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*American Enterprise Institute for Public Policy Research*

# An Empirical Analysis of Middle Class Welfare: Testing Alternative Approaches

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# An Empirical Analysis of Middle Class Welfare: Testing Alternative Approaches

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## *Abstract*

Every year the Census Bureau reports data on income inequality and poverty, based on income estimates derived from the Current Population Survey. Our analysis suggests that the data may not be presenting an accurate picture. By under-reporting incomes, leaving out certain sources of income, and not making equivalence adjustments that are now standard among researchers, the reports present an imperfect picture of overall welfare. We develop an alternative that relies on data from the National Income and Product Accounts. Our data reveal that real median incomes have been increasing in the recent period, albeit at a slower rate than the long-term average. Using the same methodology for consumption, we find that consumption for all income groups, including the middle, has been growing robustly in recent times. This is in contrast to statistics reported by the Consumer Expenditure Survey, the most often cited data for all consumption analysis, which show middle class consumption declining.

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## 1. Introduction

The August 2006 release of the Census Report on Income, Poverty and Health contained surprising news about income growth.<sup>3</sup> While median household income increased in nominal terms, real incomes showed virtually no increase between 2001-2004 (Figure 1). This was consistent with a picture that has recently emerged from data compiled by the Bureau of Labor Statistics that showed that real average hourly earnings for production workers have stagnated since 1973, and the income share for the middle income group has declined between 2000 and 2005. This has fueled the notion of a middle class “squeeze”, the idea that households in the middle income group today face declining standards of living as a result of being ‘squeezed’ between rising costs and low incomes. This notion of a squeeze has received considerably attention in policy circles.<sup>4</sup>

There are many reasons why a change in the distribution of wage or income gains might have occurred over time. Katz and Krueger (1997) examine the effect of technological change on the relative demand for skilled workers and the recent growth of U.S wage differentials. They conclude that the spread of computer technology may explain as much as 30 to 50 percent of the demand for skilled workers since 1970. Dew-Becker and Gordon (2005) suggest a role for de-unionization, immigration and free trade, combined with pure rents earned by the top 1 percent of the distribution, as alternative explanations for widening income inequality. Blank (1991) and Cutler and Katz (1991) find that family composition changes may have played a small part in

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<sup>3</sup> <http://www.census.gov/prod/2006pubs/p60-231.pdf>

<sup>4</sup> (a) “The Middle Class Squeeze” U.S. House of Representatives report by Henry Waxman (September 2006) <http://www.democrats.reform.house.gov/Documents/20060921125958-34269.pdf> (b) “An Ever Increasing Divide”, by Douglas, D. and Sayeed, A. (September 2006), Center for American Progress (3) “A Tough Recovery By Any Measure”, Bernstein, J. and Furman, J., Economic Policy Institute (November 2006) <http://www.epinet.org/content.cfm?id=2553>

explaining the trend toward greater inequality in the period after 1979. Burtless (1991) finds a role for employment and hours worked by working age males.

Most, if not all of these papers, use data that from the Current Population Survey to measure changes in the wage distribution. However, it is seldom if ever remarked upon in the previous literature, but these data suggest that a similar picture of real income stagnation or decline held not just for the middle, but for *all* income quintiles, including the top income quintile over the same period. Census data showed that real incomes (in constant 2005 dollars) for the top income group declined from 161,272 to 159,583 over the period 2000-2005.<sup>5</sup> The average annual growth rate was negative 0.2 percent, and this is true for the period 2001-2005 as well.<sup>6</sup>

This suggests that the popular story regarding the changing nature of the economy may be the result of selective data analysis. Most importantly, the picture that every quintile's welfare is declining seems inconsistent with National Income and Product Accounts data (NIPA, available from the Bureau of Economic Analysis), which show that between 2000-2005, real personal incomes increased by 7.2 percent.<sup>7</sup> If all of the income quintiles, as per the Current Population Survey (CPS) data, show a decline in real incomes over this period, where did this increase in personal incomes go?

In this paper, we seek to track down this "missing income," to allocate it amongst different income groups, and evaluate the economic significance of any disparities that emerge. The approach of this paper is two-fold. First, we derive an independent estimate of middle class incomes and income growth rates, by combining the CPS data with NIPA data from the Bureau

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<sup>5</sup> <http://www.census.gov/hhes/www/income/histinc/h03ar.html>

<sup>6</sup> These are based on authors' calculations, using published Census data. See Table 3B.

<sup>7</sup> Population growth over this period was 5 percent, so even if we look at averages, there was a real increase in incomes.

of Economic Analysis. Second, we apply the same methodology to the consumption data, combining the CE data with consumption estimates from NIPA to get an objective, consumption based measure of welfare. On both counts, it appears that the middle class is not doing as badly as it is generally perceived to be doing.

We proceed as follows. In section II, we assess the reliability of the CPS data on the basis of which income distribution and income inequality measures are derived. Different subsections are devoted to developing an alternative income measure that uses income data from NIPA and assigns it across income quintiles using CPS income shares. This approach provides us new perspective on middle class welfare. In Section III, we approach the welfare issue by using a consumption rather than an income based measure. We use the same methodology as for income, and results show robust consumption growth for the middle class, even in the current period of economic recovery. Section IV concludes. The Appendix includes a discussion of our methodology. We have also included a separate section which addresses the sensitivity of our results to changes in underlying assumptions.

## **II. An Income Based Measure of Welfare**

The most obvious measure of household welfare is income. High and increasing incomes naturally imply that households are able to meet their needs and wants and maintain or improve their standard of living. That is the reason reports about declining median incomes generate so much interest and debate. But in recent times, doubts have been raised about the reliability of the income data which the Census produces as a good measure of welfare. For instance, in the literature on income inequality and poverty, researchers have for some time now been arguing for a more comprehensive measure of income that includes taxes and transfers (see Besharov

(2004) for a summary). In response, the Census Bureau in 1995 introduced a new series titled “Experimental Measures of Income and Poverty”, which adjusts money income by including certain cash transfers and deducting taxes.<sup>8</sup> However, these measures have yet to receive currency and are hardly the focus of debates. In this section, we spell out some of the problems present in the CPS money income measure, and suggest an alternative approach to estimating the share of income accruing to different income groups.<sup>9</sup>

## **II.A. Reliability of the CPS Data**

Most of the debate about the shrinking middle class is based on reports showing that real incomes have declined, stagnated or not increased for an average family or a typical worker since 2001. How reliable is the data on which all of this analysis is based? The Current Population Survey (CPS) is the dataset on the basis of which the Census derives its estimates of income, poverty and health insurance. The CPS data show that real family incomes have been declining for all income groups for the period 2000-2005. However, the NIPA data show personal incomes increasing over this period. What could account for this difference?

Numerous researchers have noted that the CPS suffers from problems of under-reporting and inadequate measurement of incomes that should make us cautious about using the data to make these judgments (see Weinberg (2006) for a summary). For instance, according to a Bureau of Economic Analysis report cited in Weinberg (2006), personal income in the U.S. was 8.7 trillion dollars in 2001, whereas the CPS money income was estimated at 6.4 trillion dollars.

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<sup>8</sup> <http://www.census.gov/hhes/www/income/histinc/incexper.html>. The tables are restrictive in that they use Census defined measures of after-tax or transfer income, and cannot be altered to reflect the researchers choice of income measure.

<sup>9</sup> The list of items included in the Census money income measure is available from the Census Report on Income, Poverty and Health (2005). <http://www.census.gov/prod/2006pubs/p60-231.pdf>

Figure 2 shows that this divergence in the estimate of income obtained from the CPS and the NIPA has tended to increase over time.

These problems arise because the CPS is a household level dataset, relying on respondent recall to gather information on demographic characteristics, employment, and income. To the extent that household members are unable to provide accurate information about these subjects, the CPS estimates are subject to large measurement errors. This is in fact true of most household surveys, as we will discuss for the Consumer Expenditure Survey later. These discrepancies show up when we compare the income estimates derived from the survey to independent estimates, such as NIPA which rely on company records and IRS tax records and are less subject to such error. The CPS does a poor job of measuring certain incomes such as worker compensation, social security incomes, unemployment compensation etc.<sup>10</sup> The definition of money income excludes income from certain sources. The largest missing component is employer contributions to health benefits and pensions, which the Bureau of Labor Statistics (BLS) reports, today forms nearly 30 percent of overall worker compensation.<sup>11</sup> These sources of income are likely to be important for middle income groups who rely more on incomes from work. This definition of income also excludes a lot of non-cash transfers to individuals, such as food stamps, value of housing subsidies, Medicaid and Medicare, which are likely to be important for the lower income groups.

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<sup>10</sup> <http://www.census.gov/dusd/MAB/wp215.pdf>

<sup>11</sup> It is unclear whether medical benefits are poorly estimated or are not included at all in worker compensation in the CPS data. The CPS questionnaire does not specifically ask about employer contributions towards health insurance. [www.bls.gov](http://www.bls.gov), National Compensation Survey data



To the extent that income is under-reported or not measured at all, our estimates of mean income levels for each income group are likely to be understated as well. Hence correcting problems with the CPS data is important to get at the true picture.<sup>12</sup>

## **II.B. An Alternative Measure Of Income**

In this section, we introduce a new approach to calculate the share of income accruing to households at different income levels.

### **II.B.1. Data and Methodology**

The income shares in the CPS data are calculated as the share of aggregate incomes accruing to different percentiles (quintiles) of households. These data are available from published tables provided by the Census Bureau, from which we reproduce the share of income accruing to the middle income quintile in Table 1. The CPS share data show relatively little variation. Over the entire period, the share of the middle has declined from approximately 16 percent to approximately 15 percent. The average for the median quintile is about 15.67 percent, with a standard deviation of 0.78.

We applied these shares to aggregate (real) personal incomes derived from NIPA.<sup>13</sup> (Throughout our analysis, we use fourth quarter NIPA numbers to ensure that the growth rates coincide with the calendar year. However, it makes little difference to the analysis whether we use annual averages or fourth quarter numbers. We also adhere to the labeling convention that applies when fourth quarter numbers are used.) This gave us the total income in each quintile. To

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<sup>12</sup> For our analysis, we will be using the March Supplement of the CPS survey, also called the Annual Social and Economic Supplement.

<sup>13</sup> Note that the definitions of personal income under NIPA and Money Income under CPS are not identical. NIPA includes some items such as employer contributions to pensions and medical plans, imputed interest etc, which the CPS measure does not.

get the average income for each quintile, we then divided this by the fraction of the population in each quintile. This required us to account for household size differences across quintiles in each year using household equivalence scales. This is important since household sizes vary across quintiles, and so we should account for the fact that the same income would be shared by a larger number of people in the high income groups (Table 2). The results presented here are obtained by using an equivalence measure that divides income by the average household size for that quintile. However, the literature also suggests an alternative equivalence scale which involves dividing by the square root of household size to account for economies of scale in living arrangements (Cutler and Katz (1992), Auerbach and Hassett (2002)). Results with this measure are available in a separate section at the end of the paper.

There are advantages and disadvantages to our approach that may introduce a certain kind of bias. To the extent that aggregate incomes are under-reported in the CPS, using NIPA accounts for the “missing income”. However, in applying CPS income shares to the NIPA number, we need to be cautious on two points. One, NIPA income includes certain incomes such as employer contributions to medical plans and pensions, imputed interest etc, which are not part of CPS money income. Second, if there is systematic under-reporting of CPS income specific to certain income groups, this may get reflected in the income share data and affect our analysis. From a review of the literature (Weinberg, 2006), the big difference seems to be in employer contributions for medical benefits and pensions and the fact that the money income measure does not take account of transfers to the poor, such as housing subsidies, Medicaid etc. This suggests that we are likely to ascribe lower income shares to the poor and middle classes. If anything, our results therefore understate incomes for these classes, and possibly understate growth as well,

since employee medical benefits and government transfers to the poor have been increasing over time.<sup>14</sup>

## **II.B.2. Results**

Figure 3 shows trends in per capita income over the period 1984-2005 for each quintile. These estimates provide a very different picture than the CPS data would suggest. Even though income growth rates have fluctuated a lot over this entire period, sometimes dipping below zero, the long-term growth numbers show strong positive growth for all income groups. This includes the post-recession period of 2001. In fact, perhaps surprisingly, the bottom income quintile shows even stronger growth than the middle over the entire period, boosted by a period of high growth in the late 1980s. These high numbers are also partly attributable to the household equivalence adjustment, and the numbers are lower if we divide by the square root of household size. However, the overall picture is still positive.

How is the middle class doing? Our results suggest that over the period 1984-2005, median real incomes (per capita) grew by nearly 23 percent, with an annualized growth rate of close to 1 percent per annum. Dividing up the period into five year growth averages (Table 3A), over the period 1985-1989, incomes grew annually at 1.7 percent, then declined dramatically to negative 0.5 over the period 1990-1994. Over the period 1995-1999, they grew at 2.6 percent and between 2000-2005 at 0.3 percent. Thus the income growth numbers show significant fluctuation.

In the post-recession period, it appears that all income quintiles have experienced lower than average growth rates. Between 2000-2005, the growth rate declined tremendously for all income groups. Growth in the top quintile declined from 2.8 percent in the previous period to 1.0

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<sup>14</sup> National Compensation Survey data, [www.bls.gov](http://www.bls.gov)

in the current, and in the second highest quintile from 2.5 to 0.5 percent during the same period. Trends in the middle quintile mirror trends in the top two quintiles across these years.<sup>15</sup> Despite the weakened growth, incomes are still growing positively.

Comparing these numbers to the growth numbers for household income derived from the CPS (Table 3B), the annualized growth rate over the period 2001-2005 was -0.4 for the middle and -0.3 percent for the top quintile. (We compare with household incomes since the Census does not publish an estimate of income per capita for each quintile. Also, this is the relevant comparison period for the CPS data since it takes 2001 as the base year, which is the base year for our period as well). Thus according to the published Census data, real household incomes actually declined during the period of economic recovery for almost all quintiles.<sup>16</sup> However, the NIPA data do not support this conclusion.<sup>17</sup> According to the NIPA data, incomes are growing, albeit at slower rates of growth than the long-term averages for each quintile.

## **II.C. Summary**

The two income measures therefore present two completely different pictures. Looking solely at the CPS data, we would conclude that the average household is much worse off today than in the 1990s. With real incomes declining, and the recent steep increase in costs of living, we would naturally be forced to conclude that the middle is being squeezed from both sides. However, if we look at income growth using this alternative measure, the picture looks more

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<sup>15</sup> All of the NIPA calculations are based on quarterly NIPA data, and the growth rates reflect the relevant calendar year with Q4 of the previous year as the beginning-of-period value. So, for example, the growth rate for 1985 is calculated comparing 1984 Q4 to 1985 Q4.

<sup>16</sup> We believe that our per capita measure is a better measure of welfare, since using family as the unit to define incomes leaves ambiguous how many people there are in each unit and therefore how many people that income level supports.

<sup>17</sup> We would have liked to do further analysis with the wage and salary component of income. However, the Census does not publish data on the distribution of wage and salary income by quintiles. The alternative is to use the microdata files, but they are subject to topcoding i.e wages above a certain income level are not reported, but are replaced by the average of all values above the topcoded amount. This biases analyses of the relative shares of this income for each quintile, and the extent of bias is unclear since there is no published data to compare with.

promising. Income growth rates are lower than the long-term average, but incomes are still growing. That too, in real terms, after accounting for price increases. In fact, if we focus on the period since the recession of 2001, incomes have been increasing at a rate close to the long-term average of 1 percent per annum, similar to income growth rates for the highest income quintile.

### **III. A Consumption Based Measure**

It has long been recognized that consumption may be as good, or a better measure of welfare, than income. Rational economic agents tend to base consumption on expected lifetime incomes, rather than current incomes. This is evident in the data. For instance, Cutler and Katz (1992) document changes in consumption and income shares by quintile since the 1960s, using data from the CPS and the CE. They find that the consumption distribution is substantially more equal than the income distribution in every year, exactly as is predicted by the permanent income hypothesis. Similarly, Krueger and Perri (2002) using data from the CE, conclude that rising income inequality has not been accompanied by a corresponding rise in consumption inequality. This is possible because households are able to smooth consumption against idiosyncratic income fluctuations, by either dis-saving or accessing the credit market. To the extent that households are able to do so, income fluctuations do not substantially impact household welfare. Hence as a logical next step, we approach the issue of middle class welfare from the perspective of consumption, rather than income.

The latest report from the Bureau of Labor Statistics released in November 2006 showed that ‘consumer units’ in the middle quintile consumed \$39,098 of goods (in real terms) in 2005, a decline over the estimated consumption of \$39,353 in 2000. A measure often used to assess the *relative* well-being of the middle class is their share of aggregate consumption. In 2005, the share of the middle quintile in aggregate consumption was 16.80 percent, which was a drop of

0.2 percentage points from the previous year. At the same time, the share of the top income group went up by 0.4 percentage points. This has increased the perception that the middle class today is worse off than previously. All of these statistics rely on the Consumer Expenditure Survey data produced by the BLS. In this section, we discuss the pros and cons of working with the CE data and then assess it against independent consumption estimates derived from NIPA. Dissatisfaction with the CE data then encourages us to develop an alternative measure of consumption shares accruing to each income quintile, using a similar methodology as described for income.

### **III.A. Reliability of the CE data**

The best source for household consumption data is the Consumer Expenditure Survey (CE), published by the Bureau of Labor Statistics.<sup>18</sup> These data provide information on the buying habits of American consumers, such as their expenditures on food, housing, transportation, health care etc. How reliable is this data when compared with independent or alternative measures of consumption?

Perhaps not surprisingly, the CE data grossly understate aggregate consumption (see Figure 4). For instance, in 2005, the aggregate consumption reported by the survey was about 6 trillion dollars, whereas using another source, such as the Personal Consumption Expenditures (PCE) data from the National Income and Product Accounts (NIPA), aggregate consumption was closer to 9 trillion dollars. In fact, these divergences have tended to increase over time, suggesting that the CE data are not a reliable measure of aggregate consumption.

These problems are partly a consequence of the fact that, like any other household survey, the CE data relies on recall by respondents of their consumption expenditures over the

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<sup>18</sup> <http://www.bls.gov/cex/>

previous few months. Some authors, such as Branch (1994) and Betson (1997), have noted that that the CE averaged about 84 percent of aggregate spending on food, clothing, shelter and utilities in the PCE over the period 1989-1992 and about three-fourths of out-of-pocket medical expenditures in 1987, respectively. Further, as Meyer and Sullivan (2004) point out, the CE data do not provide information on housing subsidies and in-kind transfers, which are likely to be important consumption items for low-income families. Moreover, the CE sample is subject to high attrition rates and may not be truly representative of the population.

### **III.B. An Alternative Measure of Consumption**

In this section, we propose and develop an independent measure of consumption, which combines the CE consumption shares for each income quintile, with the NIPA Personal Consumption Expenditures (PCE) data, available from the Bureau of Economic Analysis. NIPA's PCE is based on reports from retailers and presents a truer picture of consumption than the CE data.

#### **III.B.I. Data and Methodology**

We first derived the entire series of consumption shares for all quintiles from 1984 onwards. A look at the data reveals that consumption shares for all quintiles have remained surprisingly steady.

We present shares for the middle quintile in Table 4. The mean share for the third quintile for the period 1984-2005 was 17.18, and the standard deviation (fluctuation around the mean) was only 0.002. The largest year-on-year decline in shares took place between 1992 and 1993 by about 0.5 percentage points, which may have been a consequence of the recession. Doing this for each quintile, we find that the shares tend to be stable around the mean, with a minimal tendency

to deviate. Thus not too much can be made of changes in relative shares across years as the changes are marginal. The relative distribution within a year, however, is significantly different and perhaps more indicative of consumption expenditures across quintiles.

Our methodology involved applying the CE shares to the NIPA measure of aggregate consumption to get the distribution of consumption across income groups.<sup>19</sup> To get average per capita consumption in each quintile, we then divided the total consumption in each quintile by its share of the population using the equivalence scale adjustments described earlier. Note that, once again, we use NIPA fourth quarter data and the labeling convention applies. Further details are provided in the Appendix.

Per-capita consumption is a better measure of welfare than say averaging over ‘consumer units’, as the CE data does, since consumer units could include households with 5 people or 1, and we want to be sure that consumption is scaled to some extent by the size of the household. Averaging also creates problems when the average size of a consumer unit is not the same across income groups. The CE data reveal that the average number of persons in a consumer group tends to differ across income categories (Table 5). For instance, it is larger for the higher income groups and smaller for the low income groups. Therefore, we adjust the average consumption in each quintile to account for consumer unit size effects. This adjustment may be too large if some consumption at the household level can be considered joint. Therefore, we again tried an alternative adjustment based on the square root of family size. Results with this approach are shown in a separate section at the end of the paper.

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<sup>19</sup> The CE data present end of year average consumption shares, in the sense that they represent the aggregate consumption for an average consumer unit during the year, rather than the average during any particular month of the year. However, whether we treat them as annual averages or end of period averages should not make much difference to our calculations, since the BLS does not publish quarterly data and so the shares can be assumed to apply to each quarter as well.



### **III.B.2. Results**

How do these shares translate to changes in real consumption? To study long term trends in middle class well-being, we derived real (constant 2005 dollar) consumption averages from 1984-2005. In 1984, average per capita consumption for the third quintile stood at \$17,129.60. By 2005, it had increased to \$25,391.66, an increase of nearly 48 percent in 21 years. The compounded annual growth rate for this entire period was about 1.9 percent. Figure 5 shows trends in consumption per capita over the period 1984-2005 for all income quintiles, including the middle.

We further disaggregated this growth rate into five year periods starting in 1984, i.e. we calculated the average annual growth rate for the five year period 1985-1989, taking Q4 of 1984 consumption as the base. Our results, shown in Table 6A, indicate that consumption grew fastest in the 1980s and early 1990s at 2.1 percent. The growth rate declined in the period 1995-1999, to less than 1.5 percent, but has increased since then, reaching 1.83 percent between 2000-2005 and 1.6 percent in the period of economic recovery. Thus unlike incomes, which have fluctuated widely over this long time period, consumption has grown relatively steadily. This belies the notion that the current episode is somehow different.

Some authors have focused solely on the period of economic recovery, starting in 2001. Our data suggest that real consumption increased from \$23,854.30 in 2001 to about \$25,391.66 in 2005 in per capita terms for the middle income quintile. This represents an increase of about 6.4 percent between 2001-2005. The average annual growth rate of consumption over this period of recovery has been 1.57 percent. This is weaker than the long-term average of 1.89 percent, by about 0.3 percentage points. Hence a general conclusion to be drawn from the data is that consumers in the middle income levels have been affected to some degree by the economic

downturn in 2001 and other economic imbalances since then. But despite that, consumption is still up.

A look at the CE data for the similar period would however, lead us to conclude exactly the opposite. Table 6B tabulates average annual growth rates for all quintiles for the period 2001-2005. All income groups, except the top 40 percent, seem to be worse off today compared to 2001. Not only is consumption growth weak for the middle quintile, it's actually negative. This is most likely a data issue. As the aggregate trend shows, the divergence between NIPA consumption and the CE measure has increased over time. In fact, the CE measure shows very little increase in total consumption over this period. Therefore, when we derive averages (over consumer units) for different quintiles, we get even flatter curves showing little or no movement over time.

### **III.B.3. Summary**

While the CE data paint a gloomy picture of middle class welfare, our measure using NIPA arrives at a very different conclusion: Middle class consumption is growing strongly, and is in line with long-term trends.

## **III.C. Disaggregated Consumption**

In this subsection, we explore the variation in disaggregated consumption across quintiles.

### **III.C.1. CE Data**

The CE data provide a breakdown of consumption expenditures by different categories. While the broad categories include Food, Housing, Transportation, Health Care etc, there are sub-categories that we can classify as choice-based consumption, such as Food Away from Home (rather than at home), Entertainment, and the choice of buying a home rather than

renting.<sup>20</sup> Figure 6 shows average annual growth rates of consumption of these products for different income quintiles. Note that these data are in real terms, and each product is deflated using its own specific deflator.<sup>21</sup>

The data show that the middle classes are continuing to consume more of owned dwellings and housing, healthcare and education. They are consuming more “Food Away from Home”, though they are consuming less food in aggregate, less entertainment and buying fewer cars, possibly a consequence of high gas prices and the fact that incomes were hit hard by the 2001 recession.

### III.C.2. CPS Data

To some extent, it is also possible to use the CPS data to analyze consumption choices, especially those related to housing and health insurance. First, we disaggregate households into different income deciles.<sup>22</sup> The mid-range of this distribution i.e. households in the fifth and sixth decile would be considered the middle income group. We focus our analysis on the period of economic recovery 2001-2005. The data are shown in Table 7.

The first variable we look at is home ownership. If we care about *relative* welfare of the middle class vis-à-vis the other income classes, we need to look at the share of home-owning middle class households as a fraction of all home-owning households. The share of the fifth decile increased from 9.4 to 9.7 percent over the period 2001-2005, while the share of the sixth decile increased from 10.3 to 10.4 percent over this period. Thus the middle class increased its relative home ownership rate over this period.

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<sup>20</sup> The category for home ownership is “Owned Dwellings”, *Owned dwellings* includes interest on mortgages, interest on home equity loans and lines of credit, property taxes and insurance, refinancing and prepayment charges, ground rent, expenses for property management and security, homeowners’ insurance, fire insurance and extended coverage, expenses for repairs and maintenance contracted out, and expenses of materials for owner-performed repairs and maintenance for dwellings used or maintained by the consumer unit.

<sup>21</sup> Each item was deflated using its own price deflator. The data is available at:  
[http://www.econstats.com/nipa/NIPA2u\\_2\\_3\\_4U\\_.htm](http://www.econstats.com/nipa/NIPA2u_2_3_4U_.htm)

<sup>22</sup> A decile is a tenth of the population.

If we look at the data in absolute terms, we need to see what fraction of all middle income households owned a home (as opposed to renting one). Within the fifth decile, the proportion of households reporting home ownership increased from 64.3 percent to 66.5 percent over the period 2001-2005. Similarly the proportion of households in the sixth decile reporting home ownership increased from 70.3 percent to 71.2 percent over this period. Thus households are unambiguously better off in terms of their consumption of housing. (These data are not shown in Table 7, but are available on request.)

With health insurance, the picture is mixed. The CPS survey differentiates between households reporting all members with health insurance and some members with health insurance. In relative terms, the share of middle class households in all households with complete health insurance stayed the same for the sixth decile, but declined by 0.1 percentage point for the fifth decile. This is obviously not a significant drop. In absolute terms, however, the proportion of middle income households reporting all members with health insurance has declined from about 80 percent to 77 percent while the number of households reporting some members with insurance has gone up from 14 to 16 percent. The explanation for why the relative picture does not look as bad is that all income classes, including those in the top two deciles, have reported losses in health insurance coverage.<sup>23</sup> Thus economy-wide increases in health insurance costs have affected not only the middle income groups, but also the high income groups proportionately.<sup>24</sup>

### **III.C.3. Summary**

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<sup>23</sup> Another way of thinking about this is that if the middle class were hit especially hard by rising health care costs, the proportion of people who lost health insurance should have been significantly higher for this group, compared to the higher income groups. This would then mean much larger declines in the share of this group in all households with health insurance.

<sup>24</sup> For the high income groups, the share in absolute terms declined from 88 percent to 86.7 percent.

The consumption data paint an even brighter picture than the income data, as we may expect if we think households are able to smooth through bad times.

#### **IV. Conclusion**

Every year the Census Bureau reports data on income inequality and poverty, based on income estimates derived from the Current Population Survey. These reports have stirred debate on the issue of poor and middle class well-being. Our data reveal that real median incomes have been increasing in the recent period, albeit at a slower rate than the long-term average. This is in keeping with the general picture on income volatility, where periods of high growth are interspersed with periods of low growth.

Approaching the issue from the perspective of consumption, we are forced to confront the same set of problems with the CE data. The household data under-reports consumption and suggests that median household consumption has been declining as well in recent times. This is inconsistent with patterns drawn from the NIPA data. Consumption for all income groups, including the middle, has been growing robustly in recent times. Even in the post-recession period since 2001, the middle has been consuming more of housing, health care and education, the very things we are most afraid are increasingly becoming out of reach for this group.

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## Appendix

### A.1. Methodology and Sources for Computing Consumption (Income) Growth by Quintile

Data excerpt from years 2000-2005 to demonstrate our calculations

#	Series Name <small>Source _#</small>	2000	2001	2002	2003	2004	2005
1	<a href="#">NIPA Aggregate Personal Income (API), billions of nominal \$</a> <sup>1</sup>	8,566	8,755	8,926	9,341	10,019	10,484
2	CPI-U-RS: U.S. city average, All items <sup>2</sup>	250.8	257.8	261.9	267.9	275.1	284.3
3	<a href="#">Population</a> , millions <sup>3</sup>	284	287	290	293	295	298
4	Census Income Share for the 3 <sup>rd</sup> Quintile <sup>4</sup>	14.8%	14.6%	14.8%	14.8%	14.7%	14.6%
5	NIPA API deflated by CPI-U-RS Index, billions of constant 2005 \$	9,710	9,655	9,689	9,913	10,354	10,484
6	Aggregate Income Share for the 3 <sup>rd</sup> Quintile, billions of Constant 2005 \$ (see a)	1,437	1,410	1,434	1,467	1,522	1,531
7	Average Household Size <small>Source</small>	2.6	2.6	2.6	2.6	2.6	2.6
8	Population Proportion for the 3 <sup>rd</sup> Quintile, percentage (see b)	20.63%	20.47%	20.47%	20.47%	20.47%	20.63%
9	Per Capita Income for 3 <sup>rd</sup> Quintile adjusted for household size, constant 2005 \$ (see c)	24,509	23,990	24,168	24,491	25,168	24,874

Note: numbers may not add up exactly due to rounding off.

#### 1. Calculations Used to Derive the Series:

a. Aggregate income share for 3<sup>rd</sup>, or any other, quintile in billions of constant 2005 \$ (#6):

$$AS_x^{3rd} = CIX_x^{3rd} * PI_x^{2005\_USD}$$

where:  $CIX_x^{3rd}$  = (#4) percentage share of total for 3<sup>rd</sup> quintile, %

$PI_x^{2005\_USD}$  = (#5) aggregate personal income in billions of constant 2005 \$

b. Proportion of population (PP) in the 3<sup>rd</sup> quintile (#8) is equal to:

$$PP = \frac{AHHS\_3rd * HHs}{HHs * (AHHS\_1st + AHHS\_2nd + AHHS\_3rd + AHHS\_4th + AHHS\_5th)}$$

where AHHS is average household size and HHs is number of households in each quintile

c. Per capita income for 3<sup>rd</sup>, or any other, quintile (#9):

$$PCI_x^{2005\_USD} = \frac{AS_x^{3rd}}{PP * Pop_x}$$

where  $Pop_x$  = aggregate national population in year x (line 3)

PP is 3<sup>rd</sup> quintile's population share

**2. Calculating Compounded Growth in Per Capita Income for 3<sup>rd</sup> Quintile (e.g.: Years 2000 through 2005).** Using real per capita income (PCI):

$$G = \left( \frac{PCI - 2005}{PCI - 2000} \right)^{\frac{1}{5}} - 1 = \left( \frac{24,874}{24,509} \right)^{\frac{1}{5}} - 1 = 0.30\%$$

Sources:

1. Bureau of Economic Analysis, National Income and Product Accounts, Table 2.1. Personal Income and Its Disposition, Line 1 (Fourth Quarter Rates), <http://bea.gov/> .
2. Bureau of Labor Statistics, Consumer Price Index Research Series Using Current Methods (CPI-U-RS). (U.S. city average, All items, December 1977=100); <http://www.bls.gov/cpi/cpiurstx.htm>
3. International Finance Statistics.
4. U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplements. (Percent of Households, All Races).



Table 1: Middle Quintile Share in Income: CPS, 1984-2005

Years	Income Share
1984	16.3
1985	16.2
1986	16.2
1987	16.1
1988	16
1989	15.8
1990	15.9
1991	15.9
1992	15.8
1993	15.1
1994	15
1995	15.2
1996	15.1
1997	15
1998	15
1999	14.9
2000	14.8
2001	14.6
2002	14.8
2003	14.8
2004	14.7
2005	14.6
Mean	15.67
Std. Dev	0.78

*Source: <http://www.census.gov/hhes/www/income/histinc/h02ar.html>*

Table 2: Adjustment for Size of Sampled Unit

Average Number of Persons in Household (CPS): Selected Years

	1999	2000	2001	2002	2003	2004	2005
Lowest	1.9	1.8	1.8	1.8	1.8	1.8	1.8
Second	2.3	2.2	2.3	2.3	2.3	2.2	2.2
Third	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Fourth	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Highest	3.1	3.1	3.1	3.1	3.1	3.2	3.1

*Note: These data were tabulated from the Public Use Microdata files and other sources, since they are not available on the Census website.*

Table 3A: Annual Growth Rates of Income (Per Capita) Using Authors' Methodology

Quintiles	2002-2005	2001-2005	2000-2005	1995-1999	1990-1994	1985-1989	1985-2005
Lowest	0.18	-0.57	0.58	3.03	-0.82	1.55	1.05
Second	1.74	-0.12	0.81	1.97	-0.02	1.58	1.07
Third	0.91	0.30	0.30	2.61	-0.51	1.68	0.98
Fourth	0.91	0.57	0.49	2.49	0.10	1.74	1.17
Highest	1.06	0.81	0.97	2.75	2.26	2.26	2.01

*Notes:*

1. For every growth calculation, we take the fourth quarter NIPA number as the base. For example, for 2001-2005, the 2000 fourth quarter NIPA personal income is used as the base for calculation. We label this as growth over the period 2001-2005.
2. For the years 1984 and 1986-1989, we assume the household size of 1985. For the year 1991, we assume the household size of 1990. Data for these years were unavailable from the Census public use microdata files and other sources.

Table 3B: Annual Income Growth Rates, Current Population Survey

Quintiles	1999-2005	2000-2005	2001-2005
Lowest	-1.43%	-1.54%	-1.19%
Second	-0.69%	-0.99%	-0.66%
Third	-0.51%	-0.67%	-0.38%
Fourth	-0.33%	-0.43%	-0.30%
Highest	0.12%	-0.21%	-0.30%

*Notes:*

1. Based on authors' calculations using published data on real household incomes  
<http://www.census.gov/hhes/www/income/histinc/h03ar.html>
2. The growth over any period, say 2001-2005 is calculated taking average annual 2001 consumption as the base.

Table 4: Middle Quintile Share in Consumption, CE: 1984-2005

Years	Consumption Shares
1984	17.25
1985	16.98
1986	17.26
1987	17.52
1988	17.66
1989	17.28
1990	16.97
1991	17.18
1992	17.41
1993	16.93
1994	17.41
1995	17.34
1996	17.08
1997	17.40
1998	16.85
1999	16.87
2000	17.25
2001	17.23
2002	17.33
2003	16.94
2004	17.04
2005	16.80
Mean	17.18
Std. Dev	0.002

Table 5: Adjustment for Size of Sampled Unit

Average Number of Persons in Each Consumer Unit (CE): Selected Years

	1999	2000	2001	2002	2003	2004	2005
Lowest	1.8	1.8	1.7	1.7	1.8	1.7	1.7
Second	2.2	2.3	2.2	2.2	2.3	2.2	2.2
Third	2.5	2.5	2.5	2.5	2.5	2.6	2.5
Fourth	2.8	2.8	2.9	2.8	2.8	2.9	2.9
Highest	3.1	3.2	3.1	3.2	3.1	3.2	3.2

*Notes: These data were compiled from Consumer Expenditure Survey reports for various years. They are available from the CE website, <http://www.bls.gov/cex/>*

Table 6A: Annual Growth Rates of Consumption (Per Capita) Using Authors' Methodology

Quintile	2002-2005	2001-2005	2000-2005	1995-1999	1990-1994	1985-1989	1985-2005
Lowest	-0.43	1.07	2.18	1.64	1.69	1.77	1.84
Second	1.60	1.38	1.63	2.91	0.86	2.51	1.96
Third	1.57	1.04	1.83	1.48	2.15	2.12	1.89
Fourth	2.06	1.00	1.23	2.54	0.92	3.65	2.04
Highest	2.53	2.44	1.63	2.74	1.04	3.57	2.21

Notes:

1. For every growth calculation, we take the fourth quarter NIPA number as the base. For example, for 2001-2005, the 2000 fourth quarter NIPA consumption is used as the base for calculation. We label this as growth over the period 2001-2005.

Table 6B: Annual Consumption Growth Rates, Consumer Expenditure Survey

Quintile	2001-2005	2000-2005	1999-2005
Lowest	-2.11%	-1.23%	-0.43%
Second	-0.25%	-0.79%	-0.10%
Third	-0.15%	-0.13%	0.17%
Fourth	0.29%	0.49%	0.15%
Highest	1.56%	1.22%	0.49%

Notes:

1. These data are based on author's calculations using average expenditures per 'consumer unit'

<http://www.bls.gov/cex/2005/Standard/quintile.pdf>

2. The growth over any period, say 2001-2005 is calculated taking average annual 2001 consumption as the base. It is not possible to get fourth quarter consumption from the published data files, which would make it exactly comparable to our series.

Table 7: Analysis of Consumption Using CPS Data: Relative Shares

Year: 2005

	Own House	Health Insurance: All members	Health Insurance: Some members	No members with health insurance
Decile 1	5.9	9.2	7.8	21.4
2	7.6	9.4	9.8	16.3
3	8.2	9.2	11.5	15.4
4	8.8	9.4	11.7	13.2
5	9.7	9.7	11.8	9.9
6	10.4	10	11.4	7.7
7	11.3	10.3	10.6	5.9
8	12.1	10.7	9.5	4.2
9	12.8	10.9	8.5	3.3
(Highest)10	13.3	11.2	7.4	2.6
Total	100	100	100	100

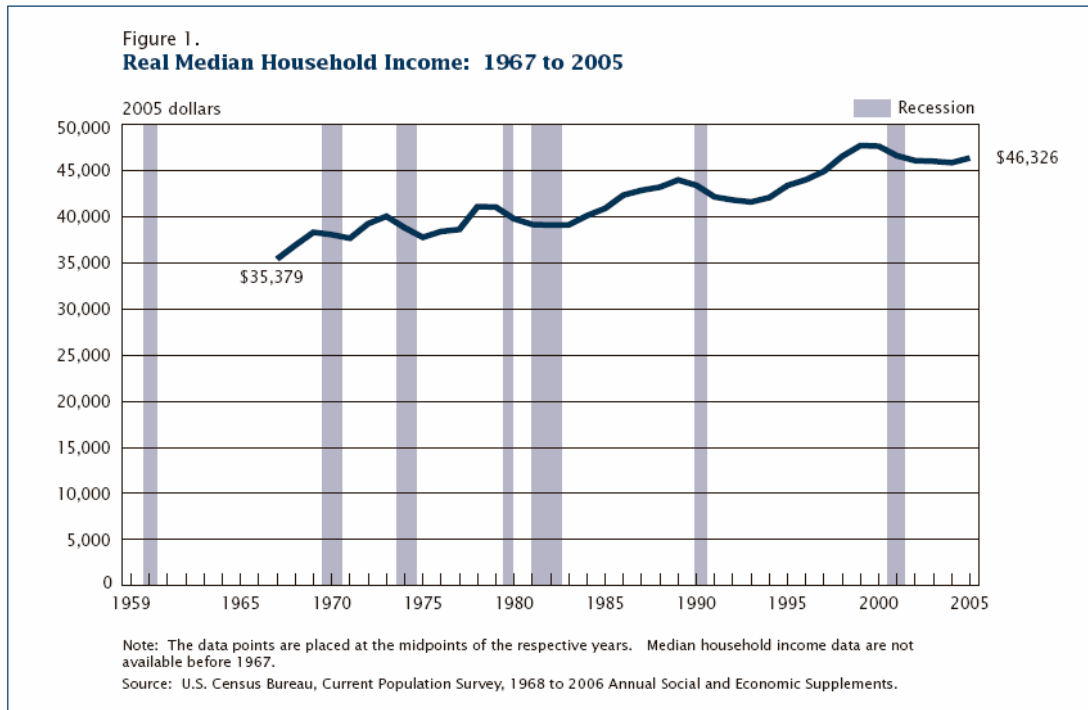
Year: 2001

	Own House	Health Insurance: All members	Health Insurance: Some members	No members with health insurance
Decile 1	6.3	9.3	8.7	20.8
2	8.1	9.4	10.4	16.4
3	8.3	9.2	11.7	16.6
4	8.9	9.5	11.6	12.7
5	9.4	9.8	11	10
6	10.3	10	11.5	7.3
7	10.9	10.4	10.2	5.4
8	12	10.6	9.2	4.7
9	12.6	10.9	8.3	3.2
(Highest)10	13	11	7.4	3
Total	100	100	100	100

*Note: These data are author tabulations from the CPS Public Use Microdata Files.*

Figure 1. Real Median Household Income

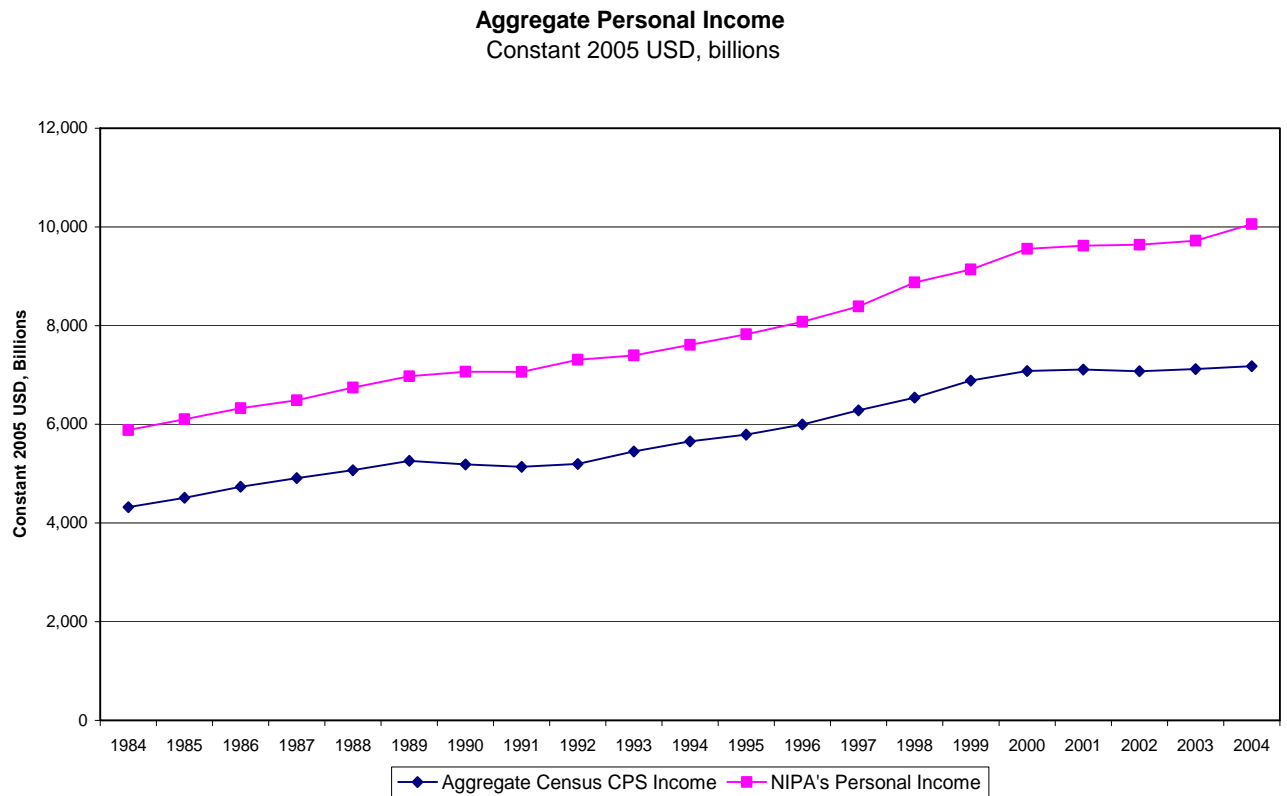
Census Bureau Report, August 2006



Source: <http://www.census.gov/prod/2006pubs/p60-231.pdf>



Figure 2: Comparison of CPS Income with NIPA Income



Source: US Department of Commerce: Bureau of Economic Analysis. NIPA., Series ID: PCECCA <http://research.stlouisfed.org/fred2/categories/110>; U.S. Census Bureau, Current Population Survey, Historical Income Tables - People. <http://www.census.gov/hhes/www/income/histinc/p01ar.html>

Figure 3: Real Income Trends Using Authors' Methodology

Income Trend for Each Quintile

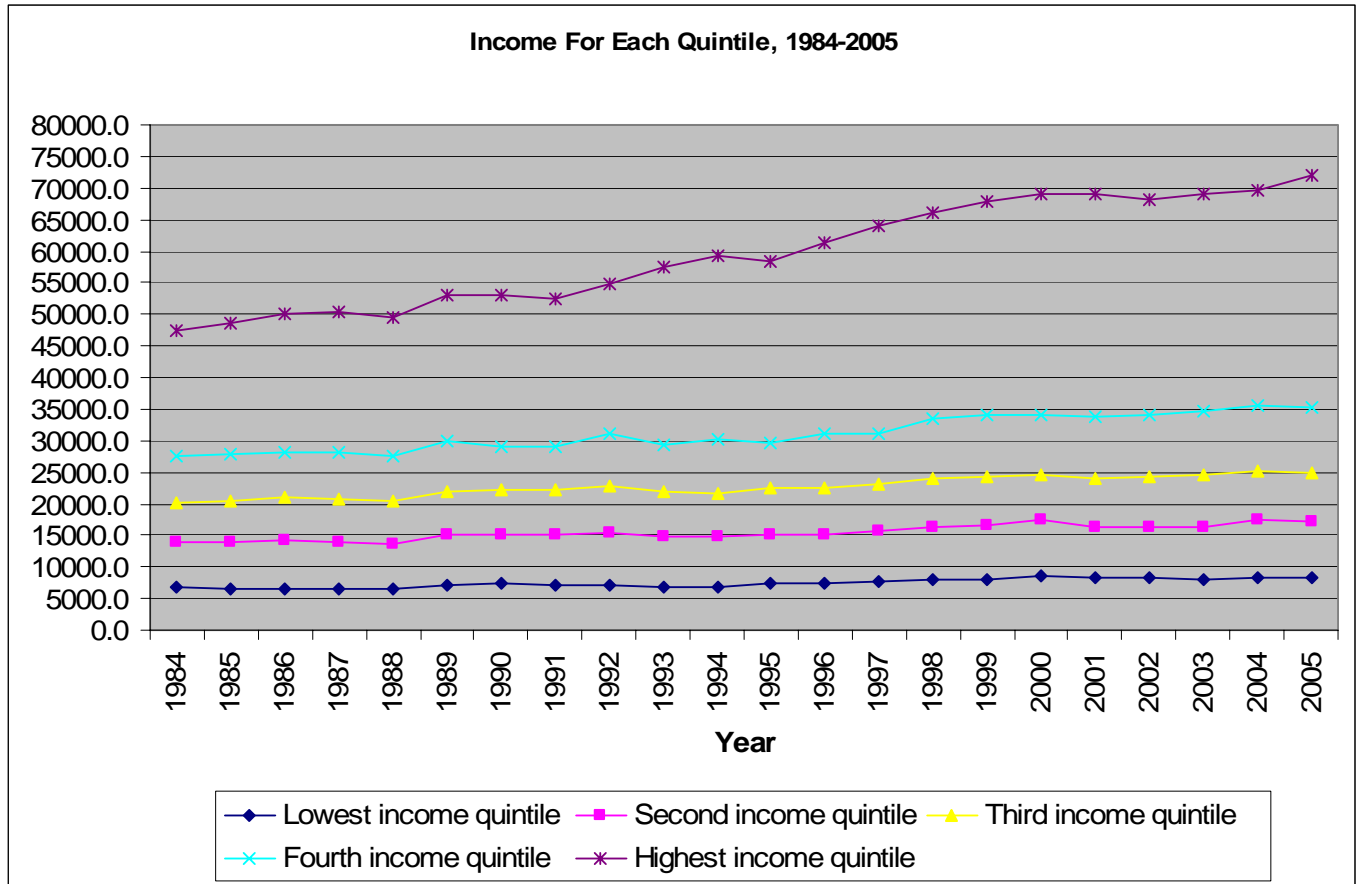
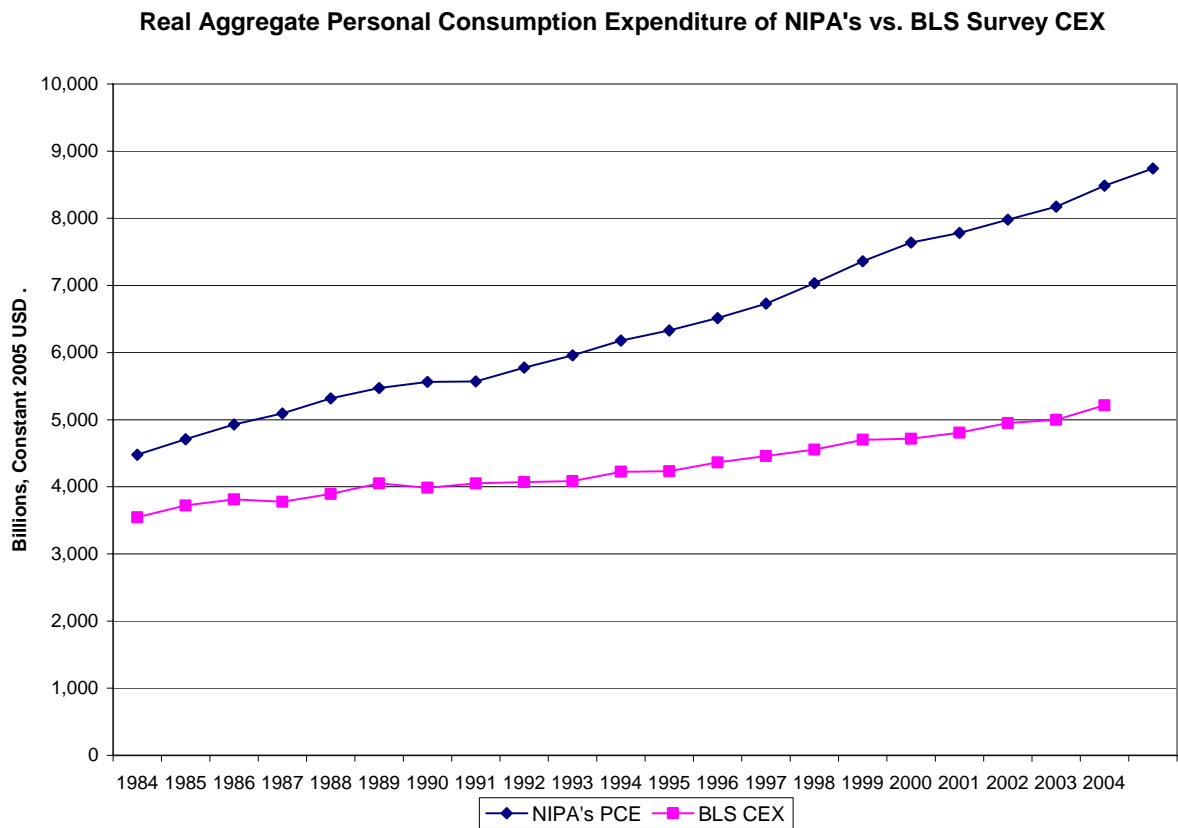


Figure 4 : Comparison of CE Consumption with NIPA Consumption



Source: Bureau of Labor Statistics, *Consumer Expenditure Survey*, <http://www.bls.gov/cex/#data>; US Department of Commerce: Bureau of Economic Analysis. NIPA,. Series ID: PCECCA <http://research.stlouisfed.org/fred2/categories/110>

Figure 5: Real Consumption Trends Using Authors' Methodology

Consumption Trend for Each Quintile

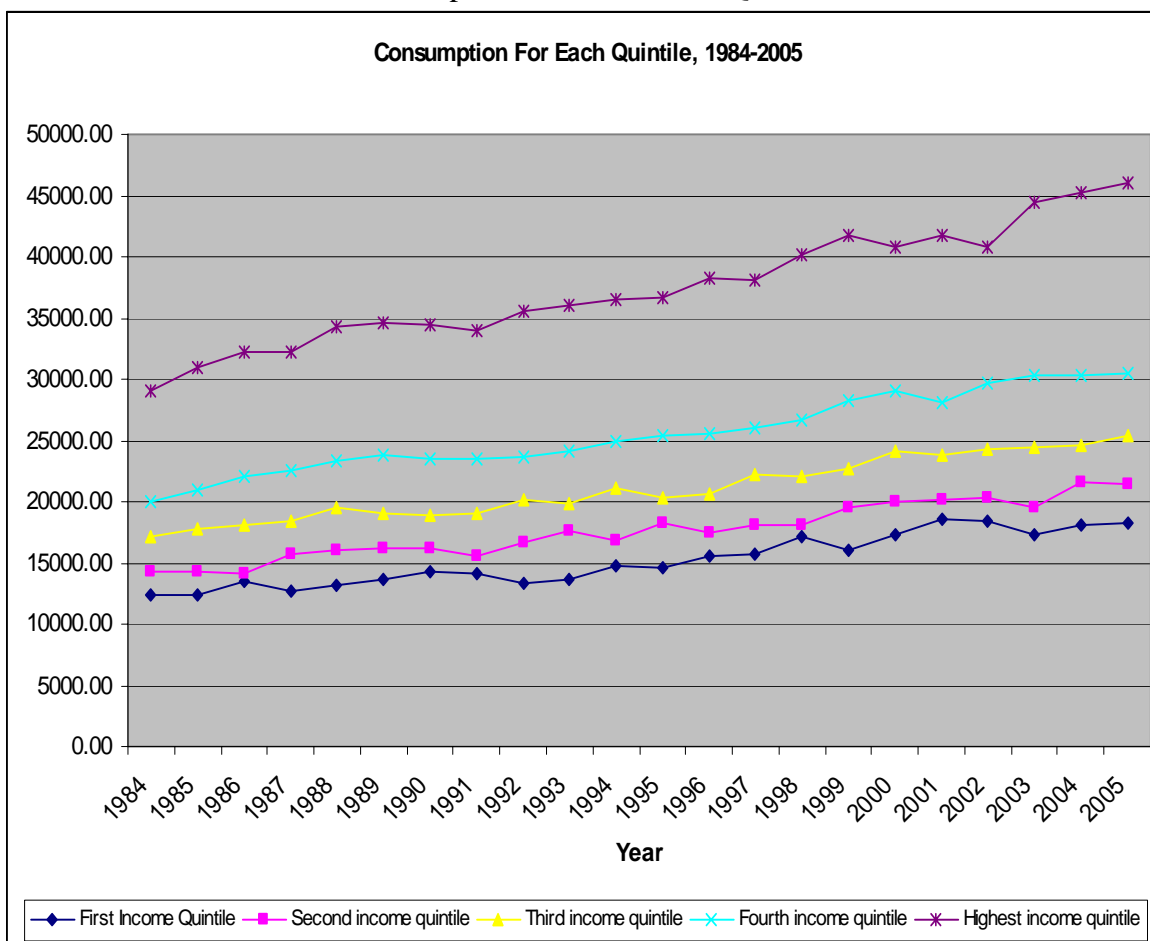
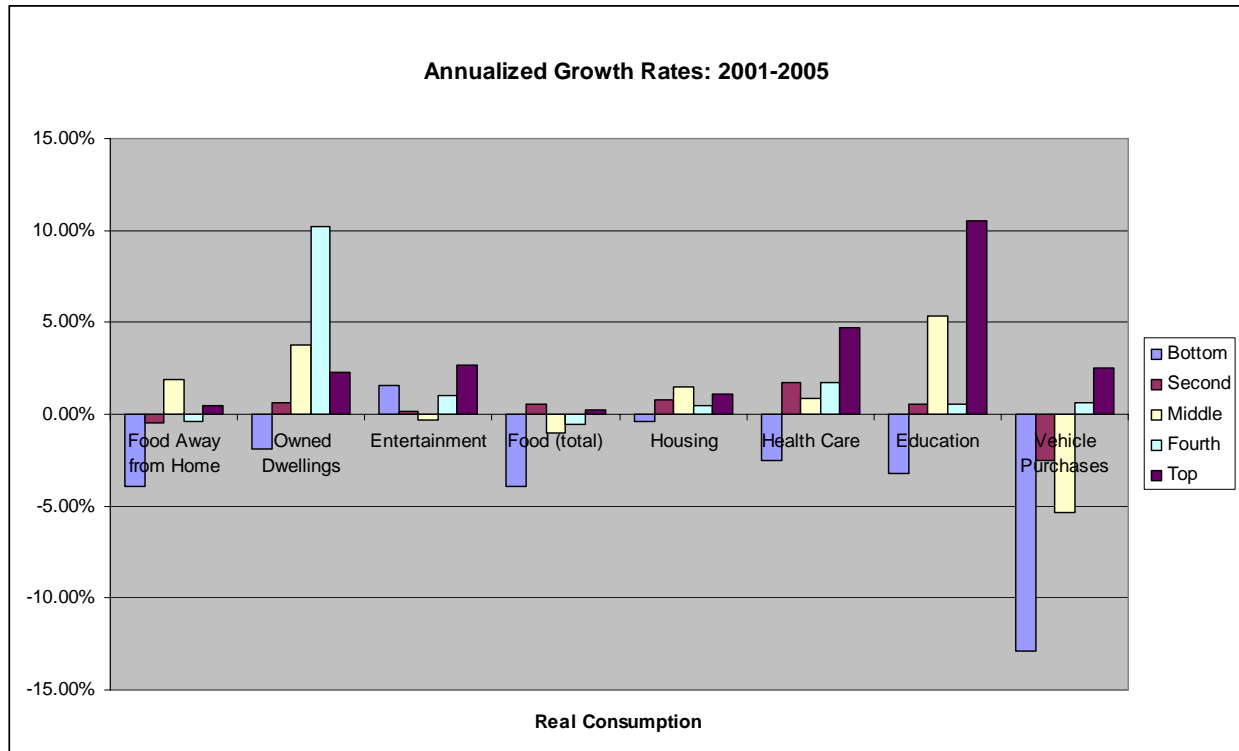


Figure 6: Consumption Disaggregated by Product Category (CE)



**Definitions:**

**Food away from home** includes all meals (breakfast and brunch, lunch, dinner and snacks and nonalcoholic beverages) including tips at fast food, take-out, delivery, concession stands, buffet and cafeteria, at full-service restaurants, and at vending machines and mobile vendors. Also included are board (including at school), meals as pay, special catered affairs, such as weddings, bar mitzvahs, and confirmations, school lunches, and meals away from home on trips.

**Health care** includes (1)**Health insurance** includes traditional fee-for-service health plans, preferred-provider health plans, health maintenance organizations (HMO's), commercial Medicare supplements, and other health insurance(2)**Medical services** includes hospital room and services, physicians' services, service by a professional other than a physician, eye and dental care, lab tests and X-rays, medical care in a retirement community, care in convalescent or nursing home, and other medical care service(3)**Drugs** includes nonprescription drugs and vitamins and prescription drugs(4)**Medical supplies** includes topicals and dressings, antiseptics, bandages, cotton, first aid kits, contraceptives, syringes, ice bags, thermometers, sun lamps, vaporizers, heating pads, medical appliances (such as braces, canes, crutches, walkers, eyeglasses, and hearing aids), and rental and repair of medical equipment.

**Entertainment** includes (1)**Fees and admissions** includes fees for participant sports; admissions to sporting events, movies, concerts, and plays; health, swimming, tennis and country club memberships; fees for other social, recreational, and fraternal organizations; recreational lessons or instruction; rental of movies, and recreation expenses on trips(2)**Television, radio, and sound equipment** includes television sets, video recorders, video cassettes, tapes, discs, disc players, video game hardware, video game cartridges, cable TV, radios, phonographs, tape recorders and players, sound components, records, compact discs, and tapes (including records, compact discs, and tapes purchased through mail order clubs), musical instruments, and rental and repair of TV and sound equipment(3)**Pets, toys, hobbies, and playground equipment** includes pets, pet food, pet services, veterinary expenses, etc.; toys, games, hobbies, and tricycles; and playground equipment(4)**Other entertainment equipment and services** includes indoor exercise equipment, athletic shoes, bicycles, trailers, purchase and rental of motorized campers and other recreational vehicles, camping equipment, hunting and fishing equipment, sports equipment (winter, water, and other), boats, boat motors and boat trailers, rental of boats, landing and docking fees, rental and

repair of sports equipment, photographic equipment and supplies (film and film processing), photographer fees, repair and rental of photo equipment, fireworks, and pinball and electronic video games.

**Education** includes tuition; fees; and textbooks, supplies, and equipment for public and private nursery schools, elementary and high schools, colleges and universities, and other schools.

**Housing** includes (1) **Owned dwellings** includes interest on mortgages, interest on home equity loans and lines of credit, property taxes and insurance, refinancing and prepayment charges, ground rent, expenses for property management and security, homeowners' insurance, fire insurance and extended coverage, expenses for repairs and maintenance contracted out, and expenses of materials for owner-performed repairs and maintenance for dwellings used or maintained by the consumer unit (2) **Rented dwellings** includes rent paid for dwellings, rent received as pay, parking fees, maintenance, and other expenses (3) **Other lodging** includes all expenses for vacation homes, school, college, hotels, motels, and other lodging while out of town (4) **Utilities, fuels, and public services** includes natural gas; electricity; fuel oil and other fuels, such as wood, kerosene, coal, and bottled gas; water and other public services, such as garbage and trash collection, sewerage maintenance, septic tank cleaning; and telephone charges (5) **Personal services** includes baby-sitting; day care, nursery school, and preschool tuition; care of the elderly, invalids and handicapped; adult day care; and domestic and other duties (6) **Other household expenses** includes housekeeping services, gardening and lawn care services, coin-operated laundry and dry-cleaning (non-clothing), termite and pest control products and services, home security systems service fees, moving, storage, and freight expenses, repair of household appliances and other household equipment, repair of computer systems for home use, computer information services, reupholstering and furniture repair, rental and repair of lawn and gardening tools, and rental of other household equipment (7) **Housekeeping supplies** includes laundry and cleaning supplies, cleaning and toilet tissues, stationery supplies, postage, delivery services, miscellaneous household products, and lawn and garden supplies (8) **Household textiles** includes bathroom, bedroom, kitchen and dining room, other linens, curtains and drapes, slipcovers and decorative pillows, and sewing materials (9) **Furniture** includes living room; dining room; kitchen; bedroom; nursery; porch, lawn, and other outdoor furniture (10) **Floor coverings** includes new and replacement wall-to-wall carpets, room-size rugs, and other non-permanent floor coverings (11) **Major appliances** includes refrigerators and freezers, dishwashers and garbage disposals, stoves and ovens, vacuum cleaners, microwaves, air-conditioners, sewing machines, washing machines and dryers, and floor cleaning equipment (12) **Small appliances/miscellaneous housewares** includes small electrical kitchen appliances, portable heating and cooling equipment, china and other dinnerware, flatware, glassware, silver and other serving pieces, nonelectric cookware, and plastic dinnerware (excludes personal care appliances) (13) **Miscellaneous household equipment** includes typewriters, luggage, lamps and light fixtures, window coverings, clocks, lawnmowers and gardening equipment, other hand and power tools, telephone answering devices, telephones and accessories, computers and computer hardware for home use, computer software and accessories for home use, calculators, business equipment for home use, floral arrangements and house plants, rental of furniture, closet and storage items, other household decorative items, infants' equipment, outdoor equipment, smoke alarms, other household appliances, and other small miscellaneous furnishings.

## Addendum: Growth Rates Under Alternative Assumptions

### (1) Using Alternative Equivalence Scales: Square Root of Sample Unit Size

#### Consumption Growth Rates

	2000-2005	2001-2005	2002-2005
Bottom	1.60%	0.55%	-0.54%
Second	1.54%	0.99%	1.49%
Third	1.74%	1.10%	1.46%
Fourth	1.44%	1.41%	1.94%
Top	1.81%	2.49%	2.82%

#### Income Growth Rates

	2000-2005	2001-2005	2002-2005
Bottom	0.46%	-0.11%	0.47%
Second	0.37%	0.22%	0.91%
Third	0.60%	0.19%	1.20%
Fourth	0.50%	0.11%	1.20%
Top	1.01%	0.70%	0.95%

*Notes:*

1. These are calculated using quarterly NIPA numbers and adjusting incomes by the square root of sample unit size.
2. For every growth calculation, we take the fourth quarter NIPA number as the base. For example, for 2001-2005, the 2000 fourth quarter NIPA personal income is used as the base for calculation. We label this as growth over the period 2001-2005.

(2) Using Annual Averages of NIPA Income and Consumption

Income Growth Rates Using Annual Averages of NIPA Personal Income

	1999-2005	2000-2005	2001-2005
Bottom	-0.03%	-0.72%	-0.13%
Second	0.35%	-0.27%	0.31%
Third	0.58%	0.14%	0.60%
Fourth	0.78%	0.42%	0.60%
Top	1.26%	0.66%	0.75%

Consumption Growth Rates Using Annual Averages of NIPA Personal Consumption

	1999-2005	2000-2005	2001-2005
Bottom	1.17%	0.05%	-0.69%
Second	1.59%	0.62%	1.34%
Third	1.80%	1.17%	1.31%
Fourth	1.79%	1.85%	1.79%
Top	2.14%	2.57%	3.08%

*Notes:*

1. These growth rates do not make any equivalence adjustments.
2. The labeling convention now requires that if we take 1999 as the base year, the growth rate is labeled as 1999-year X.