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Chapter 4

Median Income and Income Inequality: From 2000 and Beyond

Richard V. Burkhauser and Jeff Larrimore

The first decade of the twenty-first century was a turbulent economic period for the average American.¹ Based on Current Population Survey (CPS) data, in 2000 median household income hit a record high, but fell for the next four years in the aftermath of the 2001 recession. By the end of 2007, even after three years of growth, median income was still below its 2000 peak. When the Great Recession hit in 2007, median income fell by a total of 6.78 percent over the next three years—a percentage drop greater than in any previous recession since the CPS began annual collection of this information in the 1960s.

Consequently, the household income of the median American was lower in 2010 than in 2000, both because median income did not grow over the business cycle of 2000–2007 and because it then fell by a record amount over the three years of the Great Recession. Furthermore, an increasing number of policymakers, considering research based on Internal Revenue Service (IRS) income tax data, argued that while the income of the average American was stagnating, U.S. income inequality was rapidly growing.

In this chapter, we pose four questions about income trends:

1. Are the incomes of the middle class stagnating?
2. Is income inequality between the rich and the poor growing?
3. What has been the impact of economic changes (for example, employment, earnings, transfer payments) on median incomes and inequality?
4. In the future, as our population ages and grows more ethnically and racially diverse, will those demographic shifts increase inequality and slow median income growth?

We evaluate the evidence of a stagnating American middle class and an increasingly unequal income distribution over the first decade of the twenty-first century, reporting the agreement and disagreement among researchers. We use the public use version of the March Current Population Survey to track levels and trends in income and its distribution over this period. Then, in a shift-share model, we estimate the importance of demographic and economic factors in accounting for trends in both median income and income inequality over the tumultuous 2000s, comparing the trends to previous decades. Finally, as the United States ages and grows more ethnically and racially diverse, we extend our shift-share model to predict the consequences of those demographic changes on median income and income inequality in the future.

The vast majority of research on trends in median income and income inequality in the United States is based on two data sources—the CPS and the Internal Revenue Service’s Statistics of Income (SOI) tax return data. Only the CPS can be used to consistently measure changes in median income, so we use CPS data to estimate trends in median income. However, the CPS did not begin collecting this data annually for households until the 1960s. Although the IRS data series begins much earlier, it captures the income only of those Americans who file federal income tax returns—and therefore is poorly suited for measuring trends in median income. The IRS data are far more suitable, however, for measuring long-term historical trends in income inequality back to the early twentieth century, something the CPS data can do annually only since the late 1960s.

But can the CPS be used to measure trends in income inequality even then? The answer matters, since these two data sets yield different findings. Although researchers using both data sets agree that income inequality is currently at or near its peak over the past fifty years, they disagree on the timing of inequality growth. Research using the CPS data suggests that inequality increased substantially in the 1970s and 1980s but has since grown at only a moderate pace (Burkhauser et al. 2011; Gottschalk and Danziger 2005). Conversely, research using IRS tax return data suggests that inequality continued to grow rapidly through the 1990s and 2000s (Piketty and Saez 2003).²

Because recent public debates have highlighted income distribution trends, these discrepancies merit attention. Here we summarize the state of research using CPS- and IRS-based data. We reconcile their seemingly contradictory results, argue that the CPS is capable of capturing trends in income inequality, use the CPS to measure changes not only in median income but also in income inequality in the 2000s, and compare these changes to changes in previous decades.

We then focus on the demographic changes (in age, racial composition, and marital status) and economic changes (in employment and earnings, nonlabor income, transfer payments, and so on) behind these trends. Although demographic factors form a baseline for our analysis, economic factors play the most important role over the last thirty years. We argue that while the employment and earnings of men have influenced median household income trends, since 1979 the employment and earnings of women have played a far more important role.³

Finally, looking ahead, the Baby Boom generation will increasingly age into retirement, and the Hispanic population will continue to grow. We predict that, unless we reduce the persistent income gap between older and younger households and between white and minority households, these two demographic changes will drag down median income over the next two decades.

DATA

We base our analysis on data from the unrestricted public use March Current Population Survey, a nationally representative survey of approximately 200,000 individuals conducted by the U.S. Census Bureau. The March CPS supplement contains a detailed questionnaire on the sources of income of household members and is commonly used to evaluate income and income inequality trends (see, for example, Blank 2011; Burkhauser et al. 2011; Daly and Valletta 2006; Gottschalk and Danziger 2005).

We focus on the pretax, size-adjusted, household income of persons, including labor and nonlabor earnings as well as in-cash government transfers.⁴ We adjust all income for inflation using the Consumer Price Index Research Series Using Current Methods (CPI-U-RS) to capture income trends in real dollar terms.⁵

Overview of the March CPS and Corrections to Capture Top Incomes

The March CPS does not report the actual top incomes. To protect the confidentiality of high-income respondents and to prevent the random sampling of them from adding volatility to income estimates, the Census Bureau “top-codes” each of the twenty-four income sources.⁶ The income of any individual with income above this top-code threshold is reported as the top-code threshold, not the actual recorded income. Top-coding is performed on each income source separately, including social security income and unemployment compensation (UC) (Burkhauser, Feng, and Jenkins 2009). The top-code thresholds also vary by source. For example, top-codes on primary earnings range from \$50,000 to \$200,000, depending on the year, and top-codes for social security income range from \$10,000 to \$50,000, depending, again, on the year. Since top-code thresholds are not consistent from year to year, the fraction of the population that is top-coded changes over time. In 1985 fewer than 1 percent of individuals had top-coded incomes, while in 2007 almost 6 percent did (Larrimore et al. 2008). Since different amounts of income are suppressed in each year, inequality measures using the unrestricted public use March CPS data may be inconsistent. To overcome these problems we use cell means from Larrimore and his colleagues (2008) that provide information on incomes above the top-code threshold.⁷

Additionally, the data show an artificial increase in inequality between 1992 and 1993 owing to changes in census data collection procedures (Jones and Weinberg 2000; Ryscavage 1995).⁸ We removed this artificial spike.⁹

COMPARING IRS AND CPS DATA

As discussed earlier, although we use the March CPS data, some researchers who are focused on inequality instead use tax return data provided by the IRS Statistics of Income. Those researchers have recently observed faster inequality growth than has been observed by those using the March CPS. For example, Emmanuel Saez, after updating data from Piketty and Saez (2003), observes that from 2000 to 2010 the share of income going to the top 1 percent of the income distribution, excluding capital gains, rose by 5.6 percent (from 16.49 percentage points to 17.42 percentage points).¹⁰ In contrast, Carmen DeNavas-Walt, Bernadette Proctor, and Jessica Smith (2011) observe in their annual report for the Census Bureau that when looking at their preferred inequality measure, the Gini coefficient, income inequality rose by just 1.5 percent (from 0.462 to 0.469) in the CPS data over the same time period. These differences are even greater when looking at the earlier 1990s period.

A common explanation for these differences is that deficiencies in one or both data sets restrict their ability to capture true income trends. For example, the survey-based CPS may suffer from greater recall bias than seen in IRS administrative data. Furthermore, the Census Bureau’s top-codes restrict the CPS’s ability to observe changes at the top of the income distribution. To the extent that inequality changed in this censored region of the data, researchers using the CPS may inaccurately measure trends (see, for example, Burkhauser et al. 2003–2004; Burkhauser et al. 2009; Levy and Murnane 1992; Piketty and Saez 2006; Slemrod 1996). Consequently, some researchers argue against using both the restricted-access and public use CPS data to measure income trends.

On the other hand, while IRS-based research avoids recall bias, respondents, particularly high-income earners, have a financial incentive to underreport income or to classify income in ways that minimize their taxes (for example, classifying income as either wage earnings or busi-

ness profits) and result in an appearance of lower incomes (Sivadasan and Slemrod 2008). Hence, changes in tax laws can lead researchers who use tax-based data to conflate increases in income now subject to taxation with an increase in income. For instance, after the reductions in the top individual tax rates during the 1980s, many high-earners switched from classifying income as Subchapter-C corporation profits, which are not reported on personal income tax forms, to Subchapter-S corporation profits and personal wages, which are reported (Slemrod 1995).¹¹

These data deficiencies in both data sets cannot be ignored. But Burkhauser, Feng, Jenkins, and Larrimore (2012) show that the differences in results between users have more to do with differences in their methodologies for measuring income and inequality than with data inconsistencies in one or both data sets. In particular, they highlight three major differences: the focus on household income,¹² the definition of income,¹³ and differing measures of inequality.¹⁴ To test the importance of these measurement differences, Burkhauser and his colleagues compare inequality using the two data sets, while imposing the same sharing units, income definitions, and inequality metrics.¹⁵ They observe that outside of the top 1 percent of the income distribution, the two data sets provide remarkably consistent results. Even within the top 1 percent, the results are largely consistent across the two data sets when the top-coding of census data is addressed. These researchers conclude that differences in results in the literatures based on these two data sets therefore diverge, not because of fundamental flaws in either data set, but because researchers are measuring different income and inequality concepts that are not always aligned. As such, we use the Census Bureau's March CPS data, which, unlike the tax records, allow for analyses of median incomes, since it is nationally representative rather than representative of tax filers only.

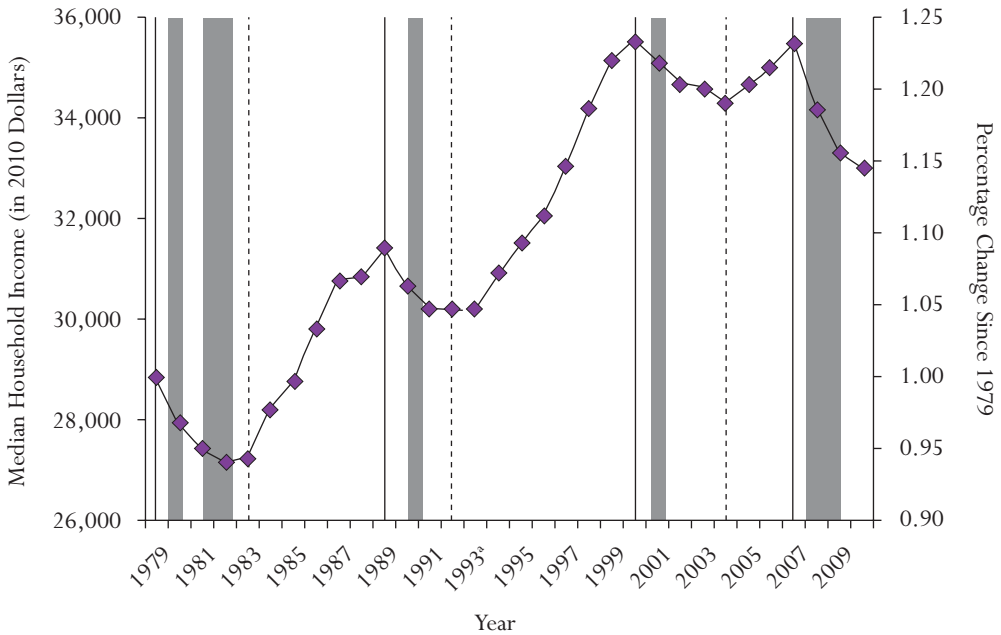
TRENDS IN MEDIAN INCOME AND INCOME INEQUALITY

In figure 4.1, we report trends in size-adjusted, household, pre-tax, post-transfer in-cash income, excluding capital gains, of the median American between 1979 and 2010.¹⁶ Although we focus on income and inequality trends over the past decade, the figure is extended back to 1979 to provide context for the more recent results. The left axis denotes median income in constant dollars; the right axis normalizes 1979 to 1 to denote its percentage change since 1979. The peaks of each business cycle (1979, 1989, 2000, and 2007) are denoted by solid vertical lines; troughs (1983, 1992, and 2004) are denoted by dashed vertical lines.¹⁷

Although median income is sensitive to business-cycle variations (cyclical changes), historically median income has risen when measured at equivalent points in the business cycle. This was true in both the 1979–1989 business cycle, when it rose by about 9 percent, and the 1989–2000 business cycle, when it rose by about 13 percent. However, this did not happen over the 2000–2007 business cycle. In the aftermath of the 2001 recession, median income fell from its all-time high in 2000; after bottoming out in 2004, it rose over the next three years to \$35,500, or \$71,000 for a household of four, in 2007, just below its previous peak in 2000. This was the first business cycle since at least the 1970s when median income was not higher at the peak following a business cycle than at the previous peak.¹⁸

Of course, any analysis of the past decade must include the Great Recession that began at the end of 2007 and continued through 2010.¹⁹ When we include this period and compare troughs of business cycles, the picture is similar to our description for peaks. Unlike the previous business cycles, when we measure trough to trough, median income falls between 2004 and 2010. In this case, however, the 3.7 percent drop between 2004 and 2010 is already much larger than the 0.2 percent drop between the peak years 2000 and 2007. Furthermore, the 7 percent decline in median size-adjusted household income from 2007 through 2010 is steeper than the fall in median income over the 1979–1983 recession (5.6 percent), the 1989–1992 recession (4.0 percent), or the 2000–2004 recession (3.5 percent). Thus, the 2000s were particularly tumultuous

FIGURE 4.1 Trends in Median Size-Adjusted Household Income, 1979–2010



Source: Authors' calculations using Current Population Survey (CPS) data.

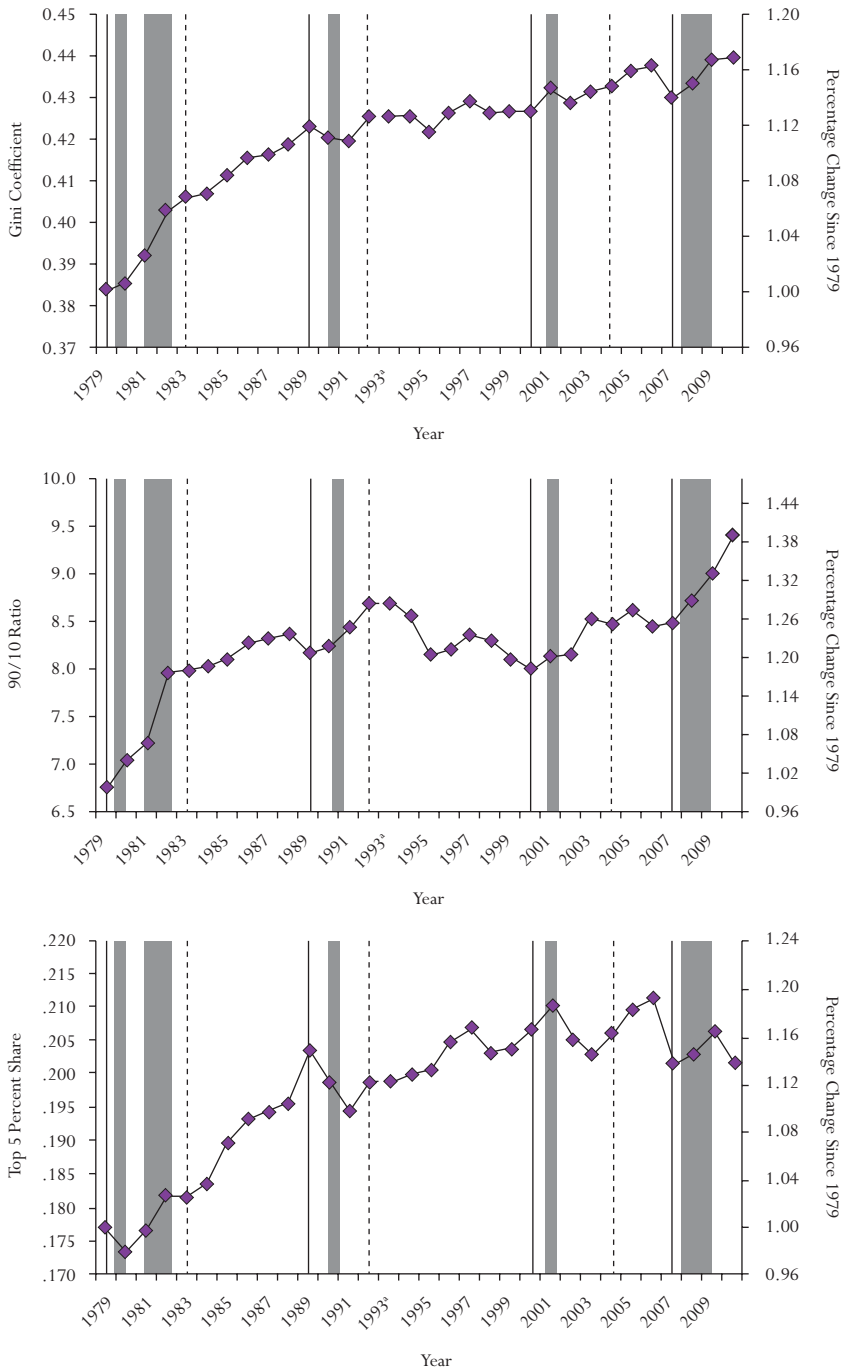
Notes for figures 4.1 and 4.2: 1979 is normalized to 1. The peak and trough years of business cycles based on median income and, in the case of 1983, unemployment are denoted with solid black and dashed vertical lines, respectively. The starting year of the period (1979) also represents a peak business cycle year. Official NBER recession periods are denoted by vertical gray bars. 1983 is treated as the trough of the recession starting in 1979 despite the slight increase in median income from 1982 to 1983, given that unemployment remained above 10 percent through June 1983. Owing to a change in CPS survey collection methods, income trends are not directly comparable between 1992 and 1993 (Ryscavage 1995; Weinberg 2006).

*Because we assume that the change in the income series in this year is due solely to collection method differences, we assume that no change in the income series occurred in this year. This assumption matches the one described in Larriamore (forthcoming). It is similar to that used by Atkinson, Piketty, and Saez (2011) and Burkhauser et al. (2012).

for those in the middle class: over a seven-year business cycle, the middle class saw little change in their median income. With the Great Recession, the middle class saw their median income plummet—the sharpest drop since the CPS began collecting annual measures of this value. Figure 4.2 shows trends in income inequality (specifically, the trends in size-adjusted, household, pretax, post-transfer cash income, excluding capital gains) using three common measures: the Gini coefficient, the 90/10 ratio, and the top 5 percent income share.²⁰ In each graph, the left axis denotes the level of the inequality measure and the right axis denotes its percentage change since 1979. As in figure 4.1, solid vertical lines denote business-cycle peaks (1979, 1989, 2000, and 2007) and dashed vertical lines represent business-cycle troughs (1983, 1992, and 2004).

Regardless of the inequality measure, several facts emerge. First, the level of inequality in 2010 was substantially above that observed three decades ago in 1979. This jibes with the conventional wisdom: income inequality is increasing. In 2010 inequality was 17 percent above the 1979 level by the Gini coefficient measure, 39 percent higher using 90/10 ratios, and 14 percent higher using the top 5 percent. However, while inequality is currently at or near record highs in all three series, using each of these three inequality measures, inequality growth was fastest in

FIGURE 4.2 Trends in the Distribution of Size-Adjusted Household Income, 1979–2010



Source: Authors' calculations using CPS data.

Notes: See figure 4.1.

*See figure 4.1.

the 1979–1989 business cycle before it slowed dramatically or reversed over the subsequent two business cycles through 2007. In the most recent full business cycle (2000–2007), the measures offer divergent statistical pictures. The Gini coefficient increases by just 0.7 percent (from 0.427 to 0.430), and the top 5 percent income share actually declines. Only the 90/10 ratio exhibits a larger increase in inequality than it did in the 1990s—although even here the 6.2 percent increase in the 90/10 ratio is smaller than the 20 percent increase in this inequality measure in the 1980s.

The Great Recession also coincided with changes in income inequality. Using the broad-based Gini coefficient, inequality grew by 2.3 percent between 2007 and 2010. The annual growth in the Gini coefficient over this period (0.76 percent per year) was well above the annual inequality growth in either of the previous two complete business cycles, although it was still below the 1.0 percent annual Gini growth over the 1980s. The 90/10 ratio shows a faster pace in the increase in income inequality—an increase of 3.5 percent per year during the Great Recession versus growth of 2.1 percent per year in the 1980s. However, different measures of the distribution can lead to different trends. Inequality as the share of income held by the top 5 percent of the distribution changed very little over the Great Recession and earlier recessions. These findings suggest that the growth in inequality during the Great Recession came primarily at the lower end of the distribution. While the top earners (the top 5 percent of household incomes) saw their income decline along with the rest of the population, the poor suffered the most.²¹

OUR METHOD OF ACCOUNTING FOR SHIFTS IN MEDIAN INCOME AND INCOME INEQUALITY

Policymakers and analysts should also understand the factors behind these trends. To isolate those factors, we use a shift-share analysis similar to Burtless (1999), Daly and Valletta (2006), Iceland (2003), and Larrimore (forthcoming). We separately estimate the degree to which changes in demographic and economic factors over the full peak-to-peak business-cycle years (2000–2007) and the peak-to-trough recession years (2007–2010) account for the changes in median income and income inequality reported in figure 4.1 and figure 4.2 (top graph). We then compare these trends to those over similar business cycles and peak-to-trough recession years of the 1980s and 1990s.

Our shift-share approach allows the demographic composition (age, race, ethnicity, and marital status) and the sources of income of our population to change, one factor at a time, thus separately accounting for changes in income and income inequality. For example, we account for the impact of the changing U.S. racial composition, holding all else constant. We do so by assuming that the income distributions of whites, blacks, and Hispanics at the beginning of each business cycle or economic downturn remain the same over the entire business cycle or recession period we explore, while allowing the share of the population in each of these racial groups to shift to match actual population trends. Hence, the shift in the share of each racial group alone accounts for the change in income that we measure.

Once we account for demographic factors, we focus on economic factors. We first separately consider the employment and earnings of male and female heads of household and their spouses. As previously noted, for ease of exposition future references to men and women refer only to the household heads and their spouses, as other household members are considered separately. We then consider the labor earnings of other household members, the returns from private nonlabor income sources, and the benefits from public transfer programs. By definition, these changes in individual sources of income will sum to the total change in median household income or income inequality found in the CPS data.

We use a two-step procedure to determine the impact of changes in the distribution of these sources on median income or income inequality. We initially consider the change in the distribu-

tion of each income source using a rank-preserving income exchange. Taking the income distribution from the first year of each business cycle, we assign each individual a percentile rank based on his or her level of income from a given source, conditional on his or her demographic characteristics and employment status. We then construct an equivalent ranking for the income source in the end-year of the business cycle—or, when analyzing economic declines, in the trough year of the business cycle. When we analyze the relationship between changes to the distribution of this source of income and the overall income distribution, we replace the source-level income from an individual at the X percentile of the source-level distribution with the source-level income from the individual at the X percentile of the source-level distribution in the latter year. We then replace the change in income statistics and inequality resulting from this replacement with the changes in the level and distribution of income from this income source. For example, John Smith receives income from wage earnings, along with income from other sources. His wage earnings are at the sixtieth percentile of earnings of males with the same demographic characteristics. We calculate his total income as the sum of his wage earnings and income from other sources at year 1. At year 2, we assume that his wage earnings are still at the sixtieth percentile, but that they may be higher or lower than they were initially depending on what the wage earnings are at that time for a man at the sixtieth percentile of the wage earnings distribution. Incomes from other sources remain unchanged. We then calculate his new total income by summing his new imputed wage earnings with his earnings from other sources. Repeating this for all members of the population and calculating inequality statistics for this new income distribution provides the extent to which inequality would have changed from year 1 to year 2 if the changes to the male earnings distribution occurred but no changes occurred for other income sources.

This procedure, by construction, holds the rank-correlation of income across income sources constant over time. For example, if the man at the fiftieth percentile of the male-head earnings distribution in 2000 is married to the woman at the thirtieth percentile of the female-head earnings distribution at the beginning of the business cycle, we assume that this will still be the case at the end of the business cycle in 2007. To capture the change in the rank-correlation of income over time, we redo the rank-preserving income exchange analysis, treating household (head and spouse) earnings as a single, combined income source.

We perform the rank-preserving income exchange with the sources combined and compare it to the change in household income distributions when conducting the procedure on each separately. We attribute this change to the changing correlation of the income sources. We determine each of the correlation components in this way, combining the income source with all previously analyzed income sources (using the order of the rows in the table of results as our order of analysis). With this procedure, the correlation change for a given income source represents the changing correlation of that source relative to all the previously analyzed income sources.

Although we include the income of all household members in our analysis, we focus on changes in the employment and earnings of the household head and, if that head is married, of his or her spouse. The household head and spouse are, in most cases, the primary earners (defined in the CPS as the primary owners or primary renters of the dwelling), and their employment and earnings outcomes are correlated. But even more importantly, we want to focus on the changing roles of women and men in the labor market and their impact on the trends in median income and income inequality (figure 4.1 and figure 4.2, top graph).

To avoid double-counting, we consider the impact of each factor conditional on previously considered factors. For example, we account for the importance of declining marriage rates on changes in income, conditional on the age, race, and ethnicity of the individual. Details on the specific procedures are available in the technical appendix, and a discussion of the order of analysis is available in the decomposition stacking order discussion box.²²

Decomposition Stacking Order

A well-known limitation of the shift-share approach we employ here is that our results may be sensitive to the order in which we analyze the components of income trends (Daly and Valletta 2006; Fournier 2001; Jenkins 1995; Larrimore, forthcoming). This concern increases as the period of our analysis grows, since the interaction effects have more time to compound.

Although any ordering is arbitrary, the logic we use is to begin with factors that are least affected by an individual's behavior. Hence, we first consider factors that cannot be changed by individuals in response to their other life circumstances—their age, race, and ethnicity. We then analyze a factor that, while alterable, is generally not a short-run choice—the individual's marital status. Only then do we measure factors that are more alterable—the income elements—roughly in the order of their importance to a household. We start with the employment and earnings of men, which are the primary income source for households; we follow with the employment and earnings of women, and then we include all other income sources. Since public transfers are often means-tested, we consider them last.

To minimize stacking-order concerns, we analyze each business cycle separately. Thus, we analyze the 1979–1989 business cycle based on the 1979 base year, the 1989–2000 business cycle based on the 1989 base year, and the 2000–2007 business cycle based on the 2000 base year. This method is particularly important for readers who are concerned, for example, about the impact of changing race relations since 1979 on our results. If the earnings gap was falling between races or ethnicities and we did not reset the base year for each business cycle, our demographic factors could overestimate the impact of race and ethnicity on income trends. However, given the stability of the white-black and white-Hispanic earnings gaps over the past thirty years, this concern should be limited in any case; analyzing each business cycle separately should further mitigate remaining concerns.

Larrimore (forthcoming), using a similar decomposition approach, reversed the order in which he analyzed income elements. This is a common way to address stacking-order concerns (see, for example, Daly and Valletta 2006). As in the present study, Larrimore found little difference in his results. Although he did not include race, ethnicity, or age in his initial decomposition or its reversal, those factors must always be analyzed first, since, by definition, they would have no effect on the income distribution if placed last. This is because race, ethnicity, and age have only indirect rather than direct effects on incomes. Given the clear and persistent race-ethnicity income gaps we observe in the CPS data and the natural age-earnings profile, with substantial income declines around retirement age, it is appropriate to assign responsibility for some level of the income trends to these demographic patterns. This is our reason for assigning changes based only on racial, ethnic, and age composition to race-ethnicity and age, while assigning any change in relative incomes within these demographic groups to the various income factors. We view any widening or shrinking of the earnings gap between incomes of different race, ethnicity, or age groups as a change in the earnings distribution from the prior equilibrium in the country and assign the income and distributional effects of that change to the earnings factors rather than to the demographic ones.

Given the close relationship between income variables and demographic variables, we are not able to completely eliminate the stacking-order effects that are present in all decomposition analyses. But we believe we have provided a plausible approach to mitigating them.

DECOMPOSING MEDIAN INCOME TRENDS FROM 2000 TO 2007

We report the outcomes of our shift-share analysis in table 4.1. To avoid distortions from business-cycle variation, we present peak-year to peak-year comparisons of each business cycle in an attempt to capture longer-term secular change. Table 4.1 (row 1) reports the average percentage-point change per year in the median size-adjusted, pretax, post-transfer, in-cash income of persons across each of the last three business cycles (1979–1989, 1989–2000, and 2000–2007). These average percentage-point changes in median income per year were first reported in figure 4.1. The next fourteen rows of table 4.1 report the percentage-point change in median income per year accounted for by the change in the demographic or economic factors. Each row has three values, one for each period we consider. The sum of the fourteen values we report for the 1979–1989 business cycle in column 1 of each of these rows equals 0.87, the average yearly change in median income over this business cycle.

We first consider three major demographic trends: an aging population, a more racially and ethnically diverse population, and the decline in the rate of marriage.²³ Table 4.1 (rows 2 to 4) reports the change we account for by changes in these demographic factors, holding the distribution of incomes within each demographic group constant at its level at the start of each business cycle. These estimated effects focus exclusively on changes in the share of people in the demographic groups, not on changes in the income gaps between these groups.

Although demography is not destiny and income trends within demographic groups can change, age, race, ethnicity, and marital status have historically been key predictors of U.S. income. This continues to be the case.

Mean income rises with age, peaks around age fifty-five, and declines as more and more people retire (see appendix figure 4A.1). Hence, an upward shift in the share of younger or older people relative to those of working age reduces the growth of median income in the population over time.

TABLE 4.1 *Factors Accounting for Changes in Median Size-Adjusted Household Income During Each Business Cycle Since 1979 (Average Change per Year)*

	1979–1989	1989–2000	2000–2007
Percentage change in median income	0.87	1.11	–0.02
Change accounted for by:			
Age	–0.00	0.05	0.13
Race and ethnicity	–0.14	–0.15	–0.29
Marriage	–0.01	–0.03	–0.12
Male-head employment	–0.05	0.12	–0.10
Male-head earnings	–0.02	0.31	0.20
Female-head employment	0.31	0.24	–0.01
Female-head earnings	0.37	0.33	0.22
Spouse correlation	0.02	0.01	0.09
Earnings of others	0.09	0.12	–0.06
Earnings of others correlation	–0.04	0.01	–0.05
Private nonlabor income	0.42	0.00	–0.05
Private nonlabor correlation	–0.11	0.01	–0.02
Public transfers	0.01	0.07	0.02
Public transfers correlation	0.01	0.03	0.01

Source: Authors' calculations using CPS data.

Similarly, the gap in mean size-adjusted household income between whites (who have relatively higher incomes) and blacks and Hispanics (who have relatively lower incomes) is persistent across the last three business cycles (see appendix table 4A.1). Hence, an upward shift in the share of blacks and Hispanics relative to whites reduces the growth of median income in the population. Similarly, a gap exists between those living in married households and those in unmarried households: an upward shift in the latter also reduces the growth of median income in the population.²⁴ Without a concomitant reduction in the income gaps with working-age Americans, whites, and those living in married households, the growth in median income slows. These demographic changes provide an underlying baseline for the median income trends shown in figure 4.1. These changes slowed the pace of median income growth over each of our three business cycles (table 4.1).

First, consider the aging of the population. Over the 2000–2007 business cycle, the youngest of the Baby Boomers born between 1946 and 1964 were entering their peak earning years, while the oldest boomers had not yet reached age sixty-five. This aging of the population accounted for an average increase of 0.13 percentage points per year in median income (table 4.1, row 2) from 2000 to 2007, a substantially larger increase than during the previous two business cycles. But as discussed in more detail later, as the Baby Boom generation ages into retirement over the next two decades, this trend will reverse and drag down increases in median income growth.

The country is also growing more racially diverse—with an even greater impact on median income. The racial groups include white non-Hispanics, blacks, and Hispanics. The Hispanic share of the population has increased (see table 4A.1). From 2000 to 2007, the Hispanic share grew by 3.14 percent (0.45 percent per year), almost twice as fast as it grew in the 1980s business cycle (2.35 percent, 0.24 percent per year). Although these changes may seem small, given that the mean size-adjusted household income of Hispanics has recently been around 60 percent of that of whites, a small increase in the Hispanic share of the population translates into a sizable downward shift in median income.

During each business cycle since 1979, the increase in the share of blacks and Hispanics in the population accounted for at least a 0.14-percentage-point-per-year reduction in median income, holding constant each racial group's income distribution (table 4.1, row 3).²⁵ Over the 2000–2007 cycle, this demographic shift nearly doubled, accounting for a 0.29-percentage-point-per-year decline in median income. This represents the difference between the 0.02-percentage-point-per-year decline in median income actually observed (table 4.1, row 1) and what would have been a 0.27-percentage-point-per-year growth in median income. In sum, the growth in the share of blacks and especially Hispanics in the population, together with their persistent income gap with whites, was the single most important factor accounting for the change in median income from 2000 to 2007. In previous business cycles, this was not the case.

One possible cause of the persistent white-Hispanic income gap is that low-skilled Hispanics are migrating to the United States for higher-paying jobs. When they succeed, they raise their own income, but they may well be driving down the U.S. median income, other things being equal. Another force behind the persistent gap, however, may be an underinvestment in the education and training of Hispanics born in the United States.

Declining rates of marriage also drag down median income, since married households report higher incomes than unmarried ones. The decreased share of Americans living in married households accounted for a 0.12-percentage-point-per-year decline in median income in 2000–2007 (table 4.1, row 4). The reason remains the same: the income gap between married and nonmarried households, which, once again, is substantially higher than in the previous two business cycles.

Overall, demographic factors accounted for a 0.28-percentage-point-per-year slowdown in median income in 2000–2007 (from 0.13 to 0.29 to 0.12), nearly twice the slowdown they accounted for in each of the previous two business cycles. The persistently wide income gap between Hispanics and whites over the past three decades as the share of Hispanics in the population has increased emerges as the key explanation. The substantial increase in the Hispanic population that is expected over the next two decades will continue to drag down median income growth should the wide income gap between these groups remain. The nation will be hindered in its ability to return to periods of substantial median income growth without shrinking this racial income gap. Similarly, the aging of the Baby Boom generation will also pull down median income, although closing that income gap would mean higher elderly transfer payments (such as Social Security), increases in returns on assets for elderly individuals, or increases in work during retirement.

Changes in the Employment and Earnings of Men and Women

Although the long-term demographic changes reported here provide an important baseline, economic factors play a much more important role in accounting for changes in median income and income inequality within business cycles. These economic factors also account for the bulk of the change in median income across business cycles (table 4.1, remainder of rows). Thus, we turn to the impact of changes in specific income sources on median income across our three business cycles.

In considering the impact of changes in each income source on household income, we first focus on the primary members of a household: the household head and, if that head is married, on his or her spouse. In table 4.1 (rows 5 and 6), we focus on changes in the employment and labor earnings of men who are household heads or spouses of a household head. In rows 7 and 8, we focus on changes in the employment and earnings of women—again, those who are household heads or spouses of a household head. Using data from the March 2007 CPS data, we find that these household heads and spouses made up 79 percent of the entire adult population and received 89 percent of all labor earnings in the United States. Thus, our household head measures capture the vast majority of U.S. labor earnings.

The decision of women to enter the workforce made its mark. The employment and labor earnings of men are important, but they are not the primary factors behind the substantial changes in household income distributions. Instead, the earnings of women and their employment in itself are more central. As table 4.2 shows, while men are much more likely to be employed than women (columns 1 and 3 versus columns 5 and 7) and on average have greater labor earnings than their female counterparts (columns 2 and 4 versus columns 6 and 8), the changes in their employment and labor earnings over the last three business cycles are small compared to those of women.

Over the 1979–1989 business cycle, the full-time employment of women increased by 6.93 percentage points versus a 1.03 decline for their male counterparts. At the same time, the mean labor earnings of female full-time workers increased by 19.17 percent versus a 7.26 percent increase for their male counterparts. The differences were smaller over the 1989–2000 business cycle: a 6.43-percentage-point increase for women versus a 2.21-percentage-point increase for men in full-time employment, and 17.01 versus 14.89 percent increases in mean full-time labor earnings. Over the 2000–2007 business cycle, women’s full-time employment was stagnant (a 0.60-percentage-point increase), and the mean earnings of these full-time workers increased by only 7.88 percent. But men did even worse—full-time employment declined by 1.84 percentage points, and full-time mean earnings declined by 2.72 percent.

TABLE 4.2 *Employment and Earnings (in 2010 Dollars) of Household Heads and Their Spouses, by Gender, During Each Business Cycle Since 1979*

	Male Household Heads				Female Household Heads			
	Employed Full-Time	Mean Full-Time Earnings	Employed Part-Time	Mean Part-Time Earnings	Employed Full-Time	Mean Full-Time Earnings	Employed Part-Time	Mean Part-Time Earnings
1979	63.42%	\$55,459	19.36%	\$26,687	26.99%	\$30,374	29.59%	\$11,429
1989	62.39	\$59,487	17.77	\$26,811	33.92	\$36,196	27.01	\$14,246
Change	-1.03	\$4,028	-1.59	\$124	6.93	\$5,822	-2.58	\$2,817
Percentage change		7.26		0.47		19.17		24.65
1989	62.39	\$59,487	17.77	\$26,811	33.92	\$36,196	27.01	\$14,246
2000	64.60	\$68,345	14.20	\$31,132	40.35	\$42,352	23.81	\$18,778
Change	2.21	\$8,858	-3.57	\$4,321	6.43	\$6,156	-3.20	\$4,532
Percentage change		14.89		16.12		17.01		31.81
2000	64.60	\$68,345	14.20	\$31,132	40.35	\$42,352	23.81	\$18,778
2007	62.76	\$66,485	14.62	\$33,290	40.95	\$45,690	21.84	\$20,196
Change	-1.84	(\$1,860)	0.42	\$2,158	0.60	\$3,338	-1.97	\$1,418
Percentage change		-2.72		6.93		7.88		7.55

Source: Authors' calculations using CPS data.

Changes in women's employment (0.31 percentage points per year) and earnings (0.37 percentage points per year) combined (0.68 percentage points per year) emerged as the most important factor accounting for increasing median income over the 1979–1989 business cycle (table 4.1, rows 7 and 8). In contrast, the employment and labor earnings of men (rows 5 and 6) combined accounted for a decline of 0.07 percentage points per year of median income.

Although the combined growth (0.43 percentage points per year) in men's employment (0.12) and labor earnings (0.31) was more important in accounting for the growth of median income in the 1989–2000 business cycle, the growth in the employment and labor earnings of women was even more important—a combined increase of 0.57 percentage points per year.

The falloff in the employment and earnings of men and women over the 2000–2007 business cycle accounts for the overall slow growth in median income over this period relative to earlier periods. Although the earnings of both men (0.20) and women (0.22) accounted for increases of around 0.20 percentage points per year, the relatively stagnant employment growth of women and an absolute decline in the employment of men accounted for concomitant declines in median income. The net result: female employment and earnings accounted for only a 0.21-percentage-point-per-year increase in median income, and male employment and earnings accounted for only a 0.10 percent increase in median income during the 2000s business cycle. These increases are far smaller than those of the 1990s business cycle.

Women augmented their households' income by entering the labor force. Over the 1980s and 1990s, the employment and earnings of women were the primary drivers of the growth in median household income. Now that more women are working and the rate of increase has slowed, what will replace these drivers? This presents a challenge.

Changes to Spouses' Earnings Correlations

The correlation of the earnings of the man and woman in a couple can also affect income growth or decline (table 4.1, row 9). Although these increases in earnings correlations influenced incomes at the tails of the distribution (as discussed later), they generally accounted for only minor variations in median household income.²⁶

Changes to All Other Sources of Income

The three remaining sources of household income are the earnings of other household members who are not household heads or their spouses, private nonlabor earnings, and public transfers. In all cases, the data represent the changing correlation of that source to all previously analyzed income sources.

As can be seen in appendix table 4A.2, the mean values of each of these nonlabor income sources are small relative to the mean earnings of heads and spouses reported in table 4.2. Even so, shifts in the shares of these sources of income have accounted, over certain business cycles, for a nontrivial change in median income.

The discussion thus far has focused only on women and men who are household heads or the spouses of household heads, but the earnings of other household members matter as well. The earnings of other household members moved in the same direction as those of women (who are household heads or spouses of household heads) and accounted for a 0.09-percentage-point-per-year increase in median income—less than the 0.37-percentage-point-per-year increase accounted for by female householders, but more than the 0.02 decline accounted for by male householders (table 4.1, row 10). The earnings of other household members then accounted for a slightly larger 0.12-percentage-point-per-year increase in median income over 1989–2000. The small growth in the earnings of other household members and these increases together with the concomitant growth of public transfers (0.07 percentage points per year) help account for some of the 1.11 percent annual growth in median income over this period. Likewise, the declines in the early 2000s in both the labor earnings of others and private nonlabor earnings further explain why the 2000–2007 business cycle was the first full business cycle since at least the 1970s when median income fell (–0.02 percent per year) in the United States.

DECOMPOSING MEDIAN INCOME TRENDS IN THE WAKE OF THE GREAT RECESSION

Because the first business cycle of the twenty-first century lasted only from 2000 to 2007, we compared it with the previous two business cycles of the 1980s and 1990s, focusing on peak-to-peak comparisons. Doing so, however, misses the consequences of the Great Recession for median income over the first decade of the twenty-first century. To consider more recent median income trends, we look at the changes in median income from the peak business-cycle year of 2007 to the end of the decade in 2010. Although median income fell even lower in 2011 and 2012, our analysis will allow us to be consistent with the decade-long (2000–2010) focus of this book while still comparing the first three years of the Great Recession with the first three years of earlier business-cycle recessions—particularly the 1979–1983 double-dip recession, which was closest to the Great Recession in severity.

The first-row values in table 4.3 report the declines in the median household, size-adjusted, pretax, post-transfer cash income of persons in the first three years of each economic downturn since 1979. Since these are consistent time periods, the results are for the entire three-year

TABLE 4.3 *Factors Accounting for Changes in Median Size-Adjusted Household Income During the First Three Years of the Last Four Economic Downturns*

	1979–1982	1989–1992	2000–2003	2007–2010
Percentage change in median income	–5.79	–3.96	–2.59	–6.97
Change accounted for by:				
Age	0.14	–0.04	0.40	0.04
Race and ethnicity	–0.34	–0.33	–0.96	–0.94
Marriage	–0.23	–0.43	–0.35	–0.28
Male-head employment	–2.31	–1.40	–1.24	–2.90
Male-head earnings	–3.39	–1.55	0.56	–1.45
Female-head employment	0.57	0.72	–0.77	–1.13
Female-head earnings	0.22	0.57	1.05	0.27
Spouse correlation	–0.03	0.15	0.16	–0.30
Earnings of others	–1.61	–1.45	–0.95	–0.88
Earnings of others correlation	0.02	–0.15	–0.01	–0.05
Private nonlabor income	1.12	–1.15	–0.87	–0.92
Private nonlabor correlation	–0.52	0.14	0.17	0.36
Public transfers	0.44	0.62	0.31	1.25
Public transfers correlation	0.14	0.28	–0.02	0.02

Source: Authors' calculations using CPS data.

period rather than the average annual change. Consistent with the severity of the Great Recession, the median income decline over this period surpasses any of the three previous recessions. Table 4.3 (remaining rows) delineates the separate factors behind this decline, comparing their importance to earlier recessions.

We first look at the relative importance of changes in male earnings and employment. Unlike the findings from our peak-to-peak comparisons across the entire business cycle (table 4.1), the single most important factor accounting for the decline in median income during the Great Recession and all other recessions was the combined change in employment and earnings for men. Comparing the Great Recession to the double-dip recession in the early 1980s reveals that the Great Recession differs in the relative importance of men's employment and earnings declines. Over the first three years of the early 1980s recession, declines in earnings among men accounted for more of the decline in median income than did their declines in employment. In contrast, during the Great Recession declines in male employment were twice as important as declines in labor earnings in accounting for declines in the earnings of those men still working. In short, unemployment increases were more important than reductions in earnings, even for the median of the income distribution.

Consider the changing impact of the earnings and employment of male heads and spouses on median income found in the first four rows of appendix table 4A.3. Over the recession years 2007–2010, the decline in full-time employment (6.9 percentage points) exceeded the decline in full-time employment in the 1979–1982 recession (5.5 percentage points). Consistent with Andrew Sum and Ishwar Khatiwada's (2010) findings of substantial underemployment in the Great Recession, there was also a concurrent increase in part-time work between 2007 and 2010 that exceeded that of other recessions.

In contrast, the real mean earnings of men employed full-time over the recession years 2007–2010 rose by 0.9 percent. This compares to a 3.9 percent drop over the recession of 1979–1982. The small increase in the earnings of those who were working may have resulted

from either fewer wage cuts among those who remained employed or the fact that layoffs in the Great Recession had a disproportionate impact on low-wage workers compared to what was seen in earlier recessions. Increases in part-time employment partially offset the overall decline in employment in each recession, but not enough to fully counteract the declines in median income from the earnings and employment of men working full-time.

One potential explanation for this relative decline in the importance of earnings over the Great Recession is inflation. Over 2007–2010, inflation was at historic lows (1.6 percent annually based on the CPI-U-RS), while over 1979–1982 inflation was very high (9.4 percent annually based on the CPI-U-RS). Since nominal wages rarely fall, in periods of low inflation firms are more likely to lay off workers than to reduce wages. In contrast, during periods of high inflation, when real wages can fall more easily, firms may more easily cut real wages. This is especially true if the inflation is unexpected.

A second important story in the Great Recession is women. Their combined employment and earnings accounted for increases in median income over the first three years of the three previous recessions (table 4.3, rows 7 and 8). This was not the case during the Great Recession. Although the earnings growth of women continued to account for a small increase in median income, the decline in their employment more than offset that increase.

The explanation can be clearly seen in appendix table 4A.3 (columns 5 to 8). During the 1979–1982 and 1989–1992 periods, the full-time employment of women grew despite the recession and offset other factors accounting for declining median income. The long-term movement of women into the workforce during the 1970s and 1980s was strong enough to overcome cyclical employment declines during recession years. By the 2000s, however, the movement of women into the workforce had slowed and no longer offset cyclical declines in female employment during recession years.²⁷ Thus, in 2007–2010 female employment fell and accounted for a 1.13-percentage-point decline in median income (table 4.3, row 7), a reversal from 1979–1982.

Although the vast majority of adult workers are male and female heads or their spouses, a fall in the earnings of other household members accounted for 0.88 percentage points of the fall in median income in the Great Recession, less than in any of the previous recessions (table 4.3, row 10). Nevertheless, even this decline may reflect the severity of the recession: some previous household heads or spouses moved in with relatives to weather the economic storm, thereby increasing the number of employed adults in a household.²⁸

Although labor earnings receive more attention during recessions, nonlabor income (such as interest or dividends) and public transfers (for example, unemployment insurance [UI], social security, or cash welfare) are important components of many households' income. As such, changes to these sources also can account for changes in median income during recessions.

Appendix table 4A.4 (column 1) provides details on the changes in mean size-adjusted nonlabor income during each of the past four recessions. Mean private nonlabor income fell by 9.7 percent over the Great Recession, partially owing to the decline in real (inflation-adjusted) interest rates during this period. In contrast, during the first three years of the 1980s recession (1979–1982), fears of inflation increased real interest rates, pushing up private nonlabor income by 11.8 percent. During the Great Recession, the decline in private nonlabor income helped account for declining median income (table 4.3, row 12), especially compared to the 1979–1982 period. Declines in private nonlabor income during this recession accounted for a 0.92-percentage-point decline in median income. Although reduced pensions, smaller dividends, and low interest on savings accounts undoubtedly hurt those with high incomes, the decline hurt the median American as well.

Public cash transfer income is especially important during recessions. Although public transfers, like unemployment insurance, increase during all recessions, they increased more

during this recent one (appendix table 4A.4, column 2). While mean household size-adjusted public transfers per person increased by 11.5 percent during the recession years 1979–1982, they increased by almost twice as much (22.0 percent) more recently, from \$2,963 in 2007 to \$3,616 in 2010. During this period, Congress extended UI benefits to ninety-nine weeks, an unprecedented extension, at the same time that the program relaxed the criteria for eligibility. Approximately two-thirds of the increase in public transfer income during the Great Recession came from unemployment compensation, workers' compensation, and veterans' benefits (appendix table 4A.4, columns 3 to 6). From 2007 to 2010, income from these sources increased by 121.0 percent, compared to a 29.8 percent increase from 1979 to 1982.²⁹ Clearly these programs bolstered the short-term pretax income of many individuals—even without counting the increases in in-kind benefits such as food stamps.

This increase in public transfers during the Great Recession offset the declines in private-sector income to a much greater extent than had been seen in earlier recessions (table 4.3, row 14). While changes to public transfer programs during the recession years 1979–1982 offset declines in median income by 0.44 percentage points (or 7.6 percent of the total change), public transfers mitigated median income declines by 1.25 percentage points (or 17.9 percent of the total change) in the 2007–2010 period. Thus, at least over the first three years of the Great Recession, the increase in public transfers—especially the growth and extension of UI benefits beyond that seen in previous recessions and the automatically triggered eligibility for means-tested transfer programs—mitigated the recessionary fall in median income.³⁰

Overall, in this recession median income fell more as a result of declining employment (of both men and women) than seen in earlier recessions, and less as a result of the falling earnings of those who remained employed. Additionally, falling nonlabor income from declines in interest rates contributed to median income declines in a way that was not present in the early 1980s. Indeed, had it not been for growth in public transfers that exceeded that seen in earlier recessions, median income might have fallen even further.

DECOMPOSING INEQUALITY TRENDS FROM 2000 TO 2007

Median income growth is the key to understanding the plight of “average Americans”—those at the middle of the income distribution. However, the evenness (or unevenness) of the distribution of incomes is also important. We undertake a similar analysis, decomposing the factors accounting for trends in income inequality in the United States. Here we measure average changes in income inequality over the last three business cycles using the Gini coefficient. The values reported in table 4.4 (row 1) come from this income inequality series (first reported in figure 4.2, top graph). Inequality grew in all three business cycles, but substantially faster during the 1980s business cycle than thereafter.

Demographic trends also account for trends in income inequality. Upward shifts in the share of blacks and Hispanics accounted for a 0.07-percentage-point-per-year increase in the Gini coefficient from 2000 to 2007 and slightly smaller 0.06- and 0.05-percentage-point-per-year increases in the previous two periods (table 4.4, row 3). As discussed previously, this finding assumes no change in the income distributions within these demographic groups over the course of each business cycle, but reflects their growth as a share of the population.

Although the small contribution to inequality growth accounted for by demographic trends is relatively constant across the three business cycles, the remaining factors reported in table 4.4 are much less so. In particular, in the 1980s business cycle, growth in the earnings inequality of male heads and spouses was by far the most important factor accounting for the rapid growth in income inequality—0.65 percentage points per year (row 6). In the 1990s, while the inequality

TABLE 4.4 *Factors Accounting for Changes in the Gini Coefficient of Size-Adjusted Household Income During Each Business Cycle Since 1979 (Average Change per Year)*

	1979–1989	1989–2000	2000–2007
Percentage change in the Gini coefficient	0.97	0.08	0.10
Change accounted for by:			
Age	–0.01	0.03	0.02
Race and ethnicity	0.06	0.05	0.07
Marriage	0.08	0.02	0.05
Male-head employment	0.03	–0.04	0.03
Male-head earnings	0.65	0.27	–0.26
Female-head employment	–0.15	–0.17	0.03
Female-head earnings	0.09	0.02	0.09
Spouse correlation	0.14	0.00	–0.02
Earnings of others	–0.01	–0.08	0.05
Earnings of others correlation	0.03	–0.02	–0.02
Private nonlabor income	–0.09	0.06	0.05
Private nonlabor correlation	0.08	–0.02	–0.00
Public transfers	0.01	–0.04	–0.01
Public transfers correlation	0.06	0.00	0.01

Source: Authors' calculations using CPS data.

growth accounted for by the labor earnings inequality of male heads and spouses slowed to 0.27 percentage points per year, it was once again the single most important factor accounting for the growth in income inequality. If not for other factors accounting for inequality declines in the 1990s, inequality growth would have been much faster. In contrast, while the earnings inequality of men was again the most important factor (0.26 percentage points per year) in the 2000s, it was declining during this period, not increasing, as it had done in the earlier periods. Hence, the contribution of the earnings inequality of male heads and spouses was offsetting the increase in income inequality in the early 2000s.³¹ To the extent that household income inequality grew in the beginning of the twenty-first century, it did not come from a rise in the earnings inequality of men.

The opposite is the case with respect to the employment of women. Their employment declined slightly in the early 2000s after at least two decades of substantial increases (table 4.2). In the 2000s, their employment accounts for a slight increase in income inequality (0.03 percentage points per year) (table 4.4, row 7). This is a reversal from the previous two business cycles, when increases in women's employment accounted for substantial reductions in household income inequality—a 0.15-percentage-point-per-year decline in the 1980s and a 0.17-percentage-point-per-year decline in the 1990s. In addition, in all three business cycles increases in women's earnings accounted for increases in income inequality. But in the 2000s, the earnings of women accounted for a further increase in income inequality rather than an offset of their employment on income inequality. Thus, in the 2000s working women accounted for a net increase in income inequality, rather than the net decrease they accounted for in the 1980s and 1990s.

As was the case with median income trends, the discussion thus far has assumed that the rank-correlation across income sources remains unchanged: in short, high-earning men continue to marry low-earning women (and vice versa) at the same rate at the end of each business cycle as at the beginning. However, spouses' earnings have increased in correlation since the

1970s, which in turn increases the concentration of income in fewer households, since high-earning men and women are now more likely to marry each other. Just as the inequality trends accounted for by the earnings of men and the employment of women have changed dramatically since 1979, the trends accounted for by the correlation of the earnings of heads and spouses have changed as well. In the 1980s, male and female earnings became more correlated and accounted for a 0.14-percentage-point-per-year growth in income inequality (table 4.4, row 9).

In the 1990s, this increase in the correlation between spouses' earnings slowed and accounted for no further inequality growth. And in the 2000s business cycle, the effect reversed directions and spouses' earnings became less correlated. This, in turn, accounted for declines in inequality. Thus, just as the earnings inequality growth of male heads and spouses accounted for rising inequality in the 1980s but now account for falling inequality, the same is true for changes in the earnings correlations among household heads.

Larrimore (forthcoming) has a partial explanation for why earnings correlations are no longer increasing as they were in the 1980s. Shifts in the correlation of earnings among dual-earner couples can have an impact on earnings correlations, but so can changes in their places in the income distribution. In the 1980s, most rapid rise in female employment occurred among women married to high-earning men. This increased the concentration of income in a smaller number of households. But in the next two business cycles, women married to nonworking men entered employment at relatively faster rates. As a result, the number of no-wage-earner couples declined, which reduced earnings correlations and income inequality in the 1990s and 2000s.

Of course, other income sources have also influenced income inequality, although not to the same extent as the labor earnings of male and female heads and spouses and their correlations (table 4.4, remaining rows). For example, public transfers are likely to be more consequential over business-cycle downturn years. But we do not explore this possibility here. However, we still observe that in the 2000s business cycle, the increases in the inequality of nonlabor income, which includes interest and dividend income, did account for small further increases in inequality.³²

In many respects, the volatility of the factors accounting for inequality growth over the past thirty years is remarkable. In the 1980s, a perfect storm of increases in the labor earnings inequality of men and women and their correlations accounted for 0.88 percentage points of the total inequality growth of 0.97 percentage points per year. By the 2000s, income inequality growth was a relatively slow 0.10 percentage points per year, in large part because of the decrease in the labor earnings inequality of men and women and the reversal in spousal earnings correlations.

THE IMPACT OF DEMOGRAPHIC CHANGES ON FUTURE INCOME DISTRIBUTION TRENDS

We have focused on changes in median income and income inequality over the 2000s, the drivers of these changes, and the divergence from earlier decades. We showed that demographic trends produced a small headwind against median income growth. That mild headwind may soon become a gale. Over the next two decades, the Baby Boom generation will age into retirement (appendix table 4A.5); by 2030, almost 20 percent of the entire U.S. population will be over the age of sixty-five, an increase from 13 percent in 2010. Additionally, the Hispanic population is projected to increase from 16 to almost 22 percent of the U.S. population by 2030, and to almost 28 percent by 2050 (U.S. Census Bureau 2008).

We use our same shift-share analysis to develop baseline median income and income inequality trends for the coming decades based on these demographic projections, again assuming

TABLE 4.5 *Projection from Demographic Trends in Age and Race of Median Income and Income Inequality—Average Annual Changes from 2007 Through 2050*

	Average Annual Median Income Change Accounted for by:		Average Annual Gini Coefficient Change Accounted for by:	
	Age	Racial Composition	Age	Racial Composition
1979–1989	0.00	–0.14	–0.01	0.06
1989–2000	0.05	–0.15	0.03	0.05
2000–2007	0.13	–0.29	0.02	0.07
2007–2020	–0.09	–0.34	0.02	0.06
2020–2030	–0.17	–0.35	0.02	0.05
2020–2040	–0.02	–0.18	0.00	0.03
2040–2050	0.00	–0.24	0.00	0.03

Source: Authors' calculations using CPS data.

that the income distributions within each group remain unchanged (table 4.5). The statistics foretell our society's Sisyphean challenge: if we are unable to close the income gaps between retired and working-age Americans and between blacks/Hispanics and whites, how will we increase median income and reduce inequality in the coming decades?

Consider the average percentage-point changes in median income and income inequality associated with a change in the age and racial composition of the United States across the last three business cycles (table 4.5, rows 1 to 3, values taken from tables 4.1 and 4.4, rows 2 and 3; the remaining rows use our same shift-share analysis for 2007 to 2020 and for each succeeding decade). Between now and 2030, the retirement of Baby Boomers will provide substantial headwinds against increasing median incomes. Changes in the age distribution accounted for no increase, or even for a positive increase, in median income over the past three decades, but over the next two decades these changes will account for first a 0.09- and then a 0.17-percentage-point-per-year reduction in median income. The result is not surprising: retirees generally earn less. Unless boomers delay retirement or there is an increase in transfer income to retirees, this is not likely to change.

The increase in the share of the black and especially the Hispanic population over this time will further limit median income growth unless we close the income gap between these groups and white Americans. Since minority mean incomes are approximately 60 percent of the mean income of whites, this upward shift in the share of the black and Hispanic population is projected to reduce median income growth by an additional 0.34 percentage points per year through 2020, and by 0.35 percentage points per year between 2020 and 2030. Thus, the combined upward shift of these two populations will account for a 0.43-percentage-point-per-year reduction in median income through 2020 and a 0.52-percentage-point-per-year reduction between 2020 and 2030 if the income gaps between these groups and their working-age white counterparts are not reduced. This gale force is more than three times the power of the mild demographic headwinds of the 2000–2007 business cycle.

These demographic trends also will exacerbate income inequality, but to a lesser extent (table 4.5, remaining columns). The increasing shares of retirees, blacks, and Hispanics are projected to moderately increase income inequality over the coming decades. Unlike our projections for median income, however, there is no marked difference in their impacts relative to the previous decades. This is partially because retirement-age persons, while having a low median

income, are unlikely to be destitute, given Social Security and Supplemental Security Income (SSI). Thus, the increase in the retirement-age population does not have the same adverse effect on inequality as it does on median income, since few retirement-age persons are at the extreme lower tail of the distribution.

CONCLUSION

The first decade of the twenty-first century was a turbulent economic time for the average American. For the first full business cycle since at least the 1970s, median income fell slightly between 2000 and 2007, and fell even more during the Great Recession. At the same time, the growth of income inequality, though it has slowed, remains at record-high levels.

Using a shift-share analysis, we have shown that the increased employment and earnings of women was the single most important factor accounting for rising median income over the business cycles of the 1980s and 1990s. Although their earnings accounted for some increase in median income over the 2000s, for the first time their employment accounted for a small decline in median income. This, together with a much larger decline in the employment of men, primarily accounted for the stagnation in median income over the 2000s business cycle relative to its more robust growth over the 1980s and 1990s cycles.

The Great Recession spurred a larger decline in median income than any of the previous three recessions, including the double-dip recession of the early 1980s. When we focused only on the changes in our factors during economic downturns, the fall in the employment and earnings of men is the most important factor behind the downturn in median income in all our periods of analysis. But the relative importance of men's employment and earnings differed in the 2000s. Unlike the last major recession (the double-dip recession of the early 1980s), the drop in employment, not the drop in earnings, was more important. In addition, women, instead of increasing their employment, as they did during the double-dip recession, retreated, accounting for a further decline in median income. The dramatic increase in public transfers, however, partially offset declines in median income during the Great Recession.

Similarly, looking at income inequality trends, the 2000s business cycle is the first since the 1970s when increases in the employment of women did not mitigate increases in income inequality. Over the 1980s and 1990s, the earnings of men accounted for rapid income inequality growth, but the earnings of women partially counterbalanced these increases. In the 2000s business cycle, this did not happen. Instead, the employment of women (along with the earnings of other household members) actually accounted for an increase in income inequality. This effect of women's employment, combined with increased inequality from demographic changes, has more than offset the major decline in inequality accounted for by changing male earnings patterns.

Looking forward, since retirees as well as blacks and Hispanics have consistently had lower incomes than working-age adults and whites, projected increases in their population shares will increase inequality and reduce median income unless these income gaps close. Over the next two decades, median incomes within each of these groups will have to increase by over half a percent per year just to keep up with the demographic changes. Alternatively, policies that reduce the income gap between minorities and whites and encourage older workers to delay retirement could overcome these demographic headwinds.

TECHNICAL APPENDIX

As described in the main text, our shift-share approach allows the demographic composition (age, race, ethnicity, and marital status) and the sources of income of our total population to

change, one factor at a time, thus separately accounting for the relationship of each of these factors with changes in income and income inequality. Embedded within this approach are three distinct techniques for decomposing income distribution changes. The first considers changes in the size of subpopulation within the total population based on demographic factors of age, race, ethnicity, and marital status as well as the employment status of the household heads. The second considers changes to the source-level income distributions within these subpopulation groups, holding the rank-correlation of the income sources unchanged. The third considers changes in the correlation of income sources over time. We describe our technique in this appendix.

Changes in the Prevalence of Subpopulations

Our first decomposition technique is based on Atkinson (1998) and Burtless (1999). It accounts for changes in the frequencies of categorical characteristics in the population, including demographic trends. For example, it considers how an increase in the share of Hispanics in the total population will change the overall income distribution, holding the income distribution of whites, blacks, and Hispanics unchanged.

This technique reweights observations from the base year, t , such that the weighted fraction of the population in each demographic group matches that in future years, t' . By increasing the weight of individuals with characteristics (such as being Hispanic) that are more prevalent in year t' than in year t in this way, we are able to estimate the impact of changing the prevalence of those in the total population with this characteristic without altering the underlying income distributions within each group. In all cases in this chapter, the base year, t , is the starting year of the business cycle. The comparison year, t' , is either the following business-cycle peak for the long-run trends or the comparison year during the trough of the business cycle in the case of the short-run economic downturn discussion.

Changes in Source-Level Income Distributions Within Population Groups

The second decomposition technique is based on Burtless (1999) and Daly and Valletta (2006). It incorporates the fact that the income distribution within each subpopulation group is changing as well. These changes can result from any income source, including male head labor earnings, female head labor earnings, nonhead earnings, nonlabor income, and public transfer income.

Note that each individual's income, Y_{ik}^t , can be represented as the sum of their incomes from each income source, f_{1ik}^t through f_{Nik}^t .

$$Y_{ik}^t = f_{1ik}^t + f_{2ik}^t + \dots + f_{Nik}^t \quad (4.1)$$

We assign individuals a percentile rank, p_{fik} , for each income source based on the rank of their source-level income within their subpopulation group k . For now, the correlations of individuals' positions in the distribution of source-level incomes (rank-correlations) within each subpopulation group are assumed to be constant. This allows us to separate the importance of changes to the level and dispersion of income from a given income source from the change in the relationship between separate income sources.

To estimate the impact of changes to the distribution of source f_1 on income inequality, each individual's income from the source f_1 in year t is replaced with the income of the individual at the same percentile rank of the source f_1 income distribution in year t' :

$$\hat{Y}_{ik}^t(p_{1ik}) = f_{1ik}^t(p_{1ik}) + f_{2ik}^t + \dots + f_{Nik}^t \quad (4.2)$$

This preserves the conditional earnings rank of each individual from source f_i and the rank-correlation of earnings from source f_i with other income sources, while capturing changes in the source-level income distribution of source f_i within each population group. Since this procedure combines income across years, prior to the analysis we adjust all income for inflation using the CPI-U-RS.

Changes in Income-Source Rank Correlations Within Subpopulation Groups

The third decomposition technique is based on Burtless's (1999) concept of measuring rank-correlations and uses a method from Larrimore (forthcoming) to operationalize the approach. The previous techniques hold the rank-correlation of income sources constant. That is, if the male and female heads at percentile-ranks p_{1ik} and p_{2ik} in their conditional earnings distributions are married to each other in one year, we assume the same rank-pairing will continue in all future years. By performing these rank-preserving income exchanges for sources f_1 and f_2 separately, we are able to analyze the impacts of the separate earnings distributions without affecting the correlation between the two:

$$\hat{Y}'_{ik}(p_{1ik}, p_{2ik}) = f'^{1}_{ik}(p_{1ik}) + f^t_{2ik}(p_{2k}) + f^t_{3ik} + \dots + f^t_{Nik} \tag{4.3}$$

To update the correlation between sources f_1 and f_2 , rather than dividing income into N separate sources, we divide income into $(N - 1)$ sources such that $g_1 = f_1 + f_2$ while f_3 through f_N are unchanged. We capture the rank-correlation change of sources f_1 and f_2 by combining these sources with the rank-preserving income exchange before rather than after. Thus, calling each individual's percentile-rank in the g_1 distribution q_{fik} , we calculate estimated incomes as:

$$\hat{Y}'_{ik}(q_{1ik}) = g'^{1}_{ik}(q_{1ik}) + f^t_{3ik} + \dots + f^t_{Nik} \tag{4.4}$$

This updates the correlation between sources f_1 and f_2 along with their income distributions. We capture the impact of the changing correlation between sources f_1 and f_2 by comparing the results in the case where only their separate income distributions change (equation 4.3) with the case where their joint distribution changes (equation 4.4). Using these three techniques, we fully account for changes in median income and income inequality via changes in the demographic, employment, and source-level income distributions of individuals in each year.

APPENDIX

TABLE 4A.1 *Racial and Ethnic Characteristics of the U.S. Population and Size-Adjusted Household Income (in 2010 Dollars) During Each Business Cycle Since 1979, by Race*

	White		Black		Income Ratio Black/ White	Hispanic		Income Ratio Hispanic/ White
	Percentage White	Mean Income	Percentage Black	Mean Income		Percentage Hispanic	Mean Income	
1979	82.45%	\$36,388	11.48%	\$21,534	59.18	6.08%	\$24,598	67.6
1989	79.48	42,577	12.09	24,745	58.12	8.43	25,873	60.77
Change	-2.97	6,189	0.61	3,211	-1.06	2.35	1,275	-6.83
Percentage change		17.01		14.91			5.18	
1989	79.48	42,577	12.09	24,745	58.12	8.43	25,873	60.77
2000	75.17	51,379	12.55	31,556	61.42	12.28	29,111	56.66
Change	-4.31	8,802	0.46	6,811	3.30	3.85	3,238	-4.11
Percentage change		20.67		27.52			12.51	
2000	75.17	51,379	12.55	31,556	61.42	12.28	29,111	56.66
2007	71.9	51,561	12.68	31,775	61.63	15.42	30,185	58.54
Change	-3.27	182	0.13	219	0.21	3.14	1,074	1.88
Percentage change		0.35		0.69			3.69	

Source: Authors' calculations using CPS data.

TABLE 4A.2 Mean Size-Adjusted Sources of Income During Each Business Cycle Since 1979
(in 2010 Dollars)

	Mean Private Nonlabor Income by Source				Mean Public Transfer Income by Source			
	Public Transfers	Total Private Nonlabor Income	Private Investment Income	Other Private Income	Public Assistance or Welfare	SSI Income	Social Security Income	UC, WC, and Veterans Benefits
1979	\$2,410	\$3,043	\$1,741	\$1,301	\$239	\$95	\$1,650	\$426
1989	2,542	4,457	2,445	2,012	195	119	1,892	336
Change	133	1,415	704	711	-44	24	242	-90
Percentage change	5.5	46.5	40.4	54.6	-18.4	25.3	14.7	-21.1
1989	2,542	4,457	2,445	2,012	195	119	1,892	336
2000	2,798	4,523	2,347	2,175	63	158	2,241	337
Change	256	65	-98	163	-132	39	349	1
Percentage change	10.1	1.5	-4.0	8.1	-67.7	32.8	18.4	0.3
2000	2,798	4,523	2,347	2,175	63	158	2,241	337
2007	2,963	4,474	2,246	2,228	35	176	2,412	341
Change	165	-48	-101	53	-28	18	171	4
Percentage change	5.9	-1.1	-4.3	2.4	-44.4	11.4	7.6	1.2

Source: Authors' calculations using CPS data.

Note: SSI = supplemental security income; UC = unemployment compensation; WC = worker's compensation.

TABLE 4A.3 *Employment and Earnings of Household Heads and Their Spouses During the First Three Years of the Last Four Economic Downturns, by Gender (in 2010 Dollars)*

	Male Household Heads				Female Household Heads			
	Percentage Employed Full-Time	Mean Full-Time Earnings	Percentage Employed Part-Time	Mean Part-Time Earnings	Percentage Employed Full-Time	Mean Full-Time Earnings	Percentage Employed Part-Time	Mean Part-Time Earnings
1979	63.4%	\$55,459	19.4%	\$26,687	27.0%	\$30,374	29.6%	\$11,429
1982	57.9	53,299	22.4	24,191	28.0	31,209	27.7	11,395
Change	-5.5	-2,161	3.0	-2,496	1.1	834	-1.9	-33
Percentage change		-3.9		-9.4		2.7		-0.3
1989	62.4	59,487	17.8	26,811	33.9	36,196	27.0	14,246
1992	59.4	57,788	19.2	24,360	35.3	37,142	25.8	14,579
Change	-3.0	-1,699	1.4	-2,450	1.3	946	-1.2	333
Percentage change		-2.9		-9.1		2.6		2.3
2000	64.6	68,345	14.2	31,132	40.4	42,352	23.8	18,778
2003	61.6	67,428	15.4	31,798	39.1	44,968	23.4	19,895
Change	-3.0	-916	1.2	666	-1.3	2,616	-0.4	1,117
Percentage change		-1.3		2.1		6.2		5.9
2007	62.8	66,485	14.6	33,290	41.0	45,690	21.8	20,196
2010	55.9	67,103	17.9	28,164	38.2	46,686	22.3	19,601
Change	-6.9	618	3.3	-5,126	-2.7	995	0.5	-595
Percentage change		0.9		-15.4		2.2		-2.9

Source: Authors' calculations using CPS data.

TABLE 4A.4 Mean Size-Adjusted Sources of Income During the First Three Years of the Last Four Economic Downturns (in 2010 Dollars)

	Mean Private Nonlabor Income	Mean Public Transfer Income	Mean Public Transfer Income by Source			
			Public Assistance or Welfare	SSI Income	Social Security Income	UC, WC, and Veterans Benefits
1979	\$3,043	\$2,410	\$239	\$95	\$1,650	\$426
1982	3,403	2,686	221	97	1,814	554
Change	360	276	-18	2	164	127
Percentage Change	11.8	11.5	-7.3	2.1	10.0	29.8
1989	4,457	2,542	195	119	1,892	336
1992	4,078	2,807	206	145	1,974	483
Change	-380	265	10	26	82	147
Percentage Change	-8.5	10.4	5.3	21.5	4.3	43.8
2000	4,523	2,798	63	158	2,241	337
2003	4,146	3,009	55	175	2,310	468
Change	-376	211	-8	18	69	132
Percentage Change	-8.3	7.5	-12.3	11.1	3.1	39.1
2007	4,474	2,963	35	176	2,412	341
2010	4,040	3,616	43	201	2,617	756
Change	-435	653	8	25	206	414
Percentage Change	-9.7	22.0	23.3	14.2	8.5	121.4

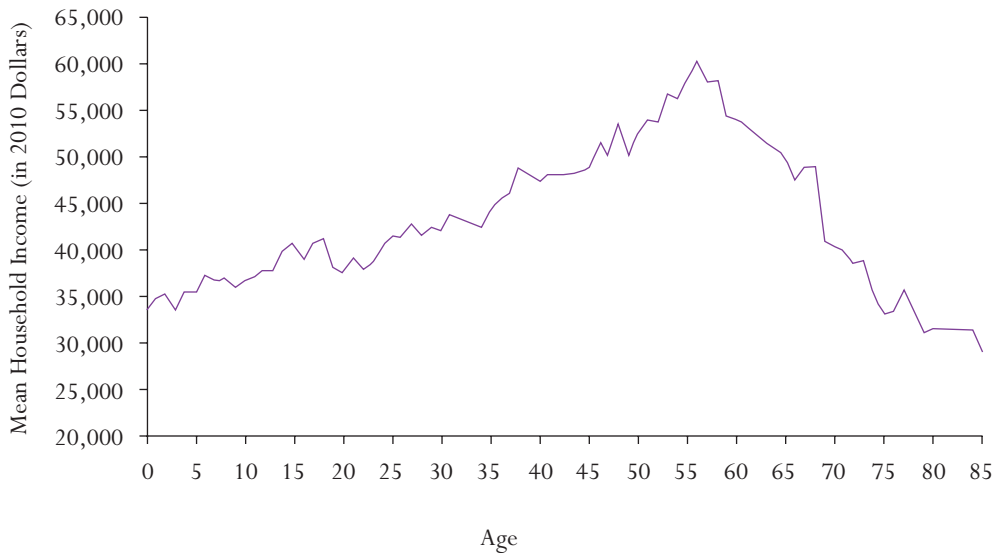
Source: Authors' calculations using CPS data.

Note: See table 4A.2 note.

TABLE 4A.5 U.S. Census Bureau Demographic Projections, by Age and Race, 2007–2050

	White	Black	Hispanic	Children (Zero to Eighteen)	Young Adult (Nineteen to Forty-Four)	Middle Age (Forty-Five to Sixty-Four)	Elderly (Sixty-Five and Older)
1979	82.4%	11.5%	6.1%	30.3%	38.6%	20.2%	11.0%
1989	79.5	12.1	8.4	27.4	41.3	19.1	12.2
2000	75.2	12.5	12.3	27.6	37.9	22.5	12.0
2007	71.9	12.7	15.4	26.2	35.4	26.0	12.4
2010	71.3	12.9	15.8	25.5	35.2	26.2	13.0
2020	68.0	13.2	18.8	25.0	33.9	24.9	16.3
2030	64.7	13.5	21.8	24.4	33.0	22.8	19.8
2040	61.4	13.7	24.8	23.9	32.4	23.0	20.8
2050	58.2	14.0	27.8	23.7	32.4	22.8	21.1

Source: Authors' calculations using U.S. Census Bureau (2008).

FIGURE 4A.1 *Mean Size-Adjusted Household Income, by Age, 2010*

Source: Authors' calculations using CPS data.

Note: Individuals age eighty to eighty-four are aggregated together in census data, as are individuals over age eighty-five. Therefore, the mean income for individuals between eighty and eighty-four is the mean of incomes across that entire range, and the mean income for individuals age eighty-five is the mean for all individuals age eighty-five or older.

NOTES

1. All opinions are those of the authors and should not be attributed to the Russell Sage Foundation, the Joint Committee on Taxation, or any member of Congress.
2. Piketty and Saez (2003) was one of the first papers in a rapidly expanding literature using tax return data to examine income inequality trends around the world. For France, see Piketty (2003); for the United Kingdom, see Atkinson (2005); for Canada, see Saez and Veall (2005); for Germany, see Bach, Corneo, and Steiner (2009); for Germany and Switzerland, see Dell (2005); and for Australia, see Atkinson and Leigh (2007). In addition, Atkinson and Piketty (2007) and Leigh (2009) provide comprehensive literature reviews. The most recent review of this literature is Atkinson, Piketty, and Saez (2011).
3. Throughout this chapter, when we discuss the earnings and employment of men and women, we are referring to the head of the household and his or her spouse. The household head is the person (or people) who officially owns or rents the dwelling. When there is no such person, "head of household" may refer to any adult member of the household excluding boarders. We treat married individuals equally as joint heads of the household. The focus on household heads is typical in the types of shift-share analyses we employ here. When we discuss the earnings of other household members, we explicitly say so.
4. Size-adjusted household income accounts for economies of scale in household consumption by dividing income by the square root of household size. This income measure is commonly used in U.S. and cross-national studies of inequality (see, for example, Atkinson and Brandolini [2001]; Burkhauser et al. [2011]; Gottschalk and Smeeding [1997]), as well as by the Organization for Economic Cooperation and Development (OECD) in its official measures of income inequality and poverty (Förster and d'Ercole 2012). This income measure also closely matches the adjustments for household size implied by the Census Bureau poverty thresholds (Ruggles 1990).

It assumes that income is shared equally among all household members, so each member receives the same amount for personal consumption.

5. The CPI-U series reported by the Bureau of Labor Statistics (BLS) has undergone methodological improvements that have not been incorporated retroactively. The CPI-U-RS accounts for these changes to provide a more accurate historical series of inflation, which is typically below that found using the CPI-U (Stewart and Reed 1999).
6. Prior to 1987, the Census Bureau reported eleven (rather than twenty-four) income sources, and each of these eleven income sources was top-coded.
7. This cell-mean series replaces top-coded values with the mean of all top-coded incomes from the specified income source in each year, thus maintaining the total level of top incomes and only losing their dispersion. This series has previously been shown to closely match both the levels and trends of Gini coefficients in the internal restricted-access CPS data used by the Census Bureau to produce its official income statistics (Larrimore et al. 2008). See Blank (2011) for a recent use of this series to measure changes in income inequality. The Census Bureau has offered a similar cell-mean series for the public use data since 1996, although this series was not made available for the years prior to its introduction in 1996. The cell means from Larrimore et al. (2008) are available from 1967 to 2004 and can be used in conjunction with the census-provided cell means since 2004 to obtain a consistent series back to 1967. Readers should also be aware that the internal data have some limited censoring of extremely high incomes. This exists to minimize recording errors and prevent volatility in annual statistics due to the random sampling of outliers. See Semega and Welniak (2007) for details on internal censoring and Burkhauser, Feng, et al. (2012) for an attempt to overcome it.
8. Burkhauser, Feng, et al. (2012) provide further evidence that this one-year increase is artificial. They show that trends in top income shares of tax-units in the March CPS closely match Piketty and Saez's (2003) results using IRS tax records in most years. But this is not the case for 1992–1993, when the top 1 percent income share increased substantially in the March CPS but was relatively constant in the IRS tax records.
9. To remove this artificial inequality spike, we use a procedure similar to that used by Atkinson, Piketty, and Saez (2011), Burkhauser, Feng, et al. (2012), and Larrimore (forthcoming): we adjust all of our income series upward for the years prior to 1993 as if the post-1993 data collection methods had already been in place and there was no change in income statistics between 1992 and 1993.
10. Updated data are provided via Saez's website, <http://elsa.berkeley.edu/~saez/> (last accessed March 2014).
11. For an earlier discussion of this problem and other concerns regarding measuring top income with tax return data, see Feenberg and Poterba (1993). Richard Burkhauser, Markus Hahn, and Roger Wilkins (2013) find that a similar problem occurs for researchers who do not control for the 1980s tax reforms in Australia, which broadened the tax base by, for the first time, taxing realized capital gains held more than one year.
12. Researchers using March CPS data typically focus on household income, assuming that income is shared across all individuals in the household, not just people who together file a tax return. In many traditional families, the tax unit is identical to the household. However, in nonstandard families (including cohabiting couples and boomerang children), income may be shared across tax units.
13. There are numerous ways to measure income, and the choice will yield different measurements of distribution. For example, Burkhauser, Larrimore, and Simon (2012) observe that the choice of what income to include and how broadly it is shared across family or household members can result in median income growth between 1979 and 2007 of 3 to 36 percent. Although CPS-based research (including this chapter) generally focuses on pretax post-transfer cash income, by necessity IRS-based research often restricts income to taxable income sources only, which excludes many sources of transfer income. Consequently, the IRS-based income measure is generally narrower than that based on the CPS. Nevertheless, while the CPS money income definition is broader than the income definition used in the tax return–based literature, some researchers have recently suggested that the CPS income definition is itself too narrowly defined. For example, the Bureau of Economic Analysis (BEA) estimates over \$2 trillion more personal income in the United States in 2001 than that observed in the CPS (\$8.7 trillion versus \$6.4 trillion), with most of the difference coming from the BEA's broader income definition (Ruser, Pilot, and Nelson 2004). Notably, the BEA personal income definition includes noncash compensation and in-kind transfer payments, including employer-provided health insurance, Medicaid, and food stamps, as well as interest and dividends received by individuals from pension plans and fiduciaries on the individuals' behalf. Discussions of such broader income measures are beyond the scope of this chapter, but given the findings of Armour, Burkhauser, and Larrimore (2013) and Burkhauser, Larrimore, and Simon (2012)—that broadening the income

definition through the inclusion of in-kind benefits substantially increases income growth for middle- and low-income individuals—recent increases in in-kind benefits would likely be important for mitigating inequality growth since 1979. However, other differences in the BEA data, such as assigning pension income to individuals at accrual rather than at receipt, would dramatically increase inequality, as it moves income of the elderly, who have relatively little other income, to their working years.

A commonly discussed income difference between the data sets is that some, but not all, IRS-based research includes income from taxable realized capital gains. Although tax return data includes taxable realized capital gains, it excludes untaxed capital gains, including gains that occur in tax-sheltered accounts and most capital gains on owner-occupied housing. Focusing on realized taxable capital gains also distorts the timing of capital gains receipts when compared to a Haig-Simon income measure, which would use yearly accrued gains, since individuals can delay the realization of gains for tax purposes. Given these limitations, even tax return data are likely to present an incomplete picture of the impact of including capital gains on the trends in income distributions. For a further discussion of the sensitivity of measures of top incomes to the measure of capital gains used, see Armour, Burkhauser, and Larrimore (2013).

14. Since CPS-based researchers recognize their limited ability to capture the very top of the income distribution, they generally focus on the Gini coefficient or 90/10 ratios for measuring inequality; each is relatively insensitive to changes at the tails of the income distribution. In contrast, IRS-based researchers generally focus on top income shares that are relatively insensitive to changes in the lower tail and middle of the distribution.
15. To better capture the very top of the income distribution despite the limited censoring that occurs even in the internal CPS data, they use a generalized beta of the second kind (GB2) distribution to estimate top incomes.
16. A common refinement on the size-adjusted household income of persons is to calculate it for a four-person household. Since the size adjustment is the square root of the household size, these values can be obtained by doubling the size-adjusted household income for a single person presented here.
17. Peak and trough years are defined based on peaks and troughs in size-adjusted median income rather than strict NBER macroeconomic business cycles, which are denoted by gray vertical bars in figures 4.1 and 4.2. Because median income declined continuously from 1979 to 1983, we treat this double-dip recession as a single continuous recession. Also, owing to the break in the CPS data between 1992 and 1993 around the trough of that recession, the trough was assumed to occur in 1992, before the break in the data series. For discussions of issues related to this break in the data, see Ryscavage (1995) and Weinberg (2006).
18. Burkhauser, Larrimore, and Simon (2012) demonstrate that this observation is sensitive to the measurement of income. If income is measured as post-tax income, including the value of employer-provided health insurance and the ex ante value of Medicare and Medicaid, rather than as pretax income excluding these in-kind benefits, then there was small income growth from 2000 to 2007. Nevertheless, income growth was slower over this business cycle's peak years than in the previous two business cycles.
19. The most recent March CPS available to us shows that median household income continued to fall at least through 2011.
20. The Gini coefficient is our preferred series since it is a commonly used measure of inequality that, unlike 90/10 ratios or top income shares, satisfies the desirable properties of an inequality index described by Stephen Jenkins and Philippe Van Kerm (2009). A Gini coefficient of 0 indicates that all individuals have identical incomes and a value of 1 indicates that a single individual controls all income in the society.
21. The growth in the Supplemental Nutrition Assistance Program (SNAP, or food stamps) and other in-kind transfers, as well as the use of tax credits in the Bush and Obama stimulus packages, disproportionately helped the bottom part of the income distribution during the Great Recession. Because these in-kind transfers and tax credits are not captured in the standard household, size-adjusted, pretax, post-in-cash-transfer income of a person's measure of income used here, we disproportionately understate the income available to low-income persons. Armour, Burkhauser, and Larrimore (2013) show that differences between their results using this broader measure of income and those of the Congressional Budget Office (2011, 2012) are primarily due to the inclusion of realized capital gains in their analysis, not to differences in their measures of in-kind transfers.
22. For a further discussion of the decomposition approach, including discussions of robustness to order of analysis and variants to the sharing unit definition, see Larrimore (forthcoming). With all shift-share analyses, a potential concern is that the order of analysis may influence the results, owing to the interaction between the considered factors. A common approach to test for order-of-analysis effects is to reverse the order of analysis and reexamine

each factor's contribution (see, for example, Daly and Valletta 2006; Larrimore, forthcoming). When we do so here, the results are largely consistent.

23. We consider aging patterns using four categorical age groups: children (age zero to eighteen), young adults (nineteen to forty-four), older adults (forty-five to sixty-four) and the aged (age sixty-five and older). We consider race-ethnicities as white non-Hispanic, black, and Hispanic. We include other race-ethnicities besides blacks and Hispanics with white non-Hispanics because the small size of these groups prevents a separate analysis. Marital status is the marital status of the household head, who can either be married, a single male, or a single female.
24. For example, in the March 2007 CPS data, the mean size-adjusted household income of those living in married households was \$53,314, while the mean household size-adjusted income of those living in a household with just a male head was \$42,545. For those living in a household with just a female head, it was \$29,521.
25. Changes in the racial or ethnic composition come both from differences in the birth and death rates of individuals of different races or ethnicities and differences in immigration rates. However, distinguishing between racial and ethnic trends from immigration and those from birth and death patterns is beyond the scope of this chapter.
26. Although earnings correlations are included here for completeness of the decomposition and to be symmetric with the decomposition for income inequality, there is no simple exposition of their impact on median income since increases in the correlation can either increase or decrease median income. They are primarily included for the discussion of income inequality that follows, where they make intuitive sense: increases in correlations increase income inequality and decreases in correlations reduce income inequality.
27. Francine Blau and Lawrence Kahn (2007) document the slowdown in the growth of the female labor supply in the 1990s. More recent statistics from Diane Macunovich (2010) indicate that female labor force participation for adults (age sixteen and older) peaked in 2000 and has fallen over the past decade. Blau and Kahn also find that the cross-price elasticity of female employment to their husbands' wages has declined since the 1980s, which suggests that women are now less likely to increase their employment to compensate for a decline in their husbands' wages.
28. For example, during the recession years 1979–1982 the mean household size for the middle quintile of the income distribution fell from 3.78 to 3.68 people. In contrast, during the recession years 2007–2009 the mean household size of the middle quintile of the income distribution grew from 3.41 to 3.46 people.
29. Gary Burtless (2010) contends that American Recovery and Reinvestment Act stimulus spending represented about 2.5 percent of the national economy in 2010.
30. Admittedly, the results of shift-share analysis do not demonstrate causality. It is possible that the layoff of one spouse affects the work effort of the other, indirectly altering the magnitude of each factor's causal relationship with median income. Similarly, it is possible that the substantial increase in unemployment compensation and other public transfers delayed a return to work and hence partially contributed to the drop in employment. Stepan Jurajda and Frederick Tannery (2003) and Lawrence Katz and Bruce Meyer (1990) suggest that this is the case; for an early review of the literature on the relationship between increasing unemployment compensation and the duration of unemployment, see Danziger, Haveman, and Plotnick (1981). This unintended consequence of the dramatic increases in government transfers during the Great Recession, especially UI and food stamps, is a major theme of Mulligan (2012). Nevertheless, these results demonstrate that these transfer payments had a substantial and direct mitigating effect on median income declines over this period.
31. The Gini coefficient for the labor earnings of all male heads working full-time fell from 0.409 in 2000 to 0.355 in 2007. Although we focus here on male household heads, the same pattern holds when we look at all male full-time workers. The labor earnings Gini coefficient for all male full-time workers, including nonheads, was 0.418 in 2000, and it declined to 0.404 in 2007. This is consistent with the findings of Armour, Burkhauser, and Larrimore (2014), who use internal CPS data and observe that earnings inequality in 2007 was slightly lower than that observed in 2000. It is also broadly consistent with the work of Wojciech Kopczuk, Emmanuel Saez, and Jae Song (2010), who use Social Security records data and find that earnings inequality in 2004, the last year of their sample, was virtually the same as it was in 2000.
32. We note that since the CPS data do not include capital gains income, this private nonlabor income does not include the effect of capital gains. Some have suggested that including taxable realized capital gains would further increase recent income inequality growth (Piketty and Saez 2003). See our discussion of this issue in Armour, Burkhauser, and Larrimore (2013).

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