

# **Household Wealth, Public Consumption and Economic Well-Being in the United States \***

Edward N. Wolff

The Levy Economics Institute and New York University

Ajit Zacharias

The Levy Economics Institute

Asena Caner

The Levy Economics Institute

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Contact information: Edward N. Wolff, 269 Mercer St., 7<sup>th</sup> Floor, Department of Economics, New York University, NY 10003, U.S.A. Email: [Edward.wolff@nyu.edu](mailto:Edward.wolff@nyu.edu)

## **ABSTRACT**

Standard official measures of household economic well-being in several countries are based on money income. The general consensus is that such measures are limited because they ignore certain crucial determinants of well-being. We examine two such determinants—household wealth and public consumption—in the context of the United States. Our findings suggest that the level and distribution of economic well-being is substantially altered when money income is adjusted for wealth or public consumption. Over the 1989-2000 period, median well-being appears to increase faster when these adjustments are made than when standard money income is used. Adding imputed rent and annuities from household wealth to household income increases measured inequality while adding public consumption reduces it. However, all three measures show about the same rise in inequality over the period.

**Keywords:** living standards, public consumption, household wealth, inequality.

**JEL codes:** D31, D6, H4, P16.

## **1. Introduction**

Conventional measures of household economic well-being have come under criticism for focusing on money income and for not incorporating the appropriate concept of money income. The most-widely used official measure for poverty and income inequality in the United States is an income concept that is gross of taxes, a measure that is hard to justify as reflecting the purchasing power of individuals or households (Citro and Michael, 1995, pp. 206–7). Since the 1980s, the agency in charge of the official measure, the U.S. Bureau of the Census, developed imputed income values for major types of noncash transfers—although these values are not included in the official measure of income—in recognition of the fact that such transfers have grown to become the major share of transfer payments (U.S. Bureau of the Census, 1993). At present, there appears to be a consensus that the measures used for assessing the level and distribution of economic well-being need to rely on a better definition of money income and include items not reckoned as part of money income (The Canberra Group, 2001).

The aim of this paper is to contribute to the effort of developing comprehensive measures of economic well-being (Smeeding and Weinberg, 2001; Wolff and Zacharias, 2003). We examine two factors that are central to economic well-being in modern capitalist economies—household wealth and public consumption. Annual property-type income (interest, dividends and rent) included in the usual definition of money income may not be an adequate measure of the economic advantage derived from the ownership of assets. The Canberra Group adds the imputed rental income from owner-occupied housing, whereas Smeeding and Weinberg adds the imputed return on equity in owner-occupied housing and net realized capital gains.

Similarly, restricting attention to government transfer payments in considerations of economic well-being ignores government expenditures for the provisioning of public amenities (such as highways) that have a substantial influence on the standard of living. The Canberra Group recommends including some items (e.g. education) of public expenditure. The Office for National Statistics in the U.K. issues an annual publication assessing the effects of taxes, transfers, and some items of public expenditure on household income (Lakin, 2002, pp. 43–46). Admittedly, there are serious conceptual and measurement problems involved in integrating wealth and public expenditures into a measure of economic well-being. It also appears that there is no single “correct” solution to many of these problems. The general approach and particular methods deployed here represent one way of approaching this set of issues.

In developing the approach and methods, we have relied on two strands of literature. The first one—relating to household wealth—follows a lineage of studies that have attempted to develop measures of economic well-being that combine net worth and income. These studies have used such combined measures to examine inequality, the extent and duration of poverty among different demographic groups and the economic well-being of the elderly (Weisbrod and Hansen, 1968; Moon, 1977; Lerman and Mikesell, 1988; and Caner and Wolff, 2002). The second strand of literature has addressed the questions of how the size distribution of personal income or the functional distribution of income is affected by government expenditures (Gillespie, 1965; Ruggles and O’Higgins, 1981; Shaikh and Tonak, 1999). Both questions were pursued to shed light on the ultimate distribution of actual (or ex post) economic well-being across income groups or social classes, after accounting for taxation and government spending. Due to limitations of space, we will

restrict our attention here to government expenditures on goods and services, ignoring transfer payments and taxes.

Our focus is on the United States. Although the U.S. is currently undergoing a period of tardy economic growth, its macroeconomic performance during the 1980s and the 1990s was exceptional among the advanced capitalist nations. It was hailed by many as the model for the rest of the world to follow. In this paper, we have chosen to study 1989 and 2000 because they can be considered as the terminal years of the last two economic expansions in the United States.

The remainder of the paper has the following structure. We first describe the main sources of data and concepts of wealth and government expenditures used in the study (Section 2). This is followed by a discussion of how we incorporate wealth into a combined income-net worth measure of economic well-being and the distribution of that measure (Section 3). The allocation of government expenditures to the household sector and the distribution of such expenditures among households are discussed in the subsequent section (Section 4). The effects of the incorporation of wealth and government expenditures on the overall distribution of economic well-being, as measured by standard inequality indices, are discussed next (Section 5). The final section concludes by outlining the limitations of the study and directions of future research.

## **2. Data and concepts**

Our empirical strategy is to begin with the public-use datafiles developed by the U.S. Bureau of the Census from the Current Population Survey's Annual Demographic Supplement (ADS). In 1989, this survey included 59,941 households while, for 2000, we have a sample of about 78,054 households. The survey is the most comprehensive source of

information that is available annually regarding household income, housing tenure, receipt of noncash transfers and a number of key demographic characteristics of U.S. households.

However, the ADS does not collect any information on household wealth. Therefore, we integrated information from the Federal Reserve Board's Surveys of Consumer Finances (SCF) for 1989 and 2001 into the ADS. The SCF is the premier survey on household wealth in the United States, conducted every three years. Completed interviews in the SCF amount to 3,143 and 4,449 households, respectively for 1989 and 2001. The integration of the datafiles was performed using statistical matching, with the objective of obtaining for each household record in the ADS the most appropriate portfolio from the SCF on the basis of household characteristics.

The principal wealth concept used here is marketable wealth (or net worth), which is defined as the current value of all marketable or fungible assets less the current value of debts. Total assets are defined as the sum of: (1) the gross value of owner-occupied housing; (2) other real estate owned by the household and net equity in unincorporated businesses; (3) cash and demand deposits, time and savings deposits, certificates of deposit, money market accounts and the cash surrender value of life insurance plans; (4) government bonds, corporate bonds, foreign bonds, and other financial securities, corporate stock and mutual funds, equity in trust funds; (5) the cash surrender value of defined-contribution pension plans, including IRAs, Keogh, and 401(k) plans. Total liabilities are the sum of: (1) mortgage debt, and (2) other debt (such as auto loans).

This measure reflects wealth as a store of value and therefore a source of potential consumption. Such a measure best reflects the level of well-being associated with a family's holdings. Thus, only assets that can be readily converted to cash without compromising current consumption (that is, "fungible" ones) are included. As a result, consumer durables

are excluded here. Also excluded are the value of future Social Security benefits individuals may receive upon retirement (usually referred to as "Social Security wealth"), and the value of retirement benefits from defined-benefit private pension plans ("pension wealth"). Even though these funds are a source of future income to households, they are not in their direct control and cannot be marketed.

Just as in the case of wealth, the ADS also does not contain information regarding the use of public amenities or consumption expenditures (such as attendance in public educational institutions or use of highways). Unlike the case of household wealth, there is no single comprehensive source of information that can be relied upon to remedy the gap. We therefore had to impute usage patterns on households in the ADS, based on summary information from other surveys. For example, we used information from the National Personal Transportation Survey (conducted by the U.S. Bureau of Transportation Statistics) to impute shares of vehicle miles traveled by households in each Census division and income bracket.

The definition of government expenditures used here is the same as the one that appears on the product side of the U.S. National Income and Product Accounts (NIPA): government consumption expenditures and gross investment. This definition has several advantages given the focus of our study: It is more comprehensive than the ones used in government budget documents; it excludes transfer payments; and, it avoids double-counting intergovernmental transfers by recording expenditures at the level of government at which the expenditure is incurred.

In order to allocate government expenditures to the households and distribute it among households, it is essential to have expenditures grouped according to purpose. We

have adopted here the functional classification given in the U.S. NIPA, with minor modifications.

Since the disparities in state and local expenditures that exist across U.S. states could possibly have effects on the distribution of economic well-being, we distributed the NIPA aggregate of state and local expenditures among the states. This distribution was accomplished using the Annual Survey of Government Finances (the primary source for annual NIPA estimates for state and local expenditures) conducted by the U.S. Bureau of the Census for 1989 and 2000. Our strategy was to use the Annual Survey of Government Finances (ASGF) to determine the proportions in which the total state and local expenditure given in the NIPA for each function (such as education) is divided among the states. Care was taken to ensure that the expenditure concept formed from the ASGF and the grouping of the ASGF functions conforms as close as possible to the NIPA expenditure and function concepts.

### **3. Household wealth**

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.<sup>1</sup> The income flow generated by wealth can be computed either as a lifetime annuity or a bond coupon. We incorporate household net worth by adding to money income the imputed rental cost of owner-occupied housing and the lifetime annuity value of non-home net worth.

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>2</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 houses.<sup>3</sup> Formally, imputed rent can be expressed as  $IR_i = (h_i/H) * IR$ , where  $IR_i$  and  $h_i$  are the imputed rental income and the value of house, respectively, of household  $i$ , while  $IR$  and  $H$  are the weighted sums of the same over households.<sup>4</sup> On average, imputed rent was 5.6% and 5.4% (respectively) of the value of the house in 1989 and in 2000.

Another difference in our approach is that 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 and using portfolio shares of these six components as weights. The lifetime annuity amount calculated is such that (i) it is the same for all remaining years of the younger spouse's life<sup>5</sup> and (ii) 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 (1x6) and (6x1) vectors:

$A_i = [f_i(r_j, race_i, sex_i, age_i)] * [W_j]$ . 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 real total rate of return on the non-home wealth component,  $r_j$ , and of the race, sex and age of the younger spouse. Multiplying this factor,  $f_i$ , by the total amount of money held in the  $j^{\text{th}}$  component,  $W_j$ , gives us the total annuity generated by this component.

We obtained data on annual total real rate of return,  $r_j$ , to each non-home wealth component  $j$  over a forty-year period (1960-2000 if possible). The average rates of return

over the same period are shown in Table 1. 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 rate of return data we use are inclusive of the incomes generated by the assets. Therefore, in order to avoid double counting, we net out from the total income measure any property income already included in money income.

(Table 1 about here)

Once estimation is done in the SCF for imputed rent and the annuity on non-home wealth, we assign values of these to the households in the ADS using statistical matching. Each household record in the SCF is matched with a household record in the ADS, where a match represents a similar unit. The strata variables used in the matching procedure are the race of the household head (white vs. non-white), the homeownership status of the household (owns or buying vs. rents), the family type (married couples, single males, single females) and age of the household head (age difference within a range of two, five, ten or more). Within these strata, records are matched by minimizing a distance function based on the education and occupation of the household head, and money income and size of the household. After the matching, the ADS money income is combined with the imputed income flows from wealth to form the “Wealth Adjusted Income”(WI) measure for household  $i$  as:

$$WI_i = \text{Money Income}_i + \text{Imputed Rent}_i + \text{Annuities}_i - \text{Property Income}_i .$$

Summary measures of household net worth based on the matched dataset are presented in Table 2. Some well-known features of the distribution of household wealth are maintained by our matching procedure: Owner-occupied housing represents an important part of wealth

for the majority of households. About 65% of households either entirely own or are buying their homes. Approximately 90% of households have liquid assets, such as bank accounts; however, the amounts invested in liquid assets are usually small; the median household has \$4,500-\$5,000 in liquid assets (not shown). The ownership of real estate, unincorporated businesses and financial assets is less prevalent than homes.

(Table 2 about here)

Both the mean and the median net worth increased between 1989 and 2000, however, the mean increased faster than the median did, hinting at growing inequality. The increase in mean net worth between 1989 and 2000 was dominated by the increase in the value of financial assets and retirement assets. In the case of retirement assets, this rise was due to an increase in both the holding rate and the mean holdings. The increase in mortgage debt, both in the ownership rate and in the mean value for those who owe mortgage debt, is also noteworthy.

(Table 3 about here)

The distribution of imputed income from wealth among households belonging to different money income deciles displays certain interesting features (see Table 3).<sup>6</sup> First, mean imputed income from wealth and its components (imputed rent and annuities) generally increase with income decile—indicative of the positive overall correlation between wealth and income—and they soar as we move from the ninth to the top decile. However, the rate of increase from the ninth to the 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 at the very top decile. From the ninth to the top decile, annuities almost tripled in 1989 and increased almost fivefold in 2000. Second, the value of income from wealth as a percent of money income displays a U-shape. If we judge the

importance of income from wealth relative to the level of money income, then it appears that the correlation between income and wealth is far from perfect, as shown by the high percentages for the lowest three deciles. This reflects the relatively low 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 about half of annuities in 1989 and only about one-third in 2000. Fourth, compared to property income, which we replace, annuities are remarkably higher in all income deciles.

#### **4. Public consumption**

The standard approach to combining government expenditure and individual income is to consider the appropriate amounts of expenditures as “a component of those individuals’ real income and additive to their money income” (Gillespie, 1965, p. 131). We present our analogous estimates later on in the paper. In this section, our focus is on public consumption as such and its distribution along the household income ladder.

An important distinction between our approach to public consumption and the traditional studies on the distribution of expenditure benefits (e.g., Musgrave, Case and Leonard (1974)) is that we do not consider all public consumption as augmenting the consumption possibilities of the households. Public consumption is conceptualized as occurring in three main sectors: household, business and government. For example, highways are used directly by individuals for personal purposes, by commercial trucks for transporting merchandise and by government vehicles for transporting troops.

The traditional approach assumes (on the basis of specific propositions regarding the character of the state and the functioning of a capitalist economy) that public consumption in the non-household sectors ultimately somehow *benefits* the household sector and the household sector alone.<sup>7</sup> Hence the *costs* involved in providing such public consumption are

considered as incurred on behalf of households or individuals. In contrast, we make no assumptions regarding the benefits from public consumption; our assumptions are about the direct usage (actual or potential) of public amenities by entities<sup>8</sup> in different sectors. Government expenditures incurred in the provision of such amenities are considered as the cost of providing them to the relevant entities.

The difference between the two approaches may be brought into sharper relief in the following manner. Let  $\mathbf{G}$  be a diagonal matrix that contains along its principal diagonal government expenditures on different functions numbered  $1, 2, \dots, p$ . We next specify a matrix  $\mathbf{A}$  which has 3 columns corresponding to the three sectors of the economy and  $p$  rows. The household sector's column, for example, contains the shares of that sector in the direct usage of each of the public amenities afforded by the expenditures on  $p$  different functions. The amounts of government expenditures incurred on behalf of different sectors can then be stacked in a matrix  $\mathbf{B}$ , calculated as:

$$\mathbf{B} = \mathbf{GA} \quad (1)$$

The traditional approach entails the assumption that  $\mathbf{A}$  is in fact a sum vector while we postulate that:

$$0 \leq a_{ij} \leq 1 \text{ with at least some } a_{ij} \text{ s.t. } 0 < a_{ij} < 1 \quad (2)$$

$$\sum_j a_{ij} = 1, \quad j = h, b, g \rightarrow \text{the three sectors.} \quad (3)$$

The rationale for our approach may be made clear by its application to the functions of government expenditures as found in today's NIPA for the United States, rather than in purely abstract terms.<sup>9</sup> Our data allowed us to construct a schema consisting of 44 functions. Allocation of expenditures between the household and other sectors was done on the basis of a set of assumptions regarding these functions. In Table 4, we group the

functions into 9 major functions and summarize the results derived from the assumptions regarding the household column in A.<sup>10</sup>

(Table 4 about here)

Two types of assumptions are at work here. One involves the designation of a particular function as involving activities that do not expand the potential amenities available to the household sector at all or as expanding only that sector's potential amenities. General public service, National defense, Law courts and Prisons (the last two are included under Public order and safety) are the prominent examples of functions that are assumed to provide no directly useable services to the household sector. They constitute social overheads that serve the purpose of keeping the ship of state afloat. Social overheads are obviously necessary for households and individuals to exercise command over the necessities and conveniences of life, but they do not inherently constitute a part of the objects over which such command is exercised. In contrast, functions such as elementary and secondary education (included under Education) or income security are assumed to directly expand amenities available only to the household sector.<sup>11</sup>

The second type of assumption concerns functions that can potentially serve the household and non-household sectors. Costs incurred in the performance of these functions (under Economic affairs and Housing and community services) are allocated to the household sector in accordance with the extent of its "responsibility" in generating such costs. We made judgments regarding the extent of responsibility, as far as possible, on the basis of available empirical information. A prominent example of this type of function is highways (included under Economic affairs) where we estimated that about 60 percent of expenditures were incurred on behalf of households. Our estimates were based on the 1997

Federal Highway Administration study that calculated costs per mile and miles traveled by vehicle type (personal versus commercial usage).

However, a certain degree of arbitrariness is unavoidable in dealing with some functions that can serve the household and non-household sectors. An example is Police and Fire (included under Public order and safety), encompassing activities presumably performed in the protection of persons and property. They play a dual role in that they constitute a social overhead and provide direct services to the household sector. We have therefore arbitrarily allocated half of these expenditures to the household sector.<sup>12</sup>

In sum, our assumptions regarding **A** led us to allocate to the household sector about 43 percent and 51 percent of total government expenditures, respectively, in 1989 and 2000. The increase in this proportion is primarily a reflection of the falling share of expenditures devoted to national defense during this period. The roughly 8 percentage points increase in the expenditures allocated to the household sector was accompanied by a reduction in total government expenditures, as a proportion of the GDP, in 2000 as compared to 1989 (18 percent as compared to 20 percent). Altogether, government expenditures allocated to households rose from 8.6 percent of GDP in 1989 to 9.2 percent in 2000.

In order to avoid cumbersome sentences, we define “public consumption” as the total government expenditure allocated to the household sector. Once public consumption under different functions was determined, we proceeded to distribute it among households. This operation can be described in general terms as follows (c.f. Reynolds and Smolensky, 1977, p. 27, equation (3-1)). Let  $\mathbf{B}^h$  be a diagonal matrix that has along its principal diagonal the  $m$  positive entries from the household column in  $\mathbf{B}$ . A matrix  $\mathbf{D}$ , similar to  $\mathbf{A}$  is specified next which has  $m$  rows and as many columns as there are households (or groupings of households by income deciles or any other relevant characteristic). A given column of  $\mathbf{D}$

shows the shares that the household has in the direct usage (potential or actual) of each of the public amenities afforded by the allocated expenditures on  $m$  different functions. The elements of  $\mathbf{D}$  satisfy the following conditions:

$$0 \leq d_{ij} \leq 1 \quad (4)$$

$$\sum_{j=1}^m d_{ij} = 1 \quad (5)$$

The amounts distributed to the households for the different functions can then be arranged in a matrix  $\mathbf{F}$ , derived as:

$$\mathbf{F} = \mathbf{B}^h \mathbf{D} \quad (6)$$

In distributing public consumption among households, we attempted to follow, as much as possible, the same principles of direct usage and cost responsibility that was employed in splitting total government expenditures between the household and non-household sectors. The problem becomes more complex now because we need household-level information on a number of variables that simply are not available in our main data source, the ADS. Various assumptions had to be necessarily made, just as in the previous studies.

There are two major categories of public consumption to be distributed among households: those distributed equally across persons and those distributed according to household-level or person-level characteristics. The amounts for the two categories and their shares in the total public consumption are shown in Table 5. The table also shows the biggest individual functions (in terms of expenditures) included under the two categories and their respective shares in total expenditure.

(Table 5 about here)

The first class of expenditures pertains to functions that we consider, at least in principle, as equally available to all individuals. Of course, the actual patterns of utilization of these public amenities are bound to vary according to a number of individual or household characteristics. However, we consider these functions as providing universal in-kind benefits, in contrast to, say, Medicare or Food Stamps, which are available only to specific segments of the population.

An alternative to distribution on an equal per capita basis in the case of these expenditures would be distribution according to income. Such an approach could be taken on the rationale that the utility derived from this type of public amenities is “complementary to those derived from private goods” or that they reflect “the recipients’ evaluation of social goods, based on the hypothesis that income and price elasticities of demand for social goods are equal, in which case application of a ‘Lindahl pricing rule’<sup>13</sup> calls for a proportional benefit tax.” (Musgrave, Case and Leonard, 1974, pp. 290–1). However, given that we do not attempt to ascertain the benefits from public consumption, this route was not taken by us.

The second class of expenditures—those distributed according to characteristics—accounts for the bulk of the public consumption (nearly three-quarters in both years). The person-level or household-level characteristics used in the distribution procedures and the functions corresponding to them are listed below:

- *Amount and type of income*: Agriculture
- *Type of income received (including receipt of noncash transfers)*: Public Housing, Administrative costs of Medicare, Disability, Retirement income (Social Security), Welfare and social services and Unemployment compensation
- *Shares in consumption expenditures on relevant items*: Energy, Pollution control and abatement, Postal service, Liquor stores, Water supply, Sewerage and Sanitation

- *Enrollment in public educational institutions*: Education
- *Patterns of vehicle ownership and transportation usage*: Transportation and Parking
- *Employment status*: Occupational safety and health

Information on the type and amount of income as well as the employment status of individuals was obtained directly from the ADS. All other characteristics were imputed to individuals or households in the ADS from information gathered from external sources.<sup>14</sup>

As an example of the imputation methods used, let us consider the case of elementary and secondary education expenditures incurred at the state and local levels of government—by far the largest item of expenditures to be distributed among households. The ADS allows us to identify those between the ages of 5 and 18, who can be considered as the relevant subset of the population. However, the ADS does not identify the children enrolled in public (as opposed to private) schools. Therefore, we used the estimates of public school enrollment rates by state and household income decile from the decennial censuses of 1990 and 2000.<sup>15</sup> Assuming that the enrollment rates in the ADS are the same as in the decennial census allows us to fix the total number of children (“control total”) attending public schools in each income decile within a state. From the group of children in each income decile, children are picked randomly till the control total is reached. Once this operation is completed for children in each income class and state, we obtain the estimated distribution of children attending public schools in the ADS by state and income decile. The state and local expenditures for each state are then split equally among those imputed to be attending public schools in that state.

The results obtained regarding the distribution of public consumption across households in different deciles of household money income (estimated **F** with income

deciles as columns) are shown in Table 6. Average household public consumption (measured in 2000 dollars) was about \$8,242 in 2000, about 15 percent higher than it was in 1989. Average household income was also 15 percent higher in 2000 than 1989, so that the ratio of public consumption to household income remained unchanged at 14 percent. However, there were notable changes once we look at households in different deciles of income and across different functions.

(Table 6 about here)

First, in both years studied, mean public consumption increases with income decile. This is the case for public consumption distributed on an equal per capita basis, because household size increases with income decile. This is also the case for public consumption distributed on the basis of characteristics, with the exception of the top decile in 1989 whose mean public consumption is slightly lower than the mean level in the ninth decile. The results are more mixed when we look at particular government functions: Economic Affairs and Education generally shows a positive correlation between average expenditures and income level, while the correlation is negative for Income Security and Health, with the exception that in the latter case there is a jump in the mean level from the lowest decile to the next. Housing and Community Services is the only function (at this level of aggregation) that shows a change in the distributional pattern between 1989 and 2000. The 1989 pattern is roughly U-shaped, while in 2000, after a decline from the first to the third, mean public expenditure generally remains flat across deciles.

Why does public consumption increase with income? As was already noted, in the case of “Public consumption A” this is purely a reflection of the fact that the average number of persons in a household grows as we move up the income ladder (see Table 6). In

the case of “Public consumption B,” the positive correlation is driven by the distribution of expenditures on education and economic affairs.

With regard to the allocation of educational expenditures, the key factors are the distribution of school-age children and expenditures per child across income deciles.<sup>16</sup> Results shown in Table 7 indicate that there is relatively little variation in the mean number of school-age children among households with children in public schools or in per-pupil expenditures across income deciles. Instead, the observed correlation between educational expenditure and income level is due to larger number of households without school-age children in the lower income deciles than in the higher income deciles. However, it should be noted that the reason that we find relatively minor disparities in per pupil expenditures across income deciles in our data might well be due to limitations in our imputation technique that did not allow for *intra-state* variation in educational expenditures per student.<sup>17</sup>

(Table 7 about here)

Economic affairs encompass a number of functions, which are all distributed on the basis of characteristics that tends to be positively correlated with income. The largest expenditures in the economic affairs category are incurred for transportation. The principal mode of transportation in the U.S., highways, are used more intensely (as measured by the share of total highway miles driven) by more affluent households except for the highest income decile (see Table 6). The other major mode of transportation, air travel, is characterized by a usage pattern that is concentrated in the upper income deciles, and air travel therefore contributes to the positive correlation between income and public expenditures. Functions that are distributed on the basis of shares in consumption expenditures by income group—energy, pollution control, postal service, and part of

economic affairs— are dominated by items for which higher income groups generally have higher shares in consumption expenditure.

Though mean levels of public consumption rise with household income, public consumption as a percentage of money income falls steadily with income because the disparity in mean money income between income deciles is far greater than the disparity in public consumption expenditures. As shown in Figure 1, households in the top income decile experienced the fastest growth in both money income *and* public consumption between 1989 and 2000. However, at the tails of the distribution (the bottom and top two deciles) money income grew faster than public consumption while the opposite pattern prevailed among the middle seven deciles. As a result, the relative importance of public consumption declined for the households at the tails of the distribution and increased for those in the middle.

## **5. Inequality**

An important motivation behind developing more comprehensive measures of economic well-being than money income is to further the understanding of the distribution of well-being. We address this issue here by examining the overall distribution of three measures: money income, wealth adjusted income (WI) and public consumption adjusted income (PCI).

(Table 8 about here)

The distribution of well-being changes considerably when money income is adjusted for wealth or public consumption (see Table 8). The distribution of WI is less equal than the distribution of money income. In contrast, the distribution of PCI is more equal than the distribution of money income. In the case of WI, the share of the top decile increases from 29 percent to 36 percent in 1989 and from 33 percent to 41 percent in 2000. The shares of all

other deciles decline slightly. In the case of PCI, there is an increase in the shares of the first through the sixth or seventh deciles (depending on the year) and a decrease in the shares of the upper deciles.

Summary measures of overall inequality also reveal that the distribution of well-being is sensitive to the measure of well-being used (see Figures 2 and 3). In 1989, the Gini coefficient increases from 0.42 to 0.48 when income is adjusted for wealth. For the same year, it decreases to 0.39 when income is adjusted for public consumption. For the year 2000, we observe a similar trend for the Gini coefficient. It increases from 0.45 to 0.52 when we adjust for wealth and decreases to 0.41 when we adjust for public consumption.

(Figures 2 and 3 here)

Our estimates of the Atkinson index, also shown in Figures 2 and 3, display the same pattern. We select three different values for the inequality aversion parameter,  $e$ , in the Atkinson index; 0.25, 0.50 and 0.75, as in U.S. Census Bureau (2000). A characteristic of this index is that the closer the  $e$  parameter is to zero, the more sensitive the index becomes to the changes in the upper end of the distribution. In the case of wealth, since the major effect of adjusting for wealth on the income distribution is seen in the top of the distribution, we observe bigger increases in the value of the Atkinson index as  $e$  gets closer to zero. In the case of public consumption, the opposite is true. We observe bigger drops in the value of the index for bigger values of  $e$ .

How significant are the differences in the level of inequality across income measures? One way to answer this question is to compare the magnitudes of these changes to historical trends observed for the U.S. The Census Bureau reports that the Gini coefficient was very stable during 1993-98; it varied only from 0.454 to 0.459. During the period 1967-92 when “the shape of the household income distribution changed

dramatically” (U.S. Bureau of the Census, 2000, p. 3), it changed from 0.399 to 0.434. During the same period, the Atkinson index (with  $e=0.50$ ) changed from 0.143 to 0.160 (U.S. Census Bureau 2000:9). Judging by this yardstick, it appears that the picture of inequality changes quite substantially if the conventional income measure is adjusted for wealth or public consumption.

(Figure 4 about here)

It is also informative to look at the changes in the entire distributions of money income, WI and PCI over time. Figure 4 shows the percent change in the percentiles at five-percentile increments. 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 95<sup>th</sup> percentile of the WI distribution is striking (27 percent). The rate of increase in PCI falls somewhat short of the rate of increase in money income up until the 20<sup>th</sup> percentile, after which it is either slightly higher or equal to the rate of increase in money income.

## **6. Conclusions**

The level and distribution of economic well-being is substantially affected by household wealth and public consumption. Measures of economic well-being that incorporate these determinants of well-being therefore display significant differences from the widely used official measure of gross money income (see Table 9).

(Table 9 about here)

The mean values of money income and PCI have changed at about the same rate between 1989 and 2000 while mean WI shows substantially faster growth. However, *median* PCI and WI both grow faster than median income. The results remain unchanged when the various income measures are adjusted for household size and composition by using an equivalence scale<sup>18</sup>. The rates of increase in all three equivalence-scale-adjusted

measures are comparable to rates of increase in the unadjusted measures. We also find that inequality is increased when imputed income from wealth is added to household income but reduced when public consumption is included. However, the inequality of income adjusted for wealth or public consumption increases to about the same degree over the 1989-2000 period as money income alone (see Figures 2 and 3).

A fuller picture of economic well-being can be obtained only if other determinants are also taken into account. In particular, the analysis of public consumption and wealth reported here needs to be supplemented by accounting for taxes and government noncash transfers. Non-market production, especially, household production, is also crucial to economic well-being. A measure that incorporates these additional determinants along with wealth, public consumption and money income is the ideal yardstick against which the adequacy of the official money income measure should be compared.

In our future work, we intend to analyze intertemporal changes in inequality using different measures of economic well-being. We also plan to study the distribution of well-being across key demographic groups, such as racial groups and types of households, in the U.S, using alternative measures. Distributional analyses continue to be as challenging and interesting today as it was at the time of the founding of our discipline.

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**Table 1: Average annual rates of return by asset type, for the period 1960- 2000.**

			<b>Nominal Return</b>	<b>Real Return</b>
<b>Assets</b>	Real Estate and Businesses	(1)	6.68%	2.12%
	Liquid Assets	(2)	5.48%	0.97%
	Financial Assets	(3)	8.39%	3.75%
	Retirement Assets	(4)	5.59%	1.07%
<b>Debts</b>	Mortgage Debt		0.00%	-4.28%
	Other Debt		0.00%	-4.28%
<i>Rate of Inflation (CPI-U average)</i>			4.47%	

\*: Real rate of return = (1+Nominal)/(1+Inflation)-1

Sources:

(1) Holding gains on unincorporated business equity as a percent of the asset value in the previous year, using data from the Flow of Funds Accounts, Tables B.100 and R.100.

(2) The figure is a weighted average of the interest rates on checkable deposits and currency, time and savings deposits and life insurance reserves, where the weights are the stocks of each asset held by the household sector. The stock information comes from Table B.100 in the Flow of funds Accounts, lines 11, 12 and 27 respectively. The interest rates assigned are zero, average interest rate on 1-month CDs (Board of Governors of the Federal Reserve System, 2003a) and CPI-U plus 1%, respectively.

(3) The figure is a weighted average of the interest rates on open market paper, U.S. government securities, municipal securities, corporate and foreign bonds, corporate equities and mutual fund shares, where the weights are the stocks of each asset held by the household sector. The stock information comes from Table B.100, lines 15,16, 21, 22, 24 and 25 respectively (Board of Governors of the Federal Reserve System, 2003b). The rates are the interest rate on 1-month financial paper (Board of Governors of the Federal Reserve System, 2003a), the average interest rate on U.S. government securities with maturities varying from 3 months to 30 years, the interest rate on high-grade municipal bonds, average annual rate of change in the S&P 500 index and the average rate of return on non-money market mutual funds (which is an average of interest rates on U.S. government securities, municipal securities, corporate and foreign bonds and corporate equities) (Council of Economic Advisers 2002).

(4) Holding gains (defined as the change in the value of assets minus net acquisitions) divided by the value of assets in the previous year, for private pension funds, defined contribution plans. Source: Tables F.119 and L.119 (Board of Governors of the Federal Reserve System, 2003b).

**Table 2: Summary Results: Net Worth (in 2000 dollars), its Asset and Debt Components and Ownership Rates**

		Mean			Ownership Rates (%)	
		1989	2000	Change	1989	2000
1	<b>Net Worth</b>	243,934	358,228	47%	100.00	100.00
2	<i>Assets</i>					
3	Owner-occupied Housing	94,501	111,693	18%	63.93	67.73
4	Real Estate and Businesses	97,921	115,364	18%	41.59	34.91
5	Liquid Assets	31,827	35,668	12%	87.26	92.05
6	Financial Assets	41,345	95,351	131%	46.81	47.25
7	Retirement Assets	16,279	53,407	228%	36.57	52.33
8	<i>Debts</i>					
9	Mortgage Debt	25,578	40,132	57%	40.29	45.43
10	Other Debt	12,360	13,123	6%	67.13	66.59
	Memo items:					
11	<i>Median Household Wealth</i>	58,326	67,310	15%	100.00	100.00
12	<i>Household Money Income</i>	49,571	57,140	15%	100.00	100.00

Notes: The figures in the “Mean” column are for the entire sample, and not just for those who own the wealth component. In all tables, we use ADS household weights. The values of net worth components in year 2000 are computed by applying the rates of return in year 2000, adjusted for inflation, to the values of components in the 2001 matched file.

Source: Authors’ calculations using Survey of Consumer Finances (SCF) data matched with ADS data, 1989 and 2001.

**Table 3. Distribution of imputed income from wealth by household income decile (all dollar amounts are in 2000 dollars)**

1989											
	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Top	All
Income from Wealth	6,954	5,830	7,169	7,969	12,035	12,471	14,321	17,621	20,476	48,632	15,520
	<i>116.4</i>	<i>44.1</i>	<i>35.4</i>	<i>28.8</i>	<i>33.9</i>	<i>28.3</i>	<i>26.5</i>	<i>26.6</i>	<i>24.2</i>	<i>35.0</i>	<i>31.3</i>
Imputed Rent	1,227	1,917	2,711	2,958	3,340	4,248	4,917	6,404	8,028	14,034	5,030
	<i>20.5</i>	<i>14.5</i>	<i>13.4</i>	<i>10.7</i>	<i>9.4</i>	<i>9.6</i>	<i>9.1</i>	<i>9.7</i>	<i>9.5</i>	<i>10.1</i>	<i>10.1</i>
Annuities	5,727	3,914	4,458	5,011	8,695	8,222	9,404	11,217	12,449	34,598	10,490
	<i>95.8</i>	<i>29.6</i>	<i>22.0</i>	<i>18.1</i>	<i>24.5</i>	<i>18.6</i>	<i>17.4</i>	<i>16.9</i>	<i>14.7</i>	<i>24.9</i>	<i>21.2</i>
Memo item:											
Mean income	5,976	13,236	20,262	27,653	35,537	44,104	53,959	66,290	84,645	138,760	49,570
Property Income	193	779	1,357	1,846	2,355	2,544	2,813	3,495	4,816	14,802	3,557
	<i>3.2</i>	<i>5.9</i>	<i>6.7</i>	<i>6.7</i>	<i>6.6</i>	<i>5.8</i>	<i>5.2</i>	<i>5.3</i>	<i>5.7</i>	<i>10.7</i>	<i>7.2</i>

2000											
	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Top	All
Income from Wealth	8,254	9,970	11,050	12,795	12,468	12,961	15,242	18,134	24,910	89,074	21,330
	<i>128.9</i>	<i>66.9</i>	<i>48.6</i>	<i>41.9</i>	<i>31.9</i>	<i>26.5</i>	<i>25.3</i>	<i>24.4</i>	<i>25.9</i>	<i>47.3</i>	<i>37.3</i>
Imputed Rent	1,620	2,650	3,027	3,518	3,905	4,549	5,789	7,143	9,250	16,778	5,743
	<i>25.3</i>	<i>17.8</i>	<i>13.3</i>	<i>11.5</i>	<i>10.0</i>	<i>9.3</i>	<i>9.6</i>	<i>9.6</i>	<i>9.6</i>	<i>8.9</i>	<i>10.1</i>
Annuities	6,634	7,320	8,023	9,277	8,563	8,412	9,453	10,990	15,661	72,296	15,586
	<i>103.6</i>	<i>49.1</i>	<i>35.3</i>	<i>30.4</i>	<i>21.9</i>	<i>17.2</i>	<i>15.7</i>	<i>14.8</i>	<i>16.3</i>	<i>38.4</i>	<i>27.3</i>
Memo item:											
Mean income	6,404	14,902	22,725	30,549	39,115	48,869	60,196	74,443	96,203	188,240	57,140
Property Income	200	627	986	1,339	1,557	1,812	2,436	3,236	5,692	15,802	3,319
	<i>3.1</i>	<i>4.2</i>	<i>4.3</i>	<i>4.4</i>	<i>4.0</i>	<i>3.7</i>	<i>4.0</i>	<i>4.3</i>	<i>5.9</i>	<i>8.4</i>	<i>5.8</i>

Notes:

- (1) Figures in italics (shaded) indicate mean amount of the component as a percentage of mean income.
- (2) Property income is the sum of rent, interest and dividend income in the CPS.

Source: Authors' calculations using SCF data matched with ADS data, 1989 and 2001.

**Table 4. Government consumption and gross investment expenditures by function (in billions of current dollars): total expenditure and, the amount and share (in percent) allocated to the household sector.**

Function	1989			2000		
	Total	Allocated	Household share	Total	Allocated	Household share
General public service	88	0	0%	172	0	0%
National defense	363	0	0%	374	0.00	0%
Public order and safety	92	24	26%	203	53.50	26%
Economic affairs	161	92	57%	278	166.24	59%
Housing and Community Services	23	16	69%	28	19.34	68%
Health	57	57	100%	92	92.70	100%
Recreation and culture	13	13	100%	25	25.20	100%
Education	270	245	90%	511	469.42	91%
Income security	29	29	100%	63	63.80	100%
<b>Total government expenditures</b>	<b>1100</b>	<b>479</b>	<b>44%</b>	<b>1751</b>	<b>890</b>	<b>51%</b>

Source: Authors' calculations based on NIPA, Annual Survey of Government Finances and supplementary data.

**Table 5. Classification of public consumption expenditures according to distribution method: total expenditure (in billions of current dollars) and share (in percent) of total expenditure allocated to the household sector.**

	1989		2000	
	Amount	Share	Amount	Share
<b>Public consumption</b>	<b>479</b>	<b>100%</b>	<b>890</b>	<b>100%</b>
<b>A. Distributed equally</b>	<b>131</b>	<b>27%</b>	<b>240</b>	<b>27%</b>
Police and Fire	24	4%	53	5%
Public health and hospitals	54	11%	88	10%
Other	52	11%	98	11%
<b>B. Distributed by characteristics</b>	<b>347</b>	<b>72%</b>	<b>649</b>	<b>73%</b>
Highways	43	9%	77	8%
Elementary and secondary education	204	42%	397	44%
Other	99	20%	175	19%

Source: Authors' calculations based on NIPA, Annual Survey of Government Finances and supplementary data.

Table 6. Distribution of household public consumption by household income decile (all dollar amounts are in 2000 dollars)

1989											
	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Top	All
Public consumption	6,185	5,947	5,949	6,335	6,646	7,028	7,616	8,099	8,915	8,566	7,140
	<i>103.5</i>	<i>44.9</i>	<i>29.4</i>	<i>22.9</i>	<i>18.7</i>	<i>15.9</i>	<i>14.1</i>	<i>12.2</i>	<i>10.5</i>	<i>6.2</i>	<i>14.4</i>
Public consumption A	1,346	1,456	1,612	1,740	1,838	1,973	2,102	2,229	2,406	2,486	1,923
	<i>22.5</i>	<i>11.0</i>	<i>8.0</i>	<i>6.3</i>	<i>5.2</i>	<i>4.5</i>	<i>3.9</i>	<i>3.4</i>	<i>2.8</i>	<i>1.8</i>	<i>3.9</i>
Public consumption B	4,839	4,491	4,338	4,594	4,808	5,055	5,515	5,870	6,509	6,080	5,217
	<i>81.0</i>	<i>33.9</i>	<i>21.4</i>	<i>16.6</i>	<i>13.5</i>	<i>11.5</i>	<i>10.2</i>	<i>8.9</i>	<i>7.7</i>	<i>4.4</i>	<i>10.5</i>
Economic affairs	528	629	797	877	1,030	1,114	1,164	1,143	1,378	1,384	1,007
	<i>8.8</i>	<i>4.8</i>	<i>3.9</i>	<i>3.2</i>	<i>2.9</i>	<i>2.5</i>	<i>2.2</i>	<i>1.7</i>	<i>1.6</i>	<i>1.0</i>	<i>2.0</i>
Housing and Community Services	295	289	227	214	210	196	199	224	265	270	239
	<i>4.9</i>	<i>2.2</i>	<i>1.1</i>	<i>0.8</i>	<i>0.6</i>	<i>0.4</i>	<i>0.4</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.5</i>
Health	48	69	65	56	52	46	43	43	44	48	51
	<i>0.8</i>	<i>0.5</i>	<i>0.3</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.0</i>	<i>0.1</i>
Education	2,568	2,504	2,658	3,038	3,248	3,548	4,012	4,374	4,735	4,323	3,508
	<i>43.0</i>	<i>18.9</i>	<i>13.1</i>	<i>11.0</i>	<i>9.1</i>	<i>8.0</i>	<i>7.4</i>	<i>6.6</i>	<i>5.6</i>	<i>3.1</i>	<i>7.1</i>
Income Security	1,400	1,000	591	409	269	152	98	86	87	56	411
	<i>23.4</i>	<i>7.6</i>	<i>2.9</i>	<i>1.5</i>	<i>0.8</i>	<i>0.3</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.0</i>	<i>0.8</i>
Memo items:											
Schools	2,380	2,333	2,437	2,737	2,935	3,168	3,624	3,869	4,040	3,322	3,088
	<i>39.8</i>	<i>17.6</i>	<i>12.0</i>	<i>9.9</i>	<i>8.3</i>	<i>7.2</i>	<i>6.7</i>	<i>5.8</i>	<i>4.8</i>	<i>2.4</i>	<i>6.2</i>
Highways	298	397	543	613	745	797	809	792	809	696	651
	<i>5.0</i>	<i>3.0</i>	<i>2.7</i>	<i>2.2</i>	<i>2.1</i>	<i>1.8</i>	<i>1.5</i>	<i>1.2</i>	<i>1.0</i>	<i>0.5</i>	<i>1.3</i>
Mean income	5,976	13,236	20,262	27,653	35,537	44,104	53,959	66,290	84,645	138,760	49,570
Mean household size	1.85	2.00	2.24	2.39	2.53	2.71	2.86	3.01	3.19	3.23	2.60

Notes: (i) Figures in italics (shaded) indicate mean public consumption as a percent of money income; (ii) "Public consumption A" refers to public consumption that is distributed equally across persons; (iii) "Public consumption B" refers to public consumption that is distributed according to household or individual characteristics. Source: Authors' calculations.



**Table 6 (contd.) Distribution of household public consumption by household income decile (all dollar amounts are in 2000 dollars)**

2000											
	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Top	All
Public consumption	6,229	6,473	7,153	7,413	7,981	8,505	9,254	9,649	9,727	10,537	8,242
	<i>97.3</i>	<i>43.4</i>	<i>31.5</i>	<i>24.3</i>	<i>20.4</i>	<i>17.4</i>	<i>15.4</i>	<i>13.0</i>	<i>10.1</i>	<i>5.6</i>	<i>14.4</i>
Public consumption A	1,465	1,649	1,847	2,012	2,145	2,315	2,471	2,590	2,653	2,754	2,174
	<i>22.9</i>	<i>11.1</i>	<i>8.1</i>	<i>6.6</i>	<i>5.5</i>	<i>4.7</i>	<i>4.1</i>	<i>3.5</i>	<i>2.8</i>	<i>1.5</i>	<i>3.8</i>
Public consumption B	4,764	4,824	5,306	5,401	5,836	6,190	6,783	7,058	7,074	7,783	6,068
	<i>74.4</i>	<i>32.4</i>	<i>23.3</i>	<i>17.7</i>	<i>14.9</i>	<i>12.7</i>	<i>11.3</i>	<i>9.5</i>	<i>7.4</i>	<i>4.1</i>	<i>10.6</i>
Economic affairs	515	670	872	961	1,153	1,229	1,287	1,297	1,321	2,125	1,132
	<i>8.0</i>	<i>4.5</i>	<i>3.8</i>	<i>3.1</i>	<i>2.9</i>	<i>2.5</i>	<i>2.1</i>	<i>1.7</i>	<i>1.4</i>	<i>1.1</i>	<i>2.0</i>
Housing and Community Services	212	177	165	147	147	150	156	164	164	167	165
	<i>3.3</i>	<i>1.2</i>	<i>0.7</i>	<i>0.5</i>	<i>0.4</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>0.1</i>	<i>0.3</i>
Health	43	56	48	43	36	30	28	25	24	26	36
	<i>0.7</i>	<i>0.4</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>
Education	2,626	2,874	3,368	3,628	3,994	4,431	5,059	5,380	5,408	5,344	4,171
	<i>41.0</i>	<i>19.3</i>	<i>14.8</i>	<i>11.9</i>	<i>10.2</i>	<i>9.1</i>	<i>8.4</i>	<i>7.2</i>	<i>5.6</i>	<i>2.8</i>	<i>7.3</i>
Income Security	1,367	1,047	853	622	506	350	253	193	158	121	563
	<i>21.3</i>	<i>7.0</i>	<i>3.8</i>	<i>2.0</i>	<i>1.3</i>	<i>0.7</i>	<i>0.4</i>	<i>0.3</i>	<i>0.2</i>	<i>0.1</i>	<i>1.0</i>
Memo items:											
Schools	2,377	2,614	3,036	3,280	3,632	4,003	4,572	4,815	4,756	4,525	3,726
	<i>37.1</i>	<i>17.5</i>	<i>13.4</i>	<i>10.7</i>	<i>9.3</i>	<i>8.2</i>	<i>7.6</i>	<i>6.5</i>	<i>4.9</i>	<i>2.4</i>	<i>6.5</i>
Highways	331	455	648	745	896	884	923	887	758	688	714
	<i>5.2</i>	<i>3.1</i>	<i>2.9</i>	<i>2.4</i>	<i>2.3</i>	<i>1.8</i>	<i>1.5</i>	<i>1.2</i>	<i>0.8</i>	<i>0.4</i>	<i>1.3</i>
Mean income	6,404	14,902	22,725	30,549	39,115	48,869	60,196	74,443	96,203	188,240	57,140
Mean household size	1.73	1.95	2.18	2.37	2.54	2.73	2.91	3.04	3.09	3.18	2.55

*Notes:* (i) Figures in italics (shaded) indicate mean public consumption as a percent of money income; (ii) “Public consumption A” refers to public consumption that is distributed equally across persons; (iii) “Public consumption B” refers to public consumption that is distributed according to household or individual characteristics. *Source:* Authors’ calculations.

**Table 7. Factors affecting the distribution of school expenditures**

Income decile	Households with children in public schools				All households	
	Mean number of children		Per-pupil expenditure		Mean number of children	
	1989	2000	1989	2000	1989	2000
Lowest	1.76	1.81	6,209	7,436	0.40	0.33
Second	1.83	1.83	6,305	7,558	0.39	0.36
Third	1.83	1.82	6,033	7,357	0.42	0.43
Fourth	1.80	1.77	6,107	7,334	0.47	0.47
Fifth	1.79	1.78	6,099	7,398	0.51	0.52
Sixth	1.73	1.78	6,067	7,319	0.55	0.58
Seventh	1.75	1.75	6,248	7,455	0.62	0.64
Eighth	1.77	1.80	6,317	7,448	0.66	0.68
Ninth	1.77	1.80	6,302	7,396	0.69	0.68
Top	1.74	1.79	6,227	7,229	0.60	0.69
<i>All</i>	<i>1.77</i>	<i>1.79</i>	<i>6,200</i>	<i>7,386</i>	<i>0.53</i>	<i>0.53</i>

Source: Authors' calculations

**Table 8: The Change in the Shares of Deciles When Wealth or Public Consumption is Added to Income, 1989 and 2000:**

<b>Shares of Deciles in Total Income, WI and PCI</b>						
<b>Decile</b>	<b>1989</b>			<b>2000</b>		
	<b>Income</b>	<b>WI</b>	<b>PCI</b>	<b>Income</b>	<b>WI</b>	<b>PCI</b>
Lowest	1.18%	1.01%	1.69%	1.19%	0.99%	1.82%
Second	2.67%	2.37%	3.22%	2.79%	2.29%	3.53%
Third	4.06%	3.60%	4.62%	4.13%	3.50%	5.01%
Fourth	5.51%	4.89%	6.10%	5.40%	4.63%	6.18%
Fifth	7.16%	6.27%	7.51%	6.85%	5.76%	7.47%
Sixth	8.82%	7.82%	9.12%	8.31%	7.01%	8.59%
Seventh	10.83%	9.63%	10.87%	9.86%	8.72%	10.18%
Eighth	13.39%	11.97%	13.20%	12.38%	10.88%	12.11%
Ninth	17.26%	16.19%	16.79%	16.19%	14.91%	15.41%
Top	29.11%	36.25%	26.89%	32.89%	41.31%	29.69%
<i>All households</i>	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Authors' calculations.

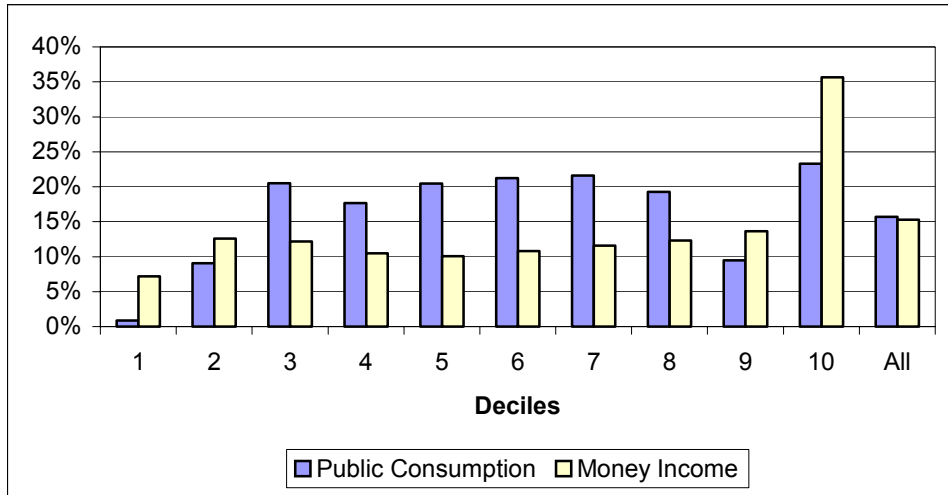
**Table 9: Money Income, Wealth Adjusted Income and Public Consumption Adjusted Income:  
Mean and Median in 1989 and 2000.**

	Median			Mean		
	1989	2000	Change	1989	2000	Change
Money Income	40,167	42,000	5%	49,570	57,140	15%
Wealth Adjusted Income (WI)	43,514	47,969	10%	61,533	75,151	22%
Public Consumption Adjusted Income (PCI)	47,265	50,904	8%	56,710	65,382	15%
<i><b>Equivalence Scale Adjusted:</b></i>						
<i>Money Income</i>	<i>53,655</i>	<i>57,095</i>	<i>6%</i>	<i>65,659</i>	<i>76,236</i>	<i>16%</i>
<i>Wealth Adjusted Income (WI)</i>	<i>58,700</i>	<i>65,086</i>	<i>11%</i>	<i>83,108</i>	<i>102,336</i>	<i>23%</i>
<i>Public Consumption Adjusted Income (PCI)</i>	<i>62,218</i>	<i>67,396</i>	<i>8%</i>	<i>73,799</i>	<i>85,597</i>	<i>16%</i>

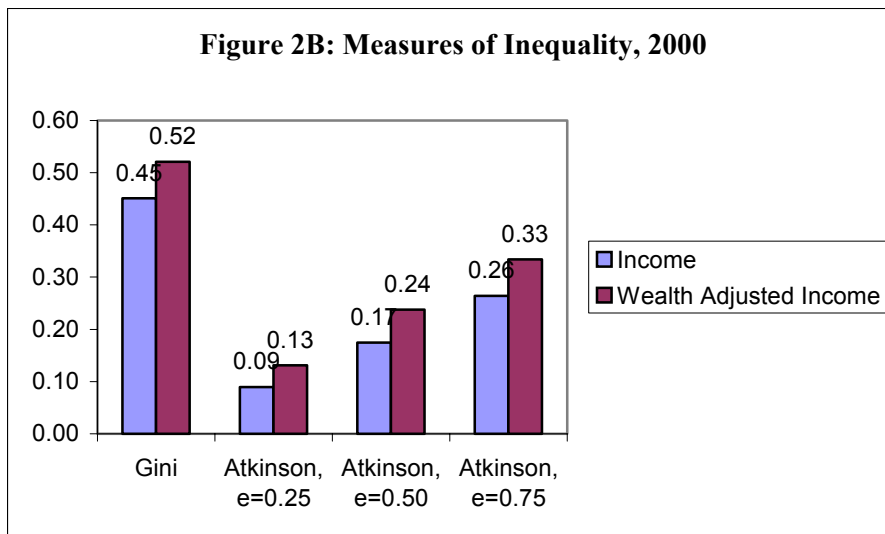
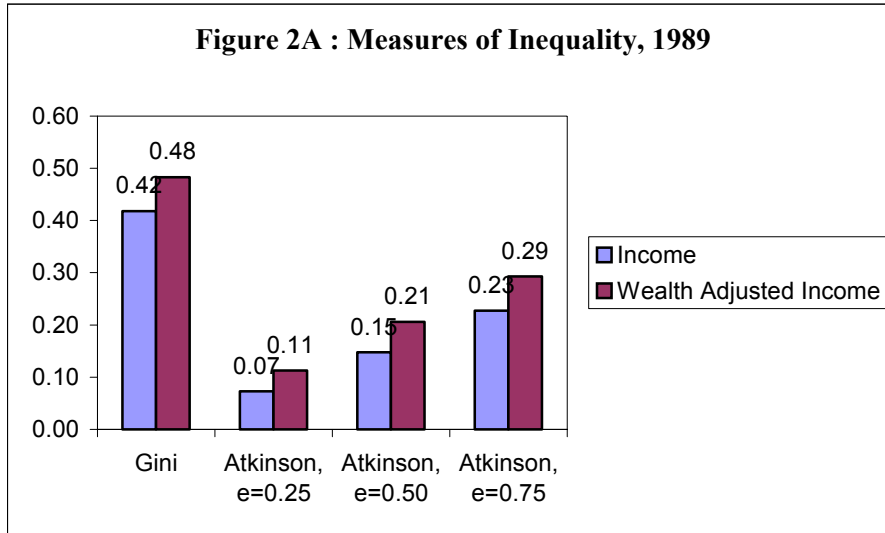
Source: Authors' calculations.

Note: WI: Wealth Adjusted Income; PCI: Public Consumption Adjusted Income

**Figure 1: Change in mean public consumption and money income by income decile, 1989-2000 (in percent)**

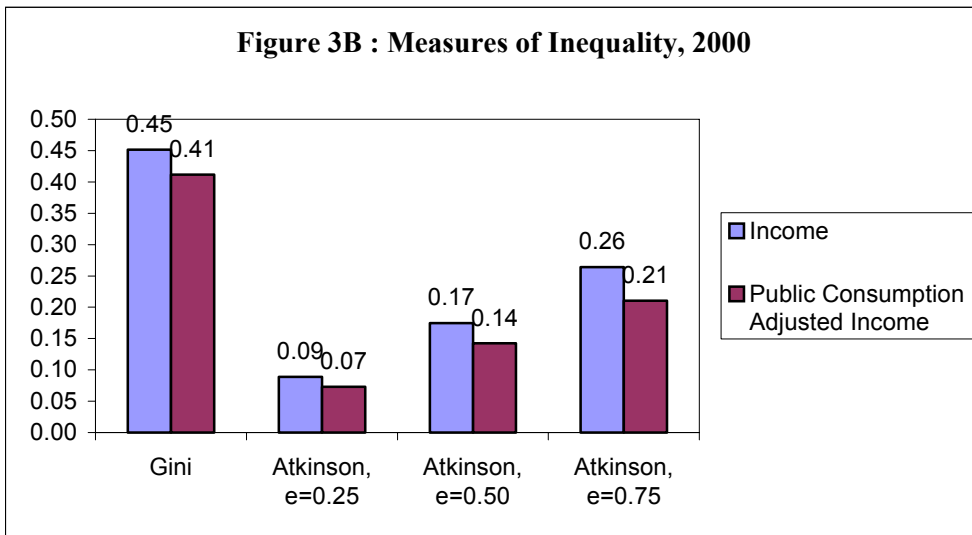
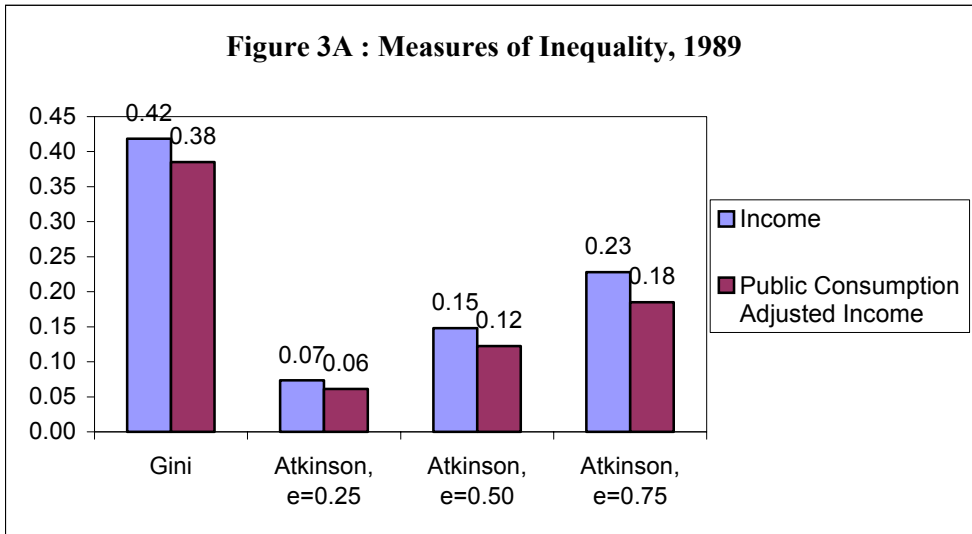


**Figures 2A-2B: The effects of adding wealth on inequality measures: 1989 and 2000.**



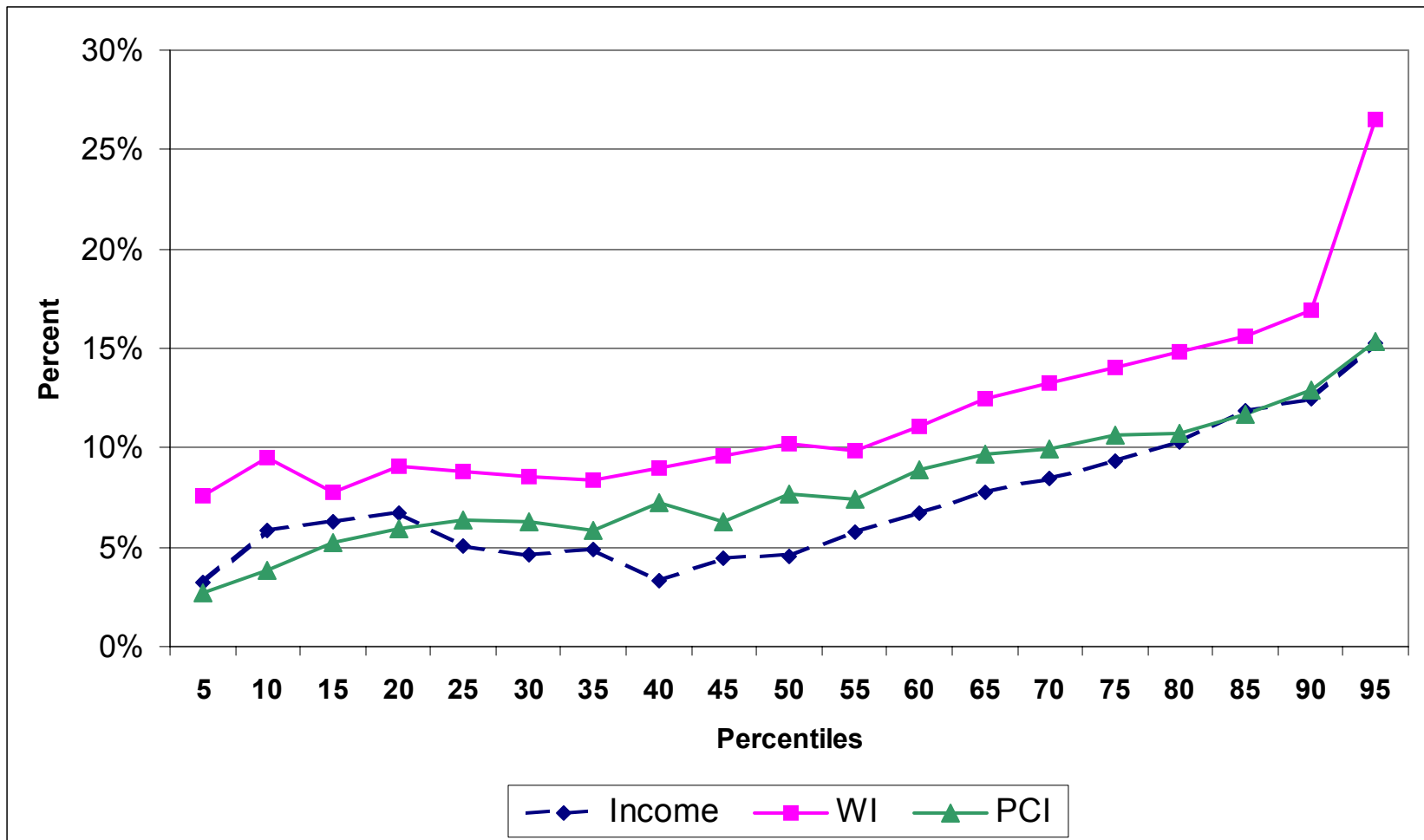
Source: Authors' calculations using SCF data matched to CPS data, 1989 and 2000.

**Figures 3A-3B: The effects of adding public consumption on inequality measures: 1989 and 2000**



Source: Authors' calculations.

**Figure 4: Percent Change in Money Income, Wealth Adjusted Income and Public Consumption Adjusted Income Deciles, from 1989 to 2000:**



## NOTES

1. Radner and Vaughan (1987) use another approach, which is to construct a two-dimensional criterion, based on both income and wealth, for classifying households into low-status, middle-status, and high-status categories.
2. This is consistent with the approach adopted in most national income accounts.
3. 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 8.21, line 172 for the estimated imputed rent.)
4. 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. Estimates are already available in the CPS for imputed return to equity in owner-occupied housing.
5. Information on remaining lifetimes comes from the tables on vital statistics. (U.S. Bureau of the Census, 2002, Table 93.)

6. Although it can be argued that our estimates are biased upwards due to inflated prices, the degree of bias is probably comparable for the chosen years due to their similar positions in economic cycle.

7. For example, in the case of highways, it is usually asserted on the assumption of perfectly competitive markets that business use of highways always translates into lower consumer prices. Similarly, it is assumed, on the basis of an explicitly or implicitly formulated liberal theory of the capitalist state, that expenditures on elected officials are ultimately incurred on behalf of all individuals.

8. The term “entities” seem preferable to agents or individuals because the constituent elements of the business and government sectors may be best understood in this manner.

9. For a discussion of the United Nations guidelines of functional classification and its comparison with the methods used in the U.S. by the U.S. Bureau of Economic Analysis, see Galbraith (2000).

10. We ignore the other two sectors in this paper.

11. If one were to consider the “benefits” of education or income security expenditures, additional considerations necessarily come into play: externalities as discussed in the usual

neoclassical fashion is the most common approach. An alternative, proposed by James O'Connor, would be to analyze these expenditures in terms of the “accumulation” and “legitimization” functions of the capitalist state (O'Connor, (1973) 2002). According to this approach, for example, a portion of expenditures on income security will have to be allocated to non-recipients also (see Peppard, 1975). However, our assumptions are regarding direct usage and cost-responsibility rather than “benefits” as discussed in the two approaches.

12. A full description of the treatment of individual government functions within the framework employed here is available upon request from the authors.

13. In this instance, the “pricing rule” is that the marginal tax rate applicable to an individual (“the price of public good”) should equal marginal benefit (utility)—assumed to be increasing with income— derived by that individual from public expenditure. This is a specific case of the general principle of “just taxation” originally proposed by Erik Lindahl in which each individual bears a tax burden that is equal to his marginal utility derived from public expenditure.

14. A full discussion of the imputation procedures is available upon request from the authors.

15. We are grateful to Thomas Hungerford for providing us with these estimates.

16. We disregard higher education expenditures here since primary and secondary school expenditures account for the bulk of total education expenditures.

17. The public-use version of the ADS did not contain a variable identifying the county of residence in 1989; a county variable is available for 2000, but only for 60 percent of household records.

18. We employed the three-parameter equivalence scale used currently in the Census Bureau's experimental poverty measures (Short, 2001, Technical Appendix (Table A-2)). For single parents, the scale is  $(A+0.8+0.5*(C-1))^{0.7}$ , while for all other households, it is  $(A+0.5*C)^{0.7}$ , where A is the number of adults and C is the number of children.