

## TRENDS IN AGGREGATE HOUSEHOLD WEALTH IN THE U.S., 1900-83

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New estimates of aggregate household wealth for the U.S. covering selected years in the period from 1900 to 1983 are presented. I find that marketable wealth per capita grew at 1.46 percent per year in real terms over the 1900-83 period, while real wealth per household grew at 0.81 percent per year. However, the growth rate was not uniform over the period, with the rates high during the 1900-29 and the 1949-69 periods, and slow during the other years. Moreover, real per capita wealth actually increased more slowly than real per capita disposable income and real per capita GNP over the century. I also find dramatic changes in the composition of household wealth over the century. In particular, both tangibles and fixed claim assets increased relative to total assets over the period from 1900 to 1983, while equities fell from about half to a quarter. Owner-occupied housing increased only moderately as a proportion of assets, from 17 percent in 1900 to 20 percent in 1983. Unincorporated business equity fell from over a third of total assets to 12 percent. Among financial assets, the biggest relative growth occurred in deposits in financial institutions, which grew from 8 percent in 1900 to 22 percent in 1983. Corporate stock had the most volatile behavior in the household portfolio, growing from 13 percent of total assets in 1900 to 27 percent in 1929, falling to 10 percent in 1949, rising to 22 percent in 1965, and then falling to 11 percent by 1983. Debt as a proportion of total assets rose from 5 percent in 1900 to 16 percent in 1983. Finally, both pension reserves and social security wealth increased relative to marketable assets from virtually zero in 1900 to 12 and 48 percent, respectively.

In this paper I present new estimates of household wealth for the U.S. covering selected years in the period from 1900 to 1983. Since there is no single set of data available for the entire period, the major contribution of this work is to develop consistent estimates for the entire period based on sources using different accounting frameworks and different basic data sources. I also present figures on the growth in per capita wealth over the period, as well as trends in the aggregate portfolio composition. I find that marketable wealth per capita grew at 1.46 percent per year in real terms over the 1900-83 period, while real wealth per household grew at 0.81 percent per year. However, the growth rate was not uniform over the period. In particular, real wealth per capita and per household grew quickly during the 1900-29 and the 1949-69 periods, and slowly during the 1929-49 and the 1969-83 periods. Moreover, real per capita wealth actually increased more slowly than real per capita disposable income and real per capita GNP over the century. Inferences are drawn about the relevance of such estimates for household well-being.

I also find dramatic changes in the composition of household wealth over the century. In particular, both tangibles and fixed claim assets increased relative to total assets over the period from 1900 to 1983, while equities fell very sharply, from about half of total assets at the beginning of the century to a quarter by

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1983. Somewhat surprisingly, (gross) owner-occupied housing increased only moderately as a proportion of marketable assets, from 17 percent in 1900 to 20 percent in 1983. Perhaps, the most dramatic change was in the importance of unincorporated business equity, which comprised over a third of total assets in 1900 but fell almost steadily over the century, reaching 12 percent of total assets by 1983. Among financial assets, the biggest relative growth occurred in deposits in financial institutions, which grew rather steadily from 8 percent of all assets in 1900 to 22 percent in 1983. Corporate stock had the most volatile behavior in the household portfolio, growing from 13 percent of total assets in 1900 to 27 percent in 1929, falling to 16 percent in 1933 and then to 10 percent in 1949, rising to 22 percent in 1965, and then falling to 11 percent by 1983.

Debt as a proportion of total assets rose from 5 percent in 1900 to 16 percent in 1983. Finally, both pension reserves and social security wealth increased relative to marketable assets over the period. By 1983, pension reserves had assumed about the same magnitude as corporate stock, while social security wealth was on a par with total tangible assets. Some preliminary explanations are provided for these trends.

The paper is divided into five parts. In the first, I introduce the wealth concepts used in the paper. In Part 2 I present a general discussion of the construction of aggregate household balance sheets for the 1900–83 period, and in Part 3 details on sources and methods are discussed. In Part 4 I present results on per capita wealth and portfolio composition. Concluding remarks are made in Part 5. Detailed data tables are provided in the accompanying diskette, and the table of contents is shown in Part 6.

## I. 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, four alternative operational measures of household wealth are developed. These wealth measures are explained below and summarized in Table 1. The first of these, W1, is defined as the cash surrender value of tangible and financial assets (less

TABLE 1  
DEFINITION OF WEALTH CONCEPTS W1, W2, W3, AND W4

W1	is defined as the cash surrender value of total assets less liabilities. The assets include owner-occupied housing, other real estate, all consumer durables, demand deposits and currency, time and savings deposits, bonds and other financial securities, corporate stock, unincorporated business equity, trust fund equity, the cash surrender value of insurance, and the cash surrender value of pensions. Liabilities include mortgage debt, consumer debt, and other debt. Trusts are measured at their "actuarial value," which represents between 40 to 60 percent of the total reserves of trusts, depending on the year. Pensions, as just noted, are measured at their cash surrender value, which represents about 5 percent of their total reserves. All other tangible and financial assets and liabilities are measured at full value.
W2	is defined as W1 plus the full reserves of trust funds less their actuarial value (included in W1).
W3	is defined as W2 plus the total value of pension reserves less the cash surrender value of pensions (which is included in W1 and W2).
W4	is defined as W3 plus social security wealth, given by the expected present value of future social security benefits.

liabilities). 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. 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. The 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. The fourth measure, W4, is defined as W3 plus the expected present value of future social security benefits. Though there are several difficult problems associated with the concept and measurement of social security wealth, I include this concept because it has attained considerable currency in the literature on household wealth (see, for example, Feldstein's 1974 article on the subject). I am not advocating its use here but rather presenting it for comparative purposes.

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 (see the next section for references) include the full value of both trusts and pension funds, as in W3. On the other hand, Ruggles' and Ruggles' estimates (see the next section for references) include only the cash surrender value of pensions but the full value of household trusts, as in W2. W4 differs from the first three measures by imputing to households retirement wealth which does not correspond to any accumulated reserves. This measure may be useful insofar as household behavior may be affected by perceived social security or pension wealth.<sup>1</sup>

All four 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 cash surrender wealth concept, such as W1 or W2, is the appropriate one for analyzing behavior if significant liquidity constraints are present or if households have a very short planning horizon. There is no behavioral model of which I am aware that corresponds to the W3 measure. If pension reserves are included, then some form of expected social security payments should also be

<sup>1</sup>A fifth measure, W5, defined as W4 less pension reserves plus the present value of future pension benefits was also used in Wolff and Marley (forthcoming). The W5 concept is preferable to W4, since both social security and pension wealth use the same accounting definition. However, no estimates of the present value of future pension wealth are available for the full period of interest here.

included, even though social security does not represent a stock of savings as does pensions. The W3 measure has been introduced in order to separate out the effects of pensions on total household wealth. Several researchers have used W4 (or W5, as discussed in footnote 1) in behavioral models under the belief that households consider future pension and social security benefits as a form of wealth which affects current savings and labor force participation decisions.

## II. AGGREGATE HOUSEHOLD BALANCE SHEETS FOR SELECTED YEARS, 1900-1983

There are several historical time series available on aggregate household wealth, but none covers the entire period from 1900 to 1983. Moreover, the sources available are not entirely consistent with each other, thus necessitating several adjustments to make them comparable. Certain years during this period were selected on the basis of the availability of estate tax data, because in another study the aggregate household balance sheet data were used to construct new estimates of household wealth concentration [see Wolff and Marley (forthcoming)].

The construction of the new household balance sheets relied on the following sources: (i) 1900-58: Full household balance sheet estimates are available in Goldsmith, Brody and Mendershausen (1956) and Goldsmith, Lipsey and Mendelsen (1963). The figures from these sources will be collectively referred to in this paper as the "Goldsmith data." These are the only sources available for nontangible assets for the period from 1900 to 1946.<sup>2</sup> (ii) 1925-85: Musgrave (1986) provides estimates of tangible assets for every year in this period.<sup>3</sup> (iii) 1946-85: Complete balance sheet data are contained in the Flow of Funds Accounts (FFA) of the Board of Governors of the Federal Reserve System (1986).<sup>4</sup> However, the FFA's household sector includes not only households, but also trusts and nonprofit organizations. For tangible assets this can be corrected, since the FFA's source is Musgrave's series, which reports separate estimates for the more narrowly defined household sector. For nontangible assets, other adjustments must be made. (iv) 1946-80: Ruggles and Ruggles (RR) (1984) provide aggregate balance sheet data for the narrowly defined household sector for all assets and liabilities.<sup>5</sup> RR's estimates are based on imputations to the FFA household balance sheet data to separate out nonprofit organizations and trust funds. They also use a wealth concept which includes only the cash surrender value of pensions and insurance and is thus consistent with W2.

The aggregate household balance sheet estimates presented here combine data from the various sources listed above. Figures for tangible assets are based

<sup>2</sup>All household balance sheet data except for trust accounts come from the 1963 volume (pp. 42-85 and 118-119, under the nonfarm household and agricultural headings). Data for personal trusts for the pre-1945 years are from the 1956 volume (pp. 42-53), and for the 1945-58 period from the 1963 volume (p. 120).

<sup>3</sup>The data are taken from his revised series on tangible wealth (Table 10, p. 65, and Table 18, p. 73).

<sup>4</sup>The data are drawn from the category Households, Personal Trusts and Nonprofit Organizations (pp. 11-15) and from the Farm Business and Nonfarm Noncorporate Business sectors (pp. 16-20).

<sup>5</sup>The source is Table 2.40, Household Sector Capital Accounts.

on Musgrave (1986) for the period from 1925 to 1983. The 1922 figures are estimated from Musgrave's data. The rationale for using Musgrave's data rather than the Goldsmith data for the period prior to 1949 is, first, that Musgrave provides a consistent series over the entire period, from 1925 to 1985, and, second, that Musgrave's numbers are based on revised and improved data that were not available to Goldsmith in 1963. Estimates for nontangibles are based on Goldsmith's data for years prior to 1949, on the Ruggles and Ruggles data for most financial assets over the period from 1949 to 1980, and flow of funds data for all assets in 1981 and 1983, as well as some nontangible assets for the 1949-80 period. The reason for our use of the Ruggles and Ruggles data instead of the flow of funds for financial assets is that RR provide a separate trust category, whereas FFA includes the financial assets, particularly stocks and bonds, held by trusts as part of the household sector. A separate asset category for trust funds is desirable, because it differs from other household assets in regard to ownership and control.

In order to create a consistent aggregate balance sheet series, a number of adjustments to these basic data sources were required. Fortunately, for the years between 1946 and 1958, household balance sheet data are available from all four sources: Musgrave, Goldsmith, RR and the FFA. Major discrepancies were found between Goldsmith and Musgrave for tangible assets (for residential structures, for example, percentage differences ranged between 10 and 32) and between Goldsmith on the one hand and RR and FFA on the other for financial assets (differences of up to 80 percent for some assets). These discrepancies were traced to the following sources. First, there are several differences in the categorization of assets between Goldsmith on the one hand and RR and FFA on the other. These differences do not affect the wealth totals, only the composition among asset categories. Second, there are some differences in the definition of household wealth. Goldsmith's total wealth concept corresponds to W3, which includes total pension reserves, whereas Ruggles' and Ruggles' definition corresponds to W2, which includes only the cash surrender value of pensions. Third, there are several methodological differences. For example, Goldsmith attributes all of the agricultural sector's net worth to the household sector, whereas RR assumes that a small percentage of this represents corporate business rather than unincorporated business and its value would be included in the household sector only through corporate stocks. Fourth, a large part of the difference in estimates is attributable to the revisions in the basic data since Goldsmith's study.

The adjustments were done in two stages. In the first, I corrected for definitional differences in the asset categories between the various sources and the new classification scheme. In the new scheme, the asset categories are divided into three broad groups: tangibles, financial fixed claims, and equities. Liabilities are separated into mortgage debt, consumer debt and other debt. This corresponds to my previous (1987) classification scheme and it represents only a slight aggregation of the RR classification scheme. However, some substantial realignment of Goldsmith's categories was required.

In the second stage, I adjusted for differences in methodology between Goldsmith on the one hand and RR and FFA on the other, especially with respect to the items to be included in each asset category. Goldsmith differs from the

other two in regard to the following assets: farm equity, unincorporated business equity, trusts, insurance, and pensions. Moreover, RR include household inventories, which consist of such items as clothing and food, in their tangible asset category. In 1983, the value of these inventory assets was roughly 253.8 billion dollars, or roughly two percent of the total value of household assets of 11.8 trillion. I eliminated the household inventory category from the new balance sheet, since it is not available for the early years. I also added social security wealth for wealth concept W4 which is not included in any of the original sources. The adjustment procedures are described by asset category in the next section.

Differences in total household net worth between the new estimates and those of Goldsmith and RR vary by year and wealth concept. In regard to Goldsmith's figures, the total net worth figure for W3 differs from his by between 3 and 6 percent, depending on the year, while for W2 the difference varies between 7 and 8 percent. The total wealth figure for W2 differs from that of Ruggles and Ruggles by between 2 and 6 percent, whereas for W3 the percentage difference ranges from 4 to 12 percent. For W1 and W4, the percentage differences between the new estimates and those of Goldsmith and RR are much larger.

The accuracy of the new aggregate estimates depends on both the reasonableness of the assumptions in realigning Goldsmith's data with RR and the FFA and in the accuracy of the original sources. I have assumed, in general, that the techniques and assumptions made in the original aggregate sources are correct. For one important category, owner-occupied housing, it is possible to compare the aggregate household balance sheet estimates with those derived from household survey data (see Table 2). These latter numbers were obtained from the U.S. Census of Housing for years 1950, 1960, 1970, and 1980, and from the 1962 *Survey of Financial Characteristics of Consumers* (SFCC) and the 1983 *Survey of Consumer Finances* (SCF). Housing values in the Census data are recorded in a limited number of groups, with the last consisting of an open-ended interval. An aggregate value of owner-occupied housing for the Census data in each year was

TABLE 2  
 VALUE OF OWNER-OCCUPIED HOUSING AND LAND:  
 A COMPARISON OF AGGREGATE VALUES DERIVED FROM HOUSEHOLD SURVEY DATA WITH  
 THE FLOW OF FUNDS DATA  
 (billions, current dollars)

Year	Household Survey Data <sup>a</sup>	Flow of Funds	Difference	Percentage Difference
1950	\$130.8	\$177.0	\$46.2	35.3
1960	353.4	372.9	19.5	5.5
1962	473.9	403.8	-70.1	-14.8
1970	626.8	689.9	63.1	10.1
1980	2,234.3	2,568.9	334.6	15.0
1983	3,363.2	3,060.0	-303.2	-9.0

<sup>a</sup>For 1950, 1960, 1970 and 1980, the figures are drawn from the corresponding Census of Housing (Volume 1, Part 1) for that year: 1950—Table 16, 1960—Table 8, 1970—Table 5, and 1980—Table 5. The 1962 figure is based on my own calculations from the *Survey of Financial Characteristics of Consumers* and the 1983 figure on my own calculations from the *Survey of Consumer Finances*.

estimated by first fitting a Pareto distribution to the upper tail of the distribution of housing values to obtain the mean for the open-ended category and then by summing across each house value category. For the 1962 SFCC and the 1983 SCF, the total value of owner-occupied housing was calculated directly from the microdata. The estimates from the surveys are compared to our balance sheet figures in Table 2. The difference between the estimated aggregate totals from the household survey data and the FFA varies between  $-15$  and  $+35$  percent. The estimates derived from the Census data are always lower than the FFA figures, while the estimates from the 1962 and 1983 surveys are higher.

It is often assumed that for financial assets, such as stocks and bonds, the aggregate estimates are more reliable than survey estimates because of nonreporting and underreporting in the upper tail of the wealth distribution. For real estate, the opposite is often assumed—namely, that the survey estimates are more reliable than the aggregate balance sheet estimates, since households are usually very accurate in their assessment of the current market value of their property. For liquid financial assets, such as bank deposits, there is some controversy over whether the FFA's methodology produces more reliable estimates than those obtained from surveys. Curtin, Juster, and Morgan (forthcoming) argue that for such liquid assets the FFA's values overestimate the true value due to its treatment of the household accounts as a residual—that is, what is left over after estimates are made for the other sectors of the economy (such as corporations, the government, and financial institutions). Their evidence is based on the intuition that households should know the value of their bank accounts better than the value of other financial assets, such as stocks and bonds. Thus, if the survey's estimate for stocks is reasonably close to the aggregate balance sheet value, as is the case for the 1983 SCF, but only 30 or 40 percent for liquid assets, then the FFA's household totals for liquid assets are very likely overestimated. While this may be true for surveys that contain a large representation of the wealthy, such as the 1983 SCF, it is not clear that survey estimates are generally better than those from the FFA, particularly when the survey is more subject to underreporting, missing values, and underrepresentation of top wealthholders. In conclusion, comparisons between aggregate household wealth estimates derived from reliable macrodata and microdata sources suggest that the aggregate balance sheet sources used in this paper may slightly underestimate real estate assets and overestimate liquid assets.<sup>6</sup>

### III. SOURCES AND METHODS IN THE CONSTRUCTION OF HOUSEHOLD BALANCE SHEETS

In this section I provide details on the procedures used to adjust the original sources of household balance sheet data to create the new series on household wealth for W1, W2, W3, and W4. The discussion is organized by asset and liability component. Final balance sheet data for W1, W2, W3, and W4 are available from Diskette Table D1. Details on the alignment and adjustment procedures can be

<sup>6</sup>A comparison of aggregate wealth totals for 1962 and 1983 from national balance sheet data and household survey data is also discussed in Wolff (1987) and Wolff and Marley (forthcoming).

found in the Diskette library documentation. Detailed balance sheets for wealth concept W2 are presented in Diskette Table D5.

A. *Real Estate*. This category includes owner-occupied housing, tenant-occupied housing, and residential land. The estimates for owner-occupied housing and tenant-occupied housing for the 1925–83 period are based directly on Musgrave’s series on the net value of structures. Musgrave’s data are also the source for the FFA’s tangible assets. The 1922 figures are derived by extrapolating time trends estimated using regression analysis for the 1925–29 period. Goldsmith’s data were used for residential structures only for 1900 and 1912. For the 1922–59 period, Musgrave’s figures were preferred to the Goldsmith data in order to maintain consistency with later years and because the underlying worksheets have been considerably updated and revised since Goldsmith’s work. As a result, the 1900 and 1912 estimates are not consistent with the rest of the series for tangible assets. Goldsmith’s figures are consistently lower than Musgrave’s, between 10 and 32 percent, for every year in which the two series overlap (see Table 3).

TABLE 3  
RESIDENTIAL STRUCTURES:  
A COMPARISON OF THE ADJUSTED GOLDSMITH’S FIGURES WITH THE MUSGRAVE DATA  
(billions, current dollars)

Year	Goldsmith	Musgrave	Difference	Percentage Difference
1922	\$52.0	\$68.5	\$16.5	31.7
1929	78.9	94.3	15.4	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	12.6	10.2
1949	189.1	222.8	33.7	17.8
1953	259.4	301.2	41.8	16.1
1958	346.2	393.1	46.9	13.5

*Note:* These figures are adjusted from Goldsmith’s original data. Adjustments to the Goldsmith data are described in Diskette library documentation.

There are some definitional differences between my real estate categories and those of Goldsmith, the FFA, and RR. Goldsmith includes both residential structures and nonresidential structures in the real estate sector, and his land estimate includes both types of property. His figures on the value of nonresidential structures were transferred to the unincorporated business equity category for years 1900–45. On the other hand, RR and the FFA include tenant-occupied housing in the unincorporated business category, which I transferred to the real estate category.

The residential land estimate used in the new household balance sheets includes both tenant and owner-occupied land. For the Goldsmith data, nonresidential land was subtracted from his total land estimates and transferred to unincorporated business equity. For the 1949–83 period, I used the FFA’s estimates for owner-occupied land. A comparison of total residential land estimates



based on Goldsmith's and the FFA data is shown in Table 4. The FFA total is uniformly higher, with the difference ranging between 5 and 17 percent. For the 1922-45 period, Goldsmith's estimates of owner-occupied land were incorporated directly into the new balance sheet series, and tenant-occupied land was estimated by assuming that the proportion of tenant-occupied land to owner-occupied land was the same as the ratio of tenant structures to owner-occupied structures in each year.

TABLE 4  
ALL RESIDENTIAL LAND:  
A COMPARISON OF THE GOLDSMITH DATA WITH ADJUSTED FLOW OF FUNDS ESTIMATES FOR  
1949, 1953 AND 1958  
(billions, current dollars)

Year	Goldsmith	Flow of Funds	Difference	Percentage Difference
1949	31.3	36.7	\$5.4	17.3
1953	46.3	50.6	4.3	9.3
1958	71.4	74.9	3.5	4.9

*Note:* The Goldsmith data are derived from Diskette Table D3A.

For the 1949-83 period, there are substantial differences between RR's estimates and the FFA's estimates for the value of owner-occupied land, with the percentage differences ranging between -1 and +48 percent, though with no systematic trend (see Table 5). There is no apparent explanation for the differences. The FFA data were used in the new balance sheet series. As for the Goldsmith years, tenant-occupied land for the 1949-83 period was estimated by assuming that the proportion of tenant-occupied to owner-occupied land was the same as the ratio of tenant- to owner-occupied structures. The estimated value of tenant-occupied land was then subtracted from the total for the unincorporated business category.

TABLE 5  
OWNER-OCCUPIED LAND:  
A COMPARISON OF THE RUGGLES AND RUGGLES DATA WITH THE FLOW OF FUNDS DATA  
(billions, current dollars)

Year	Ruggles and Ruggles	Flow of Funds	Difference	Percentage Difference
1950	\$20.3	\$30.0	\$9.7	47.8
1955	37.4	47.1	9.7	25.9
1959	64.5	68.0	3.5	5.4
1960	67.0	78.1	11.1	16.6
1965	100.3	99.6	-0.7	-0.7
1970	151.6	157.8	6.2	4.1
1975	272.7	280.6	7.9	2.9
1980	583.3	711.7	128.4	22.0

B. *Consumer Durables*. The figures for both the motor vehicle and other consumer durables category are based directly on Musgrave's series, which, like the residential structures series, are complete for the period from 1925-84. The 1922 value was derived by extrapolating from the 1925-29 time trend. A comparison of Goldsmith's and Musgrave's figures is shown in Table 6. The two series are quite close, with a maximum difference of 9 percent. Musgrave's data were used in the new balance sheet series, because they are based on revised and updated data.

TABLE 6  
TOTAL CONSUMER DURABLES:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE MUSGRAVE DATA  
(billions, current dollars)

Year	Goldsmith	Musgrave	Difference	Percentage Difference
1922	\$30.9	\$29.5	(\$1.4)	-4.5
1929	42.2	38.5	-3.7	-8.8
1933	25.8	27.0	1.2	4.7
1939	32.6	30.1	-2.5	-7.7
1945	46.3	46.2	-0.1	-0.2
1949	91.2	86.5	-4.7	-5.2
1953	133.0	143.0	10.0	7.5
1958	178.7	182.0	3.3	1.8

Note: The Goldsmith data are derived from Diskette Table D3A. Musgrave's 1922 figure is derived by extrapolation of the 1925-29 time trend.

C. *Fixed Claim Assets*. This category includes demand deposits and currency, deposits in other financial institutions, federal government securities, state and local government securities, corporate and foreign bonds, mortgages, open market paper, and other financial instruments. In the construction of the new balance sheet series for these categories, I used Goldsmith's data for the 1900-1945 period and the RR data for the 1949-80 period. As noted above, the FFA's "household sector" also includes personal trusts and nonprofit organizations, and their figures could not be directly used. Since the RR series ends in 1980, it was necessary to make imputations for these categories for later years. For each of the three bond and security categories, I first computed the mean of the ratio of the RR figure to the corresponding FFA figure over the 1946-80 period. This ratio for federal securities and the corporate bond category shows an upward trend approaching 1.0 by the end of the period. This implies that trust and nonprofit organization holdings of these two categories were essentially zero in 1980. Since this seemed unlikely, I decided to ignore the trend component in this ratio and relied, instead, on the average value of this ratio over the postwar period. Consequently, I multiplied the FFA figures for 1981 and 1983 by the mean ratio to obtain estimates for the narrowly defined household sector. For the two liquid asset categories (demand deposits and currency and deposits in other financial institutions), I used a trend regression of the ratio between the RR figures and the corresponding FFA figures to estimate the 1981 and 1983 values.

There are no major definitional differences between the Goldsmith and the RR fixed claim asset categories. A small amount of assets was shifted from Goldsmith's farm equity category into the household fixed claim asset categories to maintain consistency with my definition of farm assets held by the household sector. These adjustments are explained in the farm equity section below. Despite this adjustment, there are still large percentage differences for state and local government securities between the Goldsmith and RR data (see Table 7). These are usually offset in absolute terms by the discrepancies in the corporate bond category. For the overlapping years (1949, 1953, and 1958), Goldsmith's estimates are higher for state and local government securities, from 2 to 6 billion dollars. Except for 1958, the RR figures are higher for the corporate bond category. These differences are small relative to total assets, and, since I had no independent information, no correction was made to either series.

D. *Corporate Stock*. I used Goldsmith's and RR's corporate stock estimates in my household balance sheets. While there are substantial differences for the overlapping years between Goldsmith's estimates and RR's (see Table 8), there is no discernible trend in the percentage differences. As a result, no correction to either the RR series or the Goldsmith's data was made for this category. As noted above, the FFA household balance sheets include the nonprofit sector and personal trusts as well as households. As a result, the FFA values provide an upper bound to corporate stock holdings among households. Both the Goldsmith and the RR figures on household corporate stock are below the FFA values for all years (see Table 8). The 1981 and 1983 values were estimated using a trend regression of the ratio of the RR values to the corresponding FFA figures.

E. *Farm Equity*. The new household balance sheet series is based on Goldsmith's data for the 1900-49 period and the FFA figures for the 1953-83 period. The RR series and the FFA data are similar once adjustments are made for definitional differences. Before the adjustments, there were large differences for farm equity, both in relationship to total assets and in percentage terms, between the Goldsmith estimates on the one hand and both the RR and FFA figures on the other hand. Goldsmith's estimates are approximately 30 percent higher than the RR figures for each of the years (see Table 9).

There are two reasons for this degree of discrepancy. First, on the basis of an examination of the respective farm sector balance sheets, it became apparent that Goldsmith includes all of the residential household assets of a farm family in the farm equity category. In contrast, RR includes only those assets associated with the farm business, and all others owned by farm families are included in the household sector. In particular, RR includes the value of consumer durables, owner-occupied housing, and savings accounts owned by the farm family in the respective asset categories of the household sector instead of as part of farm equity. The FFA's approach is closer to RR's, except that the FFA includes owner-occupied farm housing in farm equity. Second, RR does not attribute all of the farm sector's net worth to households but, instead, assigns part of it to the corporate sector, whereas Goldsmith assumes no corporate ownership of farms. In 1958, a year in which farm balance sheets are available from both sources, it became clear that RR transferred 92 percent of total farm equity to the household sector and 8 percent to the corporate sector. I adjusted Goldsmith's

TABLE 7  
FIXED CLAIM ASSETS:  
A COMPARISON OF THE ADJUSTED GOLDSMITH'S FIGURES WITH THE RUGGLES AND RUGGLES  
DATA FOR 1949, 1953, AND 1958  
(billions, current dollars)

Year	Goldsmith	Ruggles and Ruggles	Difference	Percentage Difference
I. 1949				
Total Fixed Claim Assets	\$200.6	\$200.9	\$0.3	0.1
1. Demand Deposits and Currency	46.7	52.7	6.0	12.8
2. Deposits in Other Financial Institutions	68.5	63.9	-4.6	-6.7
3. Federal Government Securities	54.8	55.0	0.2	0.4
4. State and Local Government Securities	10.2	4.1	-6.1	-59.8
5. Corporate and Foreign Bonds, Mortgages, Open Market Paper and Other Instruments	20.3	25.2	4.9	24.1
II. 1953				
Total Fixed Claim Assets	246.0	244.9	-1.1	-0.4
1. Demand Deposits and Currency	56.7	62.5	5.8	10.2
2. Deposits in Other Financial Institutions	91.1	86.8	-4.3	-4.7
3. Federal Government Securities	60.0	57.9	-2.1	-3.5
4. State and Local Government Securities	11.8	7.3	-4.5	-38.1
5. Corporate and Foreign Bonds, Mortgages, Open Market Paper and Other Instruments	26.4	30.4	4.0	15.2
III. 1958				
Total Fixed Claim Assets	324.1	323.8	-0.3	-0.1
1. Demand Deposits and Currency	61.0	67.9	6.9	11.3
2. Deposits in Other Financial Institutions	143.7	139.7	-4.0	-2.8
3. Federal Government Securities	61.1	60.9	-0.2	-0.3
4. State and Local Government Securities	17.0	14.8	-2.2	-12.9
5. Corporate and Foreign Bonds, Mortgages, Open Market Paper and Other Instruments	41.4	40.5	-0.9	-2.2

*Note:* These figures are adjusted from Goldsmith's original data. Adjustments to the Goldsmith data are described in Diskette library documentation.

farm equity estimates as well as the FFA's data to be consistent with RR's approach. After these adjustments, the differences between the Goldsmith and RR figures become quite small, ranging from 0 to 8 percent for the overlapping years (1949, 1953, and 1958), in comparison to a range of 28 to 32 percent for the unadjusted data.

TABLE 8  
CORPORATE STOCK:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE RUGGLES AND RUGGLES DATA AND  
THE FLOW OF FUNDS DATA  
(billions, current dollars)

Year	Goldsmith	Ruggles and Ruggles	Flow of Funds	Percentage Difference	
				Goldsmith with RR	Goldsmith with FFA
1949	\$93.0	\$89.9	\$109.4	-3.3	17.6
1953	142.0	133.0	162.4	-6.3	14.4
1958	304.4	314.0	373.3	3.2	22.6

TABLE 9  
FARM EQUITY ESTIMATES:  
A COMPARISON OF THE UNADJUSTED AND ADJUSTED GOLDSMITH DATA AND RUGGLES AND  
RUGGLES DATA FOR 1949, 1953, AND 1958  
(billions, current dollars)

Year	Goldsmith	Ruggles and Ruggles	Difference	Percentage Difference
I. Unadjusted Figures				
1949	\$126.8	\$86.9	(\$39.9)	-31.5
1953	152.3	106.9	-45.4	-29.8
1958	186.9	135.4	-51.5	-27.6
II. Adjusted Figures				
1949	89.0	81.9	-7.1	-8.0
1953	105.5	105.4	-0.1	-0.1
1958	133.6	131.2	-2.4	-1.8

*Note:* The unadjusted figures are available from Diskette Table D2A. Adjustments to the Goldsmith and Ruggles and Ruggles data are described in Diskette library documentation.

*F. Unincorporated Business Equity.* For the 1900-45 period Goldsmith's data were used for the new household balance sheet series with adjustments for differences in definitions already discussed above (section A). For subsequent years, the new balance sheet figures were based on the FFA series, with the implicit assumption that trust fund and nonprofit organization holdings of this asset were negligible. I decided not to use the RR figures for this category, since even after correcting for differences in concept, RR's numbers are still 13 to 14 percent lower than the FFA's and 6 to 12 percent lower than Goldsmith's estimates for the 1949-58 period (see Table 10).

*G. Trust Fund Equity.* Trust funds are valued differently in Goldsmith's balance sheets than in RR's. Goldsmith distributed trust funds across all financial categories, similar to the FFA approach, although the estimates in his 1956 volume include separate trust estimates for each asset category and his 1963 publication includes a separate trust balance sheet for the 1945-58 period. The FFA balance sheets do not separate out this category from household assets and do not report any estimates for trusts in any year. The RR balance sheets, on the other hand,

TABLE 10  
UNINCORPORATED BUSINESS EQUITY:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE RUGGLES AND RUGGLES DATA AND THE  
FLOW OF FUNDS DATA  
(billions, current dollars)

I. Unadjusted Figures					
Year	Goldsmith	Ruggles and Ruggles	Difference	Percentage Difference	
1949	64.6	150.6	\$86.0	133.1	
1953	81.9	182.2	100.3	122.5	
1958	97.3	217.2	119.9	123.2	
II. Adjusted Figures					
Year	Goldsmith	Ruggles and Ruggles	Flow of Funds	Goldsmith with RR	FFA with RR
1949	\$64.6	\$58.2	\$67.2	-9.9	-13.4
1953	81.9	72.5	82.9	-11.5	-12.5
1958	97.3	91.9	106.2	-5.5	-13.5

*Note:* The unadjusted figures are available from Diskette Table D2A. Adjustments to the Goldsmith, Ruggles and Ruggles, and flow of funds data are described in Diskette library documentation.

record trust funds as a separate category. I follow the RR approach of recording trust funds as a separate category, because it was necessary to distinguish between the actuarial concept of trusts and the full trust value (see section I above). Goldsmith's balance sheets were thus adjusted by subtracting from Goldsmith's asset categories an amount estimated as belonging to trust funds. The difference between Goldsmith's and RR's estimates of total trust equity is relatively small, ranging from 2 to 14 percent for the years 1949, 1953, and 1958 (see Table 11).

For the W1 measure, only the actuarial value of trust funds is included (see section I below). Smith and Franklin (1974), based on a comparison of 1965 income tax return data with the FFA data, estimated that the actuarial value of trust funds was approximately 54 percent of trust fund equity, and this proportion

TABLE 11  
TRUST FUNDS:  
A COMPARISON OF THE ADJUSTED GOLDSMITH FIGURES WITH THE RUGGLES AND RUGGLES  
DATA FOR 1949, 1953, AND 1958  
(billions, current dollars)

Year	Goldsmith	Ruggles and Ruggles	Difference	Percentage Difference
1949	\$32.4	\$32.9	\$0.5	1.5
1953	35.6	39.1	3.5	9.8
1958	55.4	63.1	7.7	13.9

*Note:* These figures are adjusted from Goldsmith's original data. Adjustments to the Goldsmith data are described in Diskette library documentation.

was used here to estimate the actuarial value of trust funds. The W2 measure includes the total value of trust fund equity as reported in Goldsmith and Ruggles and Ruggles.

H. *Insurance Equity.* Substantial differences in the concept of insurance equity exist among the three basic sources. Insurance equity refers to the combined value of government employee insurance and private insurance plans. The FFA includes the full reserves or equity of life insurance in the category, whereas RR uses a cash surrender value (CSV) concept. RR estimated the CSV of life insurance as approximately 90 percent of the FFA's total insurance reserves for every year. Goldsmith, like the FFA, reports the full insurance reserves in his household estimates. In comparing the estimates from the different sources, I found that Goldsmith's estimates of private insurance reserves are substantially higher than the reserve figures of both the government and private insurance systems reported in the FFA. Between 1946 and 1958, the ratio of the FFA's total reserve estimate to Goldsmith's private reserve figure declined from 0.94 to 0.79 (see Table 12). Goldsmith's numbers are higher due to his inclusion of both the insurance companies' pension funds and the total net assets of the insurance companies [Goldsmith (1963), pp. 5 and 18]. These items are not included in the FFA's or RR's estimates. These two additional components in the Goldsmith category increased over time, reaching 45 percent of the FFA's figure on private life insurance reserves in 1958. The narrower FFA definition is used for insurance equity in the new balance sheets, while life insurance pension reserves are included in the pension reserve category. Goldsmith's figures were adjusted by subtracting these two extra components. In addition, I followed RR's convention in including only the CSV of life insurance reserves in this category.

TABLE 12  
CASH SURRENDER VALUE OF INSURANCE FUNDS:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE FLOW OF FUNDS DATA  
(billions, current dollars)

Year	Goldsmith	Flow of Funds	Difference	Percentage Difference
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

*Note:* The insurance funds include both private and government sources. Goldsmith's figures are available from Diskette Table D3A.

I. *Pensions.* Goldsmith's balance sheets differ from those of RR and FFA with respect to the definition of the pension category. RR and the FFA include the pension reserves only of the private and government pension systems. Goldsmith's concept is much broader and includes such items as the reserves of the unemployment insurance system and those of the OASI system [see Goldsmith (1963), p. 7]. As a result, there are significant differences between pension reserve figures calculated by Goldsmith and the FFA, though the percentage difference

between the two series fell from 54 to 22 percent between 1949 and 1958 (see Table 13). The first adjustment that I made to the Goldsmith figures was the elimination of non-pension reserves from this category.

TABLE 13  
PENSION RESERVES:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE FLOW OF FUNDS DATA  
(billions, current dollars)

Year	Goldsmith	Flow of Funds	Difference	Percentage difference
1949	43.9	20.3	(\$23.6)	-53.8
1953	63.4	37.5	-25.9	-40.9
1958	93.5	72.7	-20.8	-22.2

*Note:* The pension reserves include both private and government sources. Goldsmith's figures are available from Diskette Table D3A.

As with life insurance, RR uses a cash surrender concept. The CSV of pensions was estimated to equal about 5 percent of total pension reserves in each year. Goldsmith, in contrast, includes the full pension reserves in his household balance sheet. For W1 and W2, I use the CSV of pensions. The W3 and W4 wealth measures incorporate the full pension reserves reported in Goldsmith's data and the FFA. The difference between these pension measures has increased in magnitude as pension wealth has increased. For example in 1983, total pension reserves were \$1,316.4 billion, representing 9.3 percent of net worth, while its CSV was 65.8 billion or less than 1 percent of net worth.

*J. Social Security Wealth.* Aggregate estimates of social security wealth, defined as the expected value of future social security benefits, are not available from any of the balance sheet sources. Feldstein (1974) calculated annual aggregate social security wealth for his analysis of U.S. savings behavior over the period from 1929 through 1971. Feldstein's estimates were corrected and updated by Leimer and Lesnoy [1982]. For the W4 series, it was assumed that social security wealth was zero before 1936; from 1936 through 1978, Leimer and Lesnoy's "fixed ratio" estimates are used.<sup>7</sup> The fixed ratio assumption leads to the smallest aggregate estimates among the alternative social security series calculated by Leimer and Lesnoy.

The 1981 and 1983 social security wealth estimates for the W4 series are calculated from two sources: (1) a time trend extrapolation of the Leimer and Lesnoy series, and (2) estimates calculated directly from the 1983 Survey of Consumer Finances. The aggregate social security estimates from the 1983 survey vary between \$3,467.8 and \$7,101.4 billion for real growth rates in mean social security benefits of 0 to 3 percent.<sup>8</sup> The time trend forecasts of social security wealth, based on the Leimer and Lesnoy series, are \$4,800 billion for 1981 and

<sup>7</sup>The Leimer and Lesnoy series are in 1972 dollars and were converted to nominal values using the Consumer Price Index for the W4 series.

<sup>8</sup>The assumptions and methodology for the 1983 survey estimates are explained in detail in Wolff and Marley (forthcoming).



\$6,000 billion for 1983. For the W4 series, I use the time trend estimate for 1981 and a value of \$5,441.8 for 1983, based on direct calculations from the Survey of Consumer Finances, with a mean growth rate in real social security benefits assumed to be two percent per year.

K. *Liabilities.* This category includes mortgage debt, consumer debt, and all other household debt. There are no major differences in the definition of these categories between Goldsmith's work and that of RR and the FFA. For the new household balance sheets, Goldsmith's data are used for the 1900-45 period and the FFA's and RR's estimates for 1949 and subsequent years. For the overlapping years, the difference between Goldsmith's and RR's estimates is quite small, ranging between 1 and 6 percent (see Table 14).

TABLE 14  
TOTAL LIABILITIES:  
A COMPARISON OF THE GOLDSMITH DATA WITH THE RUGGLES AND RUGGLES DATA  
(billions, current dollars)

Year	Goldsmith	Ruggles and Ruggles	Difference	Percentage Difference
1949	58.2	61.4	\$3.2	5.5
1953	105.3	107.1	1.8	1.7
1958	177.6	178.6	1.0	0.6

*Note:* Goldsmith's figures are available from Diskette Table D3A.

#### IV. TRENDS IN PER CAPITA WEALTH AND HOUSEHOLD PORTFOLIO COMPOSITION

Table 15 shows the estimates of total household assets and net worth for wealth measures W1, W2, W3, and W4 for selected years over the period from 1900 to 1983. The figures are in current dollars. Let us first compare the four series. W1 and W2 remain very close throughout the whole 1900-83 period, since the difference between the two is the difference between the full equity value of trusts and their actuarial value, which is quite small relative to total household assets. W3 and W2 remain almost identical until 1921. The two series then diverge at an increasing rate over the remainder of the period, reflecting the growing relative importance of pension reserves as a form of household wealth. By 1983, pension reserves had grown to 11 percent of total W2 assets and 13 percent of W2 net worth (see Figure 5). Finally, W2 and W4 remain quite close until the mid-1930s, when the social security system began. By 1939 social security wealth had already amounted to 12 percent of traditional marketable assets (W2) and by 1945 to almost 30 percent. Between 1945 and 1983, social security wealth continued to increase relative to W2, though at a slower rate than during the first half of the period. By 1983, social security wealth had grown to 48 percent of total W2 assets and 57 percent of W2 net worth (see Figure 5).

Another perspective is afforded by computing annual rates of growth of the various series, shown in Table 15. Over the full 1900-83 period, W1 and W2 net

TABLE 15  
HOUSEHOLD BALANCE SHEET TOTALS FOR ASSETS AND NET WORTH, USING WEALTH  
DEFINITIONS W1, W2, W3, AND W4, 1900-1983  
(billions, current dollars)

Year	W1	W2	W3	W4	Percentage Difference	
					W3—W2	W4—W2
I. Total Assets						
1900	\$80.5	\$81.5	\$81.5	\$81.5	0.0	0.0
1912	157.3	159.7	159.7	159.7	0.0	0.0
1921	280.6	286.3	286.3	286.3	0.0	0.0
1922	309.5	315.6	315.9	315.9	0.1	0.1
1929	465.5	475.7	477.2	477.2	0.3	0.3
1933	316.0	323.0	325.6	325.6	0.8	0.8
1939	370.3	382.2	387.6	434.0	1.4	13.6
1945	637.2	652.6	663.3	856.5	1.6	31.2
1949	854.4	866.8	886.1	1,125.5	2.2	29.8
1953	1,141.0	1,159.4	1,195.0	1,601.0	3.1	38.1
1958	1,632.9	1,662.6	1,731.7	2,317.8	4.2	39.4
1962	1,927.6	1,967.6	2,071.4	2,811.3	5.3	42.9
1965	2,381.3	2,428.7	2,575.8	3,250.1	6.1	33.8
1969	3,104.2	3,158.9	3,366.3	4,727.2	6.6	49.6
1972	3,907.8	3,983.2	4,293.3	6,055.6	7.8	52.0
1976	5,550.1	5,629.5	6,073.3	8,748.8	7.9	55.4
1979	8,161.1	8,255.7	8,920.3	12,995.0	8.1	57.4
1981	9,996.3	10,118.1	11,012.4	15,873.2	8.8	56.9
1983	11,251.6	11,425.7	12,676.3	18,118.1	10.9	58.6
Annual Rate of Growth in Percents						
1900-62	5.12	5.14	5.22	5.71		
1962-83	8.40	8.38	8.63	8.87		
1900-83	5.95	5.96	6.08	6.51		
II. Net Worth						
1900	\$76.4	\$77.4	\$77.4	\$77.4	0.0	0.0
1912	149.6	152.0	152.0	152.0	0.0	0.0
1921	NA	NA	NA	NA	NA	NA
1922	292.7	298.8	299.1	299.1	0.1	0.1
1929	425.7	435.9	437.4	437.4	0.3	0.3
1933	288.7	295.7	298.3	298.3	0.9	0.9
1939	342.2	354.1	359.5	405.9	1.5	14.6
1945	608.3	623.7	634.4	827.6	1.7	32.7
1949	793.0	805.4	824.7	1,064.1	2.4	32.1
1953	1,033.9	1,052.3	1,087.9	1,493.9	3.4	42.0
1958	1,454.3	1,484.0	1,553.1	2,139.2	4.7	44.2
1962	1,671.6	1,711.6	1,815.4	2,555.3	6.1	49.3
1965	2,039.3	2,086.7	2,233.8	2,908.1	7.0	39.4
1969	2,649.3	2,704.0	2,911.4	4,272.3	7.7	58.0
1972	3,314.9	3,390.3	3,700.4	5,462.7	9.1	61.1
1976	4,687.8	4,767.2	5,211.0	7,886.5	9.3	65.4
1979	6,824.8	6,919.4	7,584.0	11,658.7	9.6	68.5
1981	8,422.5	8,544.3	9,438.6	14,299.4	10.5	67.4
1983	9,402.1	9,576.2	10,826.8	16,268.6	13.1	69.9
Annual Rate of Growth in Percents						
1900-62	4.98	4.99	5.09	5.64		
1962-83	8.22	8.20	8.50	8.81		
1900-83	5.80	5.80	5.95	6.44		

worth grew at annual average rates of 5.8 percent, W3 at 6.0 percent, and W4 at 6.4 percent. However, there was a distinct break in the rate of growth occurring in the late 1950s and early 1960s. I have used the year 1962 to partition the series. Between 1900 and 1962, W1 and W2 grew at 5.0 percent per year, W3 at 5.1 percent, and W4 at 5.6 percent. Over the last 21 years of the period, the annual rate of growth of W1 and W2 accelerated to 8.2 percent, that of W3 to 8.5 percent, and that of W4 to 8.8 percent.

Much of the acceleration in the growth of total household wealth is due to increases in the inflation rate. To correct for this, I converted these nominal values into constant-dollar series. I used the consumer price index (CPI) as the deflator for household wealth. This deflator provides the best welfare measure for the household sector, since it allows one to interpret real wealth figures in terms of the amount of consumption goods for which they could be exchanged. Thus, if housing prices rose relative to the CPI, one could interpret this as increase in real wealth, since the household could now buy more consumption goods in exchange for the house.<sup>9</sup>

Since I am interested in wealth as a welfare measure, I also provide measures of real wealth per capita and per household. Here, again, the choice of unit depends on one's evaluation of how wealth is distributed within the family unit. Insofar as wealth is a "public good" within the household, the household measure may provide the better indicator of welfare. On the other hand, insofar as wealth is a private good within the family, the per capita measure may be preferable. Tangible assets, particularly owner-occupied housing and consumer durables such as automobiles, are probably public goods within the household, since all members benefit fully from the asset. However, financial assets and equities are more in the nature of private goods, since the benefit accruing to family members is inversely related to the size of the family unit.<sup>10</sup> Also, for sake of comparison, I provide data on real GNP per capita and real family disposable income per capita.

Results are shown in Table 16 and Figures 1 and 2 for all four wealth measures, as well as real GNP and real family disposable income over the period 1900–83. Over the whole 1900–83 period, real W2 per capita grew at an average annual rate of 1.46 percent. However, the growth was not uniform over the period. Between 1900 and 1929, real W2 per capita grew at substantially higher rate, 1.9 percent per year. The annual growth rate then fell markedly during the Depression

<sup>9</sup>For the GNP series, I used the GNP deflator as the price index, since it provides the best index for the whole national product. A comparison of the CPI and GNP deflator over the 1900–83 period does reveal significant differences. For example, between 1900 and 1945, the GNP deflator and the CPI increased at almost the same rate; between 1945 and 1962, the GNP deflator rose almost a full percentage point per year faster than the CPI; between 1962 and 1969, the two were almost identical; and between 1969 and 1983, the CPI increased by 0.3 percentage points per year faster than the GNP deflator. Over the full 1900–83 period, the GNP deflator rose by 3.3 percent per year, while the CPI increased by 3.0 percent per year.

<sup>10</sup>A better approach is to use an "equivalence class" index, such as the poverty threshold, to compare family wealth. Such an index increases with family size, but less than proportionately, to reflect economies of consumption and the sharing of resources within the family unit. This approach was followed by Greenwood and Wolff (1988) to track changes in household wealth over the 1962–1983 period in the U.S. I could not use this approach here, since it requires data on the distribution of wealth by family size.

TABLE 16  
 REAL WEALTH PER CAPITA AND PER HOUSEHOLD USING WEALTH DEFINITIONS  
 W1, W2, W3, AND W4, 1900-1983  
 (1967 dollars)

Year	I. Net Worth per Capita			
	W1	W2	W3	W4
1900	\$4,016	\$4,069	\$4,069	\$4,069
1912	5,411	5,498	5,498	5,498
1921	5,298	5,409	5,414	5,414
1929	6,815	6,978	7,002	7,002
1933	5,925	6,069	6,122	6,122
1939	6,285	6,504	6,603	7,455
1945	8,065	8,270	8,411	10,973
1949	7,445	7,561	7,742	9,990
1953	8,058	8,201	8,479	11,643
1958	9,603	9,799	10,255	14,125
1962	9,891	10,128	10,742	15,120
1965	11,106	11,364	12,166	15,838
1969	11,905	12,151	13,083	19,198
1972	12,604	12,891	14,070	20,771
1976	12,610	12,824	14,017	21,215
1979	13,949	14,142	15,501	23,829
1981	13,435	13,630	15,056	22,810
1983	13,419	13,668	15,453	23,220

	Annual Rate of Growth in Percents				Disposable Income per Capita	GNP per Capita
	W1 per Capita	W2 per Capita	W3 per Capita	W4 per Capita		
1900-29	1.82	1.86	1.87	1.87	2.02	1.75
1929-49	0.44	0.40	0.50	1.78	0.92	1.22
1949-69	2.35	2.37	2.62	3.27	2.37	2.38
1969-83	0.86	0.84	1.19	1.36	1.64	1.11
1900-83	1.45	1.46	1.61	2.10	1.77	1.67

	Annual Rate of Growth in Percents				
	W1 per Household	W2 per Household	W3 per Household	W4 per Household	GNP per Household
1900-29	1.32	1.36	1.37	1.37	1.25
1929-49	-0.32	-0.36	-0.26	1.02	0.46
1949-69	1.88	1.91	2.16	2.80	1.91
1969-83	-0.16	-0.17	0.18	0.35	0.10
1900-83	0.81	0.82	0.97	1.46	1.03

All figures are deflated using the Consumer Price Index (CPI), except GNP which is deflated with the implicit GNP deflator. Sources are as follows:

1900-1969

- a. Population: U.S. Bureau of the Census (1975), Series A 6-8.
- b. Households: U.S. Bureau of the Census (1975), Series A 350.
- c. Consumer Price Index: U.S. Bureau of the Census (1975), Series E 135.
- d. GNP and GNP Implicit Price Deflator: U.S. Bureau of the Census (1975), Series F 1-5.
- e. Disposable Personal Income: U.S. Bureau of the Census (1975), Series F 9. Estimates for 1900 and 1912 are based on interpolation.

1972-1983

- a. Population: Council of Economic Advisers (1987), Table B-30.
- b. Households: U.S. Bureau of the Census (1987), Table 56.
- c. Consumer Price Index: Council of Economic Advisers (1987), Table B-57.
- d. GNP and GNP Implicit Price Deflator: Council of Economic Advisers (1987), Tables B-2 and B-3.
- e. Disposable Personal Income per Capita: Council of Economic Advisers (1987), Table B-26.

and War years of 1929 to 1949 to 0.4 percent per year. During the high growth period of the 1950s and 1960s, the growth of real W2 per capita accelerated to 2.4 percent per year, its highest level of the century. Then, during the ensuing slow growth period from 1969 to 1983, the growth rate of real W2 per capita fell to 0.8 percent per year.

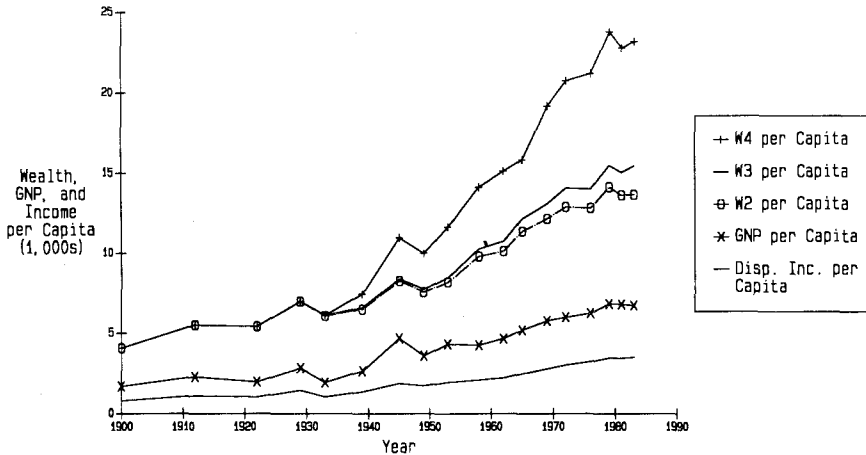


Figure 1. Net Worth, GNP, and Disposable Income per Capita, 1900-83 (1967 Dollars)

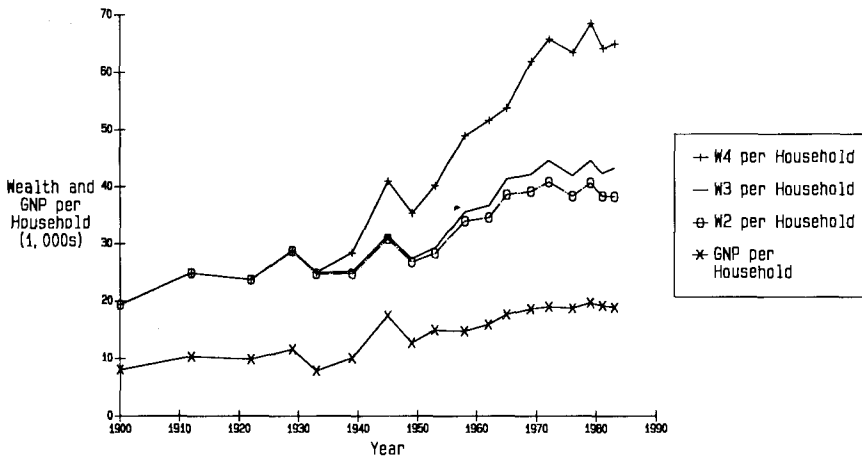


Figure 2. Net Worth and GNP per Household, 1900-83 (1967 Dollars)

A comparison with other measures reveals some striking differences. The growth of W3 per capita averaged 1.6 percent per year over the 1900-83 period, somewhat higher than that of W2. However, the difference was particularly marked during the postwar period, where it grew 0.3 percentage points per annum faster. Real W3 per capita grew considerably faster than W2 per capita, averaging 2.1 percent per year over the century. The difference was particularly striking during the 1929-49 period, when the social security system was inaugurated. During this period, real W4 per capita grew at 1.8 percent per year, while real

W2 per capita grew at only 0.4 percent per year. Over the next 20 years, real W4 grew 0.7 percentage points per year faster than real W2, while during the 1969–83 period, the difference was only 0.2 percentage points per year.

Real disposable income per capita and real GNP per capita both grew faster than real W2 per capita over the full 1900–83 period. The former grew at 1.77 percent per year over the period and the latter at 1.67 percent per year, while real W2 per capita increased at only 1.46 percent per year. Real disposable income per capita grew faster than real W2 per capita in every subperiod except 1949–69, when the two growth rates were equal. Indeed, during the 1929–49 period, real disposable income per capita increased at more than twice the rate as real W2 per capita, while during the 1969–83 period, it rose at almost exactly twice the rate. Real GNP per capita increased faster than W2 per capita during every subperiod except 1900–29, when W2 rose slightly faster, and 1949–69, when the two grew at the same rate. During the 1929–49 period, real GNP per capita grew almost three times the rate of real W2 per capita. On the other hand, real W4 per capita rose considerably faster over the full 1900–83 period than either real disposable income per capita or real GNP per capita. W4 grew faster than GNP in every subperiod as well, whereas W4 increased at a higher rate than real disposable income between 1929 and 1969 and at a slower rate during the other periods.

As shown in the last panel of Table 16 and in Figure 2, real W2 per household grew considerably slower than real W2 per capita over the full 1900–83 period. It increased at only 0.82 percent per year, a full 0.64 percentage points per year slower than W2 per capita. The difference between the two series reflects the faster growth in the number of households than in population (or, equivalently, the falling average size of the household unit). Indeed, the growth in real wealth per household was lower than that of real wealth per capita in each of the four subperiods as well. As with real wealth per capita, the growth in real wealth per household was high during the 1900–29 and the 1949–69 periods and low during the 1929–49 and the 1969–83 periods. In fact, during the 1929–49 and the 1969–83 periods, the growth in real W2 per capita was actually negative. During the first of these periods, the apparent reason is that real marketable wealth was accumulated quite slowly, a consequence of the Depression and World War II. During the more recent period, the apparent reason is that the number of households grew over one percentage point per year faster than did the total population. In contrast, real W4 per household increased in each of the four subperiods, as did real GNP per household.

*Portfolio Composition.* There have also been important changes in the composition of household wealth over the twentieth century. I first divide marketable (W2) assets into three components: tangible assets, fixed-claim assets, and equities. Moreover, because the cash surrender value of life insurance and pension plans is often used as a form of liquid savings, I include them in fixed claim assets rather than equities for this analysis. Both tangibles and fixed claim assets increased relative to total assets over the period from 1900 to 1983, while equities fell very sharply (see Figure 3). Tangibles actually remained relatively stable, at about a third of total assets, from 1900 until the mid-1960s and then increased quite sharply in the ensuing years. In 1981 tangibles comprised 49 percent of W2

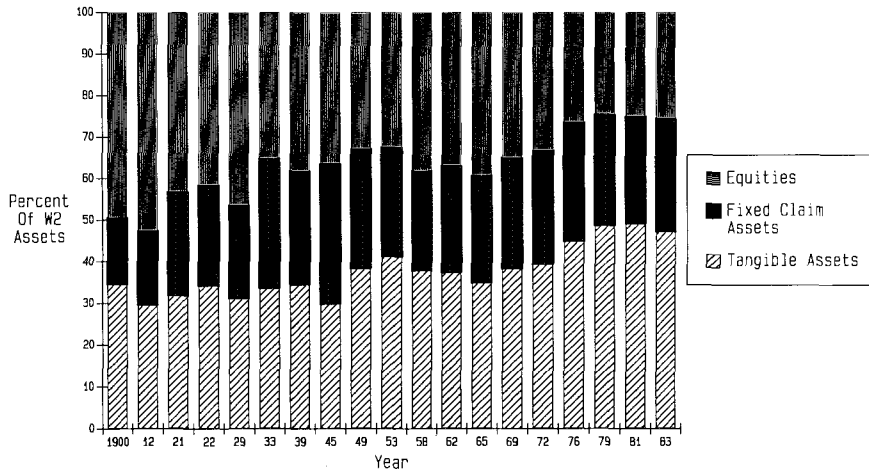


Figure 3. Aggregate Portfolio Composition by Major Asset Groups, 1900-83

assets and in 1983, 47 percent. Fixed claim assets, in contrast, rose as a proportion of total assets from 16 percent in 1900 to 34 percent in 1945 and then fell to 27 percent by 1983. Equities comprised almost half of total assets in 1900 and then fell almost continuously as a proportion of assets, reaching about a quarter in 1983.

Perhaps somewhat surprisingly, (gross) owner-occupied housing increased only moderately as a proportion of W2 assets, from 17 percent in 1900 to 20 percent in 1983 (see Figure 4). In fact, the increase was not continuous throughout the period. Between 1900 and 1912, owner-occupied housing fell from 17 to 13 percent of total assets and then remained relatively stable at this proportion until 1945. During the postwar period, owner-occupied housing rose almost continuously in proportion to total assets, peaking at 22 percent in 1979. The trend in home equity, defined as the difference between the gross value of owner-occupied housing and mortgage debt, was somewhat different.<sup>11</sup> Home equity remained relatively constant as a proportion of total assets from 1912 to 1945, rose from 11 percent of total assets in 1945 to 15 percent in 1953, fell to 11 percent in 1965, and then rose to 14 percent by 1981. In contrast, total real estate fluctuated between 21 and 29 percent of total assets from 1900 to 1972 and then increased to 36 percent in 1983. Consumer durables rose from 7 percent of total assets in 1900 to 10 percent in 1949 and then remained at this level over the postwar period. Perhaps the most dramatic change was in the importance of unincorporated business equity. This comprised over a third of total assets in 1900 but fell almost steadily over the century, reaching 12 percent of total assets by 1983.

Among financial assets, the biggest relative growth occurred in deposits in financial institutions, which grew rather steadily from 8 percent of all assets in 1900 to 19 percent in 1949 and then remained relatively constant during the

<sup>11</sup>The aggregate data provide total mortgage debt for the household sector. I estimated the value of mortgages held on owner-occupied housing by splitting total mortgage debt in proportion to the gross value of owner-occupied housing and other real estate.

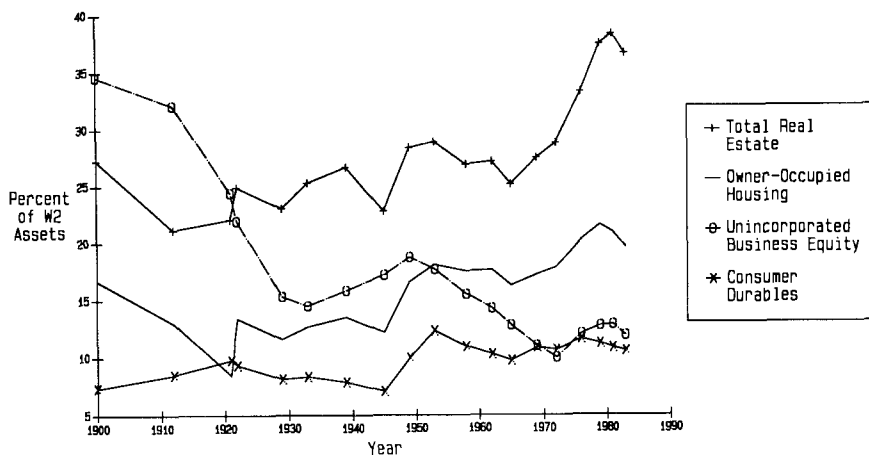


Figure 4. Tangibles and Business Equity As a Percent of W2 Assets, 1900-83

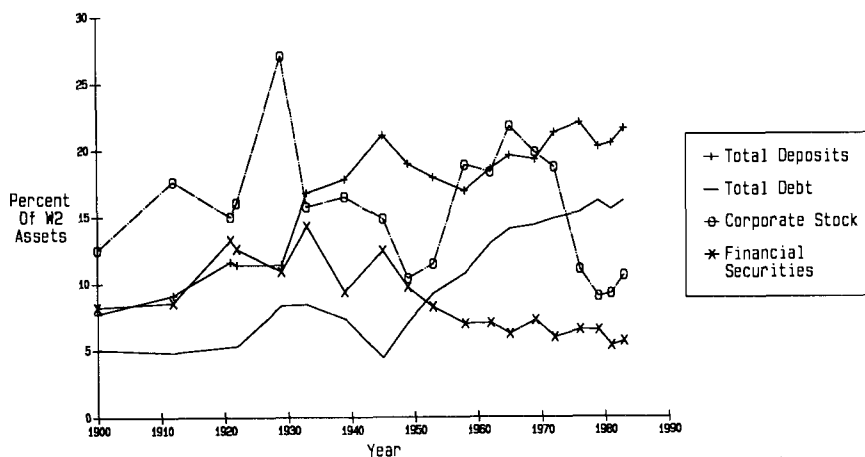


Figure 5. Financial Assets and Total Debt As a Percent of W2 Assets, 1900-83

postwar period (see Figure 5).<sup>12</sup> In contrast, financial securities rose from 8 percent of total assets in 1900 to 14 percent in 1933 and then fell rather steadily to 6 percent in 1983. Corporate stock had the most volatile behavior in the household portfolio. It grew from 13 percent of total assets in 1900 to 27 percent in 1929, fell to 16 percent in 1933 and then to 10 percent in 1949, rose to 22 percent in 1965, fell to 9 percent in 1979, and then rose to 11 percent by 1983. Debt as a proportion of total assets fluctuated during the first half of the century, from 5 percent in 1900 to 9 percent in 1933 and then to 4 percent in 1945. It then rose rather steadily over the postwar period, from 4 percent in 1945 to 16 percent in 1983.

<sup>12</sup>This category includes all deposits in financial institutions, as well as currency and the cash surrender value of life insurance and pensions.



Finally, as noted above, both pension reserves and social security wealth increased relative to marketable (W2) assets over the period (see Figure 6). The increase for the two forms of wealth was almost continuous throughout the period, though social security wealth increased at a relatively faster rate in the middle years of the century and pension reserves in later years. By 1983, pension reserves had assumed approximately the same magnitude as consumer durables and corporate stock, while social security wealth was on a par with total tangible assets.

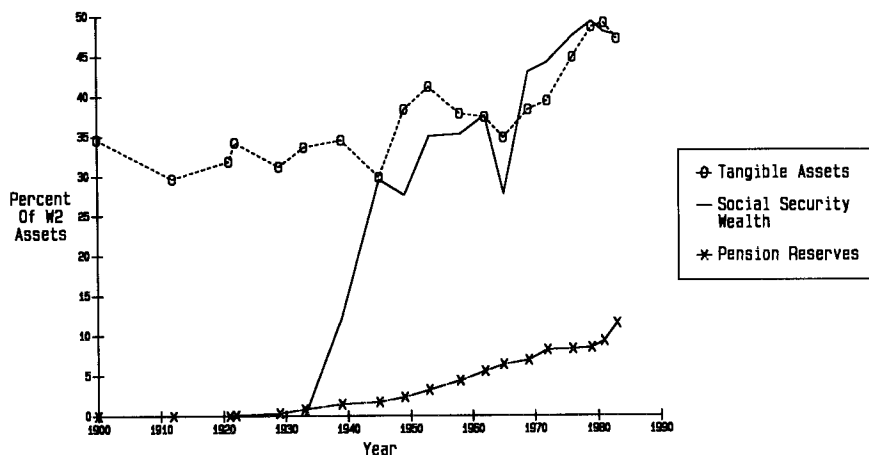


Figure 6. Pension Reserves, Social Security Wealth, and Tangible Assets As a Percent of W2 Assets, 1900-83

A full analysis of the reasons for the changes in the aggregate portfolio composition is beyond the scope of the present paper. However, there are several factors that immediately suggest themselves. First, changes in relative asset prices appear to have a strong bearing on movements in portfolio composition. This factor seems particularly germane to corporate stock, whose share in the aggregate portfolio reached a maximum of 27 percent in 1929, coincident with the peak in the stock market, and then fell to 16 percent in 1933, during the Depression. The sharp rise in the total value of real estate after 1965 and the steady rise in both the gross and net value of owner-occupied housing after this date are also partly due to the sharp increase in real estate prices.

Second, the decline in unincorporated business equity is largely explained by two factors. The major one is structural shifts in the economy, particularly the decline in agriculture in the U.S. economy over the century. The share of unincorporated farm business equity in total assets fell from 27 percent in 1900 to 6 percent in 1983. The second is the apparent declining importance of small unincorporated business in total enterprises during the postwar period. The evidence for this is that the share of unincorporated non-farm business equity in total assets fell from 9.3 percent in 1949 to 3.7 percent in 1972, though it increased to 5.9 percent by 1983.

Third, changes in household behavior as well as institutional changes appear to have affected portfolio composition. The sharp relative growth of deposits in financial institutions and the corresponding relative decline of financial securities and equities suggest that household preferences may have switched from risky, non-liquid assets to riskless, liquid assets. The rapid relative growth of both pension reserves and social security wealth relative to marketable assets suggests the importance of institutional changes in the U.S. retirement system.

Moreover, the rising ratio of liabilities to assets suggests the greater willingness of households to take on debt, as well as the greater availability of credit. To show this, I divided total debt into two components—mortgage debt on owner-occupied housing and other debt, including mortgage debt on other real estate. Home mortgage debt grew from 1.7 percent of total assets in 1900 to 5.5 percent in 1983, and, perhaps more interestingly, grew from 10 percent of the gross value of owner-occupied housing at the beginning of the century to 28 percent by 1983. Homeowners thus appeared more willing and able to secure mortgage debt in later years than during the early years of the century. The ratio of other debt (including non-home mortgage debt) to total assets also grew over the 1900s, from 3.3 percent in 1900 to 10.7 percent in 1983, as did the ratio of non-mortgage debt to total assets, from 2.1 percent to 5.9 percent. Thus, both the greater accessibility of mortgages on real property and of consumer credit, as well as greater household willingness to accept debt, appear to account for the sharp increase in household debt.

Finally, on the basis of earlier work [Wolff (1981)], I divided total wealth into two components. The first is what I previously called “life-cycle” wealth, since its pattern of accumulation seems to be heavily age-dependent in accord with the so-called “life-cycle model” [see Modigliani and Brumberg (1954)]. This component is defined as the sum of net equity in owner-occupied housing, consumer durables, and cash and demand deposits. The second is what I called “capital wealth,” since households appear to accumulate this form of wealth in order to build up large estates and transmit the wealth to succeeding generations. This is defined as the sum of time deposits, financial securities, corporate stock, trust fund equity, and unincorporated business equity less total liabilities except mortgage debt on owner-occupied housing. Life-cycle wealth as a proportion of total net worth ( $W_2$ ) increased somewhat over the twentieth century, from about a quarter in 1900 to a third in 1983. Correspondingly, capital wealth declined from three-fourths to two-thirds of  $W_2$ . Most of the change occurred during the first half of the century, and after 1949 the relative shares were quite stable. The results have two direct implications. First, since life-cycle wealth is held largely by the middle class and capital wealth almost exclusively by the upper class, the modest relative growth of life-cycle wealth suggests declining wealth inequality over the century. This is in accord with previous findings [see Wolff and Marley (forthcoming)] that wealth inequality in the U.S. declined from the late 1920s to the late 1940s and achieved relative stability thereafter. Second, the results indicate that most of the substitution among asset types has occurred within these two broad components of wealth rather than between them. Thus, behavioral reasons for assets substitution must be analyzed separately for the middle class and upper class.

## V. CONCLUSION

The results of the preceding section show that real marketable wealth (W2) increased at a slower rate than real disposable income over the century. The ratio of W2 to disposable income in real terms fell from 5.1 in 1900 to 3.9 in 1983. Can we draw any welfare implications from this? Certain assets such as owner-occupied housing and consumer durables confer direct services to households. Indeed, national accounts provide direct estimates of the former in the form of imputed rent to owner-occupied housing.<sup>13</sup> The ratio of the gross value of owner-occupied housing to personal disposable income fell by 11 percent in real terms between 1900 and 1983, though that of durables to personal disposable income rose by 10 percent. Insofar as the combined value of these assets has declined relative to personal income (which it did by 4 percent), there is probably some corresponding loss of welfare to the household. If so, the growth in personal income may overstate the increase in the actual welfare level of the family.

On the other hand, the relative decline in financial and investment assets probably has no direct bearing on family well-being (except insofar as precautionary savings yields a direct utility to households). Rather, it is symptomatic of a declining savings rate (relative to income) among U.S. families over the course of the century. This result is consistent with those found in many other studies, though in these household savings are usually defined as current income (excluding capital gains) less current expenditures, whereas here it is defined as the change in household wealth.<sup>14</sup> I have not separated out real changes in assets (and liabilities) from nominal or revaluation changes (that is, capital gains and losses). However, the evidence strongly suggests a declining propensity to save relative to disposable income. There are two likely reasons for this. First, greater credit accessibility (as reflected in the rising debt-to-equity ratio) suggests little need for precautionary savings, since loans are readily available in times of need. Second, the growth of institutionalized retirement savings, in the form of pension reserves and social security wealth, has obviated, to a great extent, the need for personal retirement savings. Indeed, W3 grew faster than W2 and W4 grew considerably faster than personal disposable income over the century. If W4 is a more appropriate welfare measure for the household than W2, then the growth in personal income may understate the actual increase in family well-being.<sup>15</sup>

In regard to changes in the aggregate portfolio composition, it is clear that several factors were at work. First, price changes appear important for several assets, particularly corporate stock, whose value is volatile over time. Second, structural changes in the economy, such as the relative decline in agriculture and the consequent fall in the number of small farms, also had a direct bearing on changes in the composition of wealth. Third, there is evidence of substitution among various asset types—particularly, away from risky, non-liquid assets toward risk-free, liquid assets. Fourth, institutional changes, such as the shift from unincorporated to incorporated forms of enterprises, the greater accessibility

<sup>13</sup>Proposals also exist to provide the same type of imputation for consumer durables.

<sup>14</sup>See, for example, Council of Economic Advisers (1987), Table B-23.

<sup>15</sup>Of course, this assessment is based only on the growth of average wealth. Whether this growth increased the national well-being depends also on how its distribution changed over time.

of credit, both secured and unsecured, and the growth in the retirement system, played a role in changes in portfolio composition. Fifth, behavioral changes, such as the greater willingness to accept debt and the apparent greater aversion to risky and non-liquid assets, also appear important. However, a full analysis of behavioral responses requires the use of microdata. Finally, changes in the composition of household wealth also reflected changes in the distribution of household wealth, particularly the decline in inequality over the first half of the century.

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