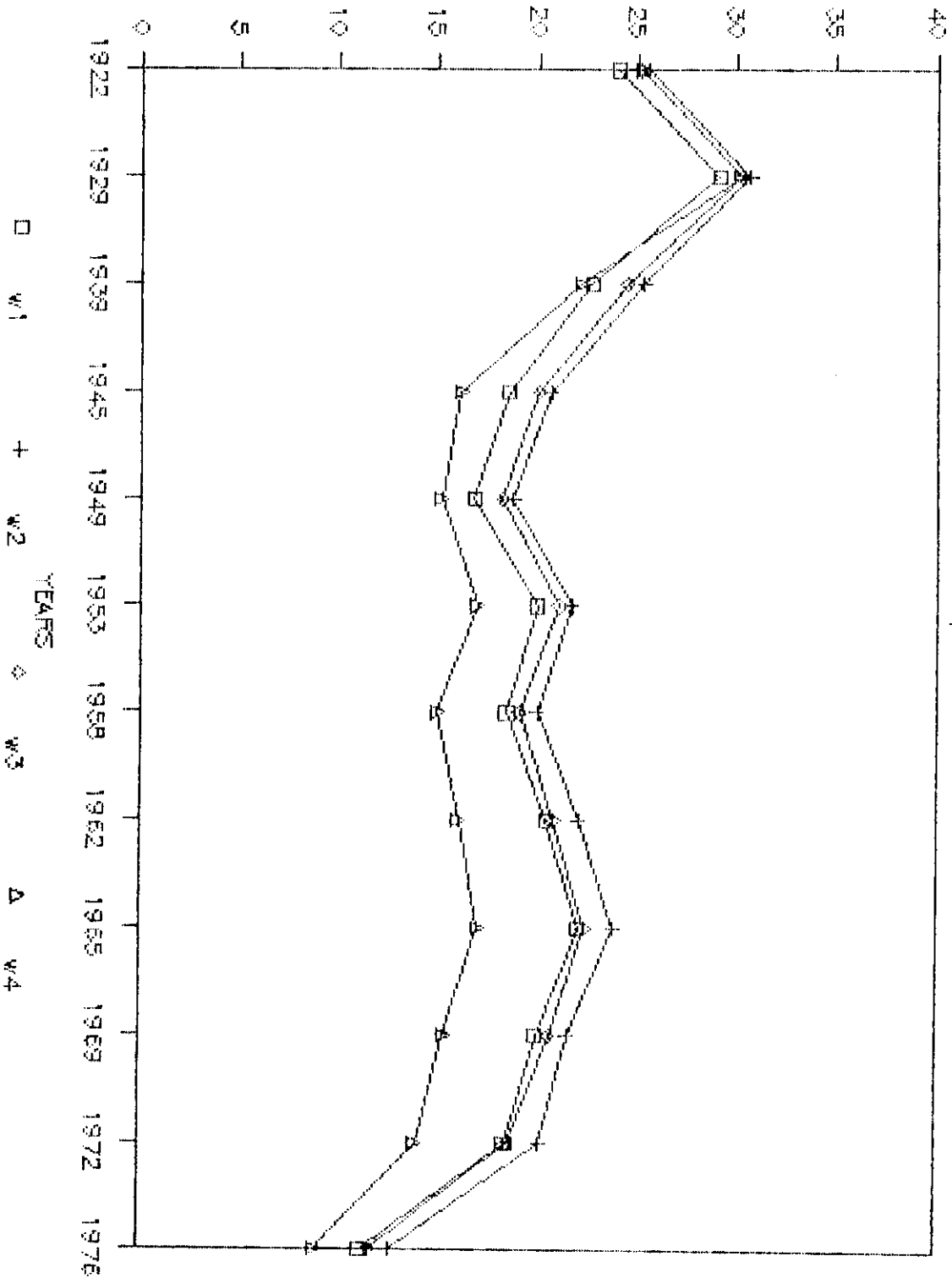
Source: Table 5

SHARE 1.0% HH

# Concentration of Wealth 1922-1976

GRAPH 7

Table 7. Top 1.0% HH



no significant change in the concentration estimates when we examine the top 1% of households rather than individuals for this period.

While most of decline in wealth concentration found by Lampman appears due to population changes, Smith's 1976 decline cannot be explained by changes in the unit of account. However there are two other possibilities. First the 1976 data could be incorrect, especially with respect to stock holdings. The 1976 results suggest not only a significant drop in the value of stocks, but also a substantial fall in the percentage of stock held by the top .5 and 1.0 percent of the population, from 57.4% in 1972 to 37.6% in 1976 for the top percentile. If this drop represented a portfolio shift than some other asset should have increased. However, this did not happen. From the relative price shift between stocks and real estate in the 1970's we would predict a fall in concentration, yet it is just the magnitude of the 1972-76 fall that is in question. The second possibility is that there was an increase in the degree of underreporting in the estate data. There is no obvious reason for such an increase in the 1970s, although in the 1980s this was probably the case, due to the large increase in the gift exclusion at the beginning of the decade.

The estate data are not corrected for underreporting or the transferring of wealth through gifts. In order to understand the extent of any underreporting we compare the estate estimates to adjusted survey estimates for 1962 and 1983 in Table 8. The survey concentration estimates have been adjusted to correspond to the balance sheet totals for most assets, and the adjustments are discussed in Section IV below and in Wolff (1986). In Table 8 we compare the concentration for the top 1.0 percent of households from the survey data with our estimates of the top 1.0 percent of households from

Table 8  
 A Comparison of Estimated Concentration of Wealth for  
 Adjusted Survey and Estate Data  
 (Percent of Total Assets)

(A) Top 1.0 Percent of Households

Wealth Def:	Estate Data			Survey Data	
	1962	1972	1976	1962	1983
W1	20.5	18.5	11.3	32.2	29.2
W2	22.1	20.2	12.7	34.3	30.5
W3	20.9	18.6	11.7	32.7	28.2
W4	16.1	14.0	9.0	25.4	20.4

(B) Top 1.0 Percent of Individuals

Wealth Def:	Estate Data			
	1962	1972	1976	1981*
W1	25.4	26.8	17.3	22.0
W2	30.2	28.6	18.9	
W3	28.8	26.8	17.7	
W4	22.5	20.5	13.8	

\* The 1981 estimates have been completed only for the W1 wealth version.

Sources: (A) Top 1.0 Percent of Households:  
 Estate estimates: Table 7  
 Survey estimates: Table 5

(B) Top 1.0 Percent of Individuals:  
 Estate estimates: Table 6



Smith's estate data. In 1962 we have estimates from both sources. The household concentration estimates from the corrected survey data are significantly higher than those from the estate estimates from Table 7. Part of this difference is due to the conservative assumption used in converting the estate data to a household base. However, a large part of the overall difference of over 12 percentage points in the household-based series suggests an underreporting problem in the estate data, particularly since the concentration estimates based on individual estate data are lower than the survey estimates based on the household unit. In addition, the survey estimates do not show a substantial decline in concentration over the 1962 to 1983 period. There is a slight decline but not one that would be statistically significant.

Finally in Table 9 we compare the adjusted concentration estimates from the above data with two other sources, unadjusted survey data and Greenwood's 1973 data. Most surveys lack sufficient over-sampling of the rich to capture the upper tail. For example, the 1979 ISDP survey captured only 66 percent of all assets and the 1979 pension survey estimated an aggregate household wealth which was only 52% of our total net worth<sup>12</sup>. The resulting concentration estimates vary with the degree of underreporting and bias in the sample. The 1979 ISDP sample captured a higher proportion of aggregate wealth and also had a higher proportion of wealthy individuals than the pension survey of the same year. Consequently, the reported inequality based on the ISDP is higher. The top 1.5 percent held 26 percent of total wealth in the ISDP, while the top 0.96 percent owned 16.2 percent in the pension survey. The concentration estimates from the 1984 SIPP (see Table 9)

<sup>12</sup> The 1979 ISDP results are from Radner and Vaughan (forthcoming). The 1979 pension survey estimates are from Cartwright and Friedland (1985).

Table 9  
Top Wealthholder Shares in Net Worth  
From Other Sources

Unadjusted Survey Data (1979,1984)  
and Greenwood's 1973 Database

Year	1973 Greenwood's sample	1979 ISDP Survey	1979 Pension Survey	1984 SIPP Survey
% of Total Households	1.0%	1.5%	1.0%	1.9%
% of Net Worth based on sample aggregate	32.6%	26.0%*	16.2%	26.0%
% of Net Worth based on national aggregate	24.0%	17.0%	8.4%	N/A

\* The ISDP concentration was estimated using the Pareto Distribution with Data from Radner and Vaughan (forthcoming).

Sources:

1973: Greenwood's synthetic database derived from matching an estate sample to estimated asset levels from income tax returns. Greenwood (1986).

1979 (ISDP): Income Survey and Development Program from Radner and Vaughan (forthcoming).

1979 (Pension): President's Commission on Pension Policy: Household Survey from Cartwright and Friedland (1985).

1984 (SIPP): Survey of Income and Program Participation estimated by Enrique J. Lamas and John M. McNeil (1986,1985). The concentration percent quoted above was provided to the authors by John M. McNeil.

and the 1983 SCF (see Table 8) provide a comparison of unadjusted and adjusted survey results. In the 1984 SIPP file, the estimated share of the top 1.9 percent was 26 percent, less than the 33 percent share of the top 1 percent from the SCF<sup>13</sup>.

Any inequality estimate, such as a Gini coefficient based on the unadjusted survey data will underestimate wealth inequality. Greenwood's estimates are based on estate files which were merged with income tax records. Her reported results also appear biased. The high wealth share of the top one percent (32.6 percent) appears the result of underestimation of total assets. Greenwood's estimated aggregate wealth was 74 percent of our balance sheet figure. Her estimates of total financial securities and stocks, assets held largely by the wealthy, were actually higher than our balance sheet estimates, while real estate, an asset concentrated in the middle class, was only 80 percent of the balance sheet total.<sup>14</sup> Based on our adjusted estate sample, the top one percent owned only 14 percent of total real estate in 1972. An adjusted estimate of the share of the wealthy in 1972 is given in row 3 of Table 8, where we divide Greenwood's estimates by our balance sheet aggregates.

The results from Tables 8 and 9 suggest that while there is substantially more underreporting and nonreporting in survey data than estate files, concentration estimated from the estate files is also biased downward. These results indicate that more time and effort should go into adjusting the survey data, especially the current Sipp panel data. In addition, there should be some analysis of the extent of underreporting in estate data through gift transfers in tax returns, which are presently unlimited at \$10,000 a year per

person, as well as the extent of unreported trusts.  
13The 1984 results are from Lamas and McNeil (1986).  
14See Greenwood (forthcoming), p.7.

The conclusions from our analysis of 20th century concentration are several. First, the concentration estimates for the early years are slightly reduced when we adjusted for inconsistencies in the aggregate data and when we included pension funds. With the exception of social security, the effect on the top-wealthholders' share of different versions of wealth and/or different asset assumptions is approximately 2 to 3 percentage points. However, the inclusion of social security wealth can make a significant difference on the concentration estimates--up to a maximum reduction of 7 percentage points. Second, when we adjust for changes in number of households and married women among the top wealthholders, the drop in concentration during World War II is considerably less than indicated from estimates based on individual shares. Third, when we include the survey comparisons of 1962 and 1983 we find a rather stable wealth concentration through the postwar period. The estate data estimates show a much larger decline over the 1962-1981 period than our adjusted survey estimates. However, the reason for this is not readily apparent, though underreporting in the estate data may have increased during the period. Finally, our results indicate that more work is needed to adjust both the survey data and to a lesser extent the estate data for underreporting.

IV. ADJUSTMENTS FOR MISSING VALUES AND UNDERREPORTING IN SURVEY DATA,  
1962 AND 1983

In this section we investigate the sensitivity of estimates of wealth inequality to varying procedures for adjusting for missing values and underreporting in survey data. Various measures of wealth inequality are considered, including the Gini coefficient, the shares of the top wealth holders, and quintile shares. We consider estimates for 1962 based on the Survey of Financial Characteristics of Consumers (SFCC) and for 1983 based on the Survey of Consumer Finances (SCF). We also consider the effects of including measures of pension and social security wealth in the household portfolio on the distribution of household wealth.

A. Adjustment Procedures for the 1962 SFCC

Table 10 presents a comparison of household balance sheet totals based on the original SFCC data with those from national balance sheet data (see section above). The total of all assets in the national balance sheet data is \$2,038.6 billion. If only the assets appearing on the SFCC tapes are included (thus excluding other consumer durables, inventories, insurance, and pensions), the national balance sheet figures total to \$1,774.0 billion. The original SFCC asset values total \$1,410.1 billion, or 79 percent of the corresponding national balance sheet total. The major items which differ are as follows:

- 1) Owner-occupied housing in the SFCC is valued higher than the national balance sheet data. The SFCC estimate is almost half again as much as the national balance sheet figure.

Table 10

Comparison of National Balance Sheet and Survey Data Estimates  
of Total Household Wealth, 1962 and 1983<sup>a</sup>

	1962			1983		
	Nat'l Balance Sheet Data	SFCC	Ratio of SCFF to Nat'l Bal. Sheets	Nat'l Balance Sheet Data	SCF	Ratio of SCF to Nat'l Bal. Sheets
I. Assets	\$2,038.6	\$1,410.6	0.69	\$11,106.7	\$9,568.2	--
A. Tangible Assets	691.6	643.3	0.93	4,681.7	3,845.8	--
1. Owner-Occupied Housing	331.2	473.9	1.43	3,263.3	3,363.2	1.03
2. Other Real Estate	104.0	114.4	1.10	--	--	--
3. Cars	72.4	55.0	0.76	413.7	482.6	1.17
4. Other Consumer Durables	127.9	--	--	760.6	--	--
5. Inventories	56.1	--	--	244.1	--	--
B. Fixed Claim Assets	417.3	265.0	0.64	\$ 2,693.3	\$1,233.6	0.46
1. Demand Deposits & Currency	69.8	23.7	0.34	334.2	137.8	0.41
2. Time & Savings Deposits <sup>b</sup>	207.3	104.7	0.51	1,744.8	776.0	0.44
3. State & Local Govt. Bonds	18.3	12.7	0.69	[ 614.3	319.8	0.52
4. Other Bonds & Securities	121.9	123.9	1.02			
C. Equities	929.7	501.8	0.54	\$3,731.7	\$4,506.8	--
1. Corp Stock	361.0	222.8	0.62	1,143.3	906.9	0.79
2. Unincorp. Business Equity <sup>c</sup>	402.9	224.7	0.56	2,225.1	2,710.0	1.22
3. Trust Fund Equity	85.2	54.3	0.64	--	461.3	--
4. Insurance (Cash Surrender Value)	75.6	--	--	213.1	102.8	0.48
5. Pensions (Cash Surrender Value)	5.0	--	--	60.9	40.1	0.66
6. Miscellaneous Assets <sup>d</sup>	--	--	--	89.3	285.7	3.20
II. Liabilities	256.0	218.5	0.85	\$1,749.6	\$ 888.2	0.51
1. Mortgage Debt	163.8	146.5	0.89	1,116.0	704.1	0.63
2. Insurance Debt	92.2	--	--	[ 633.6	184.1	0.29
3. Other Debt	--	72.0	--			
III. Net Worth	\$1,782.6	1,191.6	0.67	\$9,357.1	\$8,698.0	--

Table 10 Notes

- All figures are in billions of current dollars and valued as of midyear.
- This includes CDs, IRAs, Keoghs, and money market funds in 1983.
- This includes the value of investment real estate in 1983.
- Miscellaneous assets include: (i) other investments, consisting of boats, money lent to friends and relatives, antiques, precious metals, jewelry, and art; and (ii) the cash surrender value of company savings plans, including thrift, profit-sharing, stock options, ESOPs, annuity plans, and credit unions.

- 2) Demand deposits and currency are undervalued by two-thirds. One should note that currency is not included in the SFCC data.
- 3) Time and saving deposits are undervalued by almost half.
- 4) Corporate stock is undervalued by almost 40 percent.
- 5) Unincorporated business equity is undervalued by over 40 percent. It should be noted that the book value--not the market value--of ownership equity in businesses is used in the SFCC.
- 6) Trust fund equity is undervalued by over a third.

The total of all liabilities in the national balance sheet data is \$256.0 billion. This estimate probably includes the debt on life insurance which is excluded from the SFCC tape data. The total of all liabilities represented in the SFCC is \$218.5 billion. In the SFCC published tables (Projector and Weiss (1966), Table A14), debt on life insurance is given as \$3.6 billion. Adding this to the value of the liabilities found on the SFCC tape yields a figure of \$222.1 billion as the SFCC estimate of total liabilities, which is 15 percent lower than the national balance sheet.

The estimate of net worth from the national balance sheet data is \$1,518.0 billion if only comparable assets are included. The SFCC estimate is \$1,192 billion. Thus the national balance sheet estimate is 27 percent greater than the SFCC estimated, if only comparable assets are used.

In order to align the SFCC data with the national balance sheet totals, each asset or liability in the SFCC is adjusted either by a constant proportion or in more complex fashion, depending on the degree of error and the availability of outside information. It should be noted that there were no missing value problems in our SFCC tape version, since some imputations had already been performed. Thus, where possible, we compared both the percentage

of households holding various assets and their mean value by family income class. The latter information was obtained from the Internal Revenue Service, Statistics of Income, 1962: Individual Income Tax Returns, publication No. 79 (1-65), 1965. I refer to these data as SOI figures. Thus, dividends reported in the SOI were compared to corporate stock holdings in the SFCC. It is then possible to adjust the percentage of households holding each asset type in the SFCC by income class if the percentage of units reporting the corresponding income flow is greater in the SOI. Moreover, it is also possible to adjust the asset values in the SFCC differentially by income class if average yields, defined as the ratio of the income flow to the asset value, differ substantially by income class.

For almost all asset types, the percentage of households reporting the asset in the SFCC was greater than or equal to the percentage of units reporting the corresponding income flow in the SOI. Exceptions are indicated below. Moreover, for almost all asset types, average yield figures were fairly uniform across income classes. Again exceptions are noted below. The details for the imputations are as follows.

1) The owner-occupied housing figures in the SFCC are not adjusted. As noted, the SFCC total is larger than that in the national balance sheet data. The likely reason is that SFCC households report their estimated market value of their homes, while the national balance sheet data are based on a perpetual inventory accumulation of the value of residential investment in new construction.

2) For the same reason, the other real estate figures in the SFCC are not adjusted.

3) Automobiles are adjusted by scaling up by a factor of 1.316.



4) Other consumer durables are not included in the SFCC. Their value is imputed to each household based on a regression equation estimated from the 1969 MESP database (see Woff (1980) for more details), which is as follows:

$$\begin{aligned} \text{OTHRDUR62} = & 2871.4 + .08644 \text{ INC62} - (.3271 \times 10^{-6})(\text{INC62})^2 \\ & - 7.1401 \text{ AGEHEAD} + 811.32 \text{ MARRIED} - 240.31 \text{ FEMHEAD} \\ & + 189.51 \text{ URBANRES} \end{aligned}$$

where OTHRDUR62 = value of other consumer durables in 1962 dollars.

INC62 = income of the household unit in 1962 dollars.

AGEHEAD = age of head of unit.

MARRIED = 1 if head is married, 0 otherwise

FEMHEAD = 1 if head is female, 0 otherwise

and URBANRES = 1 if unit's residence is in an urbanized area.

The total value for other consumer durables developed from this equation is then adjusted proportionately to conform to the national balance sheet total.

5) Inventories are not included in the SFCC. The ratio of inventory holdings to family income is computed from the 1960-61 Consumer Expenditure Survey.<sup>15</sup> These ratios are applied to each household based on family income and then adjusted by a scalar to conform to the balance sheet total.

6) Demand deposits and currency are adjusted by the factor 2.945.

7) Time and savings deposits are adjusted by the factor 1.980.

8) State and local government bonds are proportionately adjusted by the factor 1.441.

9) Other financial assets, bonds and instruments are adjusted differentially by income class. The percent reporting interest income

15

The source is: Bureau of Labor Statistics, Handbook of Labor Statistics, 1975, Bulletin 1865, U.S. Government Printing Office, 1975, Table 127, p. 359. Household inventory items include (1) food purchased for home use, (2) tobacco, (3) alcoholic beverages, and (4) clothing and clothing materials.

(including interest on savings and time deposits) in the SOI either falls below the range or within the range of households in the SFCC reporting that they owned other financial assets (see Table 11). Therefore, it is unlikely that there is an underreporting problem in the SFCC with regard to the number of households who report holding other financial assets. Estimated yields show great variance but also seem extremely low. Total SOI interest (7.16 billion) divided by total national balance sheet savings deposits plus other financial assets (329.2 billion) is only two percent. Bank rates were about 2.8 percent in 1962 and bond rates were about 5 percent. Thus, it appears that IRS interest was severely underreported. Despite problems with the IRS data, it appears likely that SFCC financial assets are underreported more for lower income than for upper income groups, and the adjustment factors vary accordingly.

10) Corporate stock is also adjusted differentially by income class. As shown in Table 11, the percentage reporting stock in the SFCC is uniformly greater than the percent reporting dividends in the SOI. It should be noted that dividends are after exclusion in the SOI. Moreover, many forms of stock pay no dividends. Despite this, the comparison suggests that there is no significant underreporting in percent of holders in the SFCC. The yield figures show no clear pattern by income class. However, there are two income classes with yields significantly higher than average, suggesting greater than average underreporting of asset values in the SFCC. These income classes are assigned higher than average adjustment factors.

11) Unincorporated business equity also has different adjustment factors by income class. As shown in Table 11, the overall percentage reporting business equity in the SFCC is identical to the percent reporting business

Table 11

Reconciliation of SFCC Asset Categories  
with Corresponding Income Flows

1962 Family Income Class	Bonds and Bond Interest				Corporate Stock and Dividends			
	SFCC	SOI	SFCC	SOI	SFCC	SOI	SFCC	SOI
	Percent of Units Owning Bonds <sup>a</sup>	Percent of Units Reporting Interest <sup>b</sup>	Estimated Yield <sup>c</sup>	Adjustment Factor	Percent of Units Owning Stock <sup>d</sup>	Percent of Units Reporting Dividends <sup>e</sup>	Estimated Yield <sup>f</sup>	Adjustment Factors
Under \$3,000	12-16%	13.5%	.006	1.83	7%	5.1%	0.083	1.30
\$3,000-4,999	20-30	17.0	.018	1.59	8	6.0	0.121	2.10
\$5,000-7,499	30-41	23.3	.003	1.83	15	6.9	0.078	1.30
\$7,500-9,999	40-61	32.6	.001	1.83	19	10.5	0.056	1.30
\$10,000-14,999	51-84	49.2	.018	1.59	32	20.8	0.079	1.30
\$15,000-24,999	43-88	68.3	.044	1.43	52	46.7	0.109	1.94
\$25,000-49,999	51-100	78.2	.060	1.03	83	69.4	0.060	1.30
\$50,000-99,999	69-100	84.9	.026	1.43	88	85.7	0.078	1.30
\$100,000 or more	75-100	88.1	.109	1.03	97	94.4	0.075	1.30
All Units	28-45%	23.5%	.010	--	16%	9.3%	0.078	1.30

a. Projector and Weiss (1966), Tables A9, A10, and A12. This category includes: U.S. savings bonds, marketable securities other than stock and state and local bonds, mortgage assets, company savings plans, and loans to individuals. Percentage range indicates lowest and highest possible percent owning the asset. Mean computed from midpoint of percentage range.

b. Includes interest on time and savings deposits.

c. Interest on bonds is calculated from SOI and SFCC data under the assumption that interest on time and savings deposits averaged 2.8 percent. The estimated yield is the ratio of mean bond interest to mean bonds by income class.

d. Projector and Weiss (1966), Table A10.

e. Dividends after exclusion.

f. Defined as the ratio of SOI dividends to SFCC stock holdings.

Table 11 (continued)

## Unincorporated Business Equity and Unincorporated Business Income

	SFCC		SOI		Trust Fund Equity and Trust Income				
	Percent of Units Owning Unincorporated Business Equity*	Percent of Units Reporting Income from Unincorp. Business <sup>b</sup>	Percent of Units Owning Trusts <sup>j</sup>	Percent of Units Reporting Trust Income	Estimated Yield <sup>k</sup>	Adjustment Factor	Estimated Yield <sup>k</sup>	Percent of Units	Value
Under \$3,000	12%	16.51%	--	0.4%	0.088	2.10	0.088	--	1.10
\$3,000-4,999	12	16.38	1%	0.5	2.298	2.10	2.298	--	1.10
\$5,000-7,499	17	13.38	1	0.5	0.001	2.10	0.001	--	1.10
\$7,500-9,999	18	14.38	1	0.6	0.082	2.10	0.082	--	1.10
\$10,000-14,999	22	19.31	3	1.3	0.198	2.10	0.198	--	1.10
\$15,000-24,999	26	41.44	5	3.7	0.042	2.10	0.042	--	1.10
\$25,000-49,999	64	63.81	4	7.1	0.002	2.10	0.002	+3.19%	1.10
\$50,000-99,999	70	68.67	5	11.5	0.018	1.00	0.018	+6.5%	1.10
\$100,000 or more	35	70.63	15	22.3	0.018	1.00	0.018	+7.3%	1.10
All units	17%	16.88	1%	0.7%	0.016	--	0.016	--	--

g. Projector and Weiss (1966), Table A.8.

h. Includes partnership income.

i. Defined as ratio of SOI unincorporated business income (excluding losses) to SFCC unincorporated business equity.

j. Projector and Weiss (1966), Table A.9.

k. Defined as the ratio of SOI trust income to SFCC trust equity.

income in the SOI, and the percentages are quite close by income class. However, the estimated yields appear particularly high for lower income groups. All the adjustment is therefore done in the bottom 7 income classes.

12) Trust fund equity is the only asset whose ownership appears to be underreported in the SFCC (Table 11). The corresponding income category is income from estate and trusts. Since estates are included, the percent reporting this income item should be higher in the SOI than the SFCC. However, not all trust funds may generate income. In any case, the percent reporting trusts is uniformly greater in the SFCC than in the SOI except for three upper income classes. Additional household units in these three income classes are assigned the mean asset value in the SFCC. The yield numbers vary quite erratically, so that the adjustment factor assigned to each income class is the same.

13) The cash surrender value of life insurance and pensions do not appear on the SFCC tape. However, tabulations of both the mean value of each asset and the percentage of households owning each by income class appears in Projector and Weiss (1966), Table A31. This information is used to impute these two assets to households in the SFCC tape and the results are adjusted by a scalar to conform with the national balance sheet totals.

14) Mortgage debt is adjusted proportionately by a factor 1.118 to conform with the national balance sheet total.

15) Life insurance debt does not appear on the SFCC tape but tabulations of mean value and percent of households with this liability by income class is found in Projector and Weiss (1966), Table A14. This information is used to impute life insurance debt and the results are proportionately adjusted to conform with the aggregate totals.

16) Other debt is added to life insurance debt, and the sum is scaled by a factor of 1.07.

#### B. Imputation of Social Security and Pension Wealth

Pension wealth is defined as the present value of discounted future pension benefits. In similar fashion, social security wealth is defined as the present value of the discounted stream of future social security benefits. Future entitlements from both pensions and the social security program depend on many factors, such as the health (and survival) of a company, productivity growth and other macroeconomic factors, and future legislation. Estimating the value of such forms of wealth depends on relatively crude assumptions about the future state of the economy.

The imputation of both pension and social security wealth involves a large number of steps, which we will summarize here (technical details can be obtained directly from the authors). For retirees (r) the procedure is straightforward. Let PB be the pension benefit currently being received by the retiree. If it is assumed that pension benefits remain fixed in nominal terms over time for a particular beneficiary (as was generally true in 1962 though less true in 1983), then

$$PW_r = \int_0^{LE} PBe^{-it} dt$$

where LE is the conditional life expectancy and  $i$  the discount rate, for which the 10-year treasury bill rate is used. For current social security beneficiaries,

$$SSW_r = \int_0^{LE} SSB e^{(g'-1)t} dt$$

where SSB is the currently received social security benefit and  $g'$  the expected rate of growth of mean social security benefits over time for retirees.<sup>16</sup>

<sup>16</sup>Separate imputations were performed for husband and wife and an adjustment in the social security benefit was made for the surviving spouse.

Among current workers (w) the procedure is more complex. For pension wealth in 1962, a two-stage imputation is necessary. The first stage assigns pension coverage. From Skolnik (1976) and Kotlikoff and Smith (1983, Table 3.1.1), the total number of covered workers is estimated for 1962. From the President's Commission on Pension Policy (1980a, 1980b), information is obtained on relative coverage rates by incomes class, industry of employment, age, and sex of worker. Based on these data, pension coverage is randomly assigned among workers.<sup>17</sup> In the second stage, accumulated earnings (AE) from the start of working life to the present are estimated for each covered worker. These are based on human capital earnings functions, which are imputed separately by sex, race, and schooling level. Past earnings are accumulated on the basis of real growth in average earnings and the discount rate is the average yield on high-grade corporate bonds.

Covered workers in a given age cohort are then assigned a percentile ranking  $n$  based on the distribution of AE for their cohort. Their expected pension benefit, EPB, is then given by,

$$EPB_n = PB_n e^{g''(65-A)} \quad (1962 \text{ only})$$

where  $PB_n$  is the  $n$ th percentile among pension benefits of beneficiaries of age 65,  $g''$  is the expected rate of growth of average pension benefits, and  $A$  is current age. Then pension wealth for current workers in the  $n$ th percentile is given by,

$$PW_{w,n} = \int_0^{LD} EPB_n e^{g''t} e^{-i(t+A_r)} dt$$

where  $A_r = 65 - A$  is the years to retirement and  $LD = LE - 65$ . For the 1983 data, matters are much easier, since pension coverage and expected pension benefits are already provided for current workers.

17

For simplicity it is assumed that pension vesting is immediate.

The imputation of social security wealth among current workers is analogous to that of pension wealth. For the 1962 data, coverage is assigned based on employment status. Workers are again assigned a percentile ranking  $n$  based on the accumulated earnings for age group. Then, the expected social security benefit at retirement (at age 65), ESSB, is given by

$$ESSB_n = SSB_n e^{g(65-A)}$$

where  $SSB_n$  is the  $n$ th percentile of social security benefits among beneficiaries of age 65. Then

$$SSW_{w,n} = \int_0^{LD} ESSB_n e^{gt} e^{-i(t + A_r)} dt$$

where  $g$  is the expected rate of growth in mean social security benefits for new retirees. The procedure for the 1983 data is identical, except that information on social security coverage for current workers is already provided.

### C. Results for the 1962 SFCC

Table 12 presents results on the concentration of different components of household wealth for both the original (unadjusted) data and the data adjusted to align with the national balance sheet totals and other outside information. The striking result is the differences in the degree of concentration for the different components of wealth. Trust funds, corporate stock, unincorporated business equity, financial securities, and other (mainly investment) real estate are the most highly concentrated; bank deposits less concentrated; and owner-occupied housing and vehicles are the most equally distributed. From Table 10 it is apparent that with the exception of financial securities, the most concentrated assets are also those which are most underreported. The last set of columns of Table 12 shows concentration estimates for the adjusted



Table 12  
 Concentration of Adjusted and Unadjusted Household Wealth  
 By Component, 1962 (a)

	Original Data			Adjusted Data	
	Share of Top 1 %	Percent of HH with Item	Gini Coeff. for Holders	Share of Top 1 %	Gini Coeff. for Holders
I. Assets	28.7%	100.0%	0.713	26.8%	0.675
1. Owner-Occupied Housing	8.2%	57.0%	0.354	8.2%	0.354
2. Other Real Estate	50.5%	11.3%	0.658	50.5%	0.658
3. Vehicles	7.4%	73.9%	0.472	7.4%	0.472
4. Other Consumer Durables	--	--	--	1.8%	0.098
5. Inventories	--	--	--	4.9%	0.264
6. Demand Deposits and Currency	34.6%	100.0%	0.808	34.6%	0.808
7. Time & Savings Deposits	23.6%	58.5%	0.729	23.6%	0.729
8. State & Local Govt. Bonds	100.0%	0.4%	0.749	100.0%	0.749
9. Other Financial Securities	50.4%	39.5%	0.824	52.5%	0.832
10. Corp. Stock	71.9%	16.1%	0.858	69.7%	0.853
11. Unincorporated Business Equity	53.5%	16.2%	0.758	46.7%	0.725
12. Trust Fund Equity	99.7%	1.4%	0.914	99.7%	0.923
13. Insurance (Cash Surrender Value)	--	--	--	14.8%	0.175
14. Pensions (Cash Surrender Value)	--	--	--	3.8%	0.398
II. Liabilities	15.4%	66.1%	0.623	16.1%	0.621
1. Mortgage Debt	10.2%	32.6%	0.383	10.2%	0.383
2. Other Debt	34.7%	58.2%	0.694	34.7%	0.699
III. Net Worth	32.4%	100.0%	0.772	29.3%	0.715

(a) Results are based on the 1962 SFCC.

data. The adjustment process has almost no effect on the concentration levels of individual assets, with the possible exception of unincorporated business equity, which shows a modest decline in inequality from the adjustment procedure. The most striking result, however, is that other consumer durables and household inventories are much less concentrated than any other asset. Their inclusion in the household portfolio will thus have a pronounced equalizing effect.

These implications are confirmed by the results of Table 13. The first line indicates that the Gini coefficient for original, unadjusted household wealth is 0.772 and the share of the top percentile is 32 percent. The change in inequality that results from adding an asset to the household portfolio is a function of three factors: (i) the degree of concentration of the asset, (ii) the relative magnitude of the asset; and (iii) its covariance with other components of net worth (see Wolff (1986b), for example). The addition of other consumer durables, which comprise 6 percent of total balance sheet assets and which is distributed very equally, to original unadjusted wealth causes the Gini coefficient to decline from 0.77 to 0.70. This decline is primarily due to the increasing shares of the bottom two quintiles. The further addition of household inventories has a similar effect, with the Gini coefficient declining from 0.70 to 0.68.

The adjustment and alignment of the original components of household wealth in the SFCC to the national balance sheet causes an increase in the Gini coefficient from 0.77 to 0.79 (line 5). Most of the increased concentration occurs in the upper quintile, as might be expected, since the most underreported items were those held by the upper part of the distribution. The addition of the cash surrender value of life insurance and

Table 13  
Inequality of Household Wealth for Both Unadjusted and Adjusted Measures, 1962 (a)

	Gini Coeff.	Share of Top 1 %	Share of Top 5 %	Quintile Shares				
				Top	2nd	3rd	4th	Bottom
<b>A. Unadjusted Estimates</b>								
1. Original Net Worth	0.772	32.4%	52.5%	78.2%	14.4%	6.2%	1.4%	-0.3%
2. Original Net Worth + Other Durables	0.701	29.5%	48.0%	72.7%	15.0%	7.6%	3.2%	1.5%
3. Original Net Worth + Other Durables + Inventories	0.679	28.4%	46.5%	70.9%	15.2%	8.1%	3.9%	1.9%
4. Original Net Worth Less Autos	0.798	33.9%	54.5%	80.3%	14.0%	5.7%	0.6%	-0.6%
<b>B. Measures Adjusted to Align with the National Balance Sheets</b>								
5. Original Components Only	0.793	33.3%	54.6%	80.9%	12.9%	5.3%	1.2%	-0.3%
6. Original Components + CSV of Insurance & Pensions	0.782	32.2%	53.2%	79.6%	13.4%	5.7%	1.4%	-0.3%
7. Original Components + CSV of Insurance & Pensions + Durables + Inventories (W2)	0.715	29.3%	48.9%	74.4%	14.1%	7.1%	3.1%	1.3%
8. W2 less Durables and Inventories	0.805	33.4%	55.0%	81.7%	12.9%	5.2%	0.8%	-0.5%
<b>C. Augmented Measures of Household Wealth with Retirement Wealth</b>								
9. Social Security + Pension Wealth (b)								
g = 0.0	0.504	8.0%	22.7%	52.9%	22.9%	14.3%	8.3%	1.7%
g = 0.01	0.482	7.9%	21.4%	50.6%	23.4%	15.2%	9.0%	1.8%
g = 0.02	0.466	7.8%	20.3%	48.8%	24.1%	16.0%	9.4%	1.8%
g = 0.03	0.458	7.6%	19.4%	47.6%	24.6%	16.5%	9.5%	1.7%
10. W5 = W2 + Social Security and Pension Wealth								
g = 0.0	0.624	23.8%	40.8%	65.8%	16.8%	9.5%	5.4%	2.5%
g = 0.01	0.607	22.9%	39.5%	64.3%	17.2%	9.9%	5.9%	2.7%
g = 0.02	0.586	21.9%	38.0%	62.5%	17.6%	10.5%	6.4%	3.1%
g = 0.03	0.563	20.6%	36.1%	60.3%	18.1%	11.2%	7.1%	3.3%

(a) Results are based on the 1962 SFCC.

(b) Because of data limitations, we are unable to separate pension from social security wealth. The parameter  $g$  is the assumed rate of growth of mean social security benefits over time.

pensions to the household portfolio causes relatively little change, since these items are quite small. However, the addition of other consumer durables and household inventories causes a sharp reduction in measured inequality. The net effect of including missing items and aligning with the national balance sheets is a reduction in measured inequality, and the reduction is quite substantial, with the Gini coefficient falling from 0.77 (line 1) to 0.72 (line 7). Most of the change is due to gains by the bottom two quintiles, and, indeed, the share of the top percentile was reduced relatively little. Finally, lines 4 and 8 compare estimates of what might be called "fungible net worth"--wealth less durables and inventories. The distributional estimates are almost identical between unadjusted and adjusted fungible net worth. For fungible wealth, alignment makes almost no difference in measured concentration.

Line 9 presents results on the distribution of social security and pension wealth. Because of data limitations, we are unable to separate the two components. Retirement wealth is distributed considerably more equally than marketable wealth. In particular, the shares of the upper percentile and quintile are substantially lower and the shares of the middle three quintiles considerably higher than the corresponding shares for traditional wealth. Moreover, the higher the assumed growth rate in social security benefits over time (the parameter  $g$ ), the greater is measured equality. The reason for this is that raising  $g$  increases the equality in social security wealth between younger and older age cohorts. Moreover, the higher  $g$  is, the greater is the magnitude of retirement wealth, since the present value of the future benefit stream is increased. For  $g$  equal to 0.0, total retirement wealth is 23 percent of balance sheet assets, while for  $g$  equal to 0.03, the ratio becomes

42 percent. For all values of  $g$ , the addition of retirement wealth to traditional wealth causes a marked reduction in measured inequality. Moreover, the higher the value of  $g$ , the greater the reduction in measured concentration, since the magnitude of retirement wealth increases and its concentration declines. For  $g$  equal to 0.0, the Gini coefficient for  $W_5$  is 0.62 and for  $g$  equal to 0.03, the Gini coefficient is 0.56

#### D. Adjustment Procedures for the 1983 SCF

The 1983 SCF contains much richer detail on asset and liability holdings than the 1962 SFCC but there are also a considerable number of missing values in the portfolio entries. Table 10 presents a comparison of balance sheet totals derived from the SCF and the national balance sheet data. The SCF tabulations are based on non-missing values only.<sup>18</sup> The underreporting patterns are very similar to the 1962 SFCC, except for unincorporated business equity, trust fund equity, and liabilities. Owner-occupied housing and vehicles appear well reported in the SCF, as does unincorporated business equity (including investment real estate). Fixed claim assets are severely underreported. About 80 percent of corporate stock is captured in the SCF, and about half of insurance and pension cash surrender value. Trust fund

<sup>18</sup>All entries come directly from the SCF, except for the following imputations: (i) For multiple-family dwellings owned by the family, the owner-occupied portion is estimated as the ratio of the value of the building to the number of units in the building. (ii) For vehicles, current market value is imputed on the basis of the original cost of the vehicle, the date the vehicle was purchased, and whether the car was new or used. (A ten-year service life was assumed.) (iii) Mortgage debt was calculated on the basis of mortgage tables and the following information provided in the SCF: original mortgage loan, payment amount and schedule, date of the original loan, and interest rate. (iv) Outstanding installment loans were calculated on the basis on the total number of payments to be made on the loan, the number of payments to date, and the value of the original loan. It should be noted that insurance and pension cash surrender value is directly reported in the SCF. See Wolff (1986a) for more details.

coverage seems complete. From Ruggles and Ruggles (1982), trust fund equity in 1980 amounted to 3 percent of total assets, compared to 4 percent for 1983. Finally, liabilities are poorly covered in the SCF. Only 63 percent of mortgage debt and 29 percent of other debt is captured.

For tangible assets, unincorporated business equity, and trust fund equity, SCF coverage appears quite adequate and no alignment was done. For other components, alignment to the national balance sheet totals was effected by using a proportional adjustment factor for each of the underreported items in the balance sheet, with two exceptions. First, mortgage debt was constrained to be no greater than the maximum of either its reported value or 80 percent of the gross value of the building. Second, non-mortgage debt was constrained to be no greater than the maximum of either its reported value or 50 percent of the total value of gross assets. Other consumer durables and household inventories were imputed in the same manner as for the 1962 data.<sup>19</sup>

Missing values were treated in alternative ways to provide a range of inequality estimates. The SCF has two different questions for each asset and liability. The first is whether the individual owns the asset (or has the debt) and the second is the value of the asset or debt. Our first adjustment procedure was to assume that the missing value for asset value was actually a zero even though the household indicated that it owned the asset. This was intended for the sake of comparison. Actually, for business equity, this assumption provided the estimate closest to the national balance sheet total. The second procedure was to impute the overall mean value of the asset for missing values, where the mean is computed on the basis of all non-missing values, including zero. This procedure was again used for comparison

<sup>19</sup>The imputations for inventories were based on: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey: Integrated Diary and Interview Survey Data, 1972-73, Bulletin, 1978.

purposes. The third procedure was to impute the mean value of each asset, computed on the basis of all households that owned the asset, for missing values. The fourth and what we call the "final" adjustment procedure was to impute the mean value based on asset owners only by income class for missing values. In all four procedures, the resulting estimates were re-aligned to the national balance sheet totals.

Results of the adjustment procedures are very similar to the 1962 results. Table 14 presents a comparison of concentration measures by asset and liability type before and after adjustment. As with the 1962 data, the adjustment procedures made very little difference in the concentration level of individual items, except for unincorporated business equity. However, imputations for missing values did increase somewhat the percentage of households estimated to hold each asset and liability. Table 15 shows the estimates of overall inequality before and after adjustment. As with the 1962 SFCC, the inclusion of other consumer durables and household inventories in the household portfolio causes a substantial reduction in measured inequality, in this case from a Gini coefficient of 0.79 to 0.72. The alignment to the national balance sheet totals together with the imputation of missing values for the original wealth components only causes a slight decline in the Gini coefficient from 0.79 (line 1) to 0.77 (line 5). The net effect of the adjustment procedures is to cause a decline of the Gini coefficient from 0.79 to 0.71 (line 6), and the share of the top percentile from 34 percent of total wealth to 28 percent

The effect on measured wealth inequality of alignment to the national balance sheet totals and imputations for missing values can be separated by comparing results from the alternative adjustment techniques. Alignment to

Table 14  
 Concentration of Adjusted and Unadjusted Household Wealth  
 By Component, 1983 (a)

	Original Data			Adjusted Data (b)		
	Share of Top 1 %	Percent of HH with Item	Gini Coeff. for Holders	Share of Top 1 %	Percent of HH with Item	Gini Coeff. for Holders
I. Assets	31.5%	100.0%	0.765	26.0%	100.0%	0.680
1. Owner-Occupied Housing	12.2%	61.9%	0.432	12.0%	64.0%	0.429
2. Other Real Estate	45.2%	18.3%	0.686	50.5%	19.8%	0.658
3. Vehicles	6.5%	84.7%	0.420	6.5%	84.7%	0.420
4. Other Consumer Durables	--	--	--	2.3%	100.0%	0.144
5. Inventories	--	--	--	7.0%	100.0%	0.243
6. Demand Deposits and Currency	33.5%	100.0%	0.820	33.3%	100.0%	0.808
7. Time & Savings Deposits	29.6%	66.5%	0.780	28.9%	71.1%	0.761
8. Financial Securities	76.7%	23.9%	0.921	76.1%	24.8%	0.923
9. Corp. Stock	81.3%	16.7%	0.909	80.0%	20.0%	0.910
10. Unincorporated Business Equity	68.7%	7.1%	0.740	47.2%	12.5%	0.613
11. Trust Fund Equity	98.3%	3.0%	0.942	97.1%	4.2%	0.937
12. Insurance (Cash Surrender Value)	40.7%	38.7%	0.614	40.7%	38.7%	0.614
13. Pensions (Cash Surrender Value)	79.3%	9.3%	0.830	79.3%	9.3%	0.830
14. Miscellaneous Assets	60.5%	21.2%	0.775	60.5%	21.2%	0.775
II. Liabilities	21.3%	64.2%	0.709	21.9%	64.5%	0.659
1. Mortgage Debt	17.4%	31.6%	0.480	15.6%	32.1%	0.441
2. Other Debt	53.2%	55.7%	0.807	43.3%	55.7%	0.751
III. Net Worth	33.6%	100.0%	0.792	28.1%	100.0%	0.711

(a) Results are based on the 1983 SCF.

(b) Final adjustments based on imputing mean asset and liability values by income class, aligning to national balance sheet totals, and constraining adjustments for mortgage and non-mortgage debt.



the national balance sheet totals (with liabilities constrained) of the original wealth components in the SCF with no imputation of missing values causes the Gini coefficient to increase from 0.79 to 0.82. The reason, as with the 1962 data, is that underreporting is greater for assets concentrated in the upper wealth classes. The imputation of zero values for missing entries results in a Gini coefficient of 0.80, presumably because missing values occur more often in middle and upper middle wealth levels. The imputation of overall mean asset (or liability) values for missing entries results in a further decline of the Gini coefficient to 0.76. If mean values based only on households that own the asset (or liability) are used instead, the Gini coefficient falls to 0.74. However, the use of mean values by income class in the imputation procedure causes the Gini coefficient to increase to 0.77 (line 5 of Table 15).

As with the 1962 data, the addition of social security and pension wealth causes a marked reduction in measured inequality, from a Gini coefficient of 0.71 to 0.57, with the assumed rate of real social security benefit growth of 2 percent per year. However, social security wealth has grown relative to traditional wealth over the period. In 1962, the ratio of the sum of pension and social security wealth to total traditional assets was 0.42 for  $g$  equal to 0.03, while in 1983 the ratio of social security wealth alone to total assets was 0.52. Pension wealth is more concentrated than traditional wealth,  $W_2$ . In 1983, pension wealth amounted to 23 percent of traditional assets.

## V. CONCLUSION

The long-run record based on original sources shows a decline in wealth inequality in the U.S. from the early 1920s to the late 1940s followed by

Table 15  
 Inequality of Household Wealth for Both Unadjusted and Adjusted Measures, 1983 (a)

	Gini Coeff.	Share of Top 1 %	Share of Top 5 %	Quintile Shares				
				Top	2nd	3rd	4th	Bottom
<b>A. Unadjusted Estimates</b>								
1. Original Net Worth	0.792	33.6%	56.7%	60.6%	12.8%	5.3%	1.4%	-0.1%
2. Original Net Worth + Other Durables	0.735	31.0%	52.7%	76.1%	13.5%	6.5%	2.8%	1.2%
3. Original Net Worth + Other Durables + Inventories	0.721	30.4%	51.7%	75.0%	13.6%	6.8%	3.1%	1.5%
4. Original Net Worth Less Autos	0.818	35.2%	59.1%	83.0%	12.1%	4.6%	0.6%	-0.3%
<b>B. Final Adjustments and Alignment to the National Balance Sheets (b)</b>								
5. Original Components Only	0.770	30.6%	53.3%	78.8%	13.6%	5.9%	1.8%	-0.2%
6. Original Components + Other Durables + Inventories (W2)	0.711	28.1%	48.6%	74.1%	14.2%	7.1%	3.3%	1.3%
8. W2 less Durables and Inventories	0.795	31.9%	54.4%	81.0%	13.1%	5.4%	1.6%	-0.6%
<b>C. Augmented Measures of Household Wealth with Retirement Wealth</b>								
8. Pension Wealth	0.853	21.1%	50.6%	91.7%	8.3%	0.0%	0.0%	0.0%
<b>9. Social Security Wealth (c)</b>								
g = 0.0	0.480	7.5%	25.6%	58.8%	21.3%	12.7%	6.9%	0.4%
g = 0.01	0.446	7.6%	25.5%	55.5%	21.9%	14.1%	8.0%	0.5%
g = 0.02	0.423	8.1%	25.8%	53.4%	22.4%	14.9%	8.8%	0.6%
g = 0.03	0.417	8.7%	26.1%	52.7%	22.5%	15.2%	9.1%	0.6%
<b>10. W5 = W2 + Social Security and Pension Wealth</b>								
g = 0.0	0.602	19.6%	38.2%	63.6%	17.6%	10.6%	5.8%	2.5%
g = 0.01	0.587	18.9%	36.9%	62.6%	17.6%	10.9%	6.1%	2.9%
g = 0.02	0.568	18.0%	35.6%	61.3%	17.7%	11.1%	6.7%	3.3%
g = 0.03	0.547	16.9%	33.9%	59.8%	17.6%	11.5%	7.4%	3.7%

(a) Results are based on the 1983 SCF.

(b) Final adjustments based on imputing mean asset and liability values by income class, aligning to national balance sheet totals, and constraining adjustments for mortgage and non-mortgage debt.

(c) The parameter g is the assumed rate of growth of mean social security benefits over time.

relative stability in inequality, except for cyclical fluctuations. This mirrors very closely the time pattern for income inequality. The basic record holds up even after our adjustment procedures and the use of consistent national balance sheet data. This remains true as long as we do not combine point estimates from different sources, such as estate data and survey data. However, if we include social security and pension wealth in the household portfolio, the results indicate a continuing decline in wealth inequality from the late 1940s to the present, because of the relative growth of retirement wealth.

Though trend patterns are not sensitive, estimates of concentration levels are quite sensitive to the choice of data and the adjustment procedures used. For estate tax data, adjustments in the aggregate balance sheet data and the treatment of trust and pension funds makes a difference of 2 to 4 percentage points of the share of the top percentile. More importantly, the switch from the individual to the household unit does make an even larger difference in the point estimates. Indeed, a significant part of the decline in wealth inequality from the early 1920s to the late 1940s appears due to changes in wealth holding patterns among married women.

Adjustments to survey data also appear to make relatively little difference in trends but make a substantial difference in point estimates. Based on the 1962 SFCC and the 1983 SCF, we find that the Gini coefficient for adjusted data was 0.715 in 1962 and 0.711 in 1983. Based on the original data, the coefficients were 0.77 in 1962 and 0.79 in 1983. Though traditional wealth inequality showed no change over this period, inequality of augmented household wealth, W5, did show a decline from 0.59 in 1962 to 0.57 in 1983 (for  $g$  equal to 0.02). The decline was relatively modest, given the rapid

growth in social security wealth over this period. The apparent reason is the offset from the rapid growth of pension wealth, which is very unequally distributed. Finally, if we exclude consumer durables and inventories, then measures of "fungible net worth" inequality appear quite insensitive to adjustment procedures. Thus, unadjusted survey data seem to provide reliable concentration estimates of this component of household wealth.

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## APPENDIX I

### EXPLANATION OF ADJUSTMENTS MADE TO THE ORIGINAL ESTIMATES OF AGGREGATE HOUSEHOLD BALANCE SHEETS

Discussion is by asset type

#### I. ASSETS

##### I.A. TANGIBLE ASSETS

###### I.A.1. Real Estate

- .a Owner-Occupied Housing
- .b Tenant-Occupied Housing

For all years after 1925 the values for owner-occupied housing and tenant occupied housing are taken from Musgrave's (1986) annual estimates of net structures. Musgrave's data covers the period 1925-84. Musgrave's data was the source for R & R's estimates as well as the FOFA's balance sheets. For the 1922 estimates in both of these categories we extrapolated using regression results from the 1925-29 trend in Musgrave's estimates, the exact procedure is explained in "Musg1922" worksheet 4 and is available from the authors. We did not use Goldsmith's data for residential structures except for 1900 and 1912; both in order to maintain consistency and because we believe Musgrave's estimates to be more reliable. The 1900 and 1912 estimates are thus not consistent with the rest of the series. A comparison of Goldsmith's and Musgrave's values is given in table 3.2. As you can see Goldsmith's estimates are considerably lower for every year.

There were some definitional differences between our categories and both R & R's and Goldsmith's real estate definitions. R & R included tenant-occupied housing in the unincorporated business category (I.C.3) which we transferred to real estate. On the otherhand, Goldsmith included both residential structures and nonresidential structures in the real estate section and presumably his land estimate included both types of property. For Goldsmith years, 1900-1939, we transferred his estimate of nonresidential structures to the Business Equity category (I.C.3). Further documentation is avialable from the authors.

#### I.A.1.c Residential Land

Our residential land estimate includes both tenant and owner-occupied land. For the Goldsmith years, we subtracted out nonresidential land from his total land estimates and transferred it to the Unincorporated Business Equity catagory (I.C.3.). For Post-WWII years we used the FOFA's estimates for owner-occupied land rather than R & R's estimates. There were substantial differences between R & R's estimates and the FOFA's estimates in this category ranging between a ratio of .64 to 100 with no systematic trend. These differences are listed in table 1.3a for selected years. We estimated total residential land for the Post-WWII years by assuming that the proportion of tenant occupied land to owner-occupied land in each year was the same as the ratio of tenant structures to owner-occupied structures. The amount of tenant occupied land was then subtracted from the unincorporated business estimate. Details are available in worksheet "adjust2" from the authors. The

adjusted FOFA's land estimates for the years 1949, 1953 and 1958 are compared to our adjusted Goldsmith estimates in table 1.3b. As evident from table 1.3b, the percentage differences in the land estimates between Goldsmith and the FOFA decline over time, which is a problem since we are using Goldsmith's early years.

I.A.2. Consumer Durables

a. Motor Vehicles

b. Other

For both the Motor Vehicle and other category we used Musgrave's (1986) data which, like the residential structures series, are complete for the period from 1925-84. For 1922 we extrapolated from the estimated 1925-29 trend, the exact procedure and regression is explained in worksheet "MUSG1922" available from the authors. As for real estate, the 1900 and 1912 estimates for consumer durables are from Goldsmith and are not consistent with the other estimates although the differences are minor. The original Goldsmith estimates are compared with Musgrave's in Table 1.4, the differences are not as great as for the real estate section.

I.B. FIXED CLAIM ASSETS

- .1 Demand Deposits and Currency
- .2 Deposits in Other Financial Inst.
- .3 Federal Securities
- .4 State and Local Securities
- .5 Corporate and Foreign Bonds, Mort., Open Market Paper  
and Other Instru.

For the above fixed claim categories we used Goldsmith's data pre-1949 years and R & R's series from 1949-1980. Unfortunately, the FOFA's data includes personal trusts and non-profit holdings within the household sector and thus could not be used for these assets. For 1981 and 1983 we had to estimate values for categories B.I.3-5, federal, state and local and corporate bonds, since the R & R series was not available for these years. We took the average ratio of the R & R estimates to the FOFA's data from 1946-1980 and applied it to the FOFA's estimates for 1981 and 1983 in each of the above categories. Although this ratio for federal securities and the corporate bond category showed an upward trend approaching 1.00 by the end of the period, we found it hard to believe that trust holdings were zero in these categories. Thus we ignored the trend component in Goldsmith's data. These ratios are computed in Worksheet "BONDS1" available from the authors.

There were no major changes to the original sources' estimates of the fixed claim assets. We shifted a small amount from Goldsmith's farm equity estimates into the household sector categories I.B.2, I.B.3, I.B.5 in order to be consistent with R & R's approach to the farm household's assets. See the

discussion on farm equity in this section "Farm2" The percentage differences between Goldsmith's data and the above fixed claim categories is given in Table 1.5 for the three overlapping years. There are large percentage differences for state and local securities, these are usually offset in absolute terms by the discrepancies in the corporate bond category (I.B.5). Goldsmith for each year is higher for state and local securities, between 2 and 6 billion and except for 1958 R & R are higher for the corporate bond category. These differences are small in terms of total assets and since we had no independent information, no correction was made to either series.<sup>1</sup>

## I.C EQUITIES

### .1 Corporate Stock

We used Goldsmith's and R & R's stock estimates in the Balance Sheet. Table 1.6 lists the three year comparisons for stock estimates and, as in the securities comparison, there are substantial differences in the sources. Given that there is no discernable trend in the percentage differences, we made no correction to either R & R's estimates or Goldsmith's numbers in this category. As stated above, the Flow of Funds Accounts Household balance sheets include the non-profit sector's holdings and personal trusts as well as households. Thus the FOFA values provide an upper bound and both Goldsmith and R & R's estimate of household stock values are below the FFA values.

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1. Goldsmith's 1949 estimate of state and local securities is too high. Just the household sector's holdings was above the FOFA's estimate for households + personal trusts + non-profit organizations.

### I.C.2 Farm Equity

In the original versions we used R & R's estimates for post-1949 and Goldsmith's data for the early data. In later versions we substituted the FOFA's data for R & R's series, since data for 1981 and 1983 were available in the FOFA. The R & R series and the FOFA data are similar once adjustments are made for conceptual differences. Before our adjustments, there were large differences, both in relationship to total assets and in percentage terms, between the Goldsmith estimates and both R & R's and FOFA'S values for farm equity, as is illustrated in the unadjusted figures in Table 1.7 below. Goldsmith's estimates are approximately 1/3 higher than R & R's for each year.

There are several reasons for this discrepancy. After examining the respective farm sector balance sheets, it was apparent that Goldsmith included all of the residential household assets of a farm family in the farm equity category. R & R included only those assets associated with the farm business, all others owned by farm families were included in the general household sectors. For example, R & R included the value of consumer durables, owner-occupied housing and savings accounts owned by the farm family in the respective asset categories instead of in farm equity. The FOFA's concept was closer to R & R's except that the former included owner-occupied farm housing in farm equity. In addition to the conceptual difference, R & R did not attribute all of the farm sector's net worth to households, whereas Goldsmith assumed no corporate ownership. In 1958, a year where we have both farm balance sheets, R & R transferred 92 percent of total farm equity to the

household sector. We adjusted Goldsmith's farm equity estimates as well as the FOFA's data to be consistent with R & R's approach. The exact procedure is described in worksheet "FARM1 and 2". Our adjusted Goldsmith estimates are compared to R & R's values in table 1.7. The percentage differences are quite small.

### I.C.3 Unincorporated Business Equity

For pre-1945 years we used Goldsmith's data with adjustments, in later years we used the FOFA's series under the assumption that the holdings of trust funds and non-profit organizations of this asset were negligible. R & R's estimates are lower than the FOFA's estimates which suggests that they did not make the same assumption, see Table 1.8. Before any adjustments were made, R & R's estimates of business equity were substantially higher than Goldsmith's as illustrated in Table 1.8. This reflects R & R's approach of putting all business and tenant real estate in this category. Our corrections to the business equity category are outlined in the section on real estate (I.A.1) and in more detail in the file "ADJUST2". The unadjusted and adjusted comparisons are listed in Table 1.8.

### I.C.4 Trust Fund Equity, Wealth Variants W1 and W2

Trust funds were reported differently in Goldsmith's balance sheet than in R & R's. Goldsmith distributed trust funds across all financial categories, such as stocks, bonds, etc. R & R, on the otherhand, recorded a

separate category for trust funds. The FFA did not separate out this category from household assets and never reported an estimate for trusts in any year. We prefer the R & R approach of separating out trust funds due to the extreme concentration of this asset and our desire separate out the "annuity" concept from the full trust value. Thus we subtracted out of Goldsmith's categories an estimated amount for trust funds. The procedure and the exact amount subtracted in each year was somewhat arbitrary since we had two different values for total trusts from Goldsmith. Goldsmith's 1956 and 1963 balance sheet estimates were not the same for this asset and only in the earlier publication did he breakdown the value of trusts by asset type. Our assumptions are explained in the source note to "NATBAL3" .

The adjusted Goldsmith values are compared to R & R's estimates in Table 1.9. As is evident from Table 1.9, the percentage difference between R & R's and our derived Goldsmith estimates is positive and increases with time. We have no information on the sources for R & R's or Goldsmith's estimates, so no further correction was done to either series. W2-W4 used the full value of trusts as reported by Goldsmith and R & R. W1 reduced the reported trust value by 40 to 50 percent, based on the estimates down by Smith that the "annuity" value of trusts represented 56% of the total R&R value. In the early Goldsmith years we assumed that the annuity value represented slightly less, starting at 40%. Lampman assumed that the "annuity" value represented around 10 percent of total trusts. However this does seem low given that there was no major changes in the estate laws concerning trusts over the period.



I.C.5 Insurance Equity

In the calculation of insurance equity there were also substantial differences between the sources, both in concept and in the final numbers. Insurance value here refers to the combined value of government and private equity. R & R used a cash surrender value (CSV) concept rather than the full equity reported. R & R estimated the household CSV as approximately 90 percent of the FOFA's total insurance reserves for every year. Goldsmith included the full equity value in his household estimates and, although he stated that his value represented only total private insurance, it was higher than the total government plus private value in the FOFA accounts. From 1946 to 1958 the ratio of the FOFA's total estimate compared to Goldsmith's private estimate declined from .97 to .79, see worksheet 8 "LICOMP1" for the complete listing. Given Goldsmith's very high private estimate, we assumed the value he gave for life insurance represented the combined government and private reserves. The CSV approach is appropriate for our definition of household assets and we borrowed R & R's convention that the CSV equalled 90 percent of total reserves for each year. We applied this percentage to both the total FOFA's reserves for government and private companies and Goldsmith's private estimate. The differences between the FOFA's CSV and Goldsmith's CSV for 1949, 1953 and 1958 are given in Table 1.10. Worksheet "INSPENS1 and 2" document the insurance and pension adjustments that we made.

I.C.6 Pensions W1-W3

As with life insurance, R & R assumed that the household value of pensions is the CSV, an amount far below the total in pension funds. R & R's CVS represented 5 % of total reserves for any year. Goldsmith, on the otherhand, included the full pension reserves in his household balance sheet. Our W1 and W2 wealth versions use the CSV of R & R, while W3 uses the full pension reserves reported in the FOFA and Goldsmith. The difference between the two concepts is important. For example in 1983, full reserves were 1316.4 billion or 9.3 percent of net worth, while the cash surrender value was 65.8 billion or less than 1 percent of net worth. The procedure used to calculate the CSV followed the convention of R & R.<sup>2</sup>

Goldsmith and R & R also differed with respect to what should be included in the pension category, R & R's values for pensions are from the FOFA and included government plus private pensions. Goldsmith's estimates were from government publications and included everything from unemployment insurance to OASI reserves. For the pre-1945 years we adjusted Goldsmith's total pension reserves to remove the government transfers. The exact adjustments are described in worksheet "Inspense2". In Table 1.11, the FOFA's total pension reserves as well as R & R's CSVs are compared to

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2. This assumption while arbitrary does not matter since the CSV is essentially zero and represents a lower bound while the upper bound (W3) is full pension reserves. Full pension reserves are higher than the actual household pension accumulations, since for many defined benefit plans there is a current surplus.

Goldsmith's unadjusted data for the overlapping years. Notice that Goldsmith's values are between 20 and 50 percent higher than the FOFA's estimates before the above adjustments and the percentage differences are still considerable after our adjustments to Goldsmith's data. However, pension reserves are insignificant for the early years and even in 1945, total pension reserves represented less than 2 percent of national assets, thus any upward bias in Goldsmith's data will be small.

#### W4 only (I.D) Expected Social Security Payments

From 1939-1976 we used Leimer's and Lesnoy's (1982) correction of Feldstein's series, the fixed ratio version. The series stops in 1978, for the 1981 and 1983 values were estimated. We tried several regressions. One was a time trend, the other based on average social security payments, demographic data and income. The reported data is from the latter regression. We are currently calculating aggregate social security using Leimer and Lesnoy's algorithms for 1983.

## II. LIABILITIES

- .A Mortgages
- .B Consumer Debt
- .C Other

There were no major changes to these categories, we used Goldsmith's data for pre-1949 and the FOFA's and R & R's estimates for 1949 and subsequent

years. A comparison of the overlapping years for total liabilities is given in Table 1.12, the percentage differences between Goldsmith's and R & R's estimates are small.

TABLE 1.1

FILENAME: "NATBALB"

NOTE: Equity in Pension Funds is taken as Full Reserves.

Aggregate National Balance Sheet for the U.S., by Item  
(Billions of Dollars)

	1900	1912	1921	1922	1929
I. Assets	81.4	159.7	NA	315.8	477.3
A. Tangible Assets	28.2	47.4	NA	108.1	148.5
1. Real Estate	22.2	33.8	63.2	78.6	109.7
a. Owner Occupied Housing	13.6	20.7	24.3	42.4	55.3
b. Tenant Occupied Housing	4.6	7.0	26.4	23.0	34.3
c. Residential Land	4.0	6.1	12.5	13.2	20.1
2. Cons. Dur.	6.0	13.6	28.1	29.5	38.8
a. Motor Vehicles	0.0	1.3	4.0	3.9	11.0
b. Other	6.0	12.3	24.1	25.6	27.8
B. Fixed Claim Assets	11.7	25.0	64.6	69.0	91.8
1. Demand Deposits and Currency	1.5	2.6	8.0	9.4	7.8
2. Deposits in Other Fin. Inst.	3.5	8.7	18.6	19.6	32.1
3. Federal Sec.	0.6	0.4	5.3	10.5	4.4
4. State and Local Securities	0.4	1.1	3.5	3.6	5.4
5. Corporate and	5.7	12.2	29.2	25.7	42.1

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For. Bonds, Mort.,  
Open Market Paper  
and Other Instru.

C. Equities Held	41.6	87.3	ERR	138.8	236.9
1. Corporate Stock	10.2	28.2	43.0	50.7	128.8
2. Farm Eq.	21.7	41.8	46.0	48.7	45.7
3. Unincorp. Bus. Eq.	6.5	9.5	23.9	20.6	27.3
4. Trust Fund Eq.	1.9	4.5	10.8	11.5	19.2
5. Insurance	1.3	3.3	6.7	7.0	14.3
6. Pensions	0.0	0.0	NA	0.3	1.6
II. Liabilities	4.1	7.7	NA	16.8	39.8
1. Mortgages	2.3	3.6	NA	7.5	16.6
2. Consumer Debt	0.6	1.6	NA	3.2	6.9
3. Other	1.2	2.5	NA	6.1	16.3
III. Net Worth	77.4	152.0	ERR	299.0	437.5
IV. Addendum					
1. Life Insurance Reserves	1.4	3.7	NA	7.8	15.9
2. Pension Fund Reserves	0.0	0.0	NA	0.3	1.6
	1933	1939	1945	1949	1953
I. Assets	325.5	387.6	663.4	886.1	1195.0
A. Tangible Assets	108.7	132.0	195.0	332.5	477.9
1. Real Estate	81.7	101.9	146.8	245.9	334.9
a. Owner Occupied Housing	41.0	51.7	79.6	144.0	210.1

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b. Tenant Occupied Housing	25.4	31.7	48.4	67.5	77.1
c. Residential Land	15.3	18.5	20.8	34.4	47.7
2. Cons. Dur.	27.0	30.1	46.2	86.6	143.0
a. Motor Vehicles	8.1	8.4	5.4	21.8	54.1
b. Other	18.9	21.7	40.8	64.8	88.9
B. Fixed Claim Assets	83.4	79.9	183.0	200.9	244.9
1. Demand Deposits and Currency	10.4	13.9	47.8	52.7	62.5
2. Deposits in Other Fin. Inst.	26.8	30.1	53.9	63.9	86.8
3. Federal Sec.	4.9	6.7	54.6	55.0	57.9
4. State and Local Securities	6.8	5.2	8.6	4.1	7.3
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	34.5	24.0	18.1	25.2	30.4
C. Equities Held	133.5	175.7	285.3	352.7	472.2
1. Corporate Stock	50.9	63.1	97.0	89.9	133.0
2. Farm Eq.	28.9	32.7	71.0	81.9	105.4
3. Unincorp. Bus. Eq.	18.0	27.9	41.4	80.8	100.0
4. Trust Fund Eq.	16.0	22.4	29.0	32.9	39.1
5. Insurance	17.0	23.9	35.6	46.9	57.2
6. Pensions	2.7	5.7	11.3	20.3	37.5
II. Liabilities	27.3	28.1	28.9	61.4	107.1

	1958	1962	1965	1969	1972
1					
1. Mortgages	13.1	14.1	17.2	35.3	62.5
2. Consumer Debt	3.4	7.6	5.8	20.9	36.7
3. Other	10.8	6.4	5.9	5.2	7.9
III. Net Worth	298.2	359.5	634.5	824.7	1087.9
IV. Addendum					
1. Life Insurance Reserves	18.9	26.6	39.6	52.1	63.6
2. Pension Fund Reserves	2.7	5.7	11.3	20.3	37.5
	1958	1962	1965	1969	1972
I. Assets	1731.7	2071.5	2575.7	3366.3	4293.3
A. Tangible Assets	629.3	736.4	846.7	1211.5	1570.8
1. Real Estate	447.3	534.1	610.6	867.8	1146.1
a. Owner Occupied Housing	291.6	347.0	395.0	544.4	710.9
b. Tenant Occupied Housing	84.6	94.5	109.3	155.0	212.0
c. Residential Land	71.1	92.6	106.3	168.4	223.2
2. Cons. Dur.	182.0	202.3	236.1	343.7	424.7
a. Motor Vehicles	69.8	74.5	88.2	127.2	155.6
b. Other	112.2	127.8	147.9	216.5	269.1
B. Fixed Claim Assets	323.8	415.3	523.3	715.6	939.9
1. Demand Deposits and Currency	67.7	69.8	86.5	105.2	138.9
2. Deposits in Other Fin. Inst.	139.7	207.3	286.4	381.0	564.4



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3. Federal Sec.	60.9	67.5	67.4	98.4	82.7
4. State and Local Securities	14.8	18.3	24.9	35.5	32.7
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	40.5	52.4	58.1	95.5	121.2
C. Equities Held	778.6	919.8	1205.7	1439.2	1782.6
1. Corporate Stock	314.0	361.0	529.4	626.9	745.9
2. Farm Eq.	131.2	144.3	167.3	198.3	250.8
3. Unincorp. Bus. Eq.	126.9	136.8	143.9	150.0	146.9
4. Trust Fund Eq.	63.1	85.2	115.0	132.8	183.1
5. Insurance	70.7	83.2	95.3	112.9	129.5
6. Pensions	72.7	109.3	154.8	218.3	326.4
II. Liabilities	178.6	256.0	342.0	454.9	592.9
1. Mortgages	112.9	163.8	214.5	276.3	358.0
2. Consumer Debt	52.7	73.9	103.2	137.7	177.6
3. Other	13.0	18.3	24.3	40.9	57.3
III. Net Worth	1553.1	1815.5	2233.7	2911.4	3700.4
IV. Addendum					
1. Life Insurance Reserves	78.5	92.4	105.9	125.4	143.9
2. Pension Fund Reserves	72.7	109.3	154.8	218.3	326.4

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	1976	1977	1981	1983
I. Assets	6073.4	8920.3	11012.5	12942.2
A. Tangible Assets	2526.1	4016.6	4971.2	5390.1
1. Real Estate	1873.3	3091.3	3874.7	4183.2
a. Owner Occupied Housing	1140.0	1781.8	2117.9	2242.4
b. Tenant Occupied Housing	333.1	540.9	710.4	767.3
c. Residential Land Estate	400.2	768.6	1046.4	1173.5
2. Cons. Dur.	652.8	925.3	1096.5	1206.9
a. Motor Vehicles	235.2	344.7	388.2	428.1
b. Other	417.6	580.6	708.3	778.8
B. Fixed Claim Assets	1428.4	1988.2	2364.5	2834.4
1. Demand Deposits and Currency	184.6	250.3	291.3	346.1
2. Deposits in Other Fin. Inst.	876.7	1201.3	1534.7	1841.7
3. Federal Sec.	144.1	227.4	240.7	280.5
4. State and Local Securities	48.5	49.5	62.9	106.6
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	174.5	259.7	235.0	259.5
C. Equities Held	2118.9	2915.5	3676.7	4717.6
1. Corporate Stock	622.6	745.9	935.9	1476.4
2. Farm Eq.	461.0	693.0	743.6	687.2
3. Unincorp. Bus. Eq.	217.5	361.2	557.0	672.7
4. Trust Fund Eq.	192.8	229.8	295.8	348.2

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5. Insurance	157.8	186.0	203.0	216.7
6. Pensions	467.2	699.6	941.4	1316.4
II. Liabilities	862.3	1336.3	1573.8	1849.5
1. Mortgages	540.1	856.8	1024.0	1179.5
2. Consumer Debt	248.6	382.7	398.5	474.7
3. Other	73.6	96.8	151.3	195.3
III. Net Worth	5211.1	7584.0	9438.7	11092.7
IV. Addendum				
1. Life Insurance Reserves	175.3	206.7	225.6	240.8
2. Pension Fund Reserves	467.2	699.6	941.4	1316.4

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SOURCES AND NOTES:

Data for years 1900-1945 (except 1921) taken from years with label of the form "19xx.a" in "NATBAL6", except for categories: I.A.1.b, Tenant Occup. Housing; I.A.1.c, Resid. Land. These two categories were adjusted due to over-estimates of Tenant Occup. Housing from Musgrave, see File "ADJUSTRE" for details and also "ADJUST2a". If NATBAL6 references File "ADJUST2" then the source for "NATBAL8" is "ADJUST2a"

Data for 1921 from year 1921.d in "NATBAL6".

Data for years 1949-1983 taken from years with label of the form "19xx.b" and "19xx.c" from "NATBAL6", except for categories: I.A.1.b, Tenant Occup. Housing; I.A.1.c, Residential Land; and I.C.3, Unincorporated Business Equity. These three categories were adjusted due to over-estimates of Tenant Occup. Housing from Musgrave, see File "ADJUSTRE" for details and also "ADJUST2a". If NATBAL6 references File "ADJUST2" then the source for "NATBAL8" is "ADJUST2a"

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TABLE 1.2

Residential Structures

A Comparison of the Adjusted Goldsmith's estimates  
with Musgrave's estimates

-----In Billions-----

YEAR	Goldsmith	Musgrave	DIFF	% DIFF
1922	52.0	68.5	-16.5	-31/7%
1929	78.9	94.3	-19.4	19.5
1933	61.3	69.9	-8.6	14.0
1939	76.2	88.1	-11.9	15.6
1945	123.3	135.9	-12.9	10.2
1949	189.1	222.8	-33.7	17.8
1953	259.4	301.2	-42.0	16.2
1958	346.2	393.1	-46.9	13.5

Sources: Goldsmith's values are from "Natbal3" page references are in the source note at the end of the balance sheet, this is available from the authors. Musgrave's estimates are used in our National Balance sheets, Table 1.1 in this appendix.

TABLE 1.3a

Owner-occupied Land

A Comparison of R & R's Estimate with the  
FOFA's data for selected years

YEAR	R & R	FOFA	R&R/FFA
1950	20.3	30.0	.677
1955	37.4	47.1	.794
1959	64.5	68.0	.949
1960	67.0	78.1	.858
1965	100.3	99.6	1.007
1970	151.6	157.8	.961
1975	272.7	280.6	.972
1980	583.3	711.7	.820

Source: Worksheet "LANDCOMP" available from the authors

TABLE 1.3b

All Residential Land

A Comparison of Goldsmith's Estimates with the  
Adjusted FOFA Figures for 1949, 1953 and 1958

YEAR	Goldsmith	FOFA	DIFF	%DIFF
1949	31.3	36.7	-5.3	-16%
1953	46.3	50.6	-4.2	- 9
1958	71.4	74.9	-3.4	- 5

Sources: Goldsmith's data are from worksheet "NATBAL3", available from the authors. Adjustments to the FOFA's data are also explained in the worksheet "ADJUST3."

TABLE 1.4

Total Consumer Durables

A Comparison of Musgrave's Data with Goldsmith's Values

YEAR	Goldsmith	Musgrave	% DIFF
1922	30.9	29.5	4.5%
1929	42.2	38.5	8.0
1933	25.8	27.0	-4.7
1939	32.6	30.1	7.7
1945	46.3	46.2	0.2
1949	91.2	86.5	5.0
1953	133.0	143.0	-7.5
1958	178.7	182.0	-1.8

Sources: Goldsmith's column is from worksheet "NATBAL3", Musgrave's column is from his 1986 publication and used in our final balance sheet Table 1.1, except for the pre-1922 which is explained above.

TABLE 1.5

Fixed Claim Assets

A Comparison of the Adjusted Goldsmith's Data

with R & R's Estimates for the Years: 1949, 1953 and 1958

1949

-----in billions-----

	Goldsmith	R & R	DIFF	% DIFF
B. Fixed Claim Assets	299.6	299.9	-0.3	.00
1. Demand Deposits and Currency	46.7	52.7	-6.0	-0.12
2. Deposits in Other Fin. Inst.	68.5	63.9	4.6	0.07
3. Federal Sec.	54.8	55.0	-0.2	.00
4. State and Local Securities	10.2	4.1	6.1	0.86
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	20.3	25.2	-4.9	-0.22

1953

-----in billions-----

	Goldsmith	R & R	DIFF	% DIFF
B. Fixed Claim Assets	246.0	244.9	1.1	.00
1. Demand Deposits and Currency	56.7	62.5	-5.8	-0.10
2. Deposits in Other Fin. Inst.	91.1	86.8	4.3	0.05
3. Federal Sec.	60.0	57.9	2.1	0.04
4. State and Local Securities	11.8	7.3	4.5	0.47
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	26.4	30.4	-4.0	-0.14



Table 1.5 cont.

1958

-----in billions-----

	Goldsmith	R & R	DIFF	% DIFF
B. Fixed Claim Assets	324.1	323.8	0.3	.00
1. Demand Deposits and Currency	61.0	67.9	-7.0	-0.11
2. Deposits in Other Fin. Inst.	143.7	139.7	4.0	0.03
3. Federal Sec.	61.1	60.9	0.2	.00
4. State and Local Securities	17.0	14.8	2.2	0.14
5. Corporate and For. Bonds, Mort., Open Market Paper and Other Instru.	41.4	40.5	0.9	0.02

Source: NATBAL 6 or 7, provided by the authors on request.

TABLE 1.6

Corporate Stock Estimates

Comparison of Goldsmith's Original values with  
R & R's and the FOFA's Estimates

YEAR	Goldsmith	R & R	% DIFF	FOFA (Bill.)
1949	93.0	89.9	3.0%	109.4
1953	142.0	133.0	7.0	162.4
1958	304.4	314.0	3.0	373.3

Source: Taken from Worksheet "Test1". The Goldsmith and R & R estimates are also in NATBAL 6 or 7, both are available from the authors.

Table 1.7  
Farm Equity Estimates  
Unadjusted and Adjusted Comparisons between  
Goldsmith's and R & R's Values

YEAR	----- UNADJUSTED-----			----- ADJUSTED-----		
	Goldsmith	R & R	% DIFF	Goldsmith	R & R	% DIFF
1949	126.8	86.9	37.0%	89.0	81.9	8.0%
1953	152.3	106.9	35.0	105.5	105.4	0.0
1958	186.9	135.4	32.0	133.6	131.2	2.0

Sources: Unadjusted: Taken from "NATBAL2" which is available from the authors. Adjusted: From "NATBAL6" available from the authors, the description of the adjustments is given in Worksheet "Farm2".

TABLE 1.8  
Unincorporated Business Equity  
Comparison of Goldsmith's, R & R's and FOFA's estimates  
for 1949, 1953 and 1958

UNADJUSTED				
YEAR	Goldsmith	R & R	DIFF	% DIFF
1949	64.6	150.6	-86.0	80.0%
1953	81.9	182.2	-100.0	76.0
1958	97.3	217.2	-119.9	76.0

ADJUSTED					
YEAR	1 Goldsmith	2 R & R	3 FOFA	4 % DIFF (1-2)/1	5 %DIFF (1-3)/1
1949	64.6	58.2	67.2	10.0%	-4.0%
1953	81.9	72.5	82.9	12.0	-1.0
1958	97.3	91.9	106.2	6.0	-9.0

Sources: Unadjusted estimates are from "NATBAL2". Adjusted estimates are from "NATBAL6" or "7", available from the authors. Explanation of changes in Worksheet "ADJUST2" under method 2.

TABLE 1.9

Trust Funds

A Comparison between the Adjusted Goldsmith values  
with R & R's Estimates

YEAR	Goldsmith	R & R	DIFF	% DIFF
1949	32.4	32.9	-0.5	-1.0%
1953	35.6	39.1	-3.5	-9.0
1958	55.4	63.1	-7.8	-13.0

Source: "NATBAL3" through "7"

TABLE 1.10

CSV of Insurance Funds (gov. + priv.)

Comparison of Goldsmith's and FOFA's Estimate  
for 1949, 1953 and 1958

YEAR	Goldsmith	FOFA	DIFF	% DIFF
1949	49.7	46.9	2.8	5.6%
1953	64.8	57.2	7.6	11.7
1958	89.7	70.7	19.0	21.2

Sources: Goldsmith's column represents .9 times the full insurance value from "NATBAL3", FOFA's column is from the 1986 publication and from our national balance sheet Table 1.1 in this appendix.

Table 1.11

Pension Values (priv. + gov.)

A Comparison between Goldsmith's Unadjusted  
Figures with the FOFA's Full Pension Values and R & R's CSVs  
for the years 1949, 1953 and 1958

YEAR	1 Goldsmith Unadjusted	2 FOFA	3 R & R CSV	4 % DIFF (1-3)/1
1949	43.9	20.3	1.0	53.8%
1953	63.4	37.5	1.9	40.9
1958	93.5	72.7	3.6	22.2

Sources: "NATBAL3." The FOFA's numbers are an appendix to each year in the balance sheet.

TABLE 1.12

Total Liabilities

A Comparison of Goldsmith's Values With  
R & R's Values for 1949, 1953 and 1958

Year	Goldsmith	R & R	DIFF	% DIFF
1949	58.2	61.4	-3.2	-5.0%
1953	105.3	107.1	-1.8	-2.0
1958	177.6	178.6	-1.0	-1.0

Source: "NATBAL6" or "7". R & R's values correspond to our national balance sheet Table 1.1 reported in this section.

APPENDIX II

This appendix explains the assumptions used in deriving the various concentration results reported in section III. It is divided into 2 parts. The first concerns the adjustments and imputations to the estate data (Lampman, Smith and Schwartz) for wealth definitions W1-W4, underlying Table 5 in Section III. The second explains the transformations to the estate data, that generated Tables 6 through 8.

(I) Adjustments to the Estate Data

We made imputation assumptions to the following three assets; pensions, trusts and in the W4 wealth version social security. We made no adjustments for differences in life-insurance estimates between Lampman, Smith and Schwartz.

(A) Trusts

The estate files include trusts within each asset category rather than under a separate entry. As explained in the text, a large percentage of trusts, remainder trusts, are valued in the estate files at their "actuarial" value rather than current market value. The estate procedure is explained in Smith (1984). In contrast, the aggregate balance sheet data report trusts at their full market value. Lampman and Smith used different approaches in reconciling the aggregate numbers with the estate files. Smith reported the estate concept and reduced the aggregate estimates to equal the lower "actuarial" value of the estate files. Lampman increased the estate estimates to reflect the current market value. We report both concepts. The W1 measure is consistent with Smith's approach and the W2 is based on the full value of



trusts. In both cases several imputation assumptions are required. These are: an estimate of the percentage of total trusts included in the estate files and the percentage of total trusts owned by the top wealthholders.

Smith assumed that 54.3% of the aggregate trust value represented the smaller "actuarial" value and reduced the balance sheet aggregates by this percent. The above percentage was based on his analysis of the 1965 estate file.<sup>1</sup> Lampman assumed that the amount of trusts included in the estate file was considerably less. He calculated for 1953 that the estate file "actuarial" value of pensions was only 12% of the Goldsmith aggregate total. Lampman assumed that the top wealthholders proportion of trusts was in 1922, 1929 and 1933 66%; in 1939 75%; in 1949 80% and 1953 85%. He assumed that approximately 10% of the above was included in the estate files for each year.

For the W1 wealth variant we used Lampman's "basic version" and Smith's reported results for the top wealthholders estimates. Our adjusted aggregate balance sheet values were reduced by 40 to 50 percent based on the work of Smith. Smith's analysis of the 1965 estate file suggests that Lampman's 10 percent assumption was too low. There were no major changes in the estate laws that would account for a large increase in the percentage of trusts included in the estate file over the period.

In wealth versions W2 through W4 we included the full balance sheet value of trusts. Because we wanted to separate out the effect of trusts, we first subtracted out of each asset category our estimate of the proportion of trusts included in the estate estimates. For Lampman's data, we based our adjustments on the asset composition of trusts listed in Goldsmith. For Smith

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11. Smith and Franklin (1974) compared the capitalized income reported on the tax returns to the aggregate balance sheets filed for 1965, the only year for which data is available.

we used the percentage composition that he estimated to adjust the aggregate values. Table 2.1 lists both of the percentage compositions that we used to subtract out the estate trust values.

For the total percentage of trusts owned by the top-wealthholders we created "upper" and "lower" bounds. Our upper bound, was that the top 1% owned 100% of total trusts and the top 5% owned 95% for every year. This corresponds to the reported W2 value in the text. The lower bound was 80% for the top 1% and 75% for the top 0.5%. We also tried a decreasing trend in the percentage of trusts owned by the wealthy between 1922 and 1983. The lower bound assumption and the decreasing trend series produced concentration results between W1 and the upper bound (W2). Thus the difference in concentration between W2 and W1 represents a "reasonable" maximum for alternative trust imputation assumptions. For W3 and W4 wealth variants we assumed that the top 1% owned 90% and the top 0.5% owned 85% of trusts for every year. These percentages were the same as our estimated trust shares from the 1962 survey after adjustment for underreporting.

#### (B) Pensions

We report two values for pensions, the cash surrender value (CSV) in W1 and W2 and the full reserve value in W3 and W4. The aggregate CSV estimates are so low that any reasonable percentage imputation to the top-wealthholders has zero effect on concentration. For the CSV wealth versions we used the same percentage assumptions to derive the top-wealthholders' share as in the full reserve series.

As was the case with trusts, Smith and Lampman valued pensions differently, Smith used the CSV concept in the estate file. Lampman added a constant fraction of total pension reserves to the top wealthholders. He

assumed that the top wealthholders' share of pensions was 10% of private and 5% of public funds for every year.

We estimated four different alternatives for pension concentration. For three out of the four pension series we assumed that the top 1% owned a declining proportion of total pension wealth over the period 1922-1983. We based our imputation assumptions on the growth of actual pension plans over the period and the results from the 1962 and 1983 surveys. The 1962 survey estimates for the top shares of the CSV of pensions were very low, the top 1.0% and 0.5% of households owned 2.5% and 1.1% of pension reserves respectively.

The survey results provided a lower bound on pension concentration. We assumed for the "upper bound" that the top 1 percent's share of wealth varied between 15 and 10 percent. The W3 value reported in Table 5 was based on the assumption that the top 1 percent's share of pensions declined from 9 percent to 6 percent over the period. We also estimated a constant proportion assumption of 5 percent for the top 1 percent's share. Our alternative imputation assumptions even in 1983 resulted in less than a 1 percent difference in estimated net worth concentration.

### (C) Social Security

None of the estate estimates included any expected social security benefits. To be consistent with the aggregate data, the top-wealthholders share should be calculated on their expected discounted stream of payments. We have done this for the survey years 1962 and 1983 (see section IV). The 1962 adjusted survey estimates report a very low share for the top wealthholders. The top 1 percent of households owned between 2.0 to 2.3% of total expected retirement benefits and the top 5.0 percent of households owned

between 7.3 and 8.4 %.<sup>2</sup> Given the significance of social security in reducing the concentration estimates reported in section III and IV, we have used in W4 a rather "high" estimate for the top wealthholders share. We assumed that the top 1% owned 5% of social security wealth in 1939-58 and 4% in the period 1962 through 1983.

(II) Transformations to the Estate Series

In Table 7 we standardized the Lampman and Schwartz estimates to represent the top 0.5 and 1.0% of the population. In Tables 8 and 9 we transformed the estate series from the individual to household unit in order to estimate the effect of family composition on concentrated trends. Our assumptions and procedures are explained below.

(A) Extrapolation using the Pareto Distribution

We have fit the Pareto distribution to the estate estimates for each year. This assumes that the function provides a satisfactory fit to the upper part of the distribution. We used the following cumulative density and mean wealth equation to estimate the parameters,  $\alpha$  and  $\beta$  for each year.

1. 
$$P(X|X>W_0) = \int_{W_0}^{\infty} f(X) dx$$

$$F(X) = r(X) \beta$$

where:  $P(X|X>W_0)$  is the percentage of the population with wealth above  $W_0$ .

$r(X)$  - Pareto density function:

$$r(X) = \alpha \bar{W}^{\alpha} X^{-(\alpha+1)} \text{ which is defined only for } X > W$$

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21. The exact percentage of retirement wealth depends on the growth rate assumption used. This is explained in Section IV of the paper.

and  $\alpha > 1$ .

$\beta$  - Prob ( $X > \bar{W}$ )

$\bar{W}$  - mean wealth

$$2. E (X|X>W_0) = \left[ \int_{W_0}^{\infty} x F(x) dx \right] / \left[ \int_{W_0}^{\infty} F(x) dx \right]$$

where as above:  $f(x) = r(x)\beta$ .

For Lampman's sample  $W_0$  was 60,000.

In addition we estimated  $\alpha$  and  $\beta$  from the survey data frequencies (1962 and 1983) for the top percentiles. The estimated value of  $\alpha$  varied from (1.37 to 1.60) the higher up the frequency distribution we sampled. As a check on our point estimates for the Lampman years, we inserted different values for  $\alpha$ . Varying  $\alpha$  between 1.37 and 1.90 altered the estimated concentration shares less than .5 of a percentage point. This is due to the fact that  $\beta$  shifts with changes in  $\alpha$ .

**(B) Individual to Household Estimates. (Preliminary Analysis).**

In Tables 8 and 9 we reported shares for the estimated top 1 percent of households from the estate data. This was done in two steps. We first estimated the number of households represented by the individual top-wealthholders and then, using the Pareto distribution, standardized to the top 1% of households. The latter step was comparatively straightforward. The extrapolation technique to the top 1% of total households was the same as the population standardization explained in section (A) above except that for Smith's data we had to estimate the lower wealth bound ( $W_0$ ) for his published results. However the assumptions used to transform the individual wealth levels to represent household wealth levels requires some explanation.

Since we have no data on the number and the wealth of households represented in the estate file, we made assumptions concerning the number of households represented, keeping the wealth level of these "households" constant. This was also done by Williamson and Lindert (1980). This approach yields "assumption 1" and "assumption 2" as upper and lower bounds on household concentration. These are explained below.

"Assumption 1," which is used in Table 7, corresponds to the minimum number of households among the top individual wealthholders. We assumed that all married women married men within the top wealthholders sample. The married women represent a smaller percentage of the top individual wealthholders than married men, from 9 to 18% for women to over 50% for men. "Assumption 1" gives a "low" estimate of the concentration of households compared to individuals because it assumes that the remaining married men wed women with zero wealth. Part of the difference between the adjusted survey and our household estimates (Table 9) could be due to the underestimation of married men's wealth.

"Assumption 2" yields even lower concentration results and is even less believable. It assumes that each individual in the estate series corresponds to a household. Thus all the wealthy who were married had spouses who had zero wealth.

An alternative and more interesting range of assumptions change, in addition to the number of households, the level of wealth held by the sample of top wealthholders. For example, another version of "assumption 1" is to assume that the remaining married men married women with positive wealth levels. These alternative assumptions would obviously yield higher levels of concentration than those reported in Table 7. An extension of the work in Section III is to investigate the magnitude of the additional wealth needed to

equate the estate household estimates with those from our adjusted survey data, the difference in Table 8.

TABLE 2.1

Composition of Trusts used for Adjusting  
Top Wealthholders' Holdings  
Wealth Versions W2-W4

	<u>Lampman Years (1922-53)</u>	<u>Smith Years (1958-76)</u>
Real Estate	3%	2%
Cash	2	3
Bonds	20	22
Stocks	70	71
Debt Instruments	3	2
Misc. Assets	2	0

Sources and Notes:

Lampman's Years: The percentage composition is a weighted average of the yearly composition 1945-1959 in Goldsmith et.al.(1963) Tables III-1a, p.120

Smith Years: His own compositional results from the 1965 Internal Revenue Estate Tax File,n/ith (1984) p. 428.