

# Household wealth and the measurement of economic well-being in the United States

Edward N. Wolff · Ajit Zacharias

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**Abstract** We analyze the level and distribution of economic well-being in the United States during the 1980s and 1990s based on the standard measure of money income and a measure in which income from wealth is calculated as the sum of lifetime annuity from nonhome wealth and imputed rental-equivalent for owner-occupied homes. Over the 1982–2000 period, median well-being increases faster when these adjustments are made than when standard money income is used. This adjustment also widens the income gap between African-Americans and whites but increases the relative well-being of the elderly. Adding imputed rent and annuities from household wealth to household income considerably increases measured inequality and the share of income from wealth in inequality. However, both measures show about the same rise in inequality over the period. We also find an increasing share of wage and salary income in our expanded definition of income among the richest 1% over the period but do not find that the “working rich” have largely replaced rentiers at the top of the economic ladder.

**Keywords** Living standards · Household wealth · Inequality

**JEL Classification** D31 · D6 · H4 · P16

## 1 Introduction

Conventional measures of household economic well-being do not adequately reflect the advantage from asset ownership or the disadvantage from liabilities. Income generated from asset ownership is usually counted in the form of property income (the sum of dividends,

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E. N. Wolff (✉)  
Department of Economics, New York University,  
19 West 4th St., 6th Floor, New York, NY 10003, USA  
e-mail: Edward.wolff@nyu.edu

A. Zacharias  
Levy Economics Institute, Bard College, Annandale-on-Hudson, NY 12504, USA  
e-mail: zacharia@levy.org

interest and rent), but this does not reflect the “stock” dimension of the advantage from asset ownership and is, at best, a partial measure of the “flow” dimension. The disadvantage from the burden of debt is not captured at all in standard income measures. We believe that a better indicator of economic well-being than money income would incorporate a measure of *sustainable consumption* over time. Such a measure needs to take wealth into account in a more comprehensive manner than is done in the standard measures. The index that we propose would use annual income (excluding property income) as its basis and then add to it a constant annuity from non-home wealth as well as annual imputed rent to owner-occupied housing. This type of index thus provides a measure of potential consumption of marketed commodities in the current year (see Section 3.2 for further discussion).

The argument for including a better measure of income from wealth is a part of the wider agenda to improve measures of household economic well-being.<sup>1</sup> An international panel of experts addressing this task has lamented the preponderant focus on money income and the absence of an appropriate concept of money income [5]. Several authors have recently proposed measures that could provide a better understanding of the level and distribution of economic well-being (e.g., [24, 32]). From the early 1980s, the United States Bureau of the Census has published experimental measures of income that include, among other things, expanded definitions of income from wealth comprising imputed return on home equity and realized capital gains.

Our aim in this paper is to analyze the level and distribution of economic well-being in the United States during the 1980s and 1990s using the standard measures (that is, gross money income and gross money income plus realized capital gains) and our new wealth-adjusted measure. Admittedly, an adequate measure of economic well-being must take into account components other than money income and wealth – such as the value of household production [31]. We ignore those components here because we want to concentrate here only on the effects of modifying the standard measures for wealth. The method of

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<sup>1</sup> There are three other major approaches to construction of well-being measures: the aggregate approach, the indicators approach and the subjective approach. The distinguishing feature of the aggregate approach is that it results in a summary monetary measure of well-being of the nation. Usually, the strategy is to start with standard macroeconomic categories, such as personal consumption or the GDP, and then modify it by adding items (valued in money) believed to enhance well-being and subtracting items believed to be detrimental to well-being. The most well-known and regularly published index belonging to this family is the Genuine Progress Indicator, estimated by the nonprofit organization Redefining Progress. In our view, the key problem with this approach is that what may be considered as bad or good for well-being is largely a decision made by the researcher and this renders the index of a substantially arbitrary character. The indicators approach typically includes of a variety of noneconomic variables, such as health, environment and educational attainment, in addition to variables usually considered as economic. Some researchers prefer to combine these different indicators to form a composite index (e.g. [15]), while others report national performance with respect to these different indicators (e.g. [11]). While the details and implementation of the indicators approach are apparently very different from the aggregate approach, essentially it too possesses a similar arbitrariness with respect to which indicators are to be included and whether the changes in the indicators can be considered “good” or “bad.” A further well-known problem with composite indexes is the choice of weights attached, either explicitly or implicitly, to the different indicators. Another approach, developed by Osberg and Sharpe [19], combines current per capita consumption flows, net accumulation of stocks of productive resources, a measure of income distribution, and an index of economic security to produce their “Index of Economic Well Being.” Their index is more inclusive than ours in valuing leisure, household economies of scale, the environment and public goods, life expectancy, etc. – indicators that are not included in ours. However, whereas our measure can be imputed on a household basis and thus allows us to compute inequality and median values, their index is based on aggregate data. By using the results from a survey asking people directly about their satisfaction or happiness about several aspects of their lives, a subjective index can be formed by appropriate statistical methods (e.g. [4]). However as pointed out by Amartya Sen, subjective perceptions of well-being among those who need to survive in an unequal society are powerfully shaped by the ideological mechanisms and cultural norms that justify inequalities [23].

reckoning income from wealth here as the sum of lifetime annuity and imputed rental-equivalent represents one way of incorporating wealth. However, we also conduct a set of sensitivity analyses with alternative methods to see how robust our findings are.

The remainder of the paper has the following structure. We begin by briefly summarizing previous attempts to incorporate wealth into a measure of well-being (Section 2). We then describe the main sources of data and concepts of wealth used in the study (Section 3). This is followed by a discussion of how we incorporate wealth into a combined income-net worth measure. In Section 4, we look at the effects of the incorporation of wealth into income on the level of well-being for the total population as well as for specific sub-groups. Its effect on inequality is discussed next (Section 5). Decomposition analysis is deployed to examine two issues: the contribution of income from wealth to the level and changes in inequality; and, how the incorporation of wealth alters the rankings of, and relative income differentials among households. A critical comparison of our estimates of top income shares and those of Piketty and Saez [21] is also undertaken to assess whether the “working rich” or rentiers (those relying primarily on capital income) were at the top of the economic ladder during the period under scrutiny. A sensitivity analysis is conducted in Section 6 by replacing our definitions of income from wealth with alternatives: imputed return on home equity and bond-coupon returns. Concluding remarks are presented in Section 7.

## 2 A review of previous literature

It is often believed that income and wealth are almost interchangeable as measures of household well-being. That is to say, many believe that households with high income almost always (or, indeed, necessarily) have high wealth, and low income households are low wealth ones. However, Radner and Vaughan [20] find that this was not the case by tabulating the joint distribution of income and wealth by quintile on the basis of the 1979 Income Survey Development Program (ISP) file. They found a strong positive correlation between income and wealth. For example, in the bottom income quintile, 40.5% of the households are in the bottom net worth quintile, while only 6.5% are in the top net worth quintile (see Table 1). In the top income quintile, only 4.5% are in the bottom net worth quintile, while 44.5% fall in the top net worth quintile. However, the correlation is far from perfect. No net worth quintile contains more than 44% of the households in the corresponding income quintile. Moreover, in the three middle income quintiles, each net worth quintile has at least 10% of the households in the income quintile. Income and wealth, while positively correlated, are distributed rather differently among households. Wealth thus represents another dimension of well-being over and above income.

We have updated the results to 2001 on the basis of the 2001 Survey of Consumer Finances. The pattern is quite similar to the 1979 data. If anything the correlation between income and wealth appears a bit higher, with a somewhat higher percentage of households in the bottom income quintile who are also in the bottom net worth quintile and, likewise, a somewhat higher percentage of households in the top income quintile who are also in the top net worth quintile. For 2001, we computed a correlation coefficient between income and wealth of only 0.53.

There have been several attempts to combine the income and wealth dimension into a single index of household well-being. The most common technique is to convert the stock of wealth into a flow and add that flow to current income. In this approach, wealth is converted into a lifetime annuity for the expected remaining life of the household. The

**Table 1** The joint distribution of households among net worth and income quintiles, 1979 and 2001 (Percentage of households in the income and net worth quintile)

Income quintile	Net worth quintile					
	1	2	3	4	5	All
1. 1979 <sup>a</sup>						
1	8.1	4.8	3.5	2.2	1.3	20
2	5.5	4.5	3.5	3.5	2.9	20
3	3.6	4.9	5.0	3.5	3.1	20
4	2.0	4.5	4.6	5.1	3.8	20
5	0.9	1.2	3.4	5.6	8.9	20
All	20	20	20	20	20	100
2. 2001 <sup>b</sup>						
1	8.4	5.1	3.9	2.0	0.5	20
2	5.1	5.1	3.8	3.7	1.7	20
3	3.9	5.5	4.4	3.7	3.0	20
4	2.0	3.3	5.3	5.1	4.3	20
5	0.5	1.0	2.6	5.4	10.5	20
All	20	20	20	20	20	100

<sup>a</sup> The source is Radner and Vaughan (1987), Table 5.6. The underlying data are from the 1979 Income Survey Development Program (ISDP) file.

<sup>b</sup> Authors' computations from the 2001 SCF. Income quintiles are by money income (MI).

annuity is defined as a stream of annual payments which are equal over time and which will fully exhaust the stock of initial wealth. This annuity is then added to obtain an augmented measure of household income after property income is first subtracted from current money income so that there is no double counting of the returns from household wealth.

One of the first examples of this approach is by Weisbrod and Hansen [26] on the basis of the 1962 Survey of the Financial Characteristics of Consumers (SFCC). The original data show that the share of the top two income classes (\$15,000 and over in 1962 dollars) was 5% of total current money income in 1962, and that of the bottom income class (less than \$3,000) was 20%. They then used both an assumed 4% and a 10% annuity rate on household net worth, and find that the share of the top two income classes increased from 5 to 8% at a 4% annuity rate and to 10% at a 10% rate, while the share of the bottom income class fell from 20% to 18 and then to 17%.

A second study, by Taussig [25], made use of the 1967 Survey of Economic Opportunity (SEO) database. Three calculations of the Gini coefficient were made: (1) current (after-tax) money income; (2) the sum of current income and a 6% annuity on household wealth; and (3) the sum of current income and a 6% annuity on household wealth after adjustments for underreporting of assets among high income households. Results were also computed by age group. When the adjusted annuity (3) is added to current money income, the measured Gini coefficient for all households rose from 0.36 to 0.39. Inequality also increased for all age groups, though the disequalizing effect was considerably stronger for older age groups.

A third study, by Wolfson [33], is based on the 1970 Canadian Survey of Consumer Finances. Wolfson employed the same general technique as Taussig, except that he used both a 4% and a 10% annuity rate and also included a separate calculation for the sum of current money income and imputed rent on owner-occupied housing (valued at 8% of net equity). He found that among all households the inclusion of a wealth annuity with money income had no

effect on the Gini coefficient, which remained in the range of 0.36–0.37. The share of total income of the top 5% of households increased but the share of the bottom 20% also rose. Results also show relatively little change in measured inequality from adding a wealth annuity for younger age groups but do show a disequalizing effect for older households.

Wolff [27] examined the effects of adding the return to wealth on measured poverty. Using the 1983 Survey of Consumer Finances (SCF), he found that the inclusion of both imputed rent to owner-occupied housing and a 3% bond coupon rate on non-home wealth lowered the overall poverty rate by 4.8%. However, the effect was much stronger for the elderly (an 11.5% reduction) than the non-elderly (only a 3.1% reduction).

In sum, the Weisbrod and Hansen and Taussig studies found that the distribution of income becomes more unequal once the returns to wealth are included as part of total income, though the Wolfson study found no effect. However, the disequalizing effects were not great in the first two studies: a 3–5 percentage point increase in the share of the top two income classes in the Weisbrod and Hansen study and an increase in the overall Gini coefficient of 0.03 (about 10%) in the Taussig study. There are two reasons for these small effects. First, though household income and wealth are positively correlated, they are not perfectly correlated, so that there are households with low income but high wealth and also with high income but low wealth. Second, the annuity payments are small relative to current money income, typically on the order of 10% or so. As a result, their inclusion in augmented income does not alter the overall distribution of income very much. Moreover, annuities are much smaller for younger households than older ones, both because younger ones have lower wealth and because they have a longer remaining life expectancy. As a result, wealth annuities generally have a more disequalizing effect for older households than younger ones, as reported in the Taussig and Wolfson studies.<sup>2</sup>

### 3 Data and concepts

#### 3.1 Household wealth

Our basic data source is the Federal Reserve Board's Surveys of Consumer Finances (SCF) for 1983, 1989, 1995, and 2001. The SCF is the premier survey on household wealth in the United States, conducted every 3 years. Completed interviews in the SCF amount to 4,262, 3,143, 4,299 and 4,449 households, respectively for 1983, 1989, 1995, and 2001. Each survey consists of a core representative sample combined with a high-income supplement.

For our purposes here, we divide net worth into two components. The first is the gross value of owner-occupied housing and its corresponding liability, mortgage debt on the principal residence. The remainder, "nonhome wealth", equals the sum of (1) other real estate owned by the household and net equity in unincorporated businesses; (2) cash and demand deposits, time and savings deposits, certificates of deposit, money market accounts and the cash surrender value of life insurance plans; (3) government bonds, corporate bonds, foreign bonds, and other financial securities such as corporate stock, mutual funds, and equity in trust funds; and (4) the cash surrender value of defined-contribution pension plans, including IRAs, Keogh, and 401(k) plans; less other (nonhome) debt such as auto and credit card loans.

<sup>2</sup> See [6, 7, 12, 17], for related discussion and analyses.

We exclude two types of assets that are sometimes included in broader definitions of wealth. The first is consumer durables such as automobiles. Though cars have a resale value and can be converted to cash, it can only be done so by compromising current consumption. Indeed, cars are rarely sold except as a trade-in on new cars or in a financial emergency. The second is the value of future retirement income from Social Security and defined-benefit (DB) private pension plans. Since both are a source of future income, it would be desirable to include them in our accounting framework. However, because of data limitations, it is not possible to do so for 1983, the first year in our period of analysis.<sup>3</sup>

Table 2 shows mean values for different assets and liabilities over the 4 years in 2001 dollars. While mean net worth climbed by 82% between 1983 and 2001, the median increased by only 36%, a result indicative of rising inequality over this period. The mean value of houses, real estate and business equity, and liquid assets grew between 35 and 55%, less than the overall percentage increase of total assets. The biggest gains were recorded for financial assets (including stocks) of 162% and pension assets of 660%. The mean value of liabilities expanded by 66%, an increase less than that of total assets. Mortgage debt grew by 117% while other debt actually contracted by 2.7%. This trend is likely to stem from the facts that mortgage interest rates are lower than those on consumer debt and that mortgage interest is tax-deductible while other interest is not.

Three other interesting trends are of note. First, the percentage of households with zero or negative net worth was fairly high in 2001 (17.6%) and increased over the period by 2.1 percentage points. Second, the percentage with net worth of under \$1,000 (in 2001 dollars) was also high in 2001 (21.4%) and also increased over the period, by 1.0 percentage points. Third, median net worth grew by 36% over the 1983–2001 period. This was respectable but considerably less than the 82% gain in mean net worth. Both trends indicate widening wealth inequality over the period.

### 3.2 The imputation of annuities and rent on owner-occupied housing

The index that we propose here uses annual income (excluding property income) as its basis and then adds to it a constant annuity from non-home wealth as well as annual imputed rent to owner-occupied housing. In contrast to the standard Haig–Simons definition of income, (i.e. the net increase in the purchasing power to consume or actual consumption plus change in net worth), our measure includes all regular cash income, capital gains (both realized and unrealized), and imputed rent. Our wealth-adjusted metric differs from the Haig–Simons definition in that it seeks to approximate a measure of *sustainable consumption* over time. In this sense it is similar to the Haig–Simons notion of a regular flow of income. It differs primarily by using an annuity flow from accumulated wealth instead of the annual return on net worth.

This type of index thus provides a measure of potential consumption of marketed commodities in the current year.<sup>4</sup> We are not arguing that it is optimal in any sense for households to consume the same amount every year, since the marginal utility of consumption will, in general, vary over the life cycle. Moreover, it is also likely that a family has a bequest motive so that it is not necessarily the case that the family will

<sup>3</sup> In particular, the 1983 data contain too many missing values to allow an imputation of both Social Security and DB pension wealth.

<sup>4</sup> Since we exclude leisure here, our measure reflects only marketed commodities.

**Table 2** Mean value of net worth and its components (in thousands of 2001 dollars)

	1983	1989	1995	2001	% change 1983–2001
Assets	239.7	292.6	272.1	431.8	80.1
Houses <sup>a</sup>	79.2	96.9	86.5	122.6	54.8
Other real estate and business <sup>a</sup>	89.4	103.7	83.2	121.1	35.4
Liquid assets	26.7	32.8	28.4	38.2	42.9
Financial assets	37.6	42.2	48.0	98.5	162.2
Pension assets	6.7	17.2	25.9	51.3	660.4
Liabilities	31.9	35.3	41.3	53.0	66.0
Mortgage debt	18.3	24.3	30.2	39.8	117.1
Other debt	13.6	11.1	11.2	13.3	-2.7
Net worth	207.8	257.3	230.7	378.7	82.3
Memo: Percent of households with: net worth less than or equal to zero	15.5	17.9	18.5	17.6	–
Net worth less than \$1,000 [2001\$]	20.4	23.0	22.1	21.4	–
Memo: Median Net worth	54.5	57.8	53.3	74.0	35.9

<sup>a</sup> Houses refer to primary residences only. Other real estate consists of secondary residences, land, and rental property. Businesses refer to net equity in unincorporated businesses (both farm and non-farm).

consume down its entire wealth over the lifetime. What our metric (and those of the studies reviewed in the previous section) attempt to do is to approximate potential and sustainable consumption over a given period of time, in much the same spirit as the Haig–Simons notion of “regular” income.

The most common technique of combining income and wealth into a single measure of household well-being is to convert the stock of wealth into a flow and add that flow to current income. The income flow generated by wealth can be computed either as a lifetime annuity or a bond coupon (that is, a fixed interest rate on the value of the asset). We incorporate household net worth by adding to the amount of money income left after deducting property income (the sum of dividends, interest and rent), the imputed rental cost of owner-occupied housing and the lifetime annuity value of non-home net worth.<sup>5</sup>

Our approach differs from the standard approach in two significant ways. First, we distinguish between home and non-home wealth. Housing is a universal need and owning a house frees the owner from the obligation of paying rent, leaving that much more resources for spending on other needs. Hence, benefits from owner-occupied housing are reckoned in terms of the replacement cost of the services derived from it, i.e. a rental equivalent.<sup>6</sup>

We impute rent for owner-occupied housing by distributing the total amount of imputed rent in the GDP to homeowners in the ADS, based on the values of their house.<sup>7</sup> Formally, imputed rent can be expressed as  $IR_i = (h_i/H) * IR$ , where  $IR_i$  and  $h_i$  are the imputed rental cost and the value of house, respectively, of household  $i$ , while  $IR$  and  $H$  are the weighted

<sup>5</sup> In our sensitivity analysis conducted in Section 6 below, we also show alternative estimates based on return on home equity and the bond coupon approach.

<sup>6</sup> This is consistent with the approach adopted in most national income accounts.

<sup>7</sup> The NIPA procedure is to assign each unit of owner-occupied housing a rental equivalent on the basis of actual market rents paid on a tenant-occupied unit of similar value. (See NIPA table 7.12, line 209 for the estimated imputed rent.)

sums of the same over households.<sup>8</sup> On average, imputed rent was 5.6% and 5.4% (respectively) of the total value of houses in 1982 and in 2000.<sup>9</sup>

Another difference in our approach compared to the earlier ones cited above is that we use actual historical rates of return in computing lifetime annuities. Moreover, we take into account the differences in the portfolio composition of non-home wealth by computing the lifetime annuity as the weighted average of annuity flows generated by individual non-home wealth components with portfolio shares of these six components as weights. The lifetime annuity amount calculated is such that (1) it is the same for all remaining years of the younger spouse's life;<sup>10</sup> and (2) it brings wealth down to zero at the end of the expected lifetime. Formally, the annuity value of non-home wealth can be written as the product of  $(1 \times 6)$  and  $(6 \times 1)$  vectors:  $A_i = [f_i(r_j, \text{race}_i, \text{sex}_i, \text{age}_i)] * [W_j]$ . Each element  $f_i$  of the first vector gives the annuity flow that household  $i$  would receive each year if it held \$1 in wealth component  $j$ . This amount is a function of the total real rate of return on the non-home wealth component,  $r_j$ , and of the race, sex and age of the spouse with the longer remaining life expectancy. Multiplying this factor,  $f_i$ , by the total amount of money held in the  $j$ th component,  $W_j$ , gives us the total annuity generated by this component.

The total real rate of return,  $r_j$ , of each non-home wealth component  $j$ , is the average of annual rates over a relatively long period of time, varying from 14 to 40 years, depending on the asset (see Table 3). The rationale for employing this method, instead of using the rate of return in an arbitrarily chosen year, is that the annuity value estimated this way is a better indicator of the resources available to the household on a sustainable basis over its lifetime. The total rates of return data we use are inclusive of both the capital gains and the income generated by the assets. In order to avoid double counting, we net out from the total income measure any property income already included in money income.

The average rates of return by asset type were estimated from the data on asset holdings published by the Federal Reserve in the Flow of Funds Accounts for the United States and financial market information included in the 2005 Economic Report of the President [3, 8].<sup>11</sup> The results are shown in Table 3. In this breakdown, pension assets had the highest real rate of return at 4.6% per year, though the period covered is only from 1986 to 2000. The rate of return for this asset is calculated over a comparatively shorter period, reflecting its relatively

<sup>8</sup> An alternative would be to use a "foregone returns" approach. It posits that by tying up their financial resources in acquiring a home, the owners are foregoing the returns that they could have earned by investing the same in financial assets. In our sensitivity analysis conducted in Section 6 below, we shall show alternative estimates based on this approach as well.

<sup>9</sup> It should be noted that we treat housing differently from financial wealth by imputing a rental equivalent value (and implicitly assuming either a bequest motive or the illiquidity of home equity). We believe that this is reasonable though we should recognize that an asset like housing, which is often held until death because of the stream of services it provides is therefore imputed the same annual value as people age – even as the utility value of excess rooms in the empty nest shrinks. We do not believe that there is necessarily an inconsistency here, since the service flows from a house remain constant over time (though the utility from the home may decline over time).

<sup>10</sup> Information on remaining lifetimes are taken from the life-tables published by the U.S. National Center for Health Statistics for various years. Remaining lifetimes are reported by sex and three racial groups (white, nonwhite and black) for all the years included in this study except 2001, for which separate estimates are available only for whites and blacks. We estimated the remaining lifetimes for the nonwhite group by assuming that the proportion between black and nonwhite lifetime at each age was the same in 2001 and 1996. The latter year was the last year for which separate estimates are available for nonwhites and blacks.

<sup>11</sup> The Flow of Funds data are available at: <http://www.federalreserve.gov/releases/z1/Current/> and the 2005 Economic Report of the President is available at: <http://www.gpoaccess.gov/eop/>. Details on the data taken from the Flow of Funds, including series identifiers are available from the authors upon request.



**Table 3** Long-term average rates of return (in percent)

	Nominal	Real	Period
Real estate and business	6.97	2.39	1960–2000
Liquid assets	5.94	0.97	1965–2000
Financial assets	8.44	3.80	1960–2000
Pension assets	7.89	4.56	1986–2000
Mortgage debt	0.00	−4.28	1960–2000
Other debt	0.00	−4.28	1960–2000
Inflation rate (CPI-U)	4.47		

Real rate of return =  $(1 + \text{Nominal rate}) / (1 + \text{Inflation rate}) - 1$ .

*Real estate and business:* Holding gains (taken from the Flow of Funds table R.100) divided by equity in noncorporate business (taken from the Flow of Funds table B.100).

*Liquid assets:* The weighted average of the rates of return on checking deposits and cash, time and saving deposits, and life insurance reserves. The weights are the proportion of these assets in their combined total (calculated from the Flow of Funds table B.100). The assumptions regarding the rates of return are: zero for checking deposits, the rate of return on a 1-month CD (taken from the table “H.15 Selected Interest Rates” published by the Federal Reserve and available at: <http://www.federalreserve.gov/releases/h15/data.htm>) for time and saving deposits, and, one plus the inflation rate for life insurance reserves.

*Financial assets:* The weighted average of the rates of return on open market paper, Treasury securities, municipal securities, corporate and foreign bonds, corporate equities and mutual fund shares. The weights are the proportion of these assets in total financial assets held by the household sector (calculated from the Flow of Funds table B.100). The assumption regarding the rate of return on open market paper is that it equals the rate of return on 1-month Finance paper (taken from the table “H.15 Selected Interest Rates” published by the Federal Reserve and available at: <http://www.federalreserve.gov/releases/h15/data.htm>) [2]. The data for the rates of return on other assets are taken from the Economic Report of the President 2005, Table B.73. The assumptions regarding Treasury securities, municipal securities, corporate and foreign bonds, and corporate equities are, respectively, average of Treasury security yields, high-grade municipal bond yield, average of corporate bond yields, and annual percent change in the S&P 500 index. Mutual fund shares are assumed to earn a rate of return equal to the weighted average of the rates of return on open market paper, Treasury securities, municipal securities, corporate and foreign bonds and corporate equities. The weights are the proportions of these assets in the total financial assets of mutual funds (calculated from the Flow of Funds table L.123).

*Pension assets:* Net acquisition of financial assets (taken from the Flow of Funds table F.119c) divided by total financial assets of private defined-contribution plans (taken from the Flow of Funds table L.119c).

*Inflation rate:* Calculated from the CPI-U published by Bureau of Labor Statistics (Series Id: CUUR0000SA0).

recent appearance in the Flow of Funds data. Financial assets had the second highest rate of return, at 3.8% per year, followed by real estate and business equity at 2.4% per year. Liquid assets had the lowest real rate of return – only 1.0% per year over the 1960–2000 period.

## 4 Trends in the level of well-being

### 4.1 Overall trends

Table 4 shows trends in mean and median income using three different definitions over the years 1982–2000.<sup>12</sup> Line 1 shows the results using the U.S. Census Bureau’s standard

<sup>12</sup> The income reported in the survey is for the previous year (for example, the 2001 survey has information on income received during 2000) though the wealth data are as of the year of the survey. However, for consistency, we refer throughout this paper to the income year rather than the survey year.

**Table 4** Household income by alternative definitions (in 2001 dollars)

All households	1982		1988		1994		2000		% change, 1982–2000	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
1. Money income (MI)	35,717	48,079	36,228	56,278	34,655	54,412	39,081	65,087	9.4	35.4
2. SCF Income	36,016	49,195	37,426	59,582	34,763	55,847	39,081	69,827	8.5	41.9
3. Wealth-adjusted income (WI)	38,642	56,942	41,397	67,526	39,242	66,397	45,578	84,572	17.9	48.5
Memo items:										
4. Income from home wealth	1,581	3,062	1,229	3,481	1,527	3,367	987	3,447	-37.6	12.6
5. Income from nonhome wealth	386	10,753	473	13,545	578	13,123	1,105	20,701	186.1	92.5
6. WI <sub>a</sub>	38,915	57,427	41,699	67,991	39,348	66,631	45,932	84,601	18.0	47.3
7. Age	45	47	45	48	46	49	47	49		

1. Money income is SCF income minus realized capital gains, net of losses.

2. SCF income is the sum of its components.

3. WI is MI minus property income plus income from wealth.

4. Imputed rental cost minus the annuitized value of mortgage debt.

5. Annuitized value of nonhome wealth minus the annuitized value of other debt.

6. WI recomputed using the same average rate of return on wealth for all households.

definition of money income. It is first of note that mean money income climbed by 35% between 1982 and 2000 while the median inched up by only 9%, suggesting a steep rise in inequality. Line 2 shows trends in SCF income, which is the sum of money income and realized capital gains. Its mean value gained 42% over the period, roughly 7 percentage points more than money income, indicating a strong growth in realized capital gains over these years. In contrast, the median value of SCF income increased by only 9%.

Line 3 shows results for our wealth-adjusted measure, WI, including imputed rent on owner-occupied housing and the annuitized value of non-home wealth. Its mean value shows an even more robust growth than that of SCF income, 49% over the period. The median rose by nearly 18%, almost double the increase in median money income or median SCF income. Further analysis show that the main factor behind the sharp gains in wealth-adjusted income is the steep rise in annuitized wealth, whose mean soared by 93% over these years. Mean imputed rent, on the other hand, grew by an anemic 13%.

We have also put in an additional row into Table 4 which shows the calculation of WI if rates of return are the same for all households (see line 6). This new calculation makes clear the impact of (a) considering the flow equivalent value of wealth and (b) considering the impact of differential asset returns on the flow equivalent value of wealth. As is apparent, trends in both mean and median WI are virtually unaffected by this procedure. It is clear that the variance of wealth levels across households is much more important than the variation of rates of return.

Another concern is that in comparing the different years in Table 4, one is comparing populations with a different demographic structure. For example, as the Baby Boomers age, our methodology implies that the same asset (e.g. a bond) owned at different ages will provide a different annuity equivalent, even if its current market value remains unchanged (because \$100,000 buys a smaller annuity for a 45 year old than for a 65 year old). An

important issue is how much the changing age profile of the US matters for time trends in WI. We have therefore included both the median and mean age over the 1982–2000 period in Table 4. There is only a very modest increase in average age over the period so that it is unlikely that the changing age structure has much impact on changes in WI over the period.

#### 4.2 Racial/ethnic differences

The racial income gap was wider in 2000 and grew even more steeply between 1982 and 2000 when realized capital gains are included in income and the gap became still wider and grew even more when imputed rent and annuitized wealth (though mainly the latter) are added to money income. These results reflect the fact that the wealth gap between African-Americans and whites is considerably larger than the income gap. In 2001, for example, the ratio of mean net worth between blacks and non-Hispanic whites was only 0.14, compared to a ratio of 0.57 in money income.<sup>13</sup>

In 1982, the ratio of median MI between African-Americans and non-Hispanic whites was 0.56 and the corresponding ratio of mean income was 0.57 (see Table 5 and Fig. 1). By 2000, the ratio of medians actually edged upward a bit to 0.57 while that of means slipped to 0.50. The ratios of both median and mean SCF income in 1982 were slightly lower than those of money income. The ratio of median SCF income remained unchanged in 2000 while the ratio of mean SCF income plummeted from 0.55 to 0.46, much lower than that of mean money income. Likewise, the ratio of median WI in 1982 was somewhat lower than that of SCF income, while the ratio of mean WI was a full 5 percentage points lower. In this case, the ratio of median WI fell from 0.53 in 1982 to 0.49 in 2000, while that of mean WI fell even more steeply, from 0.50 to 0.41.

The pattern of results is very similar for Hispanics. In particular, there was a more precipitous drop in WI than standard MI, with the ratio of median MI between Hispanics and whites falling by 8 percentage points and that of mean MI by 10 percentage points, while the corresponding ratios for WI declined by 11 and 13 percentage points, respectively. Moreover, by 2000 the ratio of medians was much lower for WI, 0.50, than for MI, 0.59, as was the ratio of means, 0.43 versus 0.54.

The pattern is also similar for the fourth category, Asians and other races (“Asians” for short). In 1982 there was virtual parity in MI between Asians and whites. However, by 2001 the ratio slipped to 0.80 for median MI and 0.85 for mean MI. This drop is likely the result of a large Asian immigration and a big expansion of the Asian population in the intervening years. The ratio of WI in 1982 was slightly below parity, a ratio of 0.95 for the median and 0.89 for the mean. However, by 2000 these ratios had plummeted to 0.73 and 0.78, respectively.

#### 4.3 Age differences

Table 6 shows the same set of results by age of householder (also see Fig. 2). The effect of using wealth-adjusted income instead of money income is to increase the relative well-being of older groups relative to younger ones. There are two reasons. First, the wealth-

<sup>13</sup> A considerable literature has developed which discusses the reasons behind the large size of the racial wealth gap in comparison to the income gap (see, for example, [1, 10, 16, 18]). One of the key factors explaining the large racial wealth gap is differences in inheritances between the two racial groups. Using the Panel Study of Income Dynamics, Gittleman and Wolff [10] reported that the actual ratio of mean wealth between African-Americans and whites changed from 0.25 to 0.28 between 1984 and 1994. But if African Americans had inherited the same amount as whites during this 1984–1994 period, this ratio would have been 4 percentage points higher in 1994 – that is, 0.32.

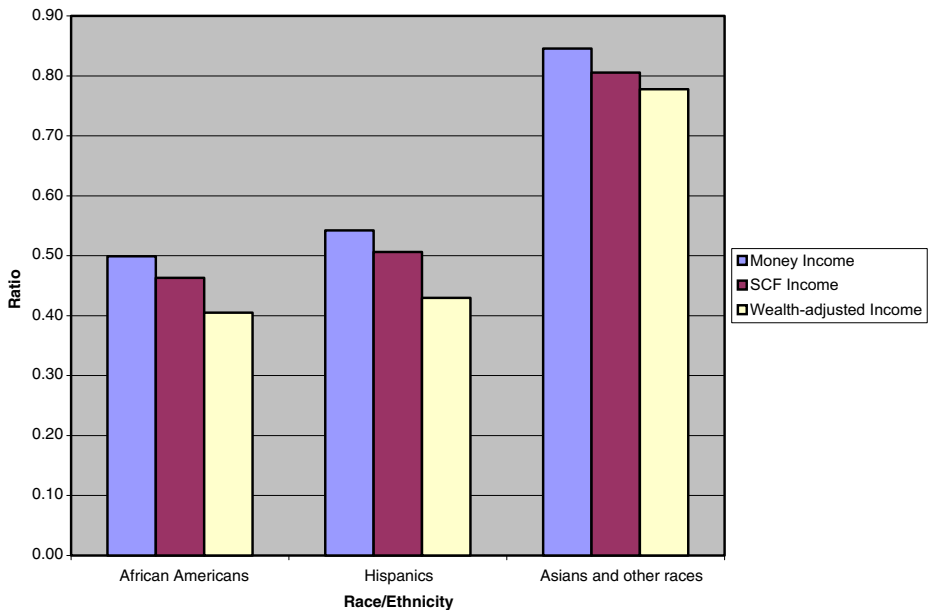
**Table 5** Household income by alternative definitions and race/ethnic groups (in 2001 dollars)

	1982		1982 ratio to whites		2000		2000 ratio to whites	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Non-Hispanic whites								
1. Money income (MI)	38,540	51,658	1.00	1.00	43,586	72,806	1.00	1.00
2. SCF Income	38,764	53,011	1.00	1.00	44,738	78,871	1.00	1.00
3. Wealth-adjusted income (WI)	42,243	62,013	1.00	1.00	52,591	97,108	1.00	1.00
Memo items:								
4. Income from home wealth	2,047	3,441	1.00	1.00	1,710	4,115	1.00	1.00
5. Income from nonhome wealth	761	12,764	1.00	1.00	2,209	25,811	1.00	1.00
African Americans								
1. Money income (MI)	21,474	29,231	0.56	0.57	24,683	36,321	0.57	0.50
2. SCF Income	21,474	29,244	0.55	0.55	24,683	36,525	0.55	0.46
3. Wealth-adjusted income (WI)	22,324	31,093	0.53	0.50	25,714	39,356	0.49	0.41
Memo items:								
4. Income from home wealth	0	1,164	0.00	0.34	0	740	0.00	0.18
5. Income from nonhome wealth	0	1,439	0.00	0.11	33	2,807	0.02	0.11
Hispanics								
1. Money income (MI)	25,693	32,912	0.67	0.64	25,711	39,494	0.59	0.54
2. SCF Income	25,693	32,912	0.66	0.62	25,711	39,935	0.57	0.51
3. Wealth-adjusted income (WI)	25,719	34,523	0.61	0.56	26,365	41,709	0.50	0.43
Memo items:								
4. Income from home wealth	0	1,440	0.00	0.42	0	1,120	0.00	0.27
5. Income from nonhome wealth	0	576	0.00	0.05	1	3,056	0.00	0.12
Asians and other races								
1. Money income (MI)	38,356	51,619	1.00	1.00	34,967	61,544	0.80	0.85
2. SCF Income	38,356	51,702	0.99	0.98	35,111	63,534	0.78	0.81
3. Wealth-adjusted income (WI)	40,156	55,303	0.95	0.89	38,508	75,514	0.73	0.78
Memo items:								
4. Income from home wealth	0	2,400	0.00	0.70	0	4,487	0.00	1.09
5. Income from nonhome wealth	19	3,688	0.03	0.29	463	15,005	0.21	0.58

income ratios are higher for older households. Second, mortality rates are higher for older individuals than younger ones, which result in larger annuity flows per dollar of wealth. Moreover, because of the tilt in age-wealth profiles in favor of older household over the years 1982 to 2000, wealth-adjusted income grows faster relative to money income for older groups than for younger ones.

The results are quite dramatic. For age group 65–74, the ratio of median WI to the overall median grew more than the corresponding ratio of MI (10 versus 5 percentage points) over the 1982–2000 period, as did the ratio of mean WI to the overall mean (3 versus –10 percentage points). By 2000, the ratio of median WI for this age group to the overall median was 0.87, compared to 0.71 for median MI, while the ratio of mean WI for the age group to the overall mean was actually over one (1.10) compared to the corresponding ratio of 0.78 for MI. Results are similar for age group 75 and over. By 2000 the mean WI of this group reached 90% of the overall, compared to 50% for MI.

For age groups 45–54 and 55–64, the WI figures relative to the overall are quite similar to those for MI. On the other hand, the two youngest age groups show a deterioration in their relative level of well-being when WI is used as the index of well-being instead of MI.



**Fig. 1** Ratio of mean income to the mean income of non-Hispanic whites by race/ethnicity and income definition, 2000

For the under 35 age group, the ratio of mean WI to the overall was 0.54 in 2000, compared to a ratio of 0.67 on the basis of MI, while for age group 35–44 the corresponding ratios are 0.97 and 1.15. Measured growth in well-being between 1982 and 2000 also appears slower for these two age groups when WI is used as the metric instead of MI.

Indeed, in absolute terms, there was virtually no change in median MI or in median WI for the under 35 age group, and only a modest increase for age group 35–44. Moreover, if one compares the median income of the same baby boomer pseudo-cohort (35–44 year olds in 1982 compared with 55–64 year olds in 2000) there is almost a 9% decline in median WI and only a 3% increase in median WI. On the other hand, the average MI of that same pseudo-cohort increases by a third and mean WI more than doubles – another indication of the huge increase in inequality for the baby-boomers.

#### 4.4 Household type

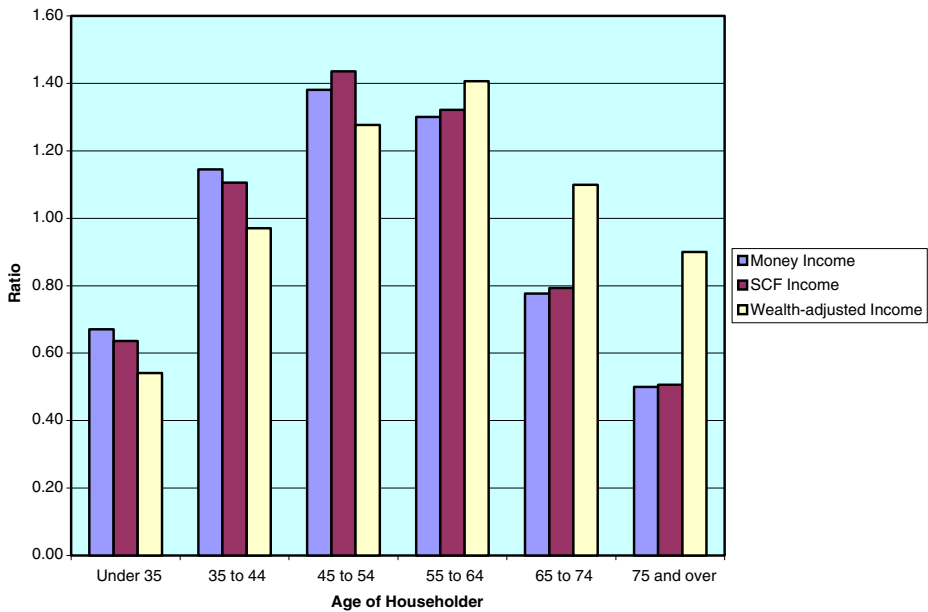
Table 7 shows median and mean income according to alternative definitions of income for five household types (also see Fig. 3). We first look at married couples with children.<sup>14</sup> These households tend to fall in the 25–55 age range, so that their wealth-income ratios also tend to be below average. Moreover, since these households are relatively young, their life expectancies are longer than average, so that their annuity to wealth ratios are lower than average. On the other hand, this group has an above average homeownership rate, so that the value of imputed rent should be above average. In 1982, the median money income of the group was 37% above average and their mean income was 23% above average. There was a marked improvement in both median and mean MI for these households between 1982 and

<sup>14</sup> This category refers to families with children under the age of 18 living at home. The income of adult children living at home is included in household income.

**Table 6** Household income by alternative definitions and age of household head (2001 dollars)

	1982		1982 ratio to overall		2000		2000 ratio to overall	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Under 35								
1. Money income (MI)	32,166	37,646	0.90	0.78	32,931	43,680	0.84	0.67
2. SCF Income	32,423	37,934	0.90	0.77	32,931	44,440	0.84	0.64
3. Wealth-adjusted income (WI)	33,173	39,072	0.86	0.69	33,608	45,729	0.75	0.54
Memo items:								
4. Income from home wealth	0	1,009	0.00	0.33	0	846	0.00	0.25
5. Income from nonhome wealth	5	1,173	0.01	0.11	0	2,010	0.00	0.10
35–44								
1. Money income (MI)	49,551	58,885	1.39	1.22	51,423	74,533	1.32	1.15
2. SCF Income	49,845	60,080	1.38	1.22	51,423	77,230	1.32	1.11
3. Wealth-adjusted income (WI)	51,617	63,246	1.34	1.11	55,055	82,043	1.22	0.97
Memo items:								
4. Income from home wealth	2,063	3,049	1.30	1.00	741	2,684	0.75	0.78
5. Income from nonhome wealth	396	3,739	1.03	0.35	854	7,760	0.77	0.37
45–54								
1. Money income (MI)	47,514	60,612	1.33	1.26	55,537	89,871	1.42	1.38
2. SCF Income	47,716	61,706	1.32	1.25	56,154	100,257	1.44	1.44
3. Wealth-adjusted income (WI)	52,146	71,562	1.35	1.26	61,576	107,966	1.37	1.28
Memo items:								
4. Income from home wealth	3,147	4,455	1.99	1.45	1,517	3,970	1.54	1.15
5. Income from nonhome wealth	738	11,107	1.91	1.03	2,207	19,274	2.00	0.93
55–64								
1. Money income (MI)	39,979	57,467	1.12	1.20	45,252	84,620	1.16	1.30
2. SCF Income	40,025	59,103	1.11	1.20	45,252	92,273	1.16	1.32
3. Wealth-adjusted income (WI)	44,908	70,610	1.16	1.24	53,211	118,918	1.18	1.41
Memo items:								
4. Income from home wealth	3,256	4,511	2.06	1.47	2,834	5,234	2.87	1.52
5. Income from nonhome wealth	2,197	17,063	5.69	1.59	3,729	36,751	3.38	1.78
65–74								
1. Money income (MI)	23,487	42,410	0.66	0.88	27,563	50,580	0.71	0.78
2. SCF Income	23,851	44,527	0.66	0.91	27,768	55,410	0.71	0.79
3. Wealth-adjusted income (WI)	28,923	60,980	0.75	1.07	38,959	92,959	0.87	1.10
Memo items:								
4. Income from home wealth	3,023	4,662	1.91	1.52	3,413	5,436	3.46	1.58
5. Income from nonhome wealth	3,184	27,019	8.25	2.51	5,336	45,638	4.83	2.20
75 and over								
1. Money income (MI)	13,764	26,298	0.39	0.55	18,615	32,550	0.48	0.50
2. SCF Income	14,073	27,996	0.39	0.57	18,615	35,379	0.48	0.51
3. Wealth-adjusted income (WI)	17,726	49,178	0.46	0.86	30,337	76,134	0.67	0.90
Memo items:								
4. Income from home wealth	1,861	3,115	1.18	1.02	3,603	5,410	3.65	1.57
5. Income from nonhome wealth	2,125	29,096	5.50	2.71	5,396	46,009	4.88	2.22

2000 to 58 and 41% above average, respectively. The wealth adjusted median income of this group was 35% above average in 1982, about the same as their relative MI, while their wealth-adjusted mean income was 13% above average, about 10 percentage points less than their relative money income. Over the period, their relative median and mean WI grew less



**Fig. 2** The ratio of mean income to the overall mean by age and income definition, 2000

than their relative median and mean MI, reaching only 49 and 24% above average, respectively. The main reason for the slower growth in WI is the relative decline in imputed rent for this group of households.

Single female-headed families with children constitute a group characterized by a very low wealth to income ratio and a low homeownership rate. In 1982 they were well below average in terms of MI and even further below average (3–4 percentage points) in terms of WI. Their relative median MI declined slightly to 53% of the overall median in 2000, and their relative mean MI dropped sharply to 38%. However, their median WI fell more steeply, to 46% of the overall in 2000, and their mean WI collapsed even more, to only 32% of the overall mean.

Married couples without children are older than average and therefore have high wealth-income ratios, high annuity to wealth ratios, and a large homeownership rate. In 1982, their median and mean MI was, respectively, 28 and 33% above average, similar levels to married couples with children. However, between 1982 and 2000, there was very little change in their relative position (unlike married couples with children). The wealth-adjusted median and mean income of this group was, respectively, 36 and 46% above average in 1982, greater than their relative MI. However, here too, there was very little change in their relative median and mean WI over the period. By 2000, their relative wealth-adjusted median income level was identical to that of married couples with children, though their relative mean WI was 18 percentage points above because of their greater wealth holdings.

The relative money income of single-female headed households without children was very similar to that of single-female headed families with children in both 1982 and 2000. However, the relative WI of the former was from 3 to 10 percentage points greater than the latter, a reflection of their higher non-home wealth holdings and their higher homeownership rate. The relative income position of single-male headed households without children lies in between that of single-female headed households and married couples. Both their median and mean MI in 1982 was 75% of the overall mean. Their median MI remained about the same in 2000 though their mean MI slipped to 63% of the overall mean. Their

**Table 7** Household income by alternative definitions and parental and marital status (in 2001 dollars)

	1982		1982 ratio to overall		2000		2000 ratio to overall	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Married couples with children								
1. Money income (MI)	49,001	58,960	1.37	1.23	61,707	91,613	1.58	1.41
2. SCF Income	49,001	59,746	1.36	1.21	61,800	95,109	1.58	1.36
3. Wealth-adjusted income (WI)	51,977	64,594	1.35	1.13	66,957	105,220	1.49	1.24
Memo items:								
4. Income from home wealth	2,098	3,278	1.33	1.07	1,204	3,458	1.22	1.00
5. Income from nonhome wealth	243	4,842	0.63	0.45	1,004	14,466	0.91	0.70
Single-female headed with children								
1. Money income (MI)	19,270	23,302	0.54	0.48	20,569	24,767	0.53	0.38
2. SCF Income	19,380	23,627	0.54	0.48	20,569	25,315	0.53	0.36
3. Wealth-adjusted income (WI)	19,767	24,862	0.51	0.44	20,629	26,883	0.46	0.32
Memo items:								
4. Income from home wealth	0	1,315	0.00	0.43	0	897	0.00	0.26
5. Income from nonhome wealth	0	872	0.00	0.08	0	1,760	0.00	0.09
Married couples without children								
1. Money income (MI)	45,881	63,743	1.28	1.33	51,731	83,117	1.32	1.28
2. SCF Income	45,991	66,038	1.28	1.34	52,863	89,368	1.35	1.28
3. Wealth-adjusted income (WI)	52,547	82,956	1.36	1.46	67,020	120,417	1.49	1.42
Memo items:								
4. Income from home wealth	3,072	4,523	1.94	1.48	2,803	5,273	2.84	1.53
5. Income from nonhome wealth	2,225	24,843	5.76	2.31	4,494	39,518	4.07	1.91
Single-female headed without children								
1. Money income (MI)	18,352	23,934	0.51	0.50	20,055	27,300	0.51	0.42
2. SCF Income	18,433	24,258	0.51	0.49	20,055	28,300	0.51	0.41
3. Wealth-adjusted income (WI)	20,838	27,459	0.54	0.48	24,302	35,413	0.54	0.42
Memo items:								
4. Income from home wealth	279	2,221	0.18	0.73	367	2,397	0.37	0.70
5. Income from nonhome wealth	259	5,382	0.67	0.50	464	8,608	0.42	0.42
Single-male headed without children								
1. Money income (MI)	26,631	35,982	0.75	0.75	28,797	41,310	0.74	0.63
2. SCF Income	26,794	36,729	0.74	0.75	28,797	53,272	0.74	0.76
3. Wealth-adjusted income (WI)	28,417	41,546	0.74	0.73	31,619	55,717	0.70	0.66
Memo items:								
4. Income from home wealth	0	1,455	0.00	0.48	0	1,964	0.00	0.57
5. Income from nonhome wealth	171	7,274	0.44	0.68	617	15,761	0.56	0.76

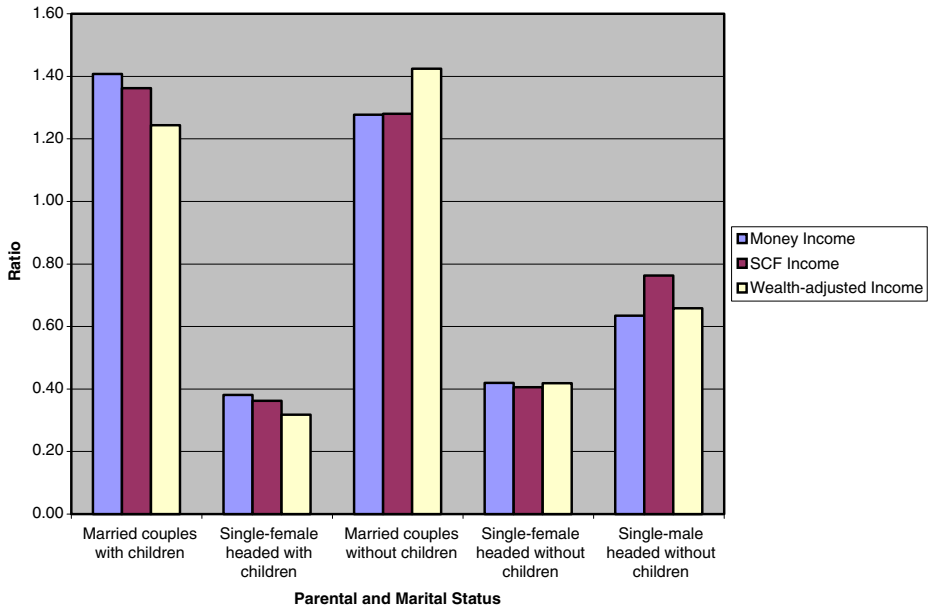
relative WI was about the same as their relative money income in 1982 but both their median and mean WI fell between 1982 and 2000.

## 5 Inequality of well-being

### 5.1 Overall trends

We next turn to trends in inequality using the three income measures. Table 8 shows time trends in Gini coefficients for the three income measures, as well as for net worth. On the basis of





**Fig. 3** The ratio of mean income to the overall mean by parental and marital status and income definition, 2000

the SCF data and the Census concept of money income, the Gini coefficient climbed by a considerable amount, 0.093, between 1982 and 2000. The SCF definition of income leads to higher measured inequality in each year because of the concentration of capital gains in the upper income classes. In 2000 the difference in Gini coefficients between the two income concepts was 0.025. Inequality on the basis of SCF income shows an even sharper increase than money income, a gain of 0.111 over the period. The likely reason is the bull market of 2000 and the large realized capital gains in corporate stocks of that year.

WI shows the highest level of inequality among all the income measures in all the years. Its level is considerably higher than that of money income (by 0.040 in 2000) but it shows about the same change over the 1982–2000 period as the Gini coefficient for money income. The last but one line shows the Gini coefficient for net worth. As expected, its value is much higher than that of any of the three income concepts. However, interestingly, inequality in net worth shows a much more modest rise over the 1982–2000 period than any of the three income concepts.<sup>15</sup> Another telling result is that for all three income measures, as well as for net worth, the big increase in inequality occurred between 1982 and 1988, followed by a more modest rise over the 1990s.<sup>16</sup>

<sup>15</sup> Wolff [28] argues that the reason for this apparent discrepancy is the failure to include Defined Benefit (DB) pension wealth in the conventional definition of household wealth. In particular, the period 1989 to 2001 was characterized by a dramatic transformation of the pension system, with Defined Contribution plans substituted for DB plans. As a result, if DB pension wealth were included in the standard wealth definition, wealth inequality for households aged 40 and over would show a large increase over the 1983–2001 period, commensurate with that of income inequality.

<sup>16</sup> Another interesting comparison is between the SCF money income series and the CPS money income series. The former show much higher levels of inequality (a difference of 0.087 in the Gini coefficients). The increase in the Gini coefficient from 1982 to 2000 is about double for the SCF data than the CPS data. The differences in results between the SCF and CPS data are likely due to the absence of top-coding and the oversampling of the rich in the SCF.

**Table 8** Economic inequality by income measure (Gini coefficients)

Income definition	1982	1988	1994	2000	Change 1982–2000
Money income	0.456	0.533	0.545	0.549	0.093
SCF Income	0.464	0.553	0.552	0.574	0.111
Wealth-adjusted income	0.493	0.556	0.562	0.589	0.096
Memo items:					
Net worth	0.798	0.814	0.823	0.827	0.029
CPS money income <sup>a</sup>	0.412	0.426	0.456	0.462	0.050

<sup>a</sup> Source: <http://www.census.gov/hhes/www/income/histinc/h04.html>.

The share of income from wealth in overall inequality depends crucially on how that income is measured. We separate the total income in each income definition into two sources, income from wealth and income from all other sources (“primary income”), and decompose inequality by income source using the method developed by Lerman and Yitzhaki [13].<sup>17</sup> As shown in Table 9, the share of income from wealth in inequality is the smallest for money income in which standard property income (sum of interest, dividends and rents) is used as the measure of income from wealth. The SCF definition includes realized capital gains too, which enhances the income from wealth share in inequality by 3.7 percentage points in 1982 (from 15.3 to 19%) and 10.3 percentage points in 2000 (from 9.9 to 20.2%). As noted above, the stock market was very bullish in 2000 and this factor accounts for the larger share of income from wealth in inequality when realized capital gains are included. However, the share of income of from wealth in inequality is far higher for WI than for the other two measures. Compared with SCF income, our measure shows that the share of income from wealth in inequality was 16.8 percentage points higher at 35.8% in 1982 and 17.6 percentage points higher at 37.8% in 2000. Closer examination shows that annuitized nonhome wealth is the driving force behind the larger share of income from wealth in inequality. In 2000 the share of annuities alone in wealth-adjusted income was 24.5%, almost double the share of income from wealth in SCF income (13.5%) and more than three times the share in money income (7.2%).

Although the change in the Gini coefficient between 1982 and 2000 is similar for MI and WI, there is a striking asymmetry between the two measures with respect to the contribution made by income from wealth to the increase in inequality (see Fig. 4). Income from wealth actually had an inequality-reducing effect on money income since its contribution to the increase of 0.093 in the Gini was  $-0.016$  points, indicating that the increase in inequality was due solely to the increasing inequality of primary income. In contrast, income from wealth and primary income contributed roughly the same amount to the increase of 0.096 in the Gini of WI. As noted above, SCF income showed the greatest increase of inequality between 1982 and 2000 among the three income measures at 0.111. However, income from wealth accounted for only about a quarter this increase (0.028), with the remainder coming from primary income.

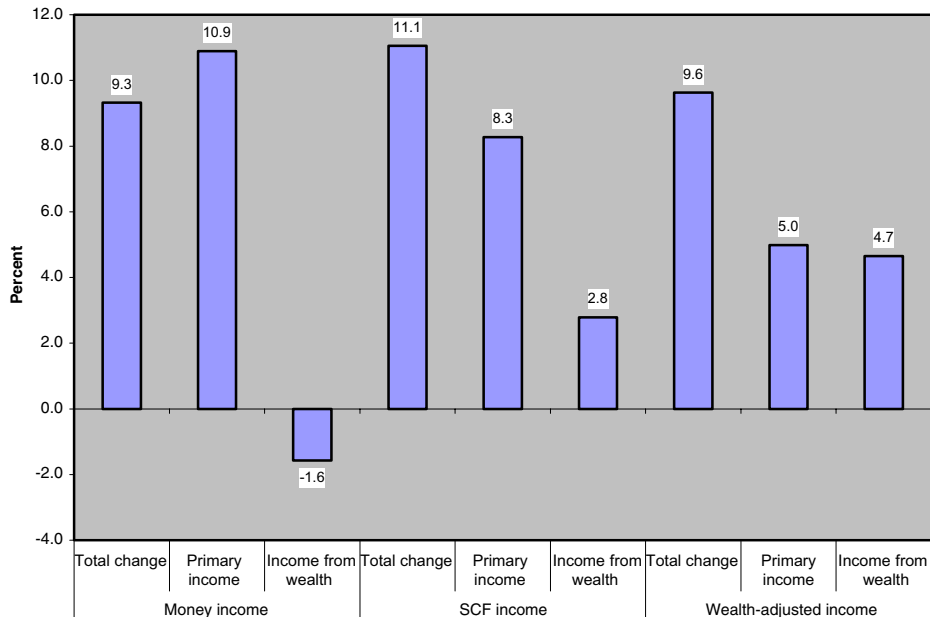
The Gini coefficient can be calculated by means of a covariance-based formula that renders transparent the roles played in the determination of inequality by income gaps between households and ranks of households in the overall distribution [14]. Let  $y$  represent income,  $F$  the cumulative distribution of income,  $\mu$  the mean income, and  $s = y / \mu$ . Then the Gini can be

<sup>17</sup> This is the so-called “natural decomposition.” In this type of decomposition, the share of an income component in inequality is the product of its concentration coefficient and its share in total income divided by the Gini coefficient of total income.

**Table 9** Decomposition of inequality by income source and definition, 1982 and 2000

	1982			2000		
	Concentration coefficient	Income share	Share in inequality	Concentration coefficient	Income share	Share in inequality
<b>A. Money income (MI)</b>						
Primary income	0.430	0.897	0.847	0.533	0.928	0.901
Income from wealth	0.679	0.103	0.153	0.755	0.072	0.099
<b>B. SCF income</b>						
Primary income	0.428	0.877	0.810	0.530	0.865	0.798
Income from wealth	0.716	0.123	0.190	0.860	0.135	0.202
<b>C. Wealth-adjusted income (WI)</b>						
Primary income	0.418	0.757	0.642	0.513	0.714	0.622
Income from wealth	0.727	0.243	0.358	0.779	0.286	0.378
Imputed rent	0.447	0.054	0.049	0.506	0.041	0.035
Annuities	0.806	0.189	0.309	0.825	0.245	0.343

calculated as:  $G = 2\text{cov}(s, F)$ . If we let  $a$  and  $b$  represent two income measures (e.g. money income and wealth-adjusted income) the difference between their Gini coefficients can be decomposed as:  $G_b - G_a = 2 \text{cov}(s_b - s_a, F_a) + 2 \text{cov}(s_b, F_b - F_a)$ . The first term in the decomposition is the change in measured inequality due to the change in relative incomes and

**Fig. 4** Contribution to the total change in the Gini coefficient (in percentage points), 1982–2000

the second term is the change due to the change in the cumulative distribution. In any actual sample, the cumulative distribution is approximated by ranks. Hence the decomposition can be described as splitting the difference in the Gini between the income measures into contributions from gap-changing and reranking components. The results from the decomposition are shown in Table 10.

In 1982, a substantial portion of the increase in the Gini coefficient (45%) that we observe when we move from MI to WI is accounted for by reranking. The role of reranking increases dramatically in 2000, with this component accounting for the overwhelming portion (83%) of the difference in inequality between the two definitions. Our definition of income from wealth thus alters not merely the picture regarding how much households are apart from one another in terms of well-being. The position of individual households in the hierarchy of well-being is also significantly changed (such as the now elevated position of the elderly in terms of WI). The bigger role of reranking in 2000 as compared to 1982 is due mainly to the sharp increase in the share of annuities that was noted above.

Reranking also plays a role in accounting for the higher Gini coefficient of SCF income relative to money income. However, its role is much more limited than that observed for the shift from money income to wealth-adjusted income. The bulk of the increase in the Gini – 70% in 1982 and 78% in 2000 – is accounted for by changes in the income gaps between individual households. Understandably, such gaps were higher in 2000 because much of realized capital gains typically accrues to recipients of property income.

Further information on the relationship between rankings according to money income and wealth-adjusted income can be obtained by examining the joint distribution of households among the quintiles of the two distributions (see Table 11). If there were no reranking across quintiles, then each element of the diagonal of the matrix would equal 20% and the off-diagonal terms would all be zero. Generally, the majority of households in a given quintile of MI are to be found in the same quintile of WI. In 2000, for example, in the bottom MI quintile, 87.5% (17.5/20.0) of the households are in the bottom WI quintile, while none are in

**Table 10** Changing ranks and income gaps, 1982 and 2000

	1982	2000
<i>A. Gini coefficients</i>		
Money income (MI)	0.456	0.549
Wealth-adjusted income (WI)	0.493	0.589
SCF Income (SI)	0.464	0.574
<i>B. Difference between the coefficients</i>		
a. $G(WI) - G(MI)$		
Reranking	0.037	0.040
Percent of total difference (%)	0.017	0.033
Changing gaps	45	83
Percent of total difference (%)	0.020	0.007
Changing gaps	55	17
Percent of total difference (%)	0.008	0.025
b. $G(SI) - G(MI)$		
Reranking	0.002	0.006
Percent of total difference (%)	30	22
Changing gaps	0.006	0.020
Percent of total difference (%)	70	78
Memo items:		
Concentration coefficient for WI with respect to MI	0.476	0.556
Concentration coefficient for SI with respect to MI	0.461	0.569

**Table 11** The joint distribution of households among quintiles of wealth-adjusted income (WI) and money income (MI), 1982 and 2000

MI quintile	WI quintile					All
	1	2	3	4	5	
1982						
1	17.9	1.7	0.2	0.1	0.1	20.0
2	2.0	15.3	2.0	0.4	0.2	20.0
3	0.0	2.9	14.8	1.8	0.4	20.0
4	0.0	0.0	3.0	15.7	1.4	20.0
5	0.0	0.0	0.0	2.0	18.0	20.0
All	20.0	20.0	20.0	20.0	20.0	100.0
2000						
1	17.5	2.1	0.3	0.1	0.0	20.0
2	2.5	13.8	2.2	0.7	0.3	20.0
3	0.0	4.1	13.4	2.3	0.7	20.0
4	0.0	0.0	4.1	13.6	2.2	20.0
5	0.0	0.0	0.0	3.2	16.8	20.0
All	20.0	20.0	20.0	20.0	20.0	100.0

the top WI quintile. In the top MI quintile, there are no households that belong to the bottom WI quintile, while 84% (16.8/20) fall in the top WI quintile. However, the correlation is less strong in the three middle quintiles. For example, 33% (1–13.4/20) of the households in the third MI quintile are not in the third quintile of WI in 2000. It is also interesting that the diagonal terms of the matrix are consistently higher in 1982 than in 2000, indicative of a weakening correlation between the two income measures within any given quintile. The very high degree of reranking in 2000 indicated by the results of our decomposition analysis suggests that considerable reranking must also be taking place within quintiles.

## 5.2 Income shares and income composition

Table 12 shows the actual income shares by percentile group in the 4 years. According to all three income measures, there was a huge increase in the share of the top 10% over the 1982–2000 period. The share increased by 9.5 percentage points for MI; by 12.2 percentage points for SCF income; and by 10.0 percentage points for WI. Most of the increase of the top decile accrued to the top 1% of the overall distribution.

The major difference in the distribution of MI and WI is in the share of the top decile. In 1982 the income share of the top 10% as ranked by WI was 4.7 percentage points greater than that of MI and by 2000 the gap had increased to 5.1 percentage points. In 1982 there was almost no difference in the income shares of P90–95 between the two income concepts and a slight difference in the shares of P95–99. The main difference between the two concepts was in the share of the top 1% (P99–100)—a difference of 4.2 percentage points. In 2000, in contrast, while there was again a very small difference in the shares of P90–95 in the two measures, the difference in the shares of P95–99 had advanced to 2.2 percentage points and that of the top 1% to 2.7 percentage points. Interestingly, while there was very little difference in the income share of the top 10% between money income and SCF income in 1982, by 2000 the difference had mushroomed to 3.4 percentage points, mainly because of a widening gap in the income share of the top percentile. The likely reason again is the surge in realized capital gains in 2000 emanating from the stock market boom.

**Table 12** Income shares of households in aggregate income, by selected percentiles and income measure (in percent)

	Money income	SCF income	Wealth-adjusted income	Money income	SCF income	Wealth-adjusted income
	1982			1988		
P0–25	5.7	5.6	5.3	4.5	4.2	3.9
P25–50	14.0	13.8	13.0	11.1	11.4	11.0
P50–90	46.9	46.6	43.6	43.9	41.4	41.2
P90–100	33.4	34.1	38.1	40.5	42.9	43.9
P90–95	10.7	10.3	10.3	11.1	11.0	10.9
P95–99	12.9	13.1	13.7	15.2	15.1	16.2
P99–100	9.9	10.7	14.1	14.1	16.8	16.7
	1994			2000		
P0–25	3.6	3.8	3.8	4.2	3.9	3.7
P25–50	11.8	11.2	11.1	11.4	10.4	9.9
P50–90	42.7	42.3	40.4	41.4	39.4	38.3
P90–100	41.8	42.7	44.7	42.9	46.3	48.1
P90–95	10.7	10.5	10.6	10.2	10.1	10.5
P95–99	15.0	15.5	16.0	15.3	15.3	17.5
P99–100	16.1	16.7	18.1	17.4	20.9	20.1

Table 13 provides more details on the differences in the distribution of MI and WI in 1982 and 2000. There are several findings of note. First, mean imputed income from wealth and its components (imputed rent and annuities) generally increases with income decile – indicative of the positive overall correlation between wealth and income – and, in particular, soars between the ninth and top decile. However, the rate of increase between the ninth and top decile is much higher in annuities than in imputed rent, showing the greater concentration of this type of wealth (primarily financial assets) among households in the top decile. From the ninth to the top decile, annuities increased more than eight-fold in 1982 and almost six-fold in 2000. Second, the value of income from wealth as a percent of money income displays a U-shape indicating that the correlation between income and wealth is far from perfect, as shown, in particular, by the high percentages for the lowest three deciles. This reflects the relatively low money incomes but high wealth holdings of the elderly.

Third, the value of annuities is the main component of income from wealth, dominating imputed rent in all income deciles. On average, imputed rent is 28% of annuities in 1982 and only 17% in 2000. Fourth, compared to property income, which we replace, annuities are remarkably higher in all income deciles. Finally, comparing 1982 and 2000, we find a modest increase in imputed rent as a share of money income for the lowest three deciles and generally a slight decline for the upper deciles. The pattern is different for annuities, which about doubles as a share of money income for all deciles except the top decile, where it remains about constant.

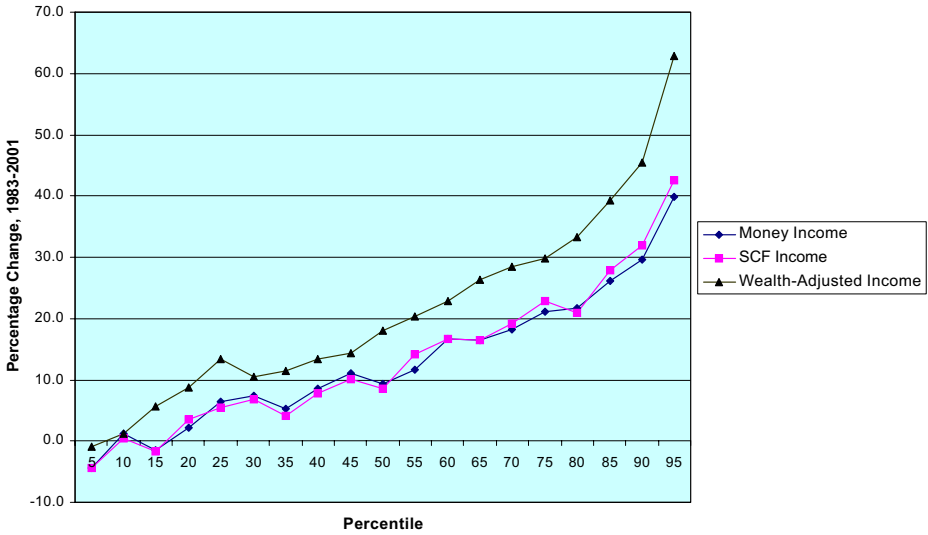
It is also informative to look at the changes in the entire distributions of money income, SCF income, and wealth-adjusted income over time (see Fig. 5). Clearly, the rate of increase is the highest for WI at all percentiles and not only at the median. Furthermore, the percentage increase at the 95th percentile of the WI distribution is striking (63%). However, the relative differences in percentage increases between MI and WI are fairly uniform across percentiles – again reflecting the fact that the increase in the Gini coefficient between 1982 and 2000 is

**Table 13** Distribution of imputed income from wealth by money income decile, 1982 and 2000 (all dollar amounts are in 2001 dollars)

	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Top	All
1982											
Income from wealth	2,423	2,844	4,627	5,240	5,064	7,184	6,877	10,305	13,284	80,073	13,815
	38.3	23.0	25.0	20.9	15.9	18.1	14.2	17.1	17.2	49.9	28.7
Income from home wealth	990	1,299	1,706	2,049	2,089	2,412	2,735	3,458	4,790	9,058	3,062
	15.7	10.5	9.2	8.2	6.6	6.1	5.6	5.8	6.2	5.6	6.4
Income from nonhome wealth	1,433	1,545	2,921	3,191	2,975	4,772	4,142	6,847	8,494	71,014	10,753
	22.7	12.5	15.8	12.7	9.4	12.1	8.5	11.4	11.0	44.3	22.4
Memo item:											
Mean money income	6,321	12,362	18,512	25,079	31,821	39,589	48,510	60,095	77,305	160,462	48,079
Property Income <sup>a</sup>	447	471	1,478	1,802	1,998	3,146	3,200	4,178	6,550	37,306	6,069
	7.1	3.8	8.0	7.2	6.3	7.9	6.6	7.0	8.5	23.2	12.6
2000											
Income from wealth	2,932	4,511	7,456	8,304	11,342	13,882	15,349	18,401	24,983	133,617	24,149
	52.2	35.3	38.2	31.2	32.9	31.4	27.3	25.5	25.8	47.6	37.1
Income from home wealth	1,065	1,542	2,434	2,103	2,368	2,458	2,838	3,698	4,122	11,769	3,447
	19.0	12.1	12.5	7.9	6.9	5.6	5.1	5.1	4.3	4.2	5.3
Income from nonhome wealth	1,867	2,969	5,022	6,201	8,974	11,425	12,511	14,703	20,861	121,848	20,701
	33.3	23.2	25.7	23.3	26.1	25.9	22.3	20.4	21.6	43.4	31.8
Memo item:											
Mean money income	5,614	12,780	19,510	26,603	34,423	44,185	56,137	72,051	96,737	280,660	65,087
Property Income <sup>a</sup>	677	300	1,039	1,516	1,889	3,318	2,606	3,885	9,495	69,001	9,403
	12.1	2.3	5.3	5.7	5.5	7.5	4.6	5.4	9.8	24.6	14.4

<sup>a</sup> Property income is the sum of dividends, interest and rent.

Numbers in italics show the item as a percentage of mean money income.



**Fig. 5** Percent change in money income, SCF income and Wealth-adjusted income, 1982–2000

roughly the same for the two income concepts. It is also of note that percentage increases over the period by percentile are quite similar for SCF income as for MI.

Table 14 shows a breakdown of income sources in 1982 and 2000. On the basis of the money income concept, earned income (the sum of wages and salaries and self-employment income) constituted 83.8% of total personal income in 2000, while income from wealth (in this case, property income) made up only 7.2%. Indeed, for the top percentile, 85.9% of total income was earned income and only 13.0% was in the form of property income. However, when the full value of wealth is properly accounted for as in the WI measure, then income from wealth appears far more important. Among all households in 2000, income from wealth now

**Table 14** Composition of income by income definition and selected percentiles, 1982 and 2000 (Percentage shares)

	Money income (MI)					Wealth-adjusted income (WI)				
	All	P40– P60	P90– 95	P95– 99	P99– 100	All	P40– P60	P90– 95	P95– 99	P99– 100
<b>A. 1982</b>										
Wages and salaries	63.6	72.0	62.8	55.6	30.1	53.7	69.0	59.8	35.1	15.6
Self-employment income	13.3	6.1	18.6	22.8	35.9	11.2	4.5	11.7	24.3	20.2
Income from wealth	10.3	6.2	12.7	15.0	29.5	24.3	12.2	21.6	36.6	61.1
Other income	12.8	15.7	5.8	6.5	4.5	10.8	14.3	6.8	4.0	3.1
Total income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>B. 2000</b>										
Wages and salaries	74.1	78.7	82.8	66.3	59.2	57.1	74.4	61.6	41.0	35.2
Self-employment income	9.7	1.5	6.1	17.8	26.7	7.4	1.5	6.0	11.3	18.0
Income from wealth	7.2	3.9	6.9	13.6	13.0	28.6	12.3	28.6	44.6	45.7
Other income	9.0	15.9	4.2	2.3	1.1	7.0	11.7	3.8	3.1	1.0
Total income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



constitutes 28.6% of all income (compared to 7.2% in the money income measure) and earned income falls from 83.8% to 64.5%. For the top percentile, income from wealth now makes up 45.7% of total income (up from 13.0%), while earned income drops from 85.9 to 53.2%.

It is also of interest that between 1982 and 2000 property income fell from 10.3 to 7.2% of total money income of all households. Also, on the basis of money income, earned income rose from 76.9 to 83.8% of total income. For the top percentile, property income plummeted from 29.5 to 13.0% of money income, while earned income climbed from 66.0 to 85.9%. These results seem to give the impression that the rich have switched from being a “rentier” class to being the “working rich.” However, on the basis of the WI measure, though income from wealth still fell in relative terms among the top one percent, in this case it was from 61.1 to 45.7% of wealth-adjusted income, while earned income rose from 35.8 to 53.2%. Though the trends are similar for the two income measures, it is clear that in 2000 on the basis of WI income from wealth still constitutes a substantial share of the total income of the very rich.

### 5.3 Income sources of the rich and a comparison with Piketty and Saez

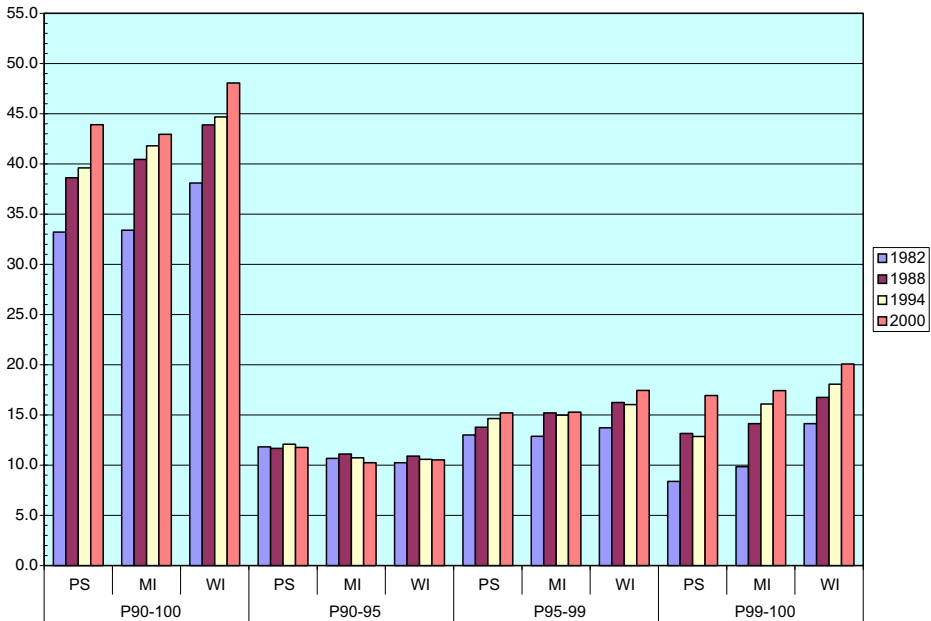
We next compare our results with those of Piketty and Saez [21, 22]. Their data source is the Internal Revenue Service *Statistics of Income* database and their income concept is Adjusted Gross Income (AGI) less realized capital gains.<sup>18</sup> The most striking difference is in the level of inequality indicated by the three measures. The share of the top 10% computed by Piketty and Saez (“PS” in Fig. 6) for 2000 is 43.9%, very close to the 42.9% figure on the basis of money income.<sup>19</sup> Since the two income concepts are quite close, this result is reassuring. However, not surprisingly, the share of the top 10% in WI is quite a bit higher – 48.1%. A similar pattern is found for the share of the top 1% in 2000 – 16.9% from PS, 17.4% on the basis of MI, and 20.1% using WI.

On the other hand, the PS results show a very similar time trend of the income shares of the top percentiles as do both the money income and wealth-adjusted income series. According to the PS figures the share of the top decile jumped 10.7 percentage points between 1982 and 2000, while the money income data shows a 9.5 percentage point rise and the WI figures a 10.0 percentage point increase. All three sources indicate almost no change in the income share of the P90–P95 income group. WI shows a 3.7 percentage point rise in the share of the P95–P99, while the PS figures indicate a 2.2 percentage point increase. In contrast, PS find a 8.6 percentage point rise in the share of the top percentile in comparison to a 6.0 percentage point increase in their share of WI.

A key argument made by PS is that the surge in top income shares since the early 1970s is due to the relatively sharp increase of top wages as reflected in the growing share of labor income, at the expense of capital income, in the total income of the rich. ([21]: 17,37). We also find a sharp decline in the share of income from wealth in the total income of the top decile on the basis of MI, but no such decline occurs on the basis of WI between 1982 and

<sup>18</sup> Piketty and Saez also exclude some other small items in AGI such as taxable Social Security income. The reference distribution is the distribution of income among taxpayers (tax units). However, the number of tax units in each quantile is defined relative to the total number of potential tax units (had everyone been required to file a tax return) and the share of each quantile is defined relative to the NIPA aggregate of personal income, after adjustments required for comparability with the AGI concept excluding realized capital gains.

<sup>19</sup> It should be noted that the PS data is for the year 1999 while our data is for 2000. As for 1982, both estimates pertain to income during that year. It is quite unlikely that the general pattern of results that we report here will be significantly affected by the fact that the endpoints are apart by 1 year.



**Fig. 6** Top income shares, 1982–2000

2000 (see Table 15). Even more striking is the difference in the levels of alternative estimates. For the richest 10%, the share of income from wealth in total income was 42% in 2000 on the basis of WI as compared to only 12% for money income and a still smaller 8% for PS. Within the top decile of WI, there is a notable diminution in the relative importance of income from wealth for the richest 1%: the share of income from wealth in total income declined from 61% in 1982 to 46% in 2000 for this group. This result is an accord with that of PS. This drop may be a reflection of the enhanced salaries of corporate executives, particularly CEOs. However, the 46% share in 2000 is still a far higher level than the corresponding estimates, 12–13%, based on MI or PS, and does not support the conclusion that the so-called “working rich” have largely displaced the “coupon-clipping rentiers” at the top of the economic ladder. Indeed, the two groups now appear to *co-habitate* the top end of the income distribution.

### 6 Sensitivity analysis

The last part of our research is to subject our estimates to sensitivity analysis. Two alternative assumptions can be used to impute income values for the home and non-home components of

**Table 15** Share of income from wealth in total income, 1982 and 2000 (in percent)

	P90–100		P90–95		P95–99		P99–100	
	1982	2000	1982	2000	1982	2000	1982	2000
PS	16	8	8	4	13	7	29	12
MI	19	12	13	7	15	14	30	13
WI	42	42	22	29	36	45	61	46

wealth. In the benchmark case, corresponding to WI, we estimate the imputed rental cost by distributing the total amount of imputed rent on nonfarm, owner-occupied housing in the GDP to homeowners, based on the gross value of housing. In our sensitivity analysis, we assign homeowners the annual benefit of converting their home equity into a financial asset, as calculated in the same manner as the Census Bureau uses in Annual Demographic Survey (ADS) of the Current Population Survey (see [9]). In this case, the variation in income from home wealth is due to the value of home equity, which depends, in turn, on house values and the remaining mortgage principal. Following the Census Bureau, we use the rate of return on high-grade municipal bonds for each year in the calculations.<sup>20</sup>

In the benchmark case, income from nonhome wealth is estimated by the constant lifetime annuity flow generated by nonhome wealth using average total real rates of return. In the sensitivity analysis, we use instead a constant coupon rate of 3% for each asset to generate income from wealth. The use of a fixed rate of return has two effects. First, it washes out differences in individual household overall rates of return caused by differences in household portfolios. Second, it also eliminates differences in annuity values deriving from differences in conditional life expectancy. In particular, individuals with a shorter conditional life expectancy will, *ceteris paribus*, have a higher ratio of annuity flow to nonhome wealth than those with a longer conditional life expectancy.

Table 16 shows trends in mean and median wealth using the alternative measures. While the mean value of imputed rent to owner-occupied housing rose by 13% over the 1982–2000 period, the mean value of the return on home equity actually declined by 26%, a reflection of the drop in the rate of return on municipal bonds. The mean value of both the annuitized value of nonhome wealth and bond coupon income from nonhome wealth increased about the same rate over the period, both about doubling in size. However, mean annuity income was over twice as great as bond income from nonhome wealth in each of the 4 years.

As a result, wealth-adjusted income WI grew faster than WI\*, the alternative income measure based on the return on home equity and bond coupon income from nonhome wealth. Between 1982 and 2000, mean WI climbed by 49%, compared to a 38% increase in WI\*, and median WI gained 18%, compared to an 11% increase in median WI\*.

Table 17 portrays inequality levels for the alternative definitions. It is at once apparent that using the return on home equity and bond coupon income resulted in a lower level of measured inequality compared to our preferred measure. Our analysis (not reported here) showed that the main factor was the substitution of bond coupon income for annuity income from nonhome wealth. In turn, the higher contribution of annuity income to inequality was a reflection of the much higher level of annuity income than bond coupon income. Annuity income from nonhome wealth was, on average, more than twice as great as bond coupon income in both 1982 and 2000. However, both WI and WI\* show almost identical increases in the Gini coefficient over the 1982–2000 period.

The substitution of bond coupon income for annuity income from nonhome wealth may have a large impact on measured racial differences in well-being. The reason is that the higher mortality rates of African-Americans relative to whites imply a higher value of annuity payments relative to wealth for the former in the calculation of WI. The use of the bond coupon technique wipes out the effects of racial differences on differential mortality rates.

However, we found instead that the ratio of bond coupon income between blacks and whites was higher than the ratio of annuity income (results not shown). These results are due to the fact that the annuity rate of return is higher for whites than blacks. This, in turn, reflects the fact that white households have a different average portfolio composition than

<sup>20</sup> The values are: 9.47% in 1983, 7.24% in 1989, 5.95% in 1995, and 5.19% in 2001.

**Table 16** Wealth-adjusted household income with alternative definitions of income from wealth (in 2001 dollars)

All households	1982		1988		1994		2000		% change, 1982–01	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
1. Wealth-adjusted income (WI)	38,642	56,942	41,397	67,526	39,242	66,397	45,578	84,572	17.9	48.5
2. WI*=WI–A–B+C+D	38,767	53,626	39,984	61,817	37,325	58,734	43,170	73,974	11.4	37.9
Memo items:										
A. Imputed rent on owner-occupied housing	1,581	3,062	1,229	3,481	1,527	3,367	987	3,447	–37.6	12.6
B. Annuity income from nonhome wealth	386	10,753	473	13,545	578	13,123	1,105	20,701	186.1	92.5
C. Return on home equity	3,128	5,952	2,168	5,508	1,422	3,447	1,655	4,422	–47.1	–25.7
D. Bond coupon income from nonhome wealth	288	4,548	359	5,808	359	5,380	685	9,129	138.1	100.7

1. Money income minus property income (sum of dividends, interest and rent) plus income from home and nonhome wealth.

A. Imputed rent on owner-occupied housing less the annuitized value of mortgage debt.

B. Annuitized value of nonhome wealth less the annuitized value of other debt.

C. Return on home equity.

D. Bond coupon income from nonhome wealth (3% real rate of return).

black households and, in particular, hold a higher percentage of their assets in the form of stocks than do black households.<sup>21</sup> Though the mortality effect would lead to a higher ratio of annuity income than bond income between blacks and whites, the use of a uniform rate of return dominates the differential mortality effect and results in a higher ratio of bond than annuity income between the two races.

The black–white ratio of the return on home equity was about the same as the racial ratio of imputed rent in 1982 but much higher in 2000. A possible reason is that by 2000 white households had a larger ratio of mortgage debt to (gross) house value than black households (the return on home equity is based on the *net value* of owner-occupied housing whereas imputed rent is based on the *gross value*). All told, the ratio of median WI\* between African-American and white households was 3 percentage points higher than the corresponding ratio of median WI in both 1982 and 2000 and the ratio of mean WI\* was 5 percentage points higher in the 2 years (Table 18). However, the ratio of both median and mean WI\* between black and white households shows about the same decline as median and mean WI between 1982 and 2000 (4 percentage points for the ratio of median values and 9 percentage points for the ratio of mean values).

The elimination of the mortality differential effect by age group had a pronounced effect on the measurement of relative well-being by age (see Table 19). The higher (conditional)

<sup>21</sup> Wolff [29] reports that in 2001 while white households held 25.4% of their total assets in the form of stocks, the corresponding figure for black households was only 14.9%.

**Table 17** Economic Inequality with alternative definitions of income from wealth (Gini coefficients)

Income definition	1982	1988	1994	2000	Change 1982–2000
1. Wealth-adjusted income (WI)	0.493	0.556	0.562	0.589	0.096
2. WI*=WI–A–B+C+D	0.457	0.526	0.533	0.555	0.098

1. Money income minus property income (sum of dividends, interest and rent) plus income from home and nonhome wealth.

A. Imputed rent on owner-occupied housing less the annuitized value of mortgage debt.

B. Annuitized value of nonhome wealth less the annuitized value of other debt.

C. Return on home equity.

D. Bond coupon income from nonhome wealth (3% real rate of return).

mortality rates of the elderly lead to much higher annuity values relative to their wealth holdings in comparison to younger households. Using a bond coupon rate approach is roughly equivalent to standardizing mortality rates across all age groups.

The ratio of mean bond income for the age group to the overall mean was much higher for the younger age groups (under age 55) than the corresponding ratio of mean annuity income, whereas the reverse was true for the older age groups (ages 65 and over). For age group 55–64, the ratio of bond income for that age group to the overall mean was 0.10 points higher in 1982 and 0.16 point higher in 2000 than the corresponding ratio of mean annuity income. The effect is particularly strong for the two older age groups. For the 65–74 age group, the bond income ratio was 1.77 compared to an annuity income ratio of 2.20 in 2000, while for the 75 and over age group, the former was 2.22 in 2000 and the latter was only 1.12.<sup>22</sup> On the other hand, differences between the ratio of the mean return on home equity by age group to the overall mean and the corresponding ratio of mean imputed rent on owner-occupied housing were very slight (results not shown).

All told, the use of the bond coupon (and return on home equity) method leads to an increase in the measured relative well-being of younger households and a corresponding reduction of that of older households. The ratio of mean wealth-adjusted income by age group to the overall mean in 2000 rose from 0.54 (for WI) to 0.62 (for WI\*) for age group 34 and under; from 0.97 to 1.09 for age group 35–44; and from 1.28 to 1.37 for age group 45–54. It fell from 1.41 to 1.37 for age group 55–64, from 1.10 to 0.88 for age group 65–64, and from 0.90 to 0.56 for the oldest age group. The elderly (65 and over) no longer appeared to be better off than the average household according to the WI\* measure. Similar results hold for the medians. However, changes over time by age group were very similar for WI\* and WI. Both measures showed a deterioration in the relative well-being of age groups under 35 and 35–44; almost no change for age group 45–54; a substantial increase in mean well-being but no change in the median level of well-being for age group 55–64; and small increases in mean well-being and substantial gains in median well-being for age groups 65–74 and 75 and over.

<sup>22</sup> Differences in portfolio composition are less marked by age group than by race. Wolff [32] calculates that in 2001 age group 65–74 held 25.0% of its total assets in the form of stocks and age group 75 and over held 29.3% in comparison to an overall figure of 24.5%.

**Table 18** Household income by alternative definitions of income from wealth and race (in 2001 dollars)

	1982		1982 ratio to whites		2000		2000 ratio to whites	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Non-Hispanic whites								
1. Wealth-adjusted income (WI)	42,243	62,013	1.00	1.00	51,681	91,043	1.00	1.00
2. $WI^* = WI - A - B + C + D$	42,406	57,848	1.00	1.00	49,402	83,697	1.00	1.00
African Americans								
1. Wealth-adjusted income (WI)	22,324	31,093	0.53	0.50	25,624	39,151	0.50	0.43
2. $WI^* = WI - A - B + C + D$	23,731	31,532	0.56	0.55	25,668	38,371	0.52	0.46

1. Money income minus property income (sum of dividends, interest and rent) plus income from home and nonhome wealth.

A. Imputed rent on owner-occupied housing less the annuitized value of mortgage debt.

B. Annuitized value of nonhome wealth less the annuitized value of other debt.

C. Return on home equity.

D. Bond coupon income from nonhome wealth (3% real rate of return).

**Table 19** Household income by alternative definitions of income from wealth and age of household head (in 2001 dollars)

	1982		1982 ratio to overall		2000		2000 ratio to overall	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Under 35								
1. Wealth-adjusted income (WI)	33,173	39,072	0.86	0.69	33,608	45,729	0.74	0.54
2. $WI^* = WI - A - B + C + D$	33,675	39,799	0.87	0.74	33,708	45,588	0.78	0.62
35–44								
1. Wealth-adjusted income (WI)	51,617	63,246	1.34	1.11	55,055	82,043	1.21	0.97
2. $WI^* = WI - A - B + C + D$	54,003	65,151	1.39	1.21	54,874	80,497	1.27	1.09
45–54								
1. Wealth-adjusted income (WI)	52,146	71,562	1.35	1.26	61,576	107,966	1.35	1.28
2. $WI^* = WI - A - B + C + D$	53,740	71,343	1.39	1.33	59,354	101,459	1.37	1.37
55–64								
1. Wealth-adjusted income (WI)	44,908	70,610	1.16	1.24	53,211	118,918	1.17	1.41
2. $WI^* = WI - A - B + C + D$	46,208	65,765	1.19	1.23	50,934	101,546	1.18	1.37
65–74								
1. Wealth-adjusted income (WI)	28,923	60,980	0.75	1.07	38,959	92,959	0.85	1.10
2. $WI^* = WI - A - B + C + D$	29,057	47,451	0.75	0.88	34,581	65,142	0.80	0.88
75 and over								
1. Wealth-adjusted income (WI)	17,726	49,178	0.46	0.86	30,337	76,134	0.67	0.90
2. $WI^* = WI - A - B + C + D$	17,672	28,324	0.46	0.53	25,576	41,516	0.59	0.56

1. Money income minus property income (sum of dividends, interest and rent) plus income from home and nonhome wealth.

A. Imputed rent on owner-occupied housing less the annuitized value of mortgage debt.

B. Annuitized value of nonhome wealth less the annuitized value of other debt.

C. Return on home equity.

D. Bond coupon income from nonhome wealth (3% real rate of return).

## 7 Conclusion

There are three factors that determine the distributional effects from adding an annuity flow from nonhome household wealth. The first is the variation of wealth to income ratios both across the income distribution and among different demographic groups. The second is the joint distribution of income and wealth. The third consists of differences in portfolio composition among households and rates of return by asset type and the consequent variation in overall rates of return across households.

While mean money income using the U.S. Census Bureau's standard definition of money income climbed by 32% between 1982 and 2000, our wealth-adjusted measure WI, including imputed rent on owner-occupied housing and the annuitized value of non-home wealth, surged by 44% over the period. Median money income grew by only 6% over this period, while median WI rose by 15%. The main factor behind the sharp gains in wealth-adjusted income is the steep rise in annuitized wealth, which soared by 87% over these years. Imputed rent, on the other hand, grew by only 10%.

Adding imputed rent and annuities from household wealth to household income also increases measured inequality. However, both measures show about the same rise in inequality over the period. The Gini coefficient for money income climbed by a considerable amount, 0.093 between 1982 and 2000. The Gini coefficient for wealth-adjusted income WI is considerably higher than that of money income (a difference of 0.040 in 2000) but shows about the same change over the 1982–2000 period, 0.096, as the Gini coefficient for money income.

Our results here are much stronger with regard to inequality than those of [25, 26] or [33]. All three studies find that the distribution of income becomes more unequal once the returns to wealth are included as part of total income. However, the disequalizing effects in these studies are not great. The main reason is that in their work annuity payments are small relative to current money income, typically on the order of 10%. In contrast, in our work, we find that among all households in 2000, annuity income from wealth constituted 29% of all income.

We also found that the share of income from wealth in overall inequality is much higher for our wealth-adjusted measure than for money income – nearly four times as much in 2000 (10 vs. 38%). The share of the wealth component in the growth in inequality between 1982 and 2000 was also larger for WI than even SCF income that is inclusive of realized capital gains. About a quarter of the increase in inequality of SCF income could be accounted for by the wealth component, compared to a third for WI. These results are primarily due to the magnitude of the annuitized value of nonhome wealth in WI.

We do find like Piketty and Saez [21] that the share of income of the richest 1% that emanates from labor earnings rose substantially over the period from 1982 to 2000. However, our results do *not* indicate that the working rich has *fully* displaced rentiers at the top of the economic ladder. On the basis of the money income concept, it is true that for the top percentile, earned income (the sum of wages and salaries and self-employment income) constituted the vast majority (86%) of total personal income in 2000, while income from wealth (in this case, property income) made up only 13%. However, when the full value of wealth is accounted for in WI, then income from wealth appears far more important. For the top percentile, income from wealth now makes up 46% of total income (instead of 13%), while earned income is only 53% (instead of 86%). In 2000, the top 1% relied about equally on earned income and income from wealth.

The addition of an annuity flow and imputed rent also widens the income gap between African-Americans and whites but increases the relative well-being of the elderly. In 2000,

the ratio of median MI between African-Americans and non-Hispanic whites was 0.57 and the ratio of means was 0.50. In contrast, the ratio of median WI was 0.049 and that of mean WI was 0.041. The racial gap also increases more between 1982 and 2000 when imputed rent and annuitized wealth (though mainly the latter) are added to money income. These results reflect the very large wealth gap between African-Americans and whites and differences in portfolio composition, with whites have a higher share of assets in stocks (mortality differences would go the other way, increasing the racial ratio).

The effect of using WI instead of MI is to increase the relative well-being of older groups relative to younger ones. There are two reasons. First, the wealth-income ratios are higher for older households. Second, mortality rates are higher for older individuals than younger ones, which result in larger annuity flows per dollar of wealth. The results are quite striking. The ratio of mean MI to the overall mean in 1982 was 0.88 for age group 65–74 while the corresponding ratio for WI was 1.07. The ratio of mean MI to overall for this age group actually fell over the period 1982–2000 while the corresponding ratio for WI rose by 3 percentage points. Results are similar for age group 75 and over. By 2000 the mean WI of this group reached 90% of the overall, compared to 50% for MI.

It should be noted that our results might be significantly affected by the end point, 2001. Though the stock market peaked in mid-2000, it was still strong in 2001 and did not drop substantially until 2002. It was not until the end of 2006 that the stock market regained its earlier peak, though housing prices have risen substantially over the period from 2001 to 2006.

Most studies of disparities in well-being among population subgroups and overall inequality employ money income as the metric of well-being. Since earnings are the overwhelming proportion of money income, academic and policy discussions center on differences in earnings capacity among those in the labor force and tax-transfer policies to alleviate the income shortfalls of those outside the labor force. Economic inequality often tends to be reduced to earnings inequality. By employing a combined income-net worth measure, we have attempted to demonstrate the importance of wealth inequalities in shaping overall economic inequality and disparities among subgroups. While further research is indeed required on several of the issues raised here, it appears certain that policies that ignore questions of asset ownership will only have partial success in redressing the relatively high level of economic inequality in the United States.

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