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Articles

Perspectives

Trends in Men's Wages, 1981–2014

by Patrick J. Purcell*

The Social Security Administration maintains wage and salary earnings records for all American workers. From those administrative records, the agency extracts a 1 percent sample called the Continuous Work History Sample (CWHS) for research and statistical purposes. This article uses CWHS data to examine trends in men's real wage and salary earnings from 1981 through 2014. It first describes broad trends for all men aged 25–59. Then it describes the trends over that same span for men in each of seven 5-year age intervals (25–29, 30–34, 35–39, 40–44, 45–49, 50–54, and 55–59), with detail by individual birth cohort. A series of charts shows how men's real wages changed across age groups and birth cohorts within each age group.

Introduction

Every year, employers report their employees' wage and salary earnings to the Internal Revenue Service (IRS) and the Social Security Administration (SSA) on IRS Form W-2.[1] SSA stores those earnings records in its Master Earnings File (MEF), which it uses to administer the Old-Age, Survivors, and Disability Insurance (OASDI) programs.[2] For research and statistical purposes, SSA extracts data from the MEF and other administrative files each year to create the Continuous Work History Sample (CWHS). The CWHS contains earnings records for more than 3.7 million individuals, representing 1 percent of all Social Security numbers ever issued. For researchers, the large number of earnings records in the CWHS, its longitudinal structure, and its accuracy have advantages over household surveys, which consist of smaller samples, typically collect data for relatively short periods, and are subject to reporting and recording errors.

This article describes the trends in real wages and salaries recorded in the CWHS among men aged 25–59 from 1981 through 2014. It briefly describes the change in real wages and salaries for all men aged 25–59 during this period, then examines trends for individual birth cohorts in each of seven age groups: 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, and 55–59. Using a series of charts, I show how men's real wages changed across age groups and birth cohorts within each age group.

Data and Methods

The CWHS is an analytical master file created from 1 percent samples of the Master Beneficiary Record (MBR) and the MEF, both of which SSA uses to administer the OASDI programs. To maintain the CWHS's 1 percent sample size, each year, SSA adds the earnings records associated with a random selection of newly issued Social Security numbers. The records of deceased workers remain in the CWHS, allowing researchers to study the wages of entire birth cohorts over time. When needed, SSA updates the CWHS earnings records for adjustments and corrections to the MEF.

The CWHS includes data on Social Security taxable wages in covered employment since 1951.[3] Covered employment refers to jobs for which employers submit

Selected Abbreviations

CWHS	Continuous Work History Sample
IRS	Internal Revenue Service
MEF	Master Earnings File
SSA	Social Security Administration

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payroll-tax deductions to the IRS and report wages to SSA to determine a worker's eligibility for Social Security benefits and the amount of those benefits. Taxable wages are earnings in covered employment equal to or less than an annually adjusted threshold amount called the taxable maximum.[4] Since 1978, the CWHS has included records on wages in noncovered employment and earnings exceeding the annual maximum taxable amount.

This article describes results derived from the 2014 CWHS file, the most recent available when the analysis was conducted. Following the methods of Leonesio and Del Bene (2011), the earnings analyzed in this article consist of wages and salaries since 1981 in both covered and noncovered employment, including wages and salaries exceeding the annual taxable maximum. Earnings from self-employment are not included.[5] The analysis includes only men's earnings because the changes that have occurred in employment and earnings among women warrant separate analysis.[6] It focuses on ages 25 to 59 because those are the ages with the highest employment rates.[7] For brevity, I refer to "wages and salaries" hereafter simply as "wages." To focus on workers who had substantial wages, the analysis includes only individuals with annual wages equal to or greater than the amount needed to earn four quarters of coverage under Social Security.[8] This amount ranged from $1,240 in 1981 ($2,827 in 2014 dollars) to $4,800 in 2014. All wages have been indexed to 2014 values by the personal consumption expenditure (PCE) index of the National Income and Product Accounts.[9]

In addition to excluding individuals with wages lower than the amount needed to earn four quarters of coverage, this analysis excludes the top 0.1 percent of earners each year. I exclude those records because in some cases, very high wages recorded in the CWHS indicate data-reporting errors, coding errors, or fraudulent use of a Social Security number, and there is no way to distinguish between the accurate and inaccurate records. This exclusion also reduces the effect of extreme outliers at the high end of the wage distribution on the measured mean and variance of wages. The 1981 sample was bounded at the high end at $432,197, the amount of wages (in 2014 dollars) above which a man would have been in the top 0.1 percent of male earners that year. The 2014 sample was bounded at the high end at $1,522,006, the amount of wages above which a man would have been in the top 0.1 percent of male earners that year.

The 2014 CWHS file consists of 3,727,665 individual person-records.[10] Of these records, 53.1 percent are for men and 46.9 percent are for women. For this analysis, the sample was restricted to men aged 25–59 in the year observed. Thus, for 1981, the sample includes men born from 1922 through 1956. For 2014, the sample includes men born from 1955 through 1989. Overall, the sample consists of 18,228,530 person-year observations from 1981 through 2014, with an average of 536,133 unique individuals observed each year. The number of observations ranges from a low of 434,328 for 1982 to a high of 586,865 for 2007. There are an average of 15,318 records for each year observed for each single year of age.[11] The fewest records for any year observed for a single year of age is 6,839, for men aged 59 in 1992 (born in 1933). The most records for any year observed for a single year of age is 20,467, for men aged 38 in 1998 (born in 1960).

In the next section, I summarize previous research based on the CWHS. I then describe broad trends in wages from 1981 through 2014 for men aged 25 through 59. A discussion of the main findings follows, in a section that describes the changes in median real wages from 1981 through 2014 for men in seven age groups: 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, and 55–59. These age-earnings profiles show how men's real wages changed from 1981 through 2014 across age groups and birth cohorts within each age group.

Previous Research

Several analysts have used the CWHS to study the growth and variance of earnings over time. Kopczuk, Saez, and Song (2010) investigated trends in the variance of annual earnings from 1970 to 2004. They found that almost all of the increase in variance was "due to [an] increase in the variance of permanent earnings, as opposed to transitory earnings." Sabelhaus and Song (2010) found that between 1980 and the early 1990s, the variability of earnings growth rates across the working population declined significantly, and that the lower volatility continued through the early 2000s. They suggested that over that period, both permanent and transitory components of earnings shocks had become more moderate.

Leonesio and Del Bene (2011) used the CWHS to study the distribution of men's and women's wages from 1981 through 2004. They observed that "among prime-aged men, real earnings have declined or stagnated for low-wage earners, have increased

modestly in the middle of the distribution, and have risen substantially for high earners." They also found among men "an increase in long-run earnings inequality of roughly the same magnitude as the trend seen in annual earnings dispersion." They observed relatively little increase in the dispersion of long-run earnings among women. They concluded that the trends they observed were "consistent with the view that more highly skilled and educated workers have been paid higher premiums for their labor over time, while the productivity and earnings of lower-skilled workers have not similarly benefited from improvements in technology."

Guvenen, Kaplan, and Song (2014) used the CWHS to measure the progress that women have made toward achieving earnings parity with men. They found that although the share of women in the top 1 percent of earners increased by a factor of more than three from the early 1980s to 2012, women's earnings constituted only 11 percent of the earnings of the top 1 percent of earners in 2012. Guvenen and others (2015) examined changes in annual earnings and found that in any given year, most workers experience very small changes in earnings, but a small percentage experience very large shocks. They found that positive shocks to high-income individuals are transitory, but negative shocks are persistent. For low-income individuals, however, large earnings shocks are more common but less persistent. The authors concluded that in general, high-income individuals experience earnings shocks that are persistent but that their income shows lower volatility than that of lower-earning workers. Song and others (2015) matched CWHS records to employer data to compare the dispersion of earnings within firms to earnings dispersion across firms. They found an increase in earnings inequality among workers of different firms between 1978 and 2012, while differences in earnings within firms remained almost unchanged.

This study differs in focus from those described above. It exploits the large CWHS sample and its longitudinal structure to compare the real wages of men in seven age intervals over a period spanning 33 years. Charts show real median wages each year for each age group, allowing us to observe trends in men's real median wages across age groups and birth cohorts within each age group. First, however, I summarize the broader trends in men's real wages in the study period.

Men's Wages 1981–2014

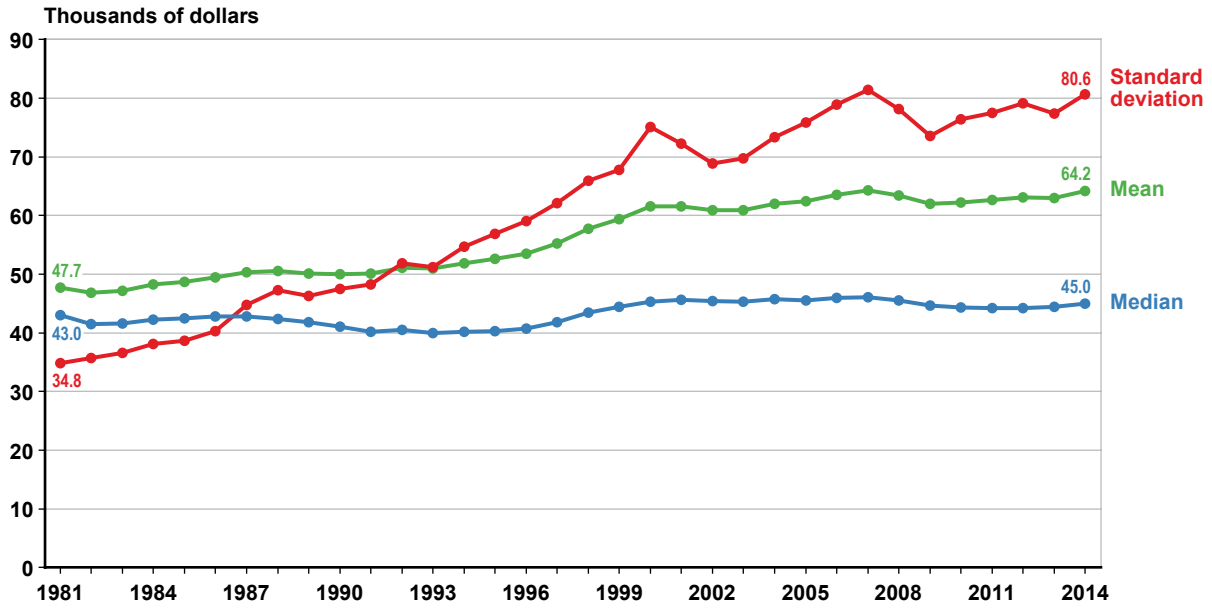
Chart 1 shows the median and mean wages along with the standard deviation of wages for men aged 25–59 from 1981 through 2014. Men's real wages during that period had a flat median, a rising mean, and increasing variance. Real median wages were $42,973 in 1981 and $45,000 in 2014, an increase of $2,027 (4.7 percent) overall and an average annual increase of 0.1 percent. Much of the growth in men's wages occurred over a relatively short period in the late 1990s. Real median wages fell from $42,973 in 1981 to $39,968 in 1993. From there, median wages rose to $45,620 in 2001 and then remained almost level over the next 6 years, rising by $489 (1.1 percent) to $46,109 in 2007. Real median wages fell during the Great Recession, declining to $44,170 in 2011 before recovering slightly to $45,000 in 2014. Nevertheless, the real median wages of men aged 25–59 in 2014 were $1,109 (2.4 percent) lower than they had been in 2007.

Real mean wages rose from $47,720 in 1981 to $64,181 in 2014, an increase of $16,461 (34.5 percent), or an average annual increase of 0.9 percent. Much of the growth occurred between 1993 and 2001. Early in the period, real mean wages rose from $47,720 in 1981 to $51,128 in 1992, an increase of $3,408, or 7.1 percent. By 2000, they had risen to $61,587, an increase since 1992 of 20.5 percent. Mean wage growth slowed after 2000. Wages rose to $64,282 in 2007, then fell to $62,027 in 2009 (during the Great Recession), before rebounding to $64,181 in 2014. Between 2000 and 2014, men's mean wages rose by 4.2 percent.

As men's real mean wages increased from 1981 to 2014, so did the standard deviation, a measure of how widely the values are distributed around the mean. In 1981, men's real mean annual wages were $47,720 and the standard deviation was $34,797. By 2014, the mean value of men's wages had risen by 34.5 percent to $64,181, yet the standard deviation had more than doubled, from $34,797 to $80,635, indicating a substantial increase in the dispersion of wages around the mean. In both 1981 and in 2014, the distribution of wages was skewed to the right: The highest values were much farther from the mean than the lowest values; recall that the latter are equivalent to the annual earnings needed to earn four quarters of coverage under Social Security.

Chart 2 shows the real wages of men aged 25–59 each year from 1981 through 2014 at the 10th, 25th, 50th, 75th, 90th, and 99th percentiles of the wage distribution. In 1981, a worker with wages at the 10th percentile

Chart 1.
Mean, median, and standard deviation of real annual wages of men aged 25–59, 1981–2014 (in 2014 dollars)

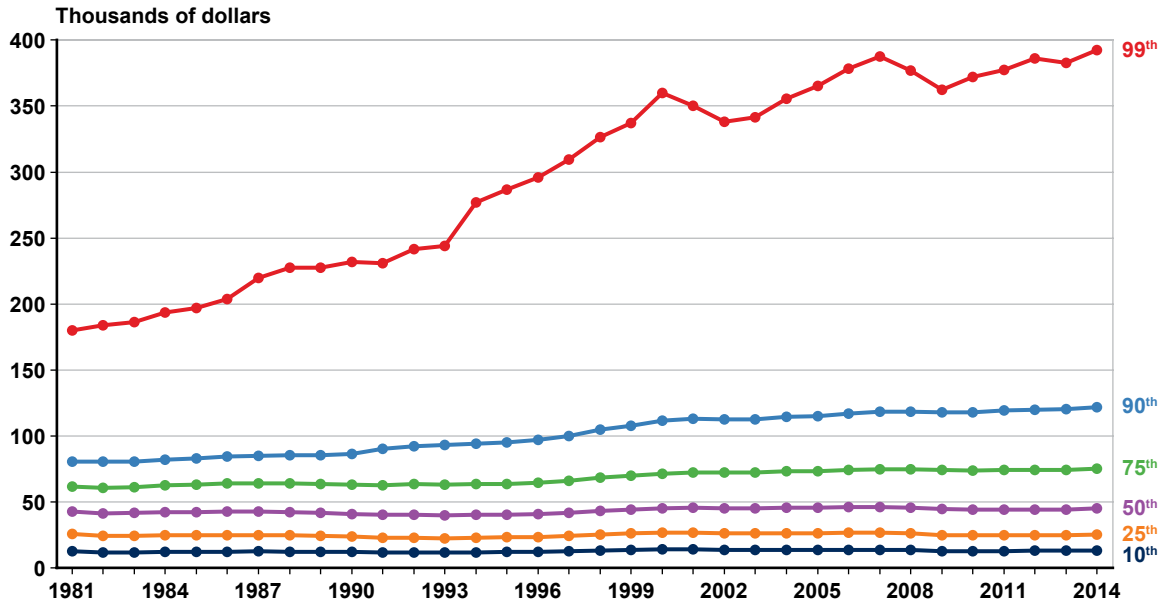


SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

For the tabulation of these values, see Appendix Table A-1.

Chart 2.
Real annual wages of men aged 25–59, by selected percentile, 1981–2014 (in 2014 dollars)



SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

For the tabulation of these values, see Appendix Table A-2.

earned $12,894 in 2014 dollars. In the study period, the wages of men at the 10th percentile peaked at $14,085 in 2000. By 2014, real wages at the 10th percentile were $13,387, only 3.8 percent higher than in 1981. Real wages at the 25th percentile were $25,848 in 1981, $26,809 at their peak in 2000, and down to $25,339 in 2014, 2.0 percent lower than in 1981. As noted earlier, median real wages among men aged 25 to 59 rose from $42,973 in 1981 to $45,000 in 2014, an increase of 4.7 percent. Men's real median wages peaked in 2007 at $46,109.

In contrast with the low rates of growth at the median and lower percentiles, real wages rose substantially more rapidly in the upper half of the earnings distribution. Real wages at the 75th percentile were $61,747 in 1981, changed relatively little through 1995, then began a steady rise to $71,601 in 2000 and finally to $75,413 in 2014—a level that was 22.1 percent higher than in 1981. Wages at the 90th percentile rose nearly continuously through the period, declining only slightly during 1989 and the recession years of 1982, 2002, and 2008–2009. Real annual wages at the 90th percentile rose from $80,791 in 1981 to $121,763 in 2014, an increase of 50.7 percent, representing an average annual growth rate of 1.25 percent. The most striking feature of Chart 2 is the steep increase in wages at the 99th percentile. From 1981 to 2014, real wages at the 99th percentile more than doubled, rising from $180,214 to $392,250—an increase of 117.7 percent, or 2.38 percent per year on average.

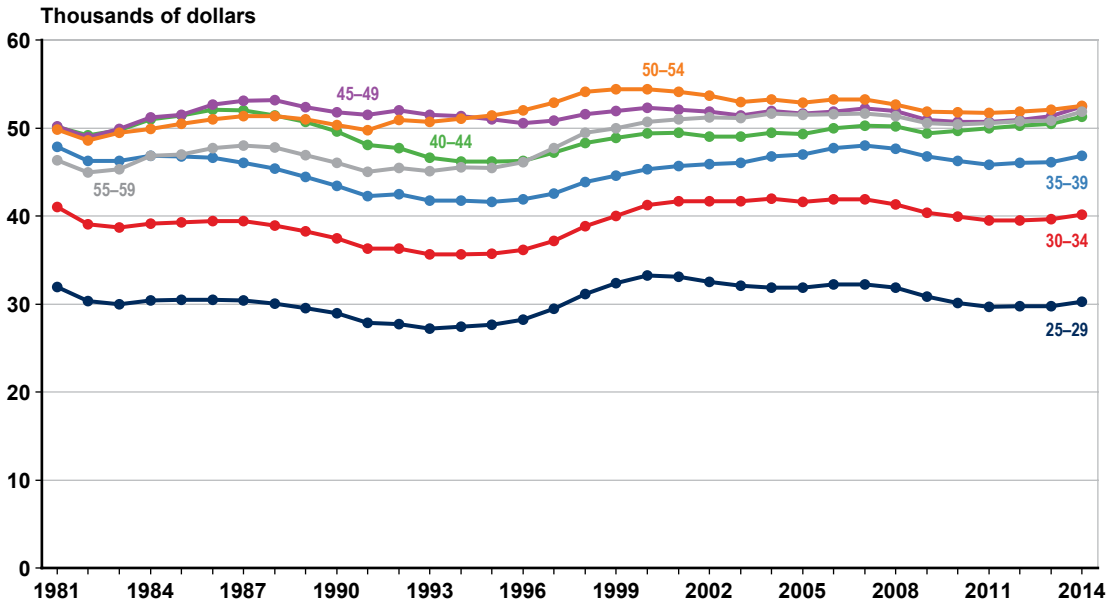
An individual's lifetime path of wages depends on a number of factors, including education, occupation, industry of employment, economic conditions, and the worker's personal traits. For many workers, annual wages are relatively low when they are in their 20s, rise rapidly in their 30s as they develop skills and gain experience, and then increase more slowly as they enter their 40s. Annual wages for many workers peak between ages 45 and 55. By the time many workers reach their late 50s, annual wages begin to decline. Some workers choose to work fewer hours as they get older, while some move to lower-paying jobs, either voluntarily or involuntarily, depending on their circumstances (Sonnega, McFall, and Willis 2016). For example, some are unable to continue in their career occupation because of chronic illness or work-limiting disabilities. Many workers experience declining wages in their late 50s; yet since the mid-1980s, the median wages of men aged 55–59 have been higher than those of men younger than 40.

Chart 3 shows median wages for 1981–2014 among men aged 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, and 55–59. All amounts are in 2014 dollars. In both 1981 and 2014, the two age groups with the lowest median wages were 25–29 and 30–34. Also in both years, men aged 35–39 had lower median wages than those aged 40–54. Men aged 55–59 had higher median wages than did those in the two youngest age groups in both 1981 and 2014, and they experienced a greater rise in median wages over that period than did those in any other age group. Real median wages among men aged 55–59 rose from $46,334 in 1981 to $51,871 in 2014, an increase of 12.0 percent. Some of this increase was due to a trend of more hours worked in the latter years of the period while some of it may reflect increases in hourly wages for older workers. As will be seen later, the real median annual wages of men aged 55–59 rose from 1981 to 2014, yet they declined for each successive year of age from 55 to 59 throughout the period, reflecting both fewer hours of work and lower wages among workers approaching retirement.

Changes in the age distribution of workers can affect the wage growth rate. For example, if the proportion of workers who are in their peak earnings years (ages 40–54) rises, the median annual wages of all men aged 25–59 may rise even if median wages within each age group remain flat. Chart 4 shows that from 1981 to 2014, the proportion of working men aged 25–59 who were 25 to 39 years old fell from 56.4 percent to 43.8 percent and the proportion who were 40 to 54 years old rose from 33.9 percent to 43.2 percent. All else being equal, the increase in the proportion of working men who were aged 40–54 would have illustrated the example noted above by causing the median annual wages of men aged 25–59 to increase even if median wages within each age group had not risen.[12]

We can estimate the effect of the change in the age distribution of working men on their median wages by reweighting the records from the CWHS so that the age distribution is constant each year, and then recalculating the annual median wage. Of course, if the distribution of workers by age had not changed over time, a static distribution of workers by age itself would likely have had some effect on wages. Nevertheless, estimating a "fixed population weight" median wage gives us an idea how much of the increase in men's real median wages during 1981–2014 was due to the growth in the proportion of workers who were in their prime earning years. After reweighting by

Chart 3.
Real median annual wages of men aged 25–59, by age group, 1981–2014 (in 2014 dollars)

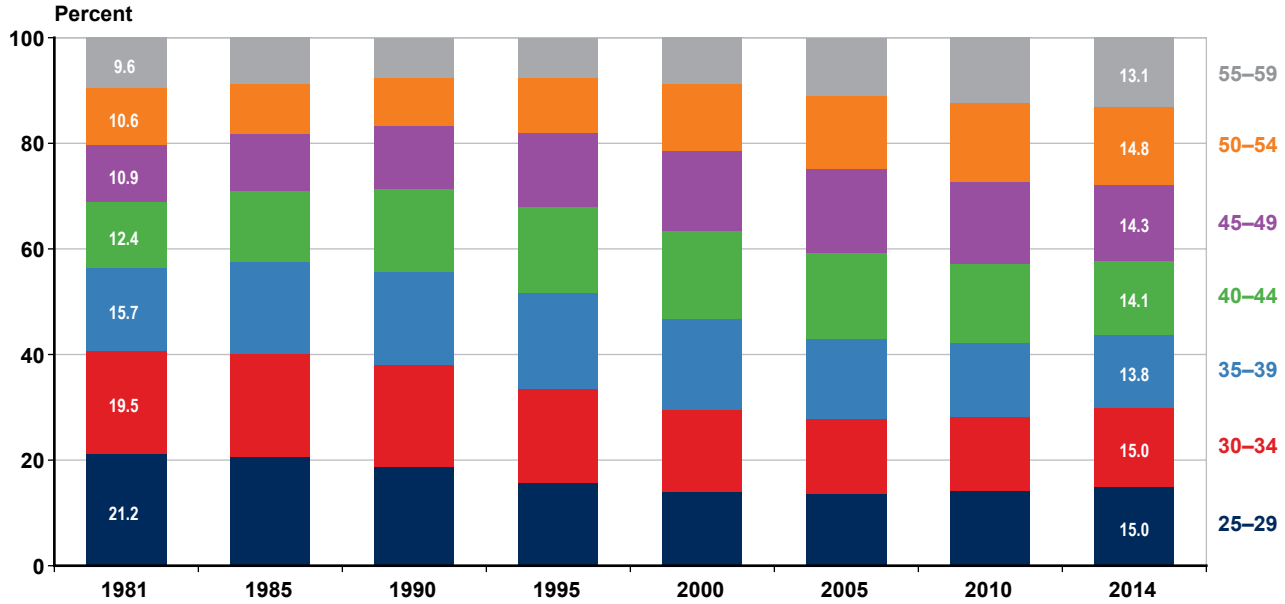


SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

For the tabulation of these values, see Appendix Table A-3.

Chart 4.
Percentage distribution of men aged 25–59 with wage and salary earnings, by age group, selected years 1981–2014



SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

Rounded components of percentage distributions do not sum to 100.0.

For the tabulation of these values, see Appendix Table A-4.

age, men's estimated real median wages for 1981 are $44,199 (2.9 percent higher than the actual median of $42,973), and for 2014, they are $44,256 (1.7 percent lower than the actual median of $45,000). In other words, if the proportion of working men in their prime earning years had not risen, the real median wages of men aged 25–59 likely would not have risen at all from 1981 to 2014, all else being equal. The observed increase in men's real median annual wages was therefore due almost entirely to the increase in the proportion of men aged 40–59 and the corresponding decrease in the proportion aged 25–39.

Age-Earnings Profiles

The CWHS' large number of records and its longitudinal structure allow the construction of age-earnings profiles that show the median wages of workers from many birth cohorts over long periods. This section contains charts showing real median wages of men in seven age intervals over a 33-year period, allowing us to compare real wages across age groups and birth cohorts within each age group. The period 1981–2014 included four recessions and four expansions, and the charts illustrate the effects of the business cycle on the age-earnings profiles.[13] Specifically, the charts show men's real median wages from 1981 through 2014 for each of the following seven age intervals:

- 25–29, comprising the 1956–1985 birth cohorts;
- 30–34, comprising the 1951–1980 birth cohorts;
- 35–39, comprising the 1946–1975 birth cohorts;
- 40–44, comprising the 1941–1970 birth cohorts;
- 45–49, comprising the 1936–1965 birth cohorts;
- 50–54, comprising the 1931–1960 birth cohorts; and
- 55–59, comprising the 1926–1955 birth cohorts.

The oldest men in the sample, the members of the 1926 birth cohort, attained age 55 in 1981. Because they (as well as men born 1927–1930) were older than 59 for all but the first few years of the observation period, I track their wages only in the 55–59 age interval. The youngest men in the sample were born in 1985; they attained age 25 in 2010. Because they (as well as men born 1980–1984) were younger than 25 in all but the final few years of the observation period, I track their wages only in the 25–29 age interval. Although no birth cohort can be fully tracked through each of the seven age intervals in the 1981–2014 span, men born 1951–1960 are fully tracked in six of the seven charts below. In total, I track the wages in 1981–2014 of men representing 60 birth cohorts (1926 through 1985).[14]

Each chart includes a note highlighting the average change in real median wages over the entire observation period for all members of the subject age group. Additional notes identify the single birth cohort whose members experienced the smallest wage growth (or greatest decline) and the cohort whose members experienced the greatest wage growth (or smallest decline) over that age interval and show the corresponding percentage changes.

Appendix A contains tables that correspond with Charts 5–11.[15] The tables show the specific real median wages for each year and cohort covered in each chart.

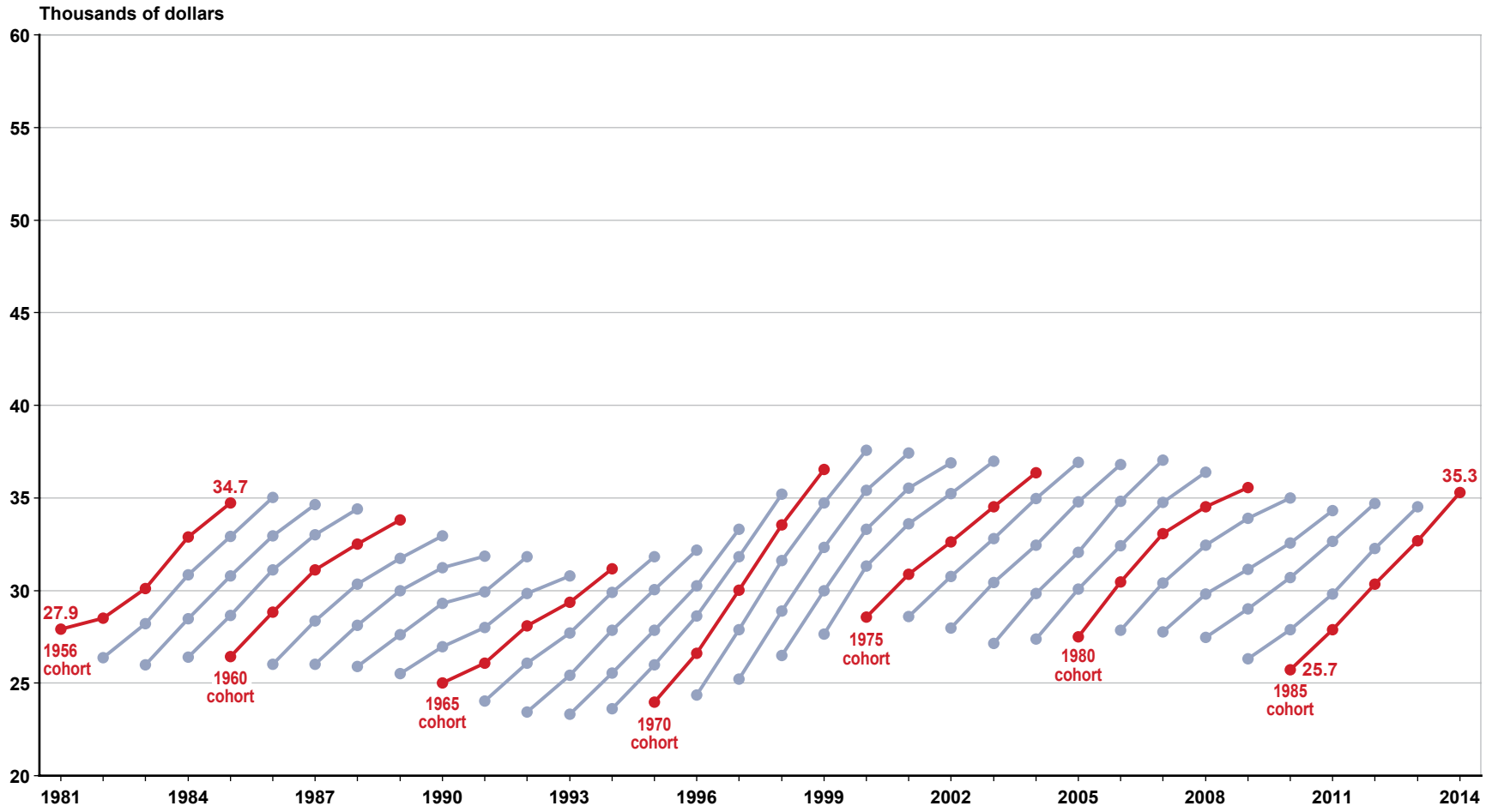
Chart 5 tracks the real median wages of men born 1956–1985 in the years when they were aged 25–29. For men in the 1956 birth cohort, wages rose from $27,921 at age 25 to $34,730 at age 29, or by 24.4 percent. For men in the 1985 birth cohort, wages rose from $25,720 at age 25 to $35,302 at age 29, or by 37.3 percent. Thus, wages at age 25 were $2,201 (7.9 percent) lower for men born in 1985 than those of men born in 1956, but at age 29 the wages of men born in 1985 were $572 (1.6 percent) higher than those of men born in 1956. On average, real median wages for all members of the 1956–1985 cohorts increased by 32.6 percent from age 25 to age 29.

Chart 6 tracks the real median wages of men born 1951–1980 in the years when they were aged 30–34. For men in the 1951 birth cohort, wages rose from $37,600 at age 30 to $42,273 at age 34, or by 12.4 percent. For men in the 1980 birth cohort, wages rose from $36,903 at age 30 to $43,343 at age 34, or by 17.5 percent. The wages of men born in 1980 were 1.9 percent lower than those of men born in 1951 at age 30 but were 2.5 percent higher at age 34. On average, across all cohorts, real median wages increased by 15.6 percent from age 30 to age 34.

Chart 7 tracks the real median wages of men born 1946–1975 in the years when they were aged 35–39. For men in the 1946 birth cohort, wages rose from $46,073 at age 35 to $50,130 at age 39, or by 8.8 percent. For men in the 1975 birth cohort, wages rose from $44,075 at age 35 to $48,642 at age 39, or by 10.4 percent. The wages of men born in 1975 were 4.3 percent lower than those of men born in 1946 at age 35 and were 3.0 percent lower at age 39. On average, across all birth cohorts from 1946 through 1975, real median wages increased by 9.1 percent from age 35 to age 39.

Chart 5.
Real median wages, 1981–2014: Men aged 25–29, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 25 to 29.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

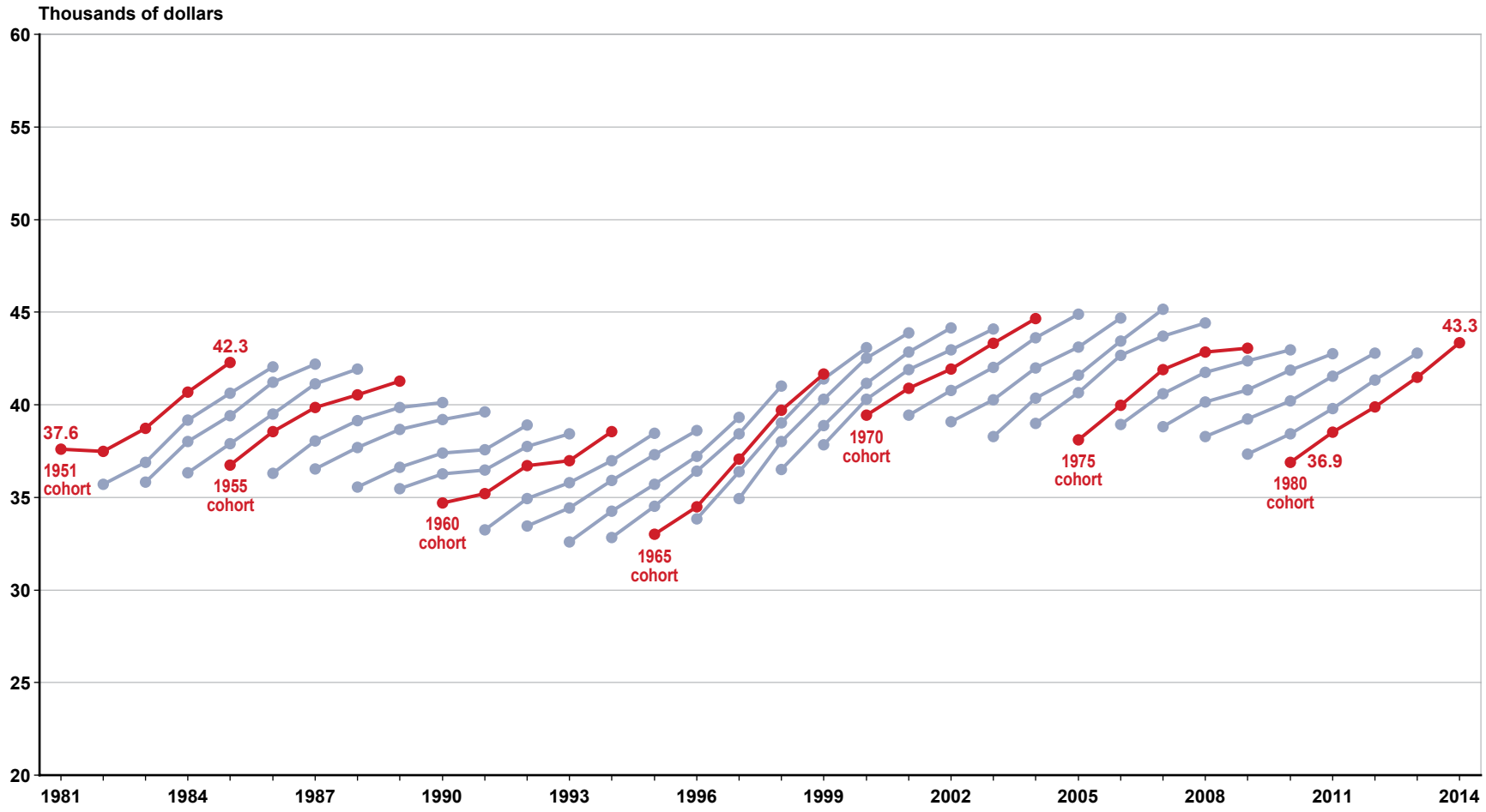
The average increase in real median wages for men in all birth cohorts (1956–1985) was 32.6 percent.

Among the 1956–1985 birth cohorts, men born in 1964 had the lowest wage increase (20.7 percent) and men born in 1971 had the greatest wage increase (54.3 percent) from ages 25 to 29.

For the tabulation of these values, see Appendix Table A-5.

Chart 6.
Real median wages, 1981–2014: Men aged 30–34, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 30 to 34.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

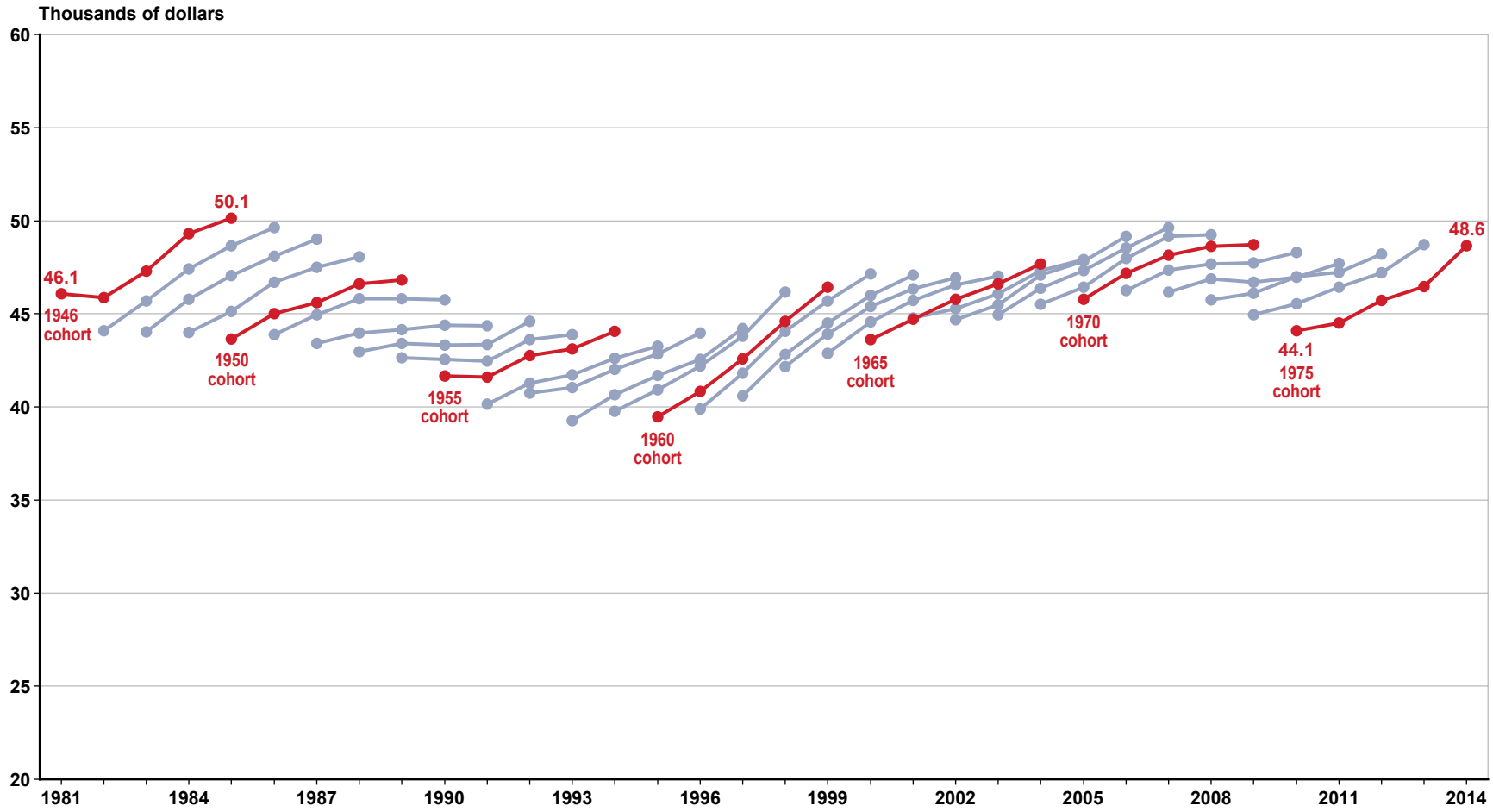
The average increase in real median wages for men in all birth cohorts (1951–1980) was 15.6 percent.

Among the 1951–1980 birth cohorts, men born in 1957 had the lowest wage increase (8.4 percent) and men born in 1966 had the greatest wage increase (27.3 percent) from ages 30 to 34.

For the tabulation of these values, see Appendix Table A-6.

Chart 7.
Real median wages, 1981–2014: Men aged 35–39, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 35 to 39.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

The average increase in real median wages for men in all birth cohorts (1946–1975) was 9.1 percent.

Among the 1946–1975 birth cohorts, men born in 1952 had the lowest wage increase (2.2 percent) and men born in 1961 had the greatest wage increase (18.2 percent) from ages 35 to 39.

For the tabulation of these values, see Appendix Table A-7.

Chart 8 tracks the real median wages of men born 1941–1970 in the years when they were aged 40–44. For men in the 1941 birth cohort, wages rose from $49,563 at age 40 to $51,979 at age 44, or by 4.9 percent. For men in the 1970 birth cohort, wages rose from $49,290 at age 40 to $52,625 at age 44, or by 6.8 percent. The wages of men born in 1970 were 0.6 percent lower than those of men born in 1941 at age 40 and were 1.2 percent higher at age 44. On average, across all cohorts from 1941 through 1970, real median wages increased by 5.6 percent from age 40 to age 44.

Chart 9 tracks the real median wages of men born 1936–1965 in the years when they were aged 45–49. For men in the 1936 birth cohort, wages rose from $49,613 at age 45 to $50,895 at age 49, or by 2.6 percent. For men in the 1965 birth cohort, they rose from $49,911 at age 45 to $51,897 at age 49, or by 4.0 percent. The wages of men born in 1965 were 0.6 percent higher than those of men born in 1936 at age 45 and were 2.0 percent higher at age 49. On average, across all cohorts from 1936 through 1965, real median wages increased by 2.8 percent from age 45 to age 49.

Chart 10 tracks the real median wages of men born 1931–1960 in the years when they were aged 50–54. For men in the 1931 birth cohort, wages fell from $50,830 at age 50 to $50,267 at age 54, a decline of 1.1 percent. For men in the 1960 birth cohort, wages rose from $51,627 at age 50 to $52,879 at age 54, or by 2.4 percent. The wages of men born in 1960 were 1.6 percent higher than those of men born in 1931 at age 50 and were 5.2 percent higher at age 54. Men in several birth cohorts experienced declines in real median wages from age 50 to age 54. On average, across all cohorts from 1931 through 1960, real median wages fell by 0.2 percent from age 50 to age 54.

Chart 11 tracks the real median wages of men born 1926–1955 in the years when they were aged 55–59. For men in the 1926 birth cohort, wages fell from $47,960 at age 55 to $44,379 at age 59, or by 7.5 percent. For men in the 1955 birth cohort, wages fell from $51,748 at age 55 to $50,710 at age 59, or by 2.0 percent. The wages of men born in 1955 were 7.9 percent higher than those of men born in 1926 at age 55 and were 14.3 percent higher at age 59. Members of all of the birth cohorts from 1926 through 1955 experienced declines in real median wages between the ages of 55 and 59; however, although the average rate of decline for the 1926 through 1939 cohorts was 9.2 percent, it was only 6.6 percent for the 1940 through 1955 cohorts. This could have resulted from members of the later cohorts working relatively more hours, earning higher hourly wages, or both. On average, real median wages across all cohorts fell by 7.4 percent from age 55 to age 59.

Discussion

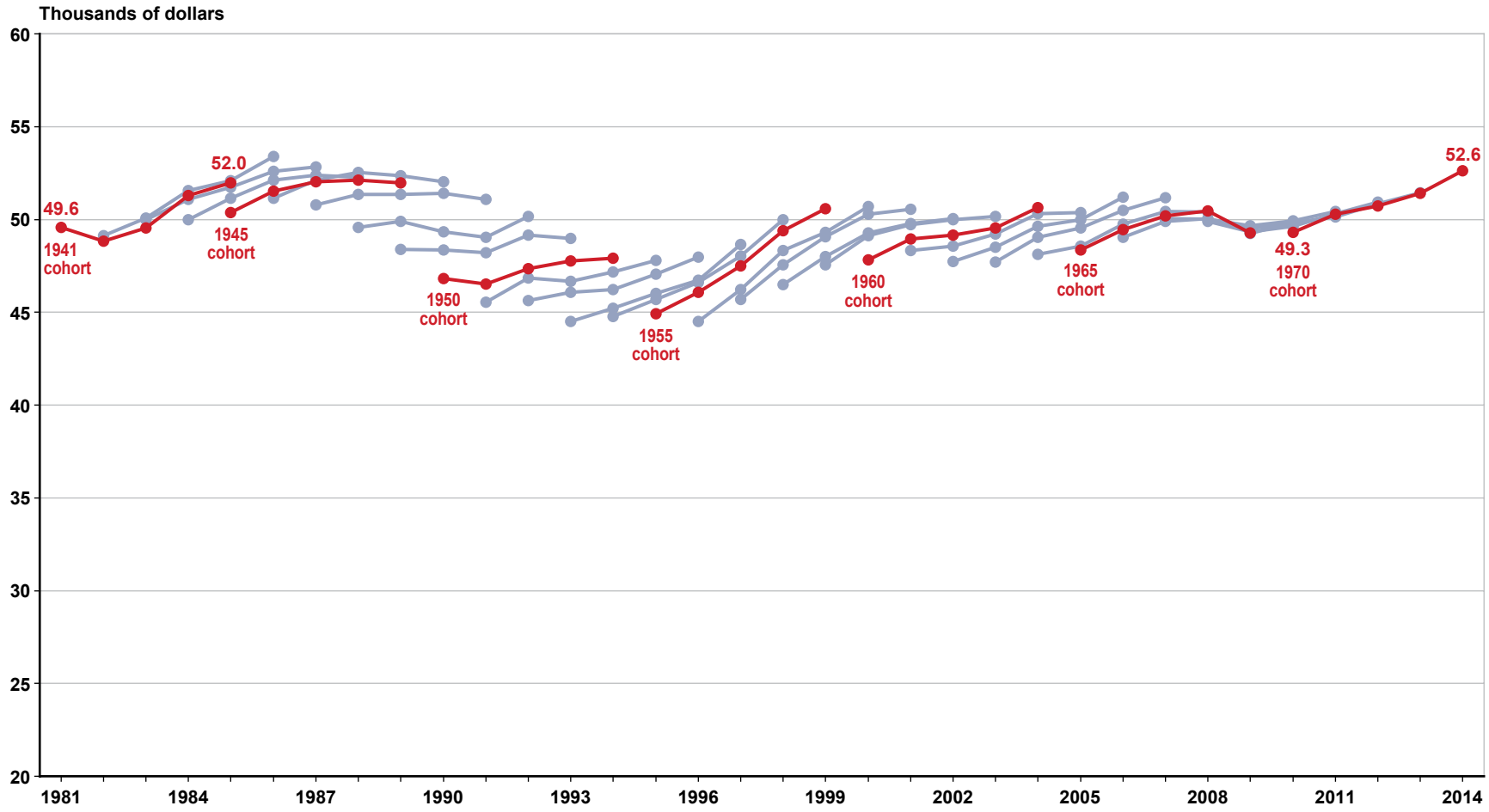
Several patterns emerge in Charts 5–11. First, the relationship between age and median wages is evident. Median annual wages grow rapidly when workers are young, as they gain skills and experience. It is not age itself that influences wage growth, but rather the increase in a worker's "human capital"—his skills and experience—that leads to the rise in earnings with age, especially in the first 10 to 20 years of a worker's career. From 1981 through 2014, men's real median wages at age 29 were, on average, 32.6 percent higher than their median wages at age 25. The rate of growth of wages slows in middle age. Men's real median wages at age 49 were, on average, just 2.8 percent higher than their median wages at age 45. Finally, real median wages fall in the later years of workers' careers. From age 55 to 59, men's real median wages fell by an average of 7.4 percent, likely through a combination of reduced hours of work and movement to lower-paying jobs before retirement.

A second pattern illustrated in the charts is the relationship between real median wages and economic expansions and contractions. Every birth cohort from 1981 to 2014 experienced its lowest rate of growth in median annual wages during one of three overlapping periods: 1987–1991, 1988–1992, or 1989–1993. Economic growth was weak in those years; real median household income in the United States fell each year from 1990 through 1993. The fastest rate of wage growth for six of the seven age intervals—all but the 55–59 age group—occurred either from 1995 through 1999 or from 1996 through 2000. Economic growth was robust in that period. From 1995 through 2000, real median household income grew at an average annual rate of 2.1 percent (Federal Reserve Bank of St. Louis 2017). The slow growth of men's median annual wages from 1987 through 1993 and their rapid growth from 1995 through 2000 illustrate the strong effect of the business cycle on annual earnings.

Finally, although both age—as a proxy for experience—and the business cycle affect the growth of wages over time, behavioral changes can also lead to patterns of wage growth that are unique to particular birth cohorts. Chart 11, for example, appears to indicate a behavioral change among workers aged 55–59

Chart 8.
Real median wages, 1981–2014: Men aged 40–44, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 40 to 44.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

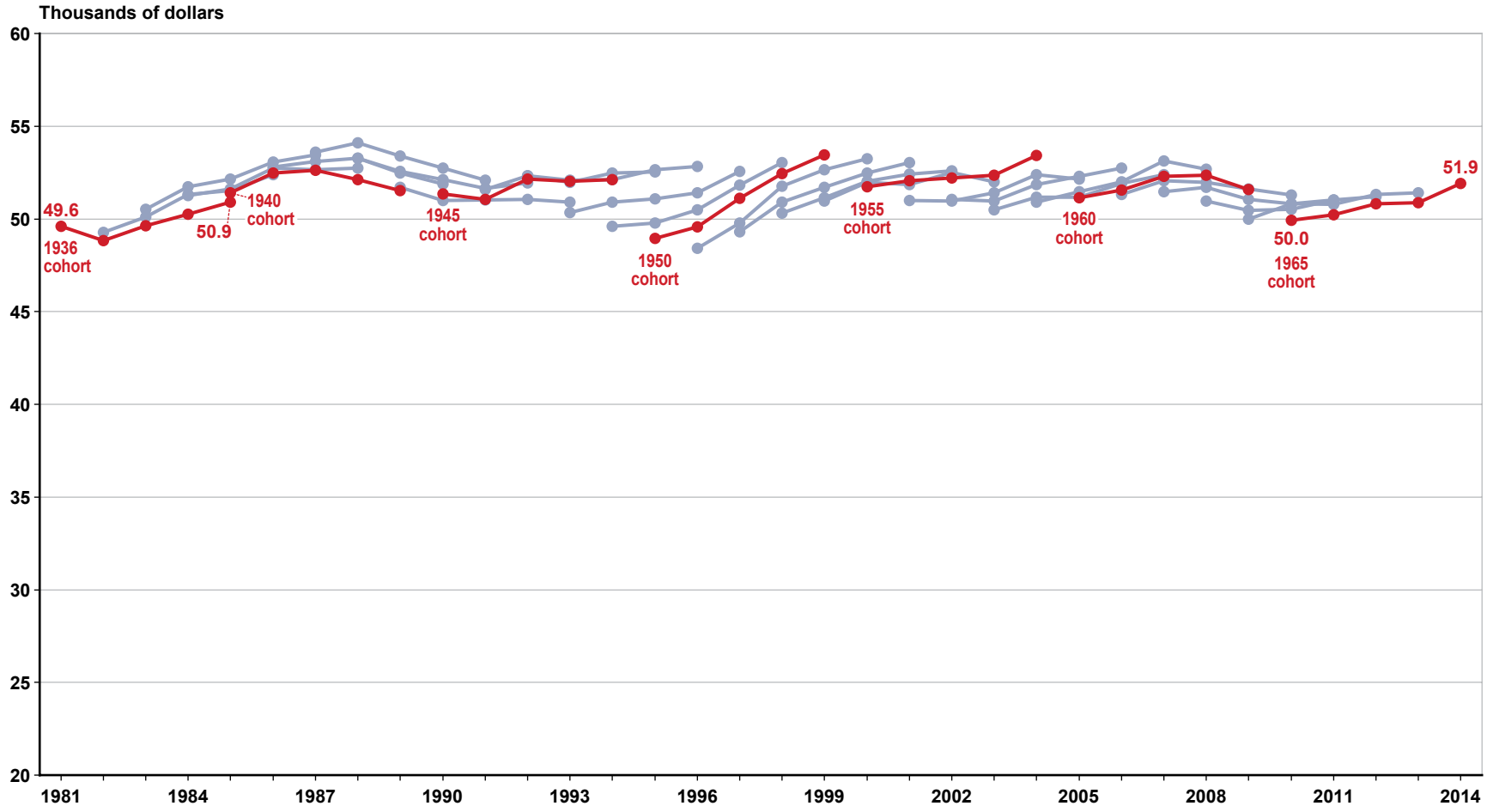
The average increase in real median wages for men in all birth cohorts (1941–1970) was 5.6 percent.

Among the 1941–1970 birth cohorts, men born in 1947 had the lowest wage increase (0.5 percent) and men born in 1956 had the greatest wage increase (13.9 percent) from ages 40 to 44.

For the tabulation of these values, see Appendix Table A-8.

Chart 9.
Real median wages, 1981–2014: Men aged 45–49, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 45 to 49.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

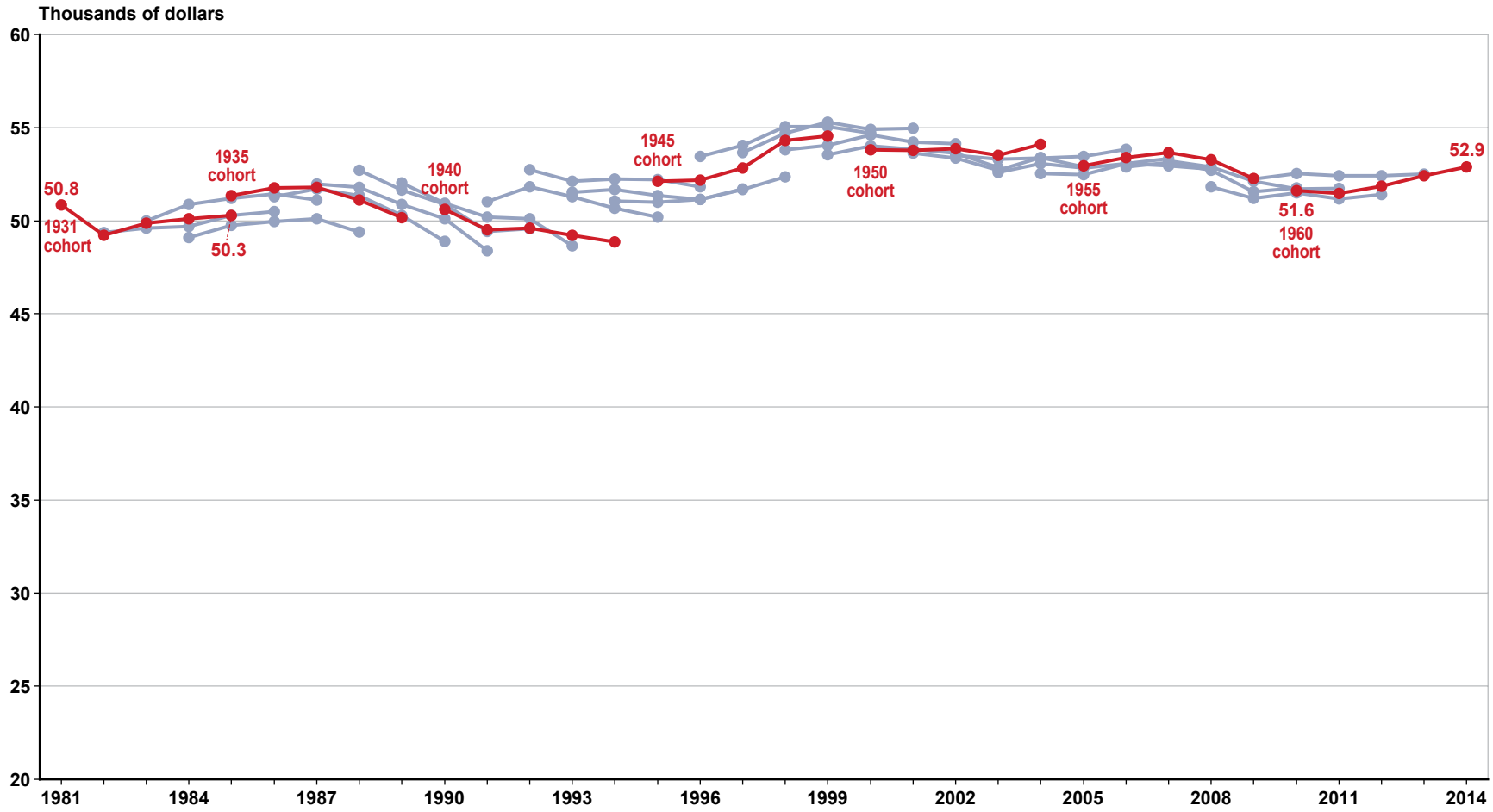
The average increase in real median wages for men in all birth cohorts (1936–1965) was 2.8 percent.

Among the 1936–1965 birth cohorts, men born in 1942 had the greatest wage decrease (−2.8 percent) and men born in 1951 had the greatest wage increase (10.0 percent) from ages 45 to 49.

For the tabulation of these values, see Appendix Table A-9.

Chart 10.
Real median wages, 1981–2014: Men aged 50–54, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 50 to 54.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

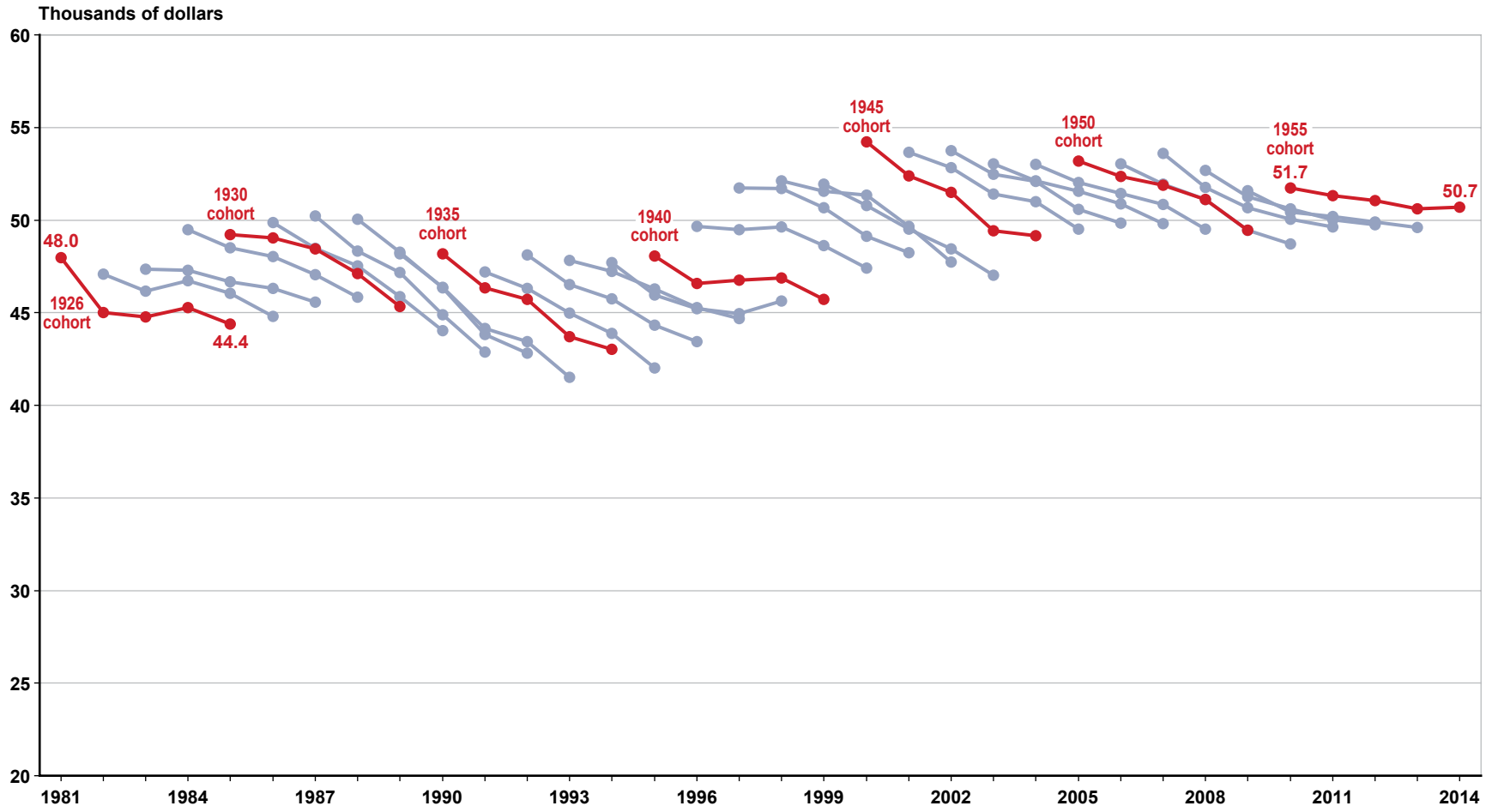
The average change in real median wages for men in all birth cohorts (1931–1960) was −0.2 percent.

Among the 1931–1960 birth cohorts, men born in 1937 had the greatest wage decrease (−6.9 percent) and men born in 1945 had the greatest wage increase (4.7 percent) from ages 50 to 54.

For the tabulation of these values, see Appendix Table A-10.

Chart 11.
Real median wages, 1981–2014: Men aged 55–59, by birth cohort (in 2014 dollars)

Click to see chart plotted on an alternative y-axis scale.



SOURCE: Author's calculations using CWHS data.

NOTES: Each line represents a single birth cohort and each data point on a given line represents a year of age, ranging left-to-right from 55 to 59.

Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

The average change in real median wages for men in all birth cohorts (1926–1955) was −7.4 percent.

Among the 1926–1955 birth cohorts, men born in 1932 had the greatest wage decrease (−14.6 percent) and men born in 1955 had the smallest wage decrease (−2.0 percent) from ages 55 to 59.

For the tabulation of these values, see Appendix Table A-11.

beginning in the mid-1990s. On average, from 1981–2014, median wages at age 59 were 7.4 percent lower than median wages at 55. Among men born from 1940 through 1954, however, the reduction in real median annual wages that occurred after age 55 was smaller than it was among earlier birth cohorts. For men born from 1926 through 1939, median wages at age 59 were 9.2 percent lower than those at age 55. For men born from 1940 through 1955, however, median wages at age 59 were only 6.6 percent lower than those at age 55. This may indicate that workers had begun to work more hours per year after reaching age 55.

Conclusion

This article has summarized trends in men's real wages from 1981 through 2014 using CWHS data. Over that period, men's median wages rose relatively slowly and mean wages rose more quickly. The wage distribution became more unequal as wage growth in the top 10 percent of earners substantially outpaced the rate of growth for earners below the 90th percentile. Men's real wages from 1981 through 2014 exhibit a relatively flat median, a rising mean, and increasing variance. The real median annual wages of men aged 25 to 59 were $42,973 in 1981 and $45,000 in 2014, an increase of just 4.7 percent in 33 years. Mean wages grew much faster, rising from $47,720 to $64,181 in that span, an increase of 34.5 percent. As the mean of men's wages increased, so did the standard deviation—from $34,797 in 1981 to $80,635 in 2014—indicating a substantial increase in the dispersion of wages around the mean.

From 1981 to 2014, men's real annual wages increased more quickly in the upper half of the income distribution than in the lower half. Wages at the 99th percentile rose from $180,214 in 1981 to $392,250 in 2014, an increase of 117.7 percent. Wages at the 90th percentile rose from $80,791 to $121,763, an increase of 50.7 percent. By contrast, men's real median annual wages increased by 4.7 percent and real wages at the 25th percentile declined by 2.0 percent. Wages at the 10th percentile rose from $12,894 in 1981 to $13,387 in 2014, an increase of 3.8 percent.

Other things being equal, the increase during 1981–2014 in the proportion of men who were in the peak earnings age range of 40 to 54 would have caused the real median wages of all men aged 25–59 to rise even if median wages within each 5-year age interval had not risen. In other words: If the average age distribution of men over the entire period had been maintained for each year *within* the period, the real median annual wages of men aged 25 to 59 would have been essentially the same in 2014 as they were in 1981; again, with all else being equal.

Members of every birth cohort experienced their lowest rate of growth in median annual wages during one of three overlapping periods: 1987–1991, 1988–1992, or 1989–1993. The fastest rate of growth for six of the seven age intervals occurred in one of two overlapping 4-year periods: 1995–1999 or 1996–2000. Among men born in 1940 or later, the reduction in median annual wages after age 55 was smaller than that for men in earlier birth cohorts. Although median wages of men at age 59 were 7.4 percent lower on average than their median wages at age 55, the average rate of decline was lower for men born during 1940–1955 (6.6 percent) than it was for men born during 1926–1939 (9.2 percent).

One limitation of this study is that the CWHS accounts for cash compensation only. Many workers receive additional compensation in the form of employer payments for health insurance and contributions to retirement accounts. During the period from 1981 to 2014, health insurance premiums for many workers rose more rapidly than wages; consequently, employers' payments toward health insurance coverage constituted an increasingly greater share of employees' total compensation over time.[16] On the other hand, workers in the lower half of the wage distribution are less likely to have employer-sponsored health insurance than are those in the upper half, and it was in the lower half of the distribution that wage growth was slowest over this period.

Government officials at the federal, state, and local level recognize the importance of identifying and pursuing economic policies that promote employment and wage growth. To evaluate the effectiveness of economic policies, officials need detailed, accurate, representative long-term data on workers' wages. The wage data recorded in the CWHS are ideal for this type of research and can contribute much to our knowledge of trends in the growth and distribution of wages.

Appendix A

Table A-1.
Mean, median, and standard deviation of real annual wages of men aged 25–59, 1981–2014 (in 2014 dollars) (see Chart 1)

Year	Mean	Median	Standard deviation
1981	47,720	42,973	34,797
1982	46,870	41,478	35,745
1983	47,128	41,613	36,527
1984	48,211	42,259	38,053
1985	48,706	42,459	38,630
1986	49,465	42,768	40,293
1987	50,327	42,766	44,774
1988	50,538	42,405	47,259
1989	50,150	41,831	46,271
1990	49,962	41,085	47,515
1991	50,048	40,181	48,243
1992	51,128	40,473	51,837
1993	50,992	39,968	51,181
1994	51,895	40,171	54,703
1995	52,569	40,271	56,823
1996	53,465	40,664	59,009
1997	55,277	41,814	62,101
1998	57,782	43,433	65,939
1999	59,362	44,410	67,762
2000	61,587	45,336	75,085
2001	61,559	45,620	72,236
2002	60,893	45,435	68,878
2003	60,922	45,276	69,718
2004	61,996	45,684	73,373
2005	62,401	45,541	75,837
2006	63,509	45,944	78,847
2007	64,282	46,109	81,368
2008	63,445	45,571	78,106
2009	62,027	44,678	73,520
2010	62,244	44,343	76,444
2011	62,638	44,170	77,526
2012	63,069	44,245	79,140
2013	63,006	44,394	77,378
2014	64,181	45,000	80,635

SOURCE: Author's calculations using CWHS data.

NOTE: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

Table A-2.
Real annual wages of men aged 25–59, by selected percentile, 1981–2014 (in 2014 dollars) (see Chart 2)

Year	10th	25th	50th (median)	75th	90th	99th
1981	12,894	25,848	42,973	61,747	80,791	180,214
1982	11,897	24,469	41,478	60,816	80,402	183,709
1983	11,644	24,244	41,613	61,309	80,812	186,490
1984	12,095	24,665	42,259	62,683	82,234	193,569
1985	12,407	24,873	42,459	63,213	83,235	196,778
1986	12,477	24,933	42,768	64,075	84,655	203,689
1987	12,605	24,986	42,766	64,322	85,210	219,761
1988	12,465	24,675	42,405	64,303	85,465	227,645
1989	12,357	24,313	41,831	63,770	85,454	227,407
1990	12,085	23,793	41,085	63,111	86,410	231,685
1991	11,563	22,888	40,181	62,496	90,498	231,084
1992	11,590	22,927	40,473	63,420	92,471	241,714
1993	11,552	22,642	39,968	63,163	93,233	244,096
1994	11,915	22,967	40,171	63,476	93,969	276,813
1995	12,012	23,147	40,271	63,771	95,220	286,687
1996	12,132	23,434	40,664	64,459	96,891	295,862
1997	12,643	24,258	41,814	66,098	100,094	309,518
1998	13,389	25,439	43,433	68,428	104,743	326,643
1999	13,734	26,120	44,410	70,019	107,927	336,921
2000	14,085	26,809	45,336	71,601	111,534	359,924
2001	14,015	26,801	45,620	72,337	112,946	349,990
2002	13,725	26,442	45,435	72,478	112,390	338,164
2003	13,525	26,178	45,276	72,533	112,827	341,631
2004	13,569	26,330	45,684	73,415	114,461	355,505
2005	13,631	26,353	45,541	73,297	115,096	365,323
2006	13,837	26,705	45,944	74,226	117,007	378,383
2007	13,811	26,687	46,109	74,897	118,529	387,392
2008	13,490	26,109	45,571	74,639	118,388	376,937
2009	12,761	24,970	44,678	74,228	117,950	362,161
2010	12,696	24,666	44,343	73,810	118,042	372,217
2011	12,842	24,645	44,170	74,069	119,234	377,233
2012	13,021	24,797	44,245	74,318	119,688	386,062
2013	13,125	24,947	44,394	74,436	120,140	382,713
2014	13,387	25,339	45,000	75,413	121,763	392,250

SOURCE: Author's calculations using CWHS data.

NOTE: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

Table A-3.
Real median annual wages of men aged 25–59, by age group, 1981–2014 (in 2014 dollars) (see Chart 3)

Year	25–29	30–34	35–39	40–44	45–49	50–54	55–59
1981	31,949	41,049	47,875	50,146	50,204	49,871	46,334
1982	30,330	39,094	46,257	49,157	48,939	48,633	44,972
1983	29,961	38,737	46,290	49,786	49,874	49,498	45,363
1984	30,431	39,167	46,848	50,965	51,219	49,909	46,823
1985	30,482	39,276	46,803	51,438	51,533	50,497	47,005
1986	30,503	39,453	46,659	52,115	52,691	51,024	47,730
1987	30,449	39,460	46,032	51,983	53,130	51,340	48,012
1988	30,050	38,902	45,397	51,459	53,154	51,351	47,771
1989	29,572	38,238	44,457	50,707	52,407	50,977	46,903
1990	28,945	37,447	43,446	49,621	51,829	50,312	46,024
1991	27,886	36,293	42,301	48,081	51,477	49,796	45,043
1992	27,737	36,331	42,496	47,760	52,046	50,956	45,498
1993	27,233	35,629	41,753	46,634	51,495	50,681	45,115
1994	27,443	35,665	41,781	46,200	51,386	51,092	45,562
1995	27,677	35,753	41,626	46,201	50,965	51,456	45,454
1996	28,217	36,139	41,882	46,309	50,553	51,984	46,150
1997	29,466	37,208	42,572	47,215	50,855	52,898	47,713
1998	31,120	38,884	43,874	48,303	51,614	54,121	49,472
1999	32,361	40,019	44,613	48,882	51,921	54,406	49,956
2000	33,288	41,236	45,316	49,373	52,279	54,401	50,728
2001	33,117	41,708	45,724	49,461	52,093	54,149	50,999
2002	32,493	41,702	45,882	49,067	51,869	53,685	51,183
2003	32,112	41,667	46,025	49,024	51,430	52,988	51,132
2004	31,900	41,962	46,771	49,462	51,942	53,227	51,670
2005	31,879	41,647	47,032	49,309	51,637	52,915	51,509
2006	32,241	41,926	47,732	49,973	51,897	53,236	51,588
2007	32,258	41,908	48,028	50,292	52,259	53,279	51,623
2008	31,839	41,350	47,636	50,184	51,936	52,658	51,339
2009	30,853	40,406	46,817	49,407	50,918	51,885	50,545
2010	30,103	39,924	46,308	49,695	50,684	51,819	50,381
2011	29,655	39,530	45,863	49,993	50,694	51,707	50,546
2012	29,728	39,478	46,025	50,242	50,902	51,851	50,747
2013	29,734	39,666	46,121	50,510	51,368	52,112	50,876
2014	30,309	40,157	46,863	51,314	52,487	52,547	51,871

SOURCE: Author's calculations using CWHS data.

NOTE: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

Table A-4.
Percentage distribution of men aged 25–59 with wage and salary earnings, by age group, 1981–2014 (see Chart 4)

Year	25–29	30–34	35–39	40–44	45–49	50–54	55–59
1981	21.2	19.5	15.7	12.4	10.9	10.6	9.6
1982	21.0	19.1	16.4	12.9	10.9	10.3	9.5
1983	20.8	19.1	16.7	13.3	10.9	10.0	9.3
1984	20.8	19.3	17.1	13.4	10.8	9.7	8.9
1985	20.6	19.5	17.5	13.4	10.8	9.4	8.7
1986	20.3	19.6	17.6	14.0	10.8	9.3	8.4
1987	20.0	19.6	17.3	14.5	11.2	9.2	8.1
1988	19.8	19.5	17.3	14.8	11.5	9.2	7.9
1989	19.3	19.4	17.5	15.2	11.7	9.2	7.7
1990	18.7	19.3	17.7	15.6	11.8	9.2	7.5
1991	17.9	19.2	18.0	15.8	12.4	9.3	7.5
1992	17.2	18.9	18.0	15.7	13.0	9.7	7.4
1993	16.5	18.7	18.1	15.8	13.3	10.1	7.5
1994	16.0	18.4	18.0	16.0	13.7	10.3	7.5
1995	15.8	17.8	18.0	16.3	14.1	10.4	7.6
1996	15.6	17.2	17.9	16.5	14.3	10.8	7.6
1997	15.3	16.6	17.8	16.7	14.2	11.4	8.0
1998	14.9	16.1	17.6	16.7	14.4	11.8	8.4
1999	14.5	15.8	17.4	16.8	14.7	12.2	8.6
2000	13.9	15.7	17.0	16.9	15.0	12.7	8.7
2001	13.5	15.5	16.6	16.9	15.4	12.9	9.2
2002	13.4	15.3	16.1	16.8	15.6	13.0	9.8
2003	13.3	15.0	15.7	16.8	15.8	13.2	10.2
2004	13.5	14.6	15.4	16.6	15.9	13.5	10.6
2005	13.7	14.0	15.3	16.3	15.9	13.9	10.9
2006	14.0	13.7	15.2	15.8	15.9	14.2	11.2
2007	14.2	13.6	15.1	15.4	15.9	14.4	11.3
2008	14.4	13.7	14.8	15.1	15.9	14.6	11.6
2009	14.2	13.8	14.5	14.9	15.9	14.8	12.0
2010	14.2	14.1	14.0	14.9	15.6	14.9	12.4
2011	14.2	14.3	13.7	14.9	15.3	14.9	12.6
2012	14.4	14.6	13.6	14.7	14.9	14.9	12.9
2013	14.7	14.8	13.7	14.5	14.5	14.9	13.0
2014	15.0	15.0	13.8	14.1	14.3	14.8	13.1

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

Rounded components of percentage distributions do not necessarily sum to 100.0.

Table A-5.
Real median wages, 1981–2014: Men aged 25–29, by birth cohort (in 2014 dollars) (see Chart 5)

	Cohort														
Year	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1981	27,921	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	28,506	26,372	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	30,093	28,200	25,982	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	32,875	30,846	28,476	26,394	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	34,730	32,915	30,799	28,663	26,420	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	35,031	32,943	31,111	28,829	26,017	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	34,635	33,022	31,125	28,369	26,026	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	34,406	32,496	30,343	28,132	25,892	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	33,799	31,726	29,974	27,600	25,508	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	32,947	31,223	29,312	26,955	25,013	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	31,849	29,911	28,005	26,060	24,042	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	31,821	29,824	28,101	26,065	23,433	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	30,789	29,352	27,710	25,430	23,304	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	31,167	29,892	27,840	25,550	23,617	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	31,825	30,031	27,849	25,998	23,977
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	32,174	30,259	28,635	26,612
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	33,291	31,815	30,011
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	35,207	33,543
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	36,520

(Continued)

	Cohort														
Year	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1996	24,353	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	27,878	25,220	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	31,621	28,875	26,477	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	34,716	32,312	29,978	27,638	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	37,583	35,405	33,296	31,309	28,560	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	37,431	35,539	33,610	30,871	28,606	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	36,876	35,220	32,611	30,751	27,985	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	36,975	34,524	32,806	30,436	27,138	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	36,363	34,977	32,432	29,836	27,367	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	36,924	34,783	32,066	30,062	27,496	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	36,811	34,804	32,405	30,466	27,841	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	37,033	34,769	33,072	30,396	27,762	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	36,391	34,521	32,455	29,807	27,478	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	35,548	33,903	31,153	29,003	26,301	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	35,001	32,574	30,709	27,878	25,720
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	34,309	32,662	29,818	27,873
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	34,707	32,259	30,348
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	34,512	32,668
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	35,302

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-6.
Real median wages, 1981–2014: Men aged 30–34, by birth cohort (in 2014 dollars) (see Chart 6)

	Cohort														
Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1981	37,600	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	37,483	35,696	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	38,737	36,903	35,808	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	40,689	39,179	38,004	36,330	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	42,273	40,617	39,419	37,902	36,726	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	42,037	41,211	39,510	38,535	36,298	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	42,189	41,123	39,855	38,054	36,546	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	41,933	40,520	39,152	37,692	35,556	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	41,260	39,856	38,663	36,633	35,467	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	40,115	39,208	37,385	36,265	34,703	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	39,624	37,568	36,488	35,203	33,256	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	38,912	37,749	36,699	34,919	33,442	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	38,444	36,987	35,790	34,440	32,607	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	38,554	36,988	35,916	34,241	32,826	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	38,451	37,312	35,717	34,510	32,996
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	38,600	37,215	36,400	34,477
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	39,331	38,416	37,065
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	41,001	39,705
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	41,667

(Continued)

	Cohort														
Year	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1996	33,832	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	36,380	34,947	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	39,030	38,021	36,508	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	41,403	40,306	38,886	37,845	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	43,080	42,532	41,163	40,307	39,445	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	43,870	42,841	41,891	40,891	39,438	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	44,141	42,968	41,925	40,765	39,092	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	44,091	43,304	42,002	40,273	38,290	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	44,658	43,610	41,989	40,341	38,990	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	44,902	43,098	41,600	40,665	38,099	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	44,674	43,441	42,673	39,975	38,943	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	45,162	43,712	41,889	40,587	38,806	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	44,414	42,832	41,741	40,158	38,276	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,046	42,375	40,787	39,218	37,342	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,950	41,870	40,217	38,425	36,903
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,764	41,544	39,783	38,513
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,780	41,327	39,886
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,784	41,471
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,343

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-7.
Real median wages, 1981–2014: Men aged 35–39, by birth cohort (in 2014 dollars) (see Chart 7)

	Cohort														
Year	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
1981	46,073	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	45,881	44,086	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	47,285	45,685	44,038	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	49,310	47,396	45,763	43,992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	50,130	48,642	47,041	45,125	43,642	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	49,634	48,086	46,691	44,995	43,891	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	49,004	47,492	45,602	44,936	43,396	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	48,050	46,602	45,794	43,962	42,971	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	46,827	45,803	44,145	43,397	42,645	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	45,756	44,376	43,308	42,535	41,672	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	44,354	43,356	42,448	41,592	40,147	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	44,587	43,619	42,757	41,276	40,738	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,871	43,109	41,706	41,026	39,263	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	44,064	42,622	42,006	40,653	39,750	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,271	42,834	41,680	40,914	39,453
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,980	42,557	42,205	40,824
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	44,215	43,787	42,590
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	46,177	44,580
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	46,436

(Continued)

	Cohort														
Year	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1996	39,893	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	41,815	40,601	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	44,058	42,808	42,167	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	45,684	44,513	43,912	42,863	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	47,147	45,993	45,390	44,563	43,601	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	47,092	46,330	45,720	44,718	44,772	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	46,919	46,559	45,765	45,286	44,672	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	47,036	46,605	46,073	45,490	44,939	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	47,662	47,322	47,079	46,376	45,501	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	47,910	47,820	47,318	46,440	45,786	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	49,149	48,536	47,970	47,167	46,249	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,627	49,147	48,152	47,338	46,150	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,250	48,609	47,676	46,885	45,749	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,716	47,720	46,702	46,118	44,939	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,298	46,954	46,994	45,546	44,075
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	47,695	47,216	46,421	44,507
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,221	47,205	45,719
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,698	46,473
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,642

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-8.
Real median wages, 1981–2014: Men aged 40–44, by birth cohort (in 2014 dollars) (see Chart 8)

	Cohort														
Year	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
1981	49,563	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	48,836	49,120	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	49,526	50,070	49,991	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	51,294	51,547	51,083	49,975	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	51,979	52,085	51,742	51,147	50,376	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	53,381	52,605	52,107	51,540	51,152	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	52,831	52,375	52,033	52,132	50,797	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	52,252	52,108	52,522	51,342	49,564	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	51,979	52,369	51,356	49,883	48,373	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	52,038	51,400	49,346	48,346	46,809	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	51,076	49,049	48,218	46,530	45,528	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,153	49,144	47,345	46,846	45,616	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,971	47,762	46,678	46,076	44,515	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	47,914	47,172	46,221	45,225	44,777	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	47,792	47,038	46,011	45,686	44,930
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	47,961	46,723	46,604	46,074
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,644	48,022	47,492
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,000	49,401
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,577

(Continued)

	Cohort														
Year	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1996	44,503	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	46,217	45,689	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	48,313	47,542	46,474	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	49,307	49,064	48,006	47,562	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	50,687	50,275	49,286	49,118	47,832	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	50,548	49,771	49,708	48,962	48,320	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	50,039	49,982	49,148	48,569	47,720	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	50,171	49,539	49,218	48,512	47,707	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	50,632	50,302	49,624	49,047	48,116	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	50,358	49,975	49,545	48,551	48,369	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	51,210	50,496	49,759	49,455	49,030	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,166	50,436	50,186	49,901	50,048	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,394	50,463	50,058	50,013	49,892	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,274	49,521	49,670	49,322	49,243	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,786	49,920	49,619	49,849	49,290
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,438	50,313	50,143	50,290
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,934	50,857	50,721
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,443	51,397
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,625

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-9.
Real median wages, 1981–2014: Men aged 45–49, by birth cohort (in 2014 dollars) (see Chart 9)

	Cohort														
Year	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
1981	49,613	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	48,818	49,278	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	49,629	50,095	50,504	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	50,251	51,319	51,745	51,266	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	50,895	51,539	52,162	51,615	51,414	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	52,395	53,053	52,751	52,474	52,808	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	53,450	52,665	52,616	53,087	53,605	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	52,752	52,106	53,286	54,107	53,284	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	51,535	52,470	53,391	52,567	51,703	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	51,883	52,736	52,124	50,989	51,343	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	52,085	51,650	51,033	51,052	51,590	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,952	51,055	52,153	52,325	52,312	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,892	52,026	51,958	52,089	50,339	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,125	52,473	52,118	50,898	49,607	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,534	52,645	51,091	49,787	48,944
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,844	51,416	50,486	49,563
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,553	51,829	51,102
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	53,045	52,432
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	53,451

(Continued)

	Cohort														
Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1996	48,413	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	49,771	49,302	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	51,760	50,914	50,310	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	52,661	51,697	51,143	50,963	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	53,257	52,479	52,038	51,981	51,720	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	53,042	52,427	51,858	52,072	50,996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	52,598	52,516	52,198	50,954	51,060	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	51,989	52,351	51,420	50,964	50,485	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	53,433	52,383	51,858	51,169	50,913	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	52,134	52,283	51,178	51,452	51,135	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	52,743	51,915	51,993	51,568	51,313	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,395	53,122	52,309	52,046	51,459	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,691	52,348	51,958	51,691	50,965	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,589	51,614	51,048	50,472	49,990	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,299	50,824	50,510	50,827	49,911
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,028	51,035	50,782	50,234
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,192	51,307	50,828
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,406	50,867
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,897

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-10.
Real median wages, 1981–2014: Men aged 50–54, by birth cohort (in 2014 dollars) (see Chart 10)

	Cohort														
Year	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
1981	50,830	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	49,206	49,372	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	49,871	49,587	49,992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	50,098	49,688	50,867	49,089	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	50,267	50,267	51,201	49,738	51,339	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	50,479	51,449	49,955	51,750	51,294	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	51,108	50,092	51,788	51,713	51,958	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	49,389	51,101	51,361	51,786	52,710	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	50,157	50,271	50,882	51,648	52,035	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	48,880	50,093	50,864	50,938	50,596	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	48,398	49,413	50,200	49,508	51,013	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,572	50,097	49,597	51,827	52,751	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,662	49,212	51,300	52,124	51,538	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,863	50,665	52,247	51,676	51,044	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,195	52,215	51,338	50,993	52,109
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,829	51,140	51,153	52,188
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,710	51,674	52,819
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,363	54,300
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	54,552

(Continued)

	Cohort														
Year	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
1996	53,442	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	54,047	53,660	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	55,056	54,702	53,821	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	55,046	55,297	54,043	53,532	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	54,687	54,891	54,609	54,003	53,799	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	54,973	54,226	53,839	53,778	53,633	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	54,125	53,643	53,877	53,375	53,503	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	52,847	53,516	52,703	53,306	52,584	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	54,095	53,397	53,366	53,065	52,539	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	52,889	53,449	52,824	52,474	52,934	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	53,836	53,061	53,058	53,402	52,899	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	53,335	52,935	53,660	53,125	53,227	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,761	53,280	52,713	52,876	51,817	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,255	51,561	52,119	51,207	52,244	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,772	51,690	51,486	52,542	51,627
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,741	51,180	52,405	51,460
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	51,394	52,422	51,863
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,504	52,411
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	52,879

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Table A-11.
Real median wages, 1981–2014: Men aged 55–59, by birth cohort (in 2014 dollars) (see Chart 11)

	Cohort														
Year	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
1981	47,960	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1982	45,022	47,079	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1983	44,784	46,162	47,362	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1984	45,281	46,714	47,294	49,488	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1985	44,379	46,040	46,672	48,502	49,212	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1986	. . .	44,797	46,299	48,026	49,036	49,864	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1987	. . .	. . .	45,584	47,038	48,438	48,472	50,221	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1988	. . .	. . .	. . .	45,841	47,112	47,523	48,323	50,038	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1989	. . .	. . .	. . .	. . .	45,332	45,867	47,157	48,254	48,184	. . .	. . .	. . .	. . .	. . .	. . .
1990	. . .	. . .	. . .	. . .	. . .	44,023	44,879	46,329	46,369	48,174	. . .	. . .	. . .	. . .	. . .
1991	. . .	. . .	. . .	. . .	. . .	. . .	42,886	43,808	44,149	46,334	47,208	. . .	. . .	. . .	. . .
1992	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,826	43,440	45,723	46,312	48,118	. . .	. . .	. . .
1993	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	41,521	43,690	44,975	46,532	47,813	. . .	. . .
1994	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,019	43,878	45,738	47,235	47,689	. . .
1995	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	42,006	44,332	46,269	45,949	48,064
1996	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	43,433	45,271	45,209	46,574
1997	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	44,687	44,949	46,743
1998	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	45,639	46,873
1999	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	45,732

(Continued)

	Cohort														
Year	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
1996	49,670	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1997	49,474	51,721	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1998	49,630	51,704	52,119	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
1999	48,627	50,673	51,567	51,926	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2000	47,405	49,114	51,359	50,771	54,214	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2001	. . .	48,232	49,668	49,508	52,392	53,659	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2002	. . .	. . .	47,747	48,457	51,482	52,816	53,762	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2003	. . .	. . .	. . .	47,037	49,434	51,408	52,488	53,046	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2004	. . .	. . .	. . .	. . .	49,168	50,994	52,082	52,108	53,003	. . .	. . .	. . .	. . .	. . .	. . .
2005	. . .	. . .	. . .	. . .	. . .	49,505	50,585	51,551	52,042	53,177	. . .	. . .	. . .	. . .	. . .
2006	. . .	. . .	. . .	. . .	. . .	. . .	49,847	50,886	51,437	52,362	53,043	. . .	. . .	. . .	. . .
2007	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,811	50,846	51,868	51,938	53,601	. . .	. . .	. . .
2008	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,503	51,111	51,120	51,763	52,674	. . .	. . .
2009	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,456	49,437	50,654	51,246	51,587	. . .
2010	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	48,707	50,049	50,618	50,423	51,748
2011	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,628	50,012	50,187	51,318
2012	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,753	49,892	51,052
2013	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	49,602	50,619
2014	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	50,710

SOURCE: Author's calculations using CWHS data.

NOTES: Sample omits men with wage and salary earnings lower than the level needed to qualify for four quarters of Social Security coverage or higher than the level that represents the top 0.1 percent of earners in the given year.

. . . = not applicable.

Notes

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[1] Employers submit taxes withheld from employee wages to the IRS and report employee wages to SSA on Form W-2. SSA and IRS share the W-2 data to administer Social Security benefits and the federal income tax, respectively.

[2] For a detailed description of the MEF, see Olsen and Hudson (2009).

[3] The CWHS comprises two component files called the active file and the inactive file. The active file contains the earnings records for workers with earnings from any employment (including self-employment), regardless of whether those earnings were covered under Social Security. The inactive file contains records only for workers who have never had covered earnings posted to the MEF. Prior to 1978, the CWHS tracked only covered earnings.

[4] In 2018, wages in covered employment of up to $128,400 are taxable. The taxable maximum amount is adjusted annually according to the percentage increase in the national average wage index. For more information, see SSA's National Average Wage Index web page (https://www.ssa.gov/oact/cola/AWI.html).

[5] Leonesio and Del Bene point to data quality problems in the CWHS for 1978–1980 earnings amounts as the main reason for examining earnings only for 1981 and later. (The errors in the CWHS, a research file, do not affect benefit computations, which are based on the MEF.) They also cite limitations in self-employment (SE) earnings data in the CWHS, noting that "recordkeeping rules for Medicare-taxable earnings imply that the CWHS data for SE earnings are substantially censored in varying degrees prior to 1994, posing considerable problems for researchers."

[6] Women's earnings during the same period will be examined in a future study.

[7] The Bureau of Labor Statistics publishes labor force participation rates in *Employment and Earnings Online* (https://www.bls.gov/opub/ee/home.htm).

[8] A worker is fully insured for Social Security retirement benefits after he or she has earned 40 quarters of coverage. A worker earns a quarter of coverage when earnings exceed the quarterly amount defined in statute for that year. A worker can earn four quarters of coverage in a single calendar quarter if his or her earnings equal or exceed four times the amount needed to earn a single quarter of coverage.

[9] Although the Consumer Price Index (CPI) is more familiar to the public, it tends to overstate long-term price increases because it measures the price of a fixed basket of goods. As a result, the CPI fails to capture the full effect of substitution on consumer expenditures. In the PCE index, recent expenditures are weighted more heavily than earlier ones, which is one reason why the PCE index captures the effects of substitution more effectively than the CPI does. For more information, see Velde (2015).

[10] This refers to the 2014 CWHS active file, as described in note 3.

[11] Throughout this article, age refers to age at year-end.

[12] The qualifier "all else being equal" is especially important in this instance. Changes in earnings depend not just on the change in the number of workers available for employment, but also on their skills and abilities, the industry- and occupation-specific demand for labor, and changes in labor laws and regulations, among other factors.

[13] The four recessions, as defined by the National Bureau of Economic Research, were July 1981–November 1982 (16 months), July 1990–March 1991 (8 months), March 2001–November 2001 (8 months), and December 2007–June 2009 (18 months). Expansions occurred December 1982–July 1990 (92 months), March 1991–March 2001 (120 months), November 2001–December 2007 (73 months), and beginning in June 2009. The 1981–2014 observation period began with the final 6 months of a prior contraction and ended with the first 67 months of an expansion that extended beyond year-end 2014.

[14] I track the 1951–1955 and the 1956–1960 birth cohorts six times each; the 1946–1950 and 1961–1965 cohorts five times each; the 1941–1945 and 1966–1970 cohorts four times each; the 1936–1940 and 1971–1975 cohorts three times each; the 1931–1935 and 1976–1980 cohorts twice each; and the 1926–1930 and 1981–1985 cohorts once each. This yields a total of 210 earnings intervals ([10 × 6] + [10 × 5] + [10 × 4] + [10 × 3] + [10 × 2] + [10 × 1]) observed for men aged 25 through 59 over the period from 1981 through 2014.

[15] For an alternative data file that combines the values from Chart 5 (Table A-5) through Chart 11 (Table A-11) into a single table, see https://www.ssa.gov/policy/docs/ssb/v78n1/v78n1p1-alt-table.xlsx.

[16] For more information on broader measures of compensation, see Pierce (2010).

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The Incidence and Consequences of Private Sector Job Loss in the Great Recession

by Kenneth A. Couch, Gayle L. Reznik, Howard M. Iams, and Christopher R. Tamborini*

Using data from the 2008 panel of the Survey of Income and Program Participation, we examine involuntary unemployment and its consequences among private-sector workers aged 26–55 during the Great Recession. We document the effects of involuntary unemployment on earnings, income, and health insurance coverage during the economic downturn and compare those outcomes across worker demographic subgroups. We find that about 7 percent of private-sector workers experienced a period of involuntary unemployment and that, of those, about 70 percent were reemployed by the end of a 3-year follow-up period. Workers who lost a job involuntarily were likely to experience sharp reductions in personal earnings and household income and were prone to lose health insurance coverage. We also discuss the implications of recession-related involuntary unemployment for retirement security in general and Social Security in particular.

Introduction

Economic downturns have a wide range of effects on workers who lose their jobs. The negative consequences of job loss are exacerbated in the aftermath of a severe recession. These include effects on employment and earnings, health insurance coverage, contributions to retirement accounts, financial security, and health-related behaviors and outcomes. Abundant literature establishes that recessions negatively affect outcomes in each of these areas (for example, Brand 2015; Couch and others 2013; Couch 1998; Couch, Jolly, and Placzek 2009, 2011; Couch and Placzek 2010; Dushi, Iams, and Tamborini 2013; Tamborini, Purcell, and Iams 2013; Gruber and Madrian 1997; Gallo and others 2004; and Gallo and others 2006). Less known is that short-run effects tend to persist over the life course. This is reflected in a growing body of literature showing that leaving work during a recession has long-term negative consequences on earnings (Jacobson, LaLonde, and Sullivan 1993; Couch and Placzek 2010) and on financial assets available for retirement (Stevens and Moulton 2013). In addition, the likelihood of receiving Disability Insurance (DI) and Supplemental Security Income (SSI) benefits—and of mortality—is greater (Couch and others 2013).

The Great Recession of 2007–2009 was the worst economic downturn since the Great Depression. Recently available longitudinal data allow us to analyze the short- and medium-term outcomes of leaving work during the downturn. We examine the experiences of prime-aged private-sector workers who became involuntarily unemployed during the Great Recession and track them through each of the first 3 years after job separation. We contrast their

Selected Abbreviations

BLS	Bureau of Labor Statistics
CPS	Current Population Survey
DI	Disability Insurance
SIPP	Survey of Income and Program Participation
SSI	Supplemental Security Income

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experiences with those of workers who did not experience job loss in that period.

Using data from the 2008 Survey of Income and Program Participation (SIPP), we present a descriptive analysis of the extent of involuntary job loss and its short- and medium-term consequences. We examine those consequences across key sociodemographic characteristics known to correlate with labor market advantages and disadvantages. We then consider the likelihood of reemployment by the end of the observation period. Finally, we consider changes in personal earnings, household incomes, and health insurance coverage rates relative to a baseline period when the workers we examine were employed.

To document the consequences of involuntary unemployment during the 2007–2009 recession, our analysis relies on longitudinal data that enable us to follow workers and their families over time, rather than on cross-sectional snapshots of the labor market. This study's data allow identification of individual workers who had a period of involuntary unemployment during the Great Recession so that their experiences can be described before and after the event. In the future, the use of panel data such as these will also allow us to examine the longer-term experiences of workers who suffered job losses during the downturn.

The results provide insights into the extent to which involuntary job losses during the Great Recession were associated with adverse outcomes for individuals and their families. The experiences of these workers have implications for their retirement security. Research has shown that periods of unemployment during severe recessions are associated with increased application for Social Security disability and retirement benefits (Couch and others 2013; Fichtner, Phillips, and Smith 2012; Johnson, Smith, and Haaga 2013). Job loss among younger workers may also influence lifetime earnings, and thus affect future Social Security benefit amounts as well as enrollment in other social insurance programs (Bitler and Karoly 2015; Haveman and others 2015).

Background

In this section, we review studies that use cross-sectional data and SIPP data to describe the economic and labor-market characteristics of the Great Recession.

Descriptions of the Great Recession and Employment from Cross-Sectional Data

The Great Recession began in December 2007 and continued through June 2009, during which the lack of aggregate demand had a major negative impact on U.S. workers. Repeated calculations using cross-sectional data allow for a timely examination of trends and provide initial evidence of the severity of the Great Recession. For example, figures derived from the monthly Current Population Survey (CPS) of the Bureau of Labor Statistics (BLS), the primary source of labor market statistics for the United States, reveal that nonfarm employment peaked in January 2008, decreased moderately in the Great Recession's early months, and then trended more sharply downward toward the end of 2008. Employment losses averaged around 700,000 per month from October 2008 through March 2009—the largest monthly losses since 1945 (Goodman and Mance 2011).

Those reductions in employment came largely in industries and occupations associated with a high prevalence of routine tasks (Jaimovich and Siu 2012). The sharp decline in job openings, particularly for lower-skilled jobs, added to the difficulty in finding new work for the unemployed (deWolf and Klemmer 2010, Charts 1 and 2; BLS 2011b; Johnson and Feng 2013). The unemployment rate increased sharply, from 5 percent to 10 percent, between the end of 2007 and October 2009 and remained above 9 percent through 2010 (BLS 2012a; Theodossiou and Hipple 2011). In total, employment declined by 8.8 million between the peak of the business cycle in January 2008 and the trough in February 2010 (Goodman and Mance 2011).

The CPS data also captured a sharp increase in the duration of unemployment spells. From 1994 through 2008, about half of unemployed persons found a job within 5 weeks; that proportion fell to two-fifths in 2009 and to one-third in 2010 (BLS 2011a, 2012b). The Great Recession also markedly increased underemployment—that is, the number of individuals working part-time but looking for full-time work. Sum and Khatiwada (2010) estimate that about 8.9 million workers were underemployed in November 2009, the highest number in 6 decades. Another 5.6 million individuals wanted a job but were not actively looking for work. Thus, the high unemployment rate, taken alone, understates the negative impact of the Great Recession on the labor market.

Estimates based on the January 2010 Displaced Workers Supplement (DWS) to the CPS show that because of insufficient aggregate demand, the Great Recession displaced about 15.4 million workers over the 3 years prior to January 2010, compared with 8.3 million workers displaced in 2005–2007 (BLS 2010). BLS defines "displaced workers" as wage-and-salary workers aged 20 or older who had held their jobs for 3 years or longer and "who lost or left their job because their plant or company closed or moved, there was insufficient work for them to do, or their position or shift was abolished" (BLS 2010, 1). The survey reported that only half of the long-term workers who were displaced from their job in the prior 3 years were reemployed, the lowest rate since the DWS was first conducted in 1984. This low reemployment rate has been described as the key feature of the labor market in the Great Recession, in contrast with reemployment rates in other recessions (Farber 2013).

With the job displacement rate in the first 3 years of the Great Recession roughly doubling the rate of the prior 3 years for long-term workers, and with extended unemployment-spell durations and relatively low earnings for the reemployed, the cross-sectional data depict a sharp decline in labor-market prospects for American workers in that period. We enhance the analysis by using longitudinal data for the same observation period from the Census Bureau's SIPP. Before discussing our findings, we summarize other studies that use SIPP data to look at distinct features of the U.S. labor market during the Great Recession.

Analyses of the Great Recession Using 2008 SIPP Data

Johnson and Butrica (2012) use data from the 2008 panel of the SIPP to examine unemployment and reemployment rates during the Great Recession. They report higher rates of unemployment for younger workers than for older ones, but the latter experienced longer durations of unemployment and lower rates of reemployment. For reemployed workers, estimated earnings losses ranged from 11 percent to 47 percent. Our analysis differs in that we focus specifically on workers who lost jobs involuntarily, examine additional outcomes such as changes in household income and health insurance coverage, and include additional demographic breakdowns.

Johnson and Feng (2013) observe workers in the 2008 SIPP panel who were laid off or looking for work. The authors examine unemployment-spell differentials by age and the financial consequences of unemployment spells lasting more than 6 months. They report large drops in household income immediately following job loss, which become even more severe among the long-term unemployed. The severity of the losses can be buffered by unemployment insurance benefits, increased spousal earnings, and, for workers aged 62 or older, Social Security benefits. Our study complements Johnson and Feng by focusing on a broader group of prime-aged workers who experience involuntary unemployment, providing a longer follow-up, and examining additional outcomes such as health insurance coverage changes.

Cawley, Moriya, and Simon (2011) use 2008 SIPP data to estimate the relationship between aggregate unemployment and the percentage of individuals covered by health insurance during the period 2004–2010. They report that a 1 percent increase in the unemployment rate is associated with a 2 percent decrease in insurance coverage for men but they find no significant change for women. The authors calculate intrastate averages to perform a time-series analysis. Here, we track changes in the health insurance coverage status of specific individuals over time—again, focusing on those who lost a job involuntarily during the Great Recession.

Fang and Silos (2012) use data from the 1991, 2001, and 2008 SIPP panels to consider wage and employment dynamics of hourly workers, who compose about half of the U.S. labor force. In examining all spells of unemployment, the authors find that the current wages of roughly half of the reemployed workers were lower than their former wages. Older workers and those who changed industries experienced larger wage losses. During the Great Recession, the proportion of unemployed hourly workers who experienced wage loss at reemployment increased, particularly among those who were unemployed longer than 4 months.

We extend these SIPP-based examinations of the Great Recession by considering all prime-aged private-sector workers who were employed at the beginning of the survey and who involuntarily lost their jobs as the unemployment rate climbed from 6.1 percent in August 2008 to 9.6 percent in August 2009.[1] We concentrate on those who lost their jobs involuntarily because this analysis focuses on unemployment related to diminishing aggregate demand and one might expect that voluntary job leavers would not be as adversely affected by the recession. Then, we examine how many workers with involuntary job losses were reemployed at each of 3 yearly intervals after the job loss. We contrast

the experiences of workers who were involuntarily displaced from their jobs in the first year of observation with those of workers who remained employed through that period.

We also examine changes in earnings, household incomes, and health insurance coverage rates before and after involuntary unemployment and compare them with those of workers who remained employed. In using the SIPP data to track the experiences of specific workers, our analysis employs an approach similar to that of Johnson and Butrica (2012) while focusing on involuntary unemployment and observing additional outcomes. Our analysis also provides information on employment and earnings dynamics, tracking the experiences of individual workers as in Fang and Silos (2012); however, we consider all prime-aged workers (whether hourly or salaried) and a broader variety of outcomes. Finally, our analysis also considers changes in health insurance coverage, the primary topic for Cawley, Moriya, and Simon (2011); but we track the experiences of a group of workers at risk of losing their jobs, rather than relating the aggregate unemployment rate to proportional changes in coverage.

Data and Methods

We draw longitudinal data from the 2008 SIPP panel, a nationally representative panel of noninstitutionalized individuals. Unlike data from cross-sectional surveys, longitudinal data offer the advantage of following individuals over time. This provides researchers with a richer picture of the changing situations of specific individuals and their families because the data reflect conditions both before and after events such as job loss. Respondents are interviewed every 4 months, with questions eliciting discrete information for each month elapsed since the last interview. Using 4-month intervals helps reduce recall-bias errors in survey responses.

This analysis uses data from wave 1 through wave 13 of the 2008 SIPP. The initial wave 1 interviews were conducted from September through December 2008, with respondents answering questions about the preceding 4 months. Thus, the first month for which nationally representative data from the 2008 SIPP are available for all respondents and their households is August 2008. Correspondingly, because August 2012 is the last month fully covered in wave 13 interviews, it is the last month analyzed.

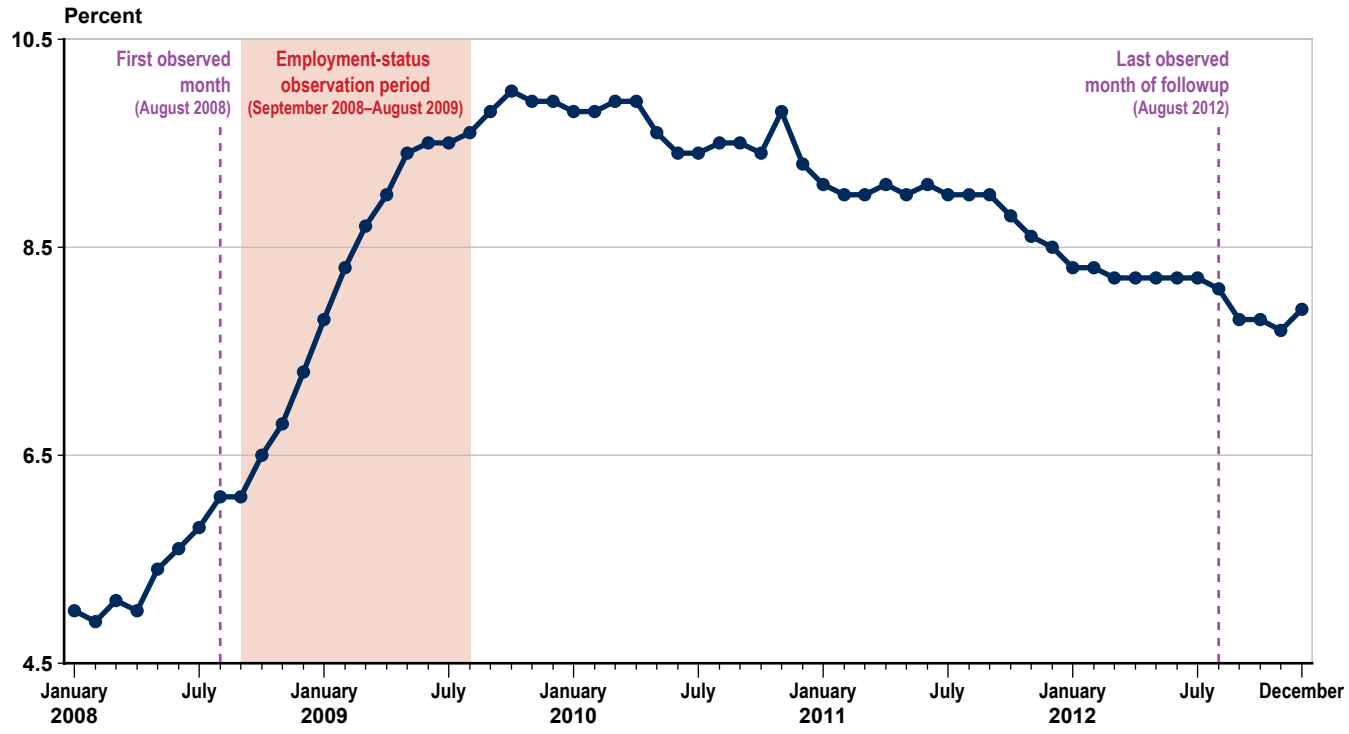
Although the Great Recession (which began in December 2007) was already under way by August 2008, data for that month reflect a period before the major stock market collapse in October 2008, after which job losses and unemployment dramatically increased (deWolf and Klemmer 2010, Charts 4 and 5). Chart 1 shows that the seasonally adjusted unemployment rate for workers aged 16 or older was 5.0 percent in January 2008. By August 2008, it was 6.1 percent. The sharp decline in the stock market in October coincided with the start of a steep increase in unemployment. By August 2009, the unemployment rate had climbed to 9.6 percent, and by October 2009 it peaked at 10.0 percent. As of the last month we analyze, August 2012, the unemployment rate had fallen to 8.1 percent—below the peak, but still above the rate in the initial month we analyze. As Chart 1 shows, the period September 2008–August 2009 is associated with about three-quarters of the total increase in the unemployment rate that occurred in the Great Recession.

Analysis

We use descriptive analysis to document the depth and consequences of the labor market difficulties of prime-aged workers during the Great Recession. Our analytical sample consists of men and women aged 26–55 in 2008. We distinguish sample members by employment status in August 2008, excluding those who were unemployed. We define a respondent as employed if the status he or she reports is "with a job [the] entire month." We also exclude those who report working for local, state, or federal government in August 2008 because we expect their experiences to differ from those of private-sector workers.[2] We further exclude the self-employed and those working in family businesses because of concerns about the availability and accuracy of data on their reported earnings.[3]

We use SIPP data to obtain information about the workers' situations in August 2008 and any employment-status changes in the 1-year interval from September 2008 through August 2009. We relate these measures to their later experience in terms of employment, labor earnings, family income, and health insurance coverage. We focus on workers whose jobs ended involuntarily (as defined in the next section). We choose these parameters so that the analysis specifically describes the experiences of individuals who became involuntarily unemployed during the steep climb in the unemployment rate associated with the Great Recession.

Chart 1.
Seasonally adjusted unemployment rate (ages 16 or older): Monthly 2008–2012



SOURCE: BLS (n.d.).

Defining Job Loss

We divide the August 2008 sample of employed workers into two groups. The first remained continuously employed through August 2009 and the second experienced a period of involuntary unemployment. We examine the SIPP data for individual respondents in the sample for each month from September 2008 through August 2009. We determine whether the respondent reported having a job for the entire month (employed) or reported being without a job for all or part of the month (unemployed). If the respondent reported being unemployed in any of these 12 months, we classify him or her as experiencing a period of unemployment. Otherwise, we classify the respondent as continuously employed.

Next, we consider whether the job separation that caused the period of unemployment was involuntary. One SIPP question asks for the main reason the respondent stopped working for the employer. If a respondent reported being laid off, the employer being bankrupt, the job being temporary and ending because of slack work or business conditions, being discharged or fired, or the employer selling the business, we identify the separation as involuntary. In general, workers who left a job for these reasons were active in the labor market and did not choose to separate. This group would be expected to have greater attachment to the labor market at the time of the job loss than would workers who left the labor market for voluntary reasons such as returning to school or taking care of children.

Additionally, we observe the experiences of those who had a period of involuntary unemployment and reported being reemployed (having a job the entire month) at follow-up intervals of 1, 2, and 3 years after job loss. Likewise, for workers who were continuously employed through August 2009, we identify those who were still (or again) employed 1, 2, and 3 years thereafter. We do this to contrast the experiences of those who lost jobs involuntarily (conditional on whether they were subsequently reemployed) with those of the continuously employed.

Thus, the study examines short- and medium-term outcomes associated with involuntary job loss during the Great Recession. All of the analyses in this article use SIPP longitudinal weights. Our standard errors adjust for SIPP's complex survey design.[4]

Longitudinal Outcomes in Focus

We examine several dimensions of change in our analysis. For workers with a job separation (involuntary or otherwise), the most fundamental statistic is the number who are reemployed at subsequent intervals. As described earlier, an individual is classified as employed or unemployed based on monthly self-reports of employment status in the 2008 SIPP.

For workers with involuntary separations, we also contrast the levels of earnings and household income at 3 yearly follow-up intervals with the levels reported at the beginning of the period. This allows us to describe how deeply some resources were affected over time by involuntary unemployment. It also indicates the effects of subsequent adjustment by such workers and their families. In addition, we track changes in rates of health insurance coverage, which is another major concern related to the loss of a job. The earnings, household income, and health insurance coverage data used in the analysis are from self-reported monthly observations in the 2008 SIPP.

Sociodemographic Characteristics in Focus

We examine how the outcomes of interest (involuntary unemployment, reemployment, earnings, household income, and health insurance coverage) vary across a set of sociodemographic characteristics known to correlate with labor market advantages and disadvantages. These characteristics are sex, race/ethnicity, age, marital status, and education.

Educational attainment is the most direct correlate of labor-market stability, even in a recession, and we would expect workers with the lowest levels of education to have the most negative experiences during periods of slack demand. Among race/ethnicity groups, non-Hispanic whites are often thought to have advantages in the labor market and tend to have the highest observed educational attainment, which generally protects workers from poor labor-market outcomes during recessions (Couch and Fairlie 2010; Couch, Fairlie, and Xu forthcoming). Similarly, older workers traditionally have more stable employment patterns, which are due in part to their longer experience and the resulting higher value of their skills to employers. Thus, we might expect to observe fewer indicators of labor market difficulty for older workers than for younger ones. Additionally, married workers have responsibilities to their families, which may affect both their work behaviors and their employer's attitudes toward them.

Note that although our tables include marital status, we do not discuss the "widowed" category because the unweighted sample size of widows who lost a job in our analysis period is small. We also omit the "other" race/ethnicity category from the discussion because it encompasses a mix of racial/ethnic groups, making interpretation for any member group difficult.

Results

In this section, we discuss our findings, focusing on unemployment, earnings, household income, and health insurance. All differences discussed in the results section are statistically significant at the 0.10 level. We do not discuss results that are not statistically significant.

Employment, Unemployment, and Reemployment

Table 1 provides information for private-sector workers aged 26–55 who were employed in August 2008 and who experienced a job separation for any reason in the period September 2008–August 2009.[5] It also shows reemployment rates at each of 3 yearly intervals after the month of separation.

Fourteen percent of prime-aged private-sector workers who were employed in the baseline month had a gap in employment during the following 12-month period.[6] The least impacted demographic subgroups were non-Hispanic whites (13 percent), workers aged 36–45 (12 percent), married individuals (13 percent), and those with a college degree (10 percent). The characteristic that appears to have been the greatest protection against unemployment was a high level of education.

By contrast, the most affected groups were non-Hispanic blacks and Hispanics (16 percent each), younger workers (aged 26–35: 16 percent), and those with a high school diploma or less (17 percent). The characteristics associated with the largest observed deviations from the overall average either are directly related to workplace skills or serve as a proxy for them. Low education, minority status, and young ages are all associated with lower levels of general or specific skills (Couch and Jolly 2010; Smith and Welch 1989) and reduce the likelihood of retaining employment.

Of the workers who left jobs for any reason during September 2008–August 2009, only 53 percent were reemployed 1 year after job loss. Across demographic subgroups, we observe a higher likelihood

Table 1.
Private-sector workers aged 26–55 in August 2008: Job separations in the following year, and subsequent annual-interval reemployment rates, by selected worker characteristics

Characteristic	Number of workers employed in August 2008 (in thousands)	Workers with any job separation during September 2008–August 2009				
		Number (in thousands)	As a percentage of those employed in August 2008	Percentage reemployed—		
				1 year after separation	2 years after separation	3 years after separation
Total	68,382	9,628	14	53	65	71
Sex						
Men	36,866	5,255	14	59	72	77
Women	31,516	4,373	14	44	56	65
Race/ethnicity						
White, non-Hispanic	45,878	6,033	13	52	64	71
Black, non-Hispanic	7,261	1,190	16	56	66	73
Hispanic	10,728	1,679	16	56	67	71
Other [a]	4,515	726	16	42	64	71
Age						
26–35	22,994	3,669	16	54	67	73
36–45	23,416	2,920	12	54	66	75
46–55	21,972	3,040	14	49	61	66
Marital status						
Married	41,882	5,448	13	54	66	74
Divorced or separated	9,779	1,495	15	46	62	64
Never married	15,831	2,524	16	55	67	73
Widowed [b]	890	161	18	36	36	46
Education						
High school diploma or less	22,070	3,695	17	48	62	67
Some college	25,688	3,824	15	53	64	71
Bachelor's degree or more	20,623	2,109	10	60	71	79

SOURCE: Authors' calculations based on 2008 SIPP panel.

a. Because this category includes a mix of racial/ethnic groups, these data may not be representative of any specific group.

b. Because the unweighted sample size is small, these data should be interpreted with caution.

of reemployment 1 year after separation among men (59 percent), married and never-married individuals (54 percent and 55 percent, respectively), and workers with a college degree (60 percent). Women (44 percent) and divorced or separated individuals (46 percent) were among the least likely to be reemployed after 1 year. The overall likelihood of reemployment 2 years after job loss was 65 percent and at 3 years it was 71 percent. After 3 years, women (65 percent), workers aged 46–55 (66 percent), and divorced or separated individuals (64 percent) continued to have the lowest rates of reemployment.

Table 2 repeats Table 1 but for workers who lost their jobs involuntarily. Seven percent of all workers who were employed in August 2008 had an involuntary job loss in the year that followed—about half as many as reported a job separation for any reason.

The pattern of involuntary job losses differs from that of all employment exits. For example, among workers experiencing a job separation for any reason (Table 1), the youngest age group is 2 percentage points more likely than the oldest group to separate in the first year covered by the SIPP panel. Yet involuntary job losses in the same period (Table 2) are equally likely among the youngest and oldest age groups. In addition, a bachelor's degree or higher reduces the likelihood of an involuntary job loss even more than it reduces the likelihood of a job separation for any reason.

The percentages of the involuntarily unemployed who were reemployed 2 and 3 years after job loss (64 percent and 72 percent, respectively) are comparable to those for workers who left a job for any reason (65 percent and 71 percent, respectively; Table 1).

Table 2.
Private-sector workers aged 26–55 in August 2008: Involuntary job losses in the following year, and subsequent annual-interval reemployment rates, by selected worker characteristics

Characteristic	Number of workers employed in August 2008 (in thousands)	Workers with involuntary job loss during September 2008–August 2009				
		Number (in thousands)	As a percentage of those employed in August 2008	Percentage reemployed—		
				1 year after job loss	2 years after job loss	3 years after job loss
Total	68,382	4,853	7	49	64	72
Sex						
Men	36,866	2,904	8	54	68	75
Women	31,516	1,949	6	41	58	68
Race/ethnicity						
White, non-Hispanic	45,878	3,015	6	49	62	72
Black, non-Hispanic	7,261	637	8	55	71	76
Hispanic	10,728	812	7	51	64	76
Other [a]	4,515	389	8	34	62	62
Age						
26–35	22,994	1,660	7	48	64	77
36–45	23,416	1,568	6	53	66	74
46–55	21,972	1,625	7	45	61	66
Marital status						
Married	41,882	2,793	6	50	63	75
Divorced or separated	9,779	764	7	39	66	65
Never married	15,831	1,237	7	54	65	73
Widowed [b]	890	59	6	16	30	21
Education						
High school diploma or less	22,070	1,941	8	44	59	67
Some college	25,688	2,041	8	51	65	73
Bachelor's degree or more	20,623	871	4	56	73	83

SOURCE: Authors' calculations based on 2008 SIPP panel.

a. Because this category includes a mix of racial/ethnic groups, these data may not be representative of any specific group.

b. Because the unweighted sample size is small, these data should be interpreted with caution.

Table 2 shows that 3 years after an involuntary job loss, men, workers aged 26–35 and 36–45, married workers, and those with a bachelor's degree or higher were among those most likely to be reemployed. Women, older workers, and those with a high school diploma or less were among those least likely to be reemployed.

Involuntary Unemployment and Monthly Earnings

Table 3 shows earnings patterns among workers with various employment experiences over the observation period. Across every demographic category, workers who would later experience involuntary unemployment had lower average earnings in August 2008 than did those who would remain employed. One reason for this may be that workers who become involuntarily unemployed tend to have lower levels of education. Another is that they are more likely to be blue-collar workers (not shown). Both of these characteristics would be associated with lower initial average earnings.

Table 3 also shows the percentage change in mean earnings at 1-, 2-, and 3-year follow-up intervals. Note that for workers who had an involuntary job loss, we measure those intervals from the month of job loss; but for workers who remained employed through August 2009, we present outcomes as of February 2010, 2011, and 2012, because February is the midpoint of the September-to-August annual cycle we observe. We further distinguish *all* workers who remained employed through August 2009—including those with a subsequent job separation—from those

Table 3.

Mean monthly earnings of private-sector workers aged 26–55 who were employed in August 2008, and the earnings effects of various subsequent employment experiences, by selected worker characteristics

Characteristic	Earnings ($) in August 2008			Percentage change in earnings from August 2008 for workers who—											
		During September 2008–August 2009, workers who—		Remained employed during September 2008–August 2009 [a]						Had involuntary job loss during September 2008–August 2009					
				Overall, as of February—			Among those employed as of February—			Overall			Among those reemployed as of—		
	All workers	Remained employed	Had involuntary job loss	2010	2011	2012	2010	2011	2012	1 year after job loss	2 years after job loss	3 years after job loss	1 year after job loss	2 years after job loss	3 years after job loss
Total	3,752	3,889	3,027	-3	-4	-2	1	3	6	-58	-48	-38	-19	-20	-17
Sex															
Men	4,331	4,502	3,365	-6	-5	-3	-2	1	4	-55	-48	-35	-22	-25	-17
Women	3,074	3,174	2,523	1	-2	0	5	6	10	-64	-48	-43	-17	-12	-19
Race/ethnicity															
White, non-Hispanic	4,040	4,160	3,427	-3	-3	-2	1	3	6	-57	-51	-38	-16	-23	-17
Black, non-Hispanic	2,842	2,988	2,015	-4	-1	-3	3	10	10	-57	-32	-34	-23	-4	-13
Hispanic	2,751	2,828	2,344	-7	-14	-11	-2	-5	-1	-60	-55	-37	-22	-31	-20
Other [b]	4,665	5,014	3,014	-2	-2	4	1	5	11	-63	-31	-42	-33	10	-9
Age															
26–35	3,271	3,422	2,603	-4	-1	4	0	7	13	-47	-36	-20	5	-1	0
36–45	3,984	4,124	3,032	-2	-5	-3	2	1	5	-58	-49	-40	-30	-24	-23
46–55	4,007	4,110	3,456	-4	-5	-7	0	2	2	-66	-57	-50	-27	-32	-25
Marital status															
Married	4,117	4,241	3,456	-3	-3	-1	0	3	6	-56	-53	-40	-19	-27	-23
Divorced or separated	3,434	3,579	2,622	-6	-9	-9	-1	0	1	-71	-38	-39	-27	-8	-7
Never married	3,026	3,157	2,350	-1	-3	0	5	5	9	-55	-37	-29	-16	-5	-6
Widowed [c]	2,949	3,165	2,181	-11	-12	-6	-2	0	4	-96	-79	-82	-73	-30	-18
Education															
High school diploma or less	2,548	2,632	2,258	-9	-11	-10	-3	-3	0	-68	-57	-42	-31	-29	-18
Some college	3,266	3,378	2,864	-5	-7	-6	-2	1	2	-59	-51	-39	-24	-27	-19
Bachelor's degree or more	5,645	5,739	5,122	0	1	4	3	6	10	-47	-35	-32	-12	-11	-20

SOURCE: Authors' calculations based on 2008 SIPP panel.

a. Includes workers who possibly experienced a job separation after August 2009.

b. Because this category includes a mix of racial/ethnic groups, these data may not be representative of any specific group.

c. Because the unweighted sample size is small, these data should be interpreted with caution.

who were still (or again) employed at the follow-up interval.

For workers who had remained employed in the first year of observation, earnings were relatively stable across subsequent years. For that group overall, earnings reductions did not exceed −4 percent; for those who were employed in the follow-up periods, we observe earnings gains of 1 percent to 6 percent. Across most demographic subgroups, we observe patterns of relatively stable earnings for workers who had remained employed through August 2009.

By contrast, 1 year after a worker's involuntary job loss, his or her earnings, on average, had declined by 58 percent. After 2 years, the average decrease was −48 percent and after 3 years, it was −38 percent. Among workers who involuntarily lost a job and were subsequently reemployed, the earnings losses were not as large, ranging from −17 percent to −20 percent over the 3 subsequent years.

Among all workers who experienced an involuntary job loss, earnings losses after 3 years were largest for women (−43 percent), workers aged 46–55 (−50 percent), and those with a high school diploma or less (−42 percent). Among workers with an involuntary exit who were subsequently reemployed, the earnings losses 3 years after job loss were greatest among women (−19 percent), Hispanics (−20 percent), and workers aged 46–55 (−25 percent). Those with persistent and significant earnings losses tend to be from demographic subgroups that face disadvantages in the labor market. Notably, the sharp earnings losses of workers with involuntary job losses contrast starkly with the relatively stable earnings of those who remained employed.

Involuntary Unemployment and Household Income

Most individuals reside in households with other individuals. One advantage of the SIPP as a data source is that it was designed specifically to improve measures of available resources by accounting for the entire household. When an individual encounters unemployment, additional work by other individuals in the household can help protect them from a large drop in their standard of living. Similarly, the receipt of social insurance payments such as unemployment insurance benefits helps reduce the severity of the effects of job loss. The same can be said of other means of assistance such as the Earned Income Tax Credit.

Table 4 reports average monthly household income and the percentage change in monthly household income over the observation period for the same groups of workers covered in Table 3. Household incomes in August 2008 among workers who would experience an involuntary job loss in the year that followed were lower than those among workers who would remain employed, regardless of demographic subgroup.[7] In general, when we examine household income rather than personal earnings, periods of involuntary unemployment have a smaller observed proportional impact on available resources.

Among all workers who remained employed from September 2008 through August 2009, average household incomes changed little in the ensuing 3 years, whether or not the individual was employed as of the February follow-up interval. Changes ranged only from −2 percent to 2 percent (for workers overall) and from 0 percent to 6 percent (for those who were employed at follow-up).

By contrast, among workers who had an involuntary job loss during September 2008–August 2009, average monthly household income 1 year after the job loss was 23 percent lower than household income in August 2008. The average reductions 2 and 3 years after the job loss were −20 percent and −15 percent, respectively. For workers who involuntarily lost their jobs and were reemployed 1 year after the job loss, the average decline in monthly household income was −10 percent. The reductions 2 and 3 years after the job loss were −11 percent and −7 percent, respectively. Thus, for workers who involuntarily lost their jobs, all households experienced sharp losses in household income that lessened, but remained meaningful, over time.

Across demographic subgroups among workers with an involuntary job loss, the reductions in average monthly household income were relatively large for older workers. The average reduction 1 year after the job loss for workers aged 46–55 was −27 percent among all such workers and −15 percent among those who were reemployed. As of 2 years after the involuntary job loss, the reductions were −25 percent and −21 percent, respectively, and as of 3 years after job loss, the reductions were still −23 percent and −15 percent, respectively. The relatively large reductions in household income reflect, to some extent, the increased labor force participation of American women across successive generations (Tamborini, Couch, and Reznik 2015). The households of older workers have greater prevalence of women who lack

Table 4.

Mean monthly household income of private-sector workers aged 26–55 who were employed in August 2008, and the income effects of various subsequent employment experiences, by selected worker characteristics

Characteristic	Household income ($) in August 2008			Percentage change in household income from August 2008 for workers who—											
		During September 2008–August 2009, workers who—		Remained employed during September 2008–August 2009 [a]						Had involuntary job loss during September 2008–August 2009					
				Overall, as of February—			Among those employed as of February—			Overall			Among those reemployed as of—		
	All workers	Remained employed	Had involuntary job loss	2010	2011	2012	2010	2011	2012	1 year after job loss	2 years after job loss	3 years after job loss	1 year after job loss	2 years after job loss	3 years after job loss
Total	6,867	7,002	5,982	-2	-1	2	0	2	6	-23	-20	-15	-10	-11	-7
Sex															
Men	6,840	6,987	5,899	-3	-1	2	0	2	5	-21	-21	-13	-7	-9	-1
Women	6,898	7,019	6,105	-2	-1	3	0	2	8	-24	-20	-19	-16	-15	-16
Race/ethnicity															
White, non-Hispanic	7,333	7,431	6,743	-2	0	3	0	3	7	-23	-22	-15	-10	-13	-5
Black, non-Hispanic	5,197	5,426	3,678	-6	-4	1	-4	1	6	-20	-17	-8	-2	-3	0
Hispanic	5,209	5,274	4,580	-4	-6	-2	-2	-3	2	-22	-22	-17	-5	-14	-11
Other [b]	8,750	9,134	6,785	-6	-5	1	-4	-1	5	-22	-9	-22	-24	7	-14
Age															
26–35	6,364	6,472	5,518	-3	-1	4	-1	2	9	-15	-12	-2	0	1	7
36–45	7,089	7,279	5,698	-1	-1	2	1	3	6	-25	-23	-20	-14	-12	-11
46–55	7,156	7,242	6,730	-3	-2	0	-1	1	5	-27	-25	-23	-15	-21	-15
Marital status															
Married	7,897	8,042	6,918	-3	-1	2	-1	2	6	-23	-23	-17	-11	-15	-12
Divorced or separated	4,940	5,024	4,380	-3	-1	4	-1	3	9	-29	-22	-16	-17	-10	-1
Never married	5,435	5,504	4,798	0	-3	2	3	0	6	-20	-15	-9	-6	4	6
Widowed [c]	5,033	4,858	7,201	-5	-3	0	1	4	7	16	5	-33	-92	-61	-54
Education															
High school diploma or less	5,002	5,077	4,854	-4	-4	-1	-2	-1	3	-28	-25	-16	-22	-23	-4
Some college	6,302	6,398	5,822	-5	-4	-1	-3	-1	2	-22	-18	-15	-17	-10	-9
Bachelor's degree or more	9,566	9,625	8,868	0	3	7	2	5	10	-17	-19	-15	3	-8	-11

SOURCE: Authors' calculations based on 2008 SIPP panel.

a. Includes workers who possibly experienced a job separation after August 2009.

b. Because this category includes a mix of racial/ethnic groups, these data may not be representative of any specific group.

c. Because the unweighted sample size is small, these data should be interpreted with caution.

extensive labor market experience or high levels of human capital. This limits their responsiveness to household income reductions resulting from the unemployment of other household members.

We find that workers who experience involuntary unemployment have sharp drops in average monthly household income, the majority of which are not fully recovered. This stands in sharp contrast with the experience of workers who remained employed in the first year of the SIPP sample.

Involuntary Unemployment and Health Insurance

A major concern for all workers is health insurance coverage. Table 5 shows the coverage rates for the same categories of workers observed in Tables 3 and 4. The coverage rate in August 2008 among all workers in the sample was 81 percent. Those with a college degree had the highest rate (94 percent), followed by non-Hispanic whites (87 percent), workers aged 46–55 (86 percent), and married individuals (also 86 percent).

Workers who would experience an involuntary job loss from September 2008 through August 2009 had a lower health insurance coverage rate in August 2008 (68 percent) than did workers who would remain employed through that period (83 percent). This pattern is evident across every demographic subgroup.[8]

One year after an involuntary job loss, the average health insurance coverage rate for all workers was 29 percent lower than it had been in August 2008. The coverage rate reductions 2 and 3 years after the job loss were −19 percent and −18 percent, respectively. For workers with involuntary job losses who were reemployed at the subsequent yearly intervals, reductions in coverage were about half those magnitudes. Because these losses of coverage tend to occur among individuals with lower levels of available resources (see Table 4), they leave individuals particularly financially vulnerable should a health problem occur. Table 5 also shows that workers who remained employed from September 2008 through August 2009 did not later experience sizable changes in health insurance coverage rates.

The patterns discussed here predate the full implementation of the Affordable Care Act (ACA) in 2014. ACA provisions include subsidies to make coverage more affordable for those near the poverty line and the creation of state-specific markets through which individuals can purchase coverage independent of their employers and regardless of preexisting health conditions. Studies of the ACA itself and of state-level reforms have shown that these provisions expand coverage (Courtemanche and Zapata 2014; Courtemanche and others 2017). Although direct analysis has not yet been completed, these ACA provisions would likely be shown to have dampened the patterns reported here of reduced health insurance coverage among workers who experience involuntary unemployment.

Discussion

Economic downturns can have a wide range of important financial and health-related impacts on workers. As longitudinal data for the period of the Great Recession become available, attention increasingly focuses on that downturn's short- and medium-term effects on domains such as employment, earnings, income, and health insurance coverage. This study uses data from waves 1–13 of the 2008 SIPP to examine prime-aged (26–55) private-sector workers who involuntarily lost their jobs during the period September 2008–August 2009—the period of sharpest increase in the unemployment rate during the Great Recession—and tracks their experiences over the ensuing 3 years.

Our analysis yields several noteworthy results. We find that 1 in 7 prime-aged private-sector workers (about 14 percent) left employment as labor market prospects plunged during September 2008–August 2009. Broadly, the reductions in employment were concentrated among less-skilled workers; more specifically, relatively younger workers, nonwhites, and those with a high school diploma or less were most likely to experience a period of unemployment. In addition, we find that about half of the prime-aged private-sector workers with a job separation lost their jobs involuntarily—this group accounted for 1 in 14 workers (about 7 percent) overall. Among them, 49 percent were reemployed 1 year after job loss and 72 percent were reemployed 3 years after job loss. Comparisons of descriptive statistics reveal that these experiences varied by sociodemographic characteristics. What did not vary by sociodemographic subgroup was that workers who lost jobs involuntarily were likely to have lower earnings, lower household incomes, and lower health insurance coverage rates than did workers who remained employed—and that was true even prior to the job loss.

Our analysis also documents the extent of the decline in earnings and income for the involuntarily unemployed. Overall, 1 year after experiencing involuntary job loss, average monthly earnings dropped by more than half (−58 percent) and average monthly

Table 5.

Mean health insurance coverage rates of private-sector workers aged 26–55 who were employed in August 2008, and the coverage-rate effects of various subsequent employment experiences, by selected worker characteristics

Characteristic	Coverage rate (%) in August 2008			Percentage change in coverage rate [a] from August 2008 for workers who—											
		During September 2008–August 2009, workers who—		Remained employed during September 2008–August 2009 [b]						Had involuntary job loss during September 2008–August 2009					
				Overall, as of February—			Among those employed as of February—			Overall			Among those reemployed as of—		
	All workers	Remained employed	Had involuntary job loss	2010	2011	2012	2010	2011	2012	1 year after job loss	2 years after job loss	3 years after job loss	1 year after job loss	2 years after job loss	3 years after job loss
Total	81	83	68	-1	-1	-2	1	1	1	-29	-19	-18	-15	-9	-7
Sex															
Men	80	83	68	-2	-2	-4	0	0	0	-32	-21	-18	-18	-9	-4
Women	81	83	70	0	0	-1	1	2	4	-27	-19	-20	-13	-10	-14
Race/ethnicity															
White, non-Hispanic	87	89	76	-1	-1	-2	1	1	1	-25	-14	-14	-11	0	-3
Black, non-Hispanic	72	75	55	-1	0	-4	3	4	4	-38	-24	-15	-18	-16	0
Hispanic	58	60	50	-5	-7	-7	-2	-2	-2	-56	-50	-52	-38	-52	-48
Other [c]	84	87	70	-1	-2	-2	0	1	1	-29	-6	1	7	0	9
Age															
26–35	76	79	59	0	-1	-3	3	3	3	-25	-10	-7	8	5	5
36–45	80	83	66	-1	-2	-2	0	0	0	-39	-23	-21	-32	-11	-9
46–55	86	88	80	-3	-2	-5	-1	1	0	-26	-23	-24	-16	-18	-14
Marital status															
Married	86	88	77	-2	-2	-3	-1	0	0	-25	-16	-16	-16	-9	-12
Divorced or separated	75	78	67	0	-5	-8	1	0	-1	-54	-36	-37	-28	-21	-18
Never married	70	73	50	0	1	1	4	7	8	-34	-18	-10	-4	4	12
Widowed [d]	76	78	84	-4	-5	-8	3	1	-5	-33	-37	-17	-44	-14	19
Education															
High school diploma or less	65	69	53	-4	-4	-7	0	0	-1	-38	-26	-28	-21	-13	-15
Some college	83	85	73	-1	-2	-2	0	1	2	-33	-18	-15	-25	-12	-8
Bachelor's degree or more	94	95	91	0	0	-1	1	1	1	-14	-13	-9	1	-3	-1

SOURCE: Authors' calculations based on 2008 SIPP panel.

a. Values are percentages of percentages and should not be mistaken for percentage-point changes.

b. Includes workers who possibly experienced a job separation after August 2009.

c. Because this category includes a mix of racial/ethnic groups, these data may not be representative of any specific group.

d. Because the unweighted sample size is small, these data should be interpreted with caution.

household income dropped by almost a quarter (−23 percent). Those reductions were moderated by subsequent reemployment. Further exposing these workers to financial instability, the health insurance coverage rate among workers with an involuntary separation had fallen by 29 percent as of 1 year after the job loss and remained 18 percent lower 3 years after the job loss. The coverage rate among workers who involuntarily lost a job and were reemployed 3 years later was 7 percent lower than it had been before job loss.

Involuntary job loss may substantially affect retirement security, especially for older workers, who were found to experience large drops in earnings and household income. In our study period, reemployment after a short spell of unemployment was uncommon and the typical family affected by involuntary job separation lost roughly one-quarter of their income. Private resources such as savings and pensions provided alternative income for some workers, but many others would turn to public programs such as DI and SSI as alternative resources. Enrollment in these programs entails access to health insurance via Medicaid. Similarly, even though these unemployed workers would be too young to be eligible for Social Security retirement benefits, some might plan to claim reduced benefits at the initial eligibility age of 62 to obtain additional income. Research has shown that older workers who experience unemployment often apply for and enroll in these programs (Coile and Levine 2011; Johnson, Smith, and Haaga 2013).

The potential impact of job loss on retirement resources for younger workers is also a concern. For example, extensive joblessness among younger workers has been shown to be associated with reduced lifetime earnings and therefore with lower Social Security retirement benefits and a diminished ability to save. It has also been shown to be associated with a much higher likelihood of receipt of both DI and SSI benefits later in life (Couch and others 2013) and a reduction in savings in defined contribution retirement plans (Dushi, Iams, and Tamborini 2013; Tamborini, Purcell, and Iams 2013). Thus, the severity of the labor-market downturn for prime-aged workers during the Great Recession would be expected to alter patterns of Social Security and SSI application and benefit receipt. Our findings represent an initial step in documenting the short- and medium-term consequences of involuntary unemployment during the Great Recession.

Notes

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[1] The seasonally adjusted U.S. unemployment rate during the Great Recession among persons aged 16 or older peaked at 10.0 percent in October 2009 (BLS n.d.).

[2] In contrast with private-sector employers, the federal government increased employment during the recession. State and local governments also increased employment at first, but as revenues declined, they decreased employment. However, the American Recovery and Reinvestment Act of 2009 provided funding to states that helped delay some of those job cuts (Goodman and Mance 2011).

[3] However, we place no such restriction on subsequent employment status; we classify as reemployed all individuals who are coded in the SIPP as "with a job entire month" following an unemployment spell.

[4] Standard errors are available on request (Gayle.Reznik@ssa.gov).

[5] The total (weighted) population aged 26–55 in the SIPP was approximately 121 million. We calculate that private-sector workers in August 2008 composed about 56 percent of that total.

[6] Slack demand was the dominant reason given for a job loss, but other categories also played an important role, such as voluntary quits and related personal reasons including continued education, poor health, family issues, and retirement.

[7] The differences in household incomes were statistically significant for every demographic subgroup except workers aged 46–55 and those with a high school diploma or less.

[8] The differences in health insurance coverage rates were statistically significant for every demographic subgroup except workers with a bachelor's degree or more.

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Poverty Among the Aged Population: The Role of Out-of-Pocket Medical Expenditures and Annuitized Assets in Supplemental Poverty Measure Estimates

by Koji Chavez, Christopher Wimer, David M. Betson, and Lucas Manfield*

We examine the extent to which the Supplemental Poverty Measure (SPM) overestimates the poverty rate of the aged population because it does not account for asset holdings. Following a conservative annuity approach, we use 2010 Health and Retirement Study data to estimate high and low bounds of potential annuitized asset withdrawals and then recalculate 2009 SPM poverty rates. Including annuitized asset principal in family resources reduces the estimated SPM poverty rate for the aged, especially among those who are in poverty because of medical out-of-pocket expenditures. For example, between 30.8 percent and 45.2 percent of the latter group would be reclassified as not SPM poor if they were to annuitize their financial assets. To better represent available family resources, poverty measurements for the aged should incorporate (at minimum) the conservative estimates of available assets produced by the bounded-annuity approach.

Introduction

In 2011, the Census Bureau released its first report on the Supplemental Poverty Measure (SPM). That report (Short 2011) was the culmination of decades of work attempting to improve the official poverty measure (OPM), which has been used in federal statistics and research since the 1960s. Among other differences between the two measures, the SPM includes after-tax income and in-kind benefits as components of family resources and broadens the definition of "family unit" to include cohabiting couples as well as married ones. The SPM also attempts to account for health needs by subtracting families' medical out-of-pocket (MOOP) expenses from family resources. These changes result in a substantial difference in measured poverty, particularly among individuals aged 65 or older. According to the SPM, 15.9 percent of the aged were in poverty in 2010, nearly 7 percentage points higher than the OPM aged poverty rate of 9.0 percent. The difference in those poverty rates is almost exclusively due to the SPM's treatment of MOOP expenses as a nondiscretionary drain on a family's resources. After accounting for MOOP expenses, it seems the "golden years" are not as golden as the OPM suggests.

The dramatic difference in poverty rates that appears when MOOP expenses are subtracted from family resources has led scholars to question whether poverty among the aged is indeed as high as the SPM suggests. Suspicion has turned to whether the poverty measures adequately account for the ways families finance their MOOP—and other—expenses, with a specific focus on the use of assets. The OPM and

Selected Abbreviations

BLS	Bureau of Labor Statistics
CD	certificate of deposit
CPS	Current Population Survey
FCSU	food, clothing, shelter, and utilities
HRS	Health and Retirement Study
IRA	individual retirement account

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Selected Abbreviations—*Continued*

MOOP	medical out-of-pocket [expenses]
OPM	official poverty measure
SPM	Supplemental Poverty Measure

SPM are both income-based measures that account for income derived from assets, but they do not address the principal that also could be used to finance current consumption.[1] Some families, particularly those with high MOOP spending, may have significant asset holdings with which to finance necessary medical care. By ignoring family assets, poverty measures may misclassify as "poor" some families that have sufficient asset principal to meet their current spending needs. This may especially apply to the aged, whose measured incomes may not reflect the significant savings and other asset holdings many of them have accumulated over many years.

The goal of this article is to develop a conservative approach to incorporating asset principal into measures of family resources, and then to examine the resulting impact on SPM poverty rates among the aged. We first document the family asset holdings of aged persons who are identified as poor in the SPM to determine how many of them have holdings from which they may draw to help meet their medical and nonmedical expenses. We then develop a lower- and upper-bound annuity approach for incorporating asset principal (as reported for the previous year) into current family resources. The lower-bound annuity represents an extremely risk-averse strategy. It assumes that individuals expect to live 120 years and to extinguish their assets at the time of their death, and that they withdraw a fixed amount from their assets accordingly. The upper-bound annuity represents extremely favorable terms for the annuitant. It assumes that individuals receive an annuity from a hypothetical insurance firm that seeks to "break even" on individuals' assets left over after their deaths. Such an annuity represents an upper bound given that real insurance firms would offer lower withdrawal rates to compensate for taking on risk, to cover the costs of selling and administering the policies, and to profit. We then determine the reduction in the SPM poverty rate that results from the inclusion of annuitized assets, specifically among the aged who are "pushed" into poverty because of their MOOP expenditures. Finally, we contextualize the conservative changes to SPM poverty rates under the bounded-annuity approach by comparing them to the changes we would see in the SPM poverty rates if the aged were to consider *all* assets to be available to meet their needs. Overall, we find evidence that the SPM, by not incorporating a drawdown of asset principal, overestimates the aged poverty rate, especially among those classified as poor specifically because of MOOP expenditures.

Assets and MOOP Expenditures in the SPM

Drawing from asset principal is an important source of income for the aged. According to life-cycle savings models, individuals accumulate assets over their working lives with the intention of using not only the income derived from the assets but also a portion of the asset principal to meet their consumption needs during retirement (Gourinchas and Parker 2002). As the aged face high and continually increasing out-of-pocket expenditures for health insurance premiums and medical services (Meara, White, and Cutler 2004; Cutler, Rosen, and Vijan 2006; Hartman and others 2008; Paez, Zhao, and Hwang 2009), drawing from asset principal is particularly important to meet those needs (Marshall, McGarry, and Skinner 2011). From 2000 to 2010, Medicare beneficiaries' average annual MOOP expenses for services and premiums increased nearly $1,500, from $3,293 to $4,734 (Cubanski and others 2014). Medical expenses are even greater in the final years of life (Marshall, McGarry, and Skinner 2011). Based on a national sample of Medicare beneficiaries who died in the period 2002–2008, total MOOP expenses in their last 5 years of life averaged $38,688 in 2008 dollars (Kelley and others 2013). Evidence suggests that the aged accumulate assets in anticipation of future medical expenditures (De Nardi, French, and Jones 2010) and draw from their assets to cover health care costs along with other expenditures associated with poor health (Poterba, Venti, and Wise 2011).

The SPM accounts for MOOP expenditures by subtracting them from family resources.[2] The SPM thereby estimates higher poverty rates among the aged than the OPM does, and the difference is almost exclusively because of the MOOP-expense subtraction (Bridges and Gesumaria 2013; Short 2011). In 2010, the SPM poverty rate for individuals aged 65 or older was 6.9 percentage points higher than the OPM rate (15.9 percent versus 9.0 percent). By itself, the subtraction of MOOP expenses from family resources accounted for a 7.0 percentage point increase in measured poverty, by far the largest effect (positive

or negative) of any individual methodological change introduced by the SPM (Short 2011).

The SPM subtraction of MOOP expenses from family resources has been controversial because there is debate on the extent to which individuals may determine their spending levels. If MOOP expenditures are at least partially discretionary, the aged may elect to spend more on medical care than is truly necessary, thus overstating medical needs and "spending their way" into SPM-defined poverty. Some scholars argue that medical care is discretionary (Cogan 1995), and point to the relative well-being of some aged individuals in SPM-defined poverty to suggest that these families *choose* to spend as much as they do on medical care (Meyer and Sullivan 2012, 126).[3]

To the extent that MOOP expenses are nondiscretionary, subtracting them from family resources poses no problems. Indeed, scholars point to the relative price inelasticity of demand for medical care as evidence for the nondiscretionary nature of medical expenses (Newhouse and the Insurance Experiment Group 1993; Betson 2000). Furthermore, individuals respond to price only for specific forms of medical care, such as initial doctor's visits (Korenman and Remler 2013; Remler and Greene 2009); for other health care decisions, medical providers tend to have more control than do the individuals themselves (Wennberg, Fisher, and Skinner 2002).[4] We will not resolve the debate in this article. Instead, we adhere to the current SPM guidelines for the treatment of medical expenditures in the measurement of poverty.

Because the SPM does not account for families' ability to draw from asset principal to supplement family resources, it is reasonable to ask whether the SPM overstates poverty among the aged. Furthermore, by combining the exclusion of asset principal with the subtraction of MOOP expenditures from family resources, the SPM may doubly overstate poverty among the aged who are classified as poor in the SPM but not in the OPM (Bavier 2006; Wimer and Manfield 2015). If the aged draw from their asset principal to cover their MOOP spending, the omission of asset principal from counted family resources calls into question whether the increase in poverty among the aged under the SPM, relative to that under the OPM, is "real." Our goal is to incorporate asset principal into SPM-defined family resources to better represent the ability of the aged to finance their expenditures—in particular, their MOOP expenditures—and thus to more accurately measure poverty status.

Asset Principal in SPM Family Resources

There are two general strategies for incorporating asset principal into poverty measurement. The first strategy is to measure asset poverty and income poverty separately. Within the asset-poverty literature, families are considered "asset poor" if their assets alone (that is, independent of income) do not cover their needs (for example, they do not meet the OPM poverty threshold) over a short period such as 3 months (Caner and Wolff 2004; Haveman and Wolff 2004). Asset-poverty measures are best suited to determining the percentage of the population that cannot weather a sudden loss of income by drawing on asset principal alone. Although asset and income poverty measures are assessed separately, they may be combined in a joint poverty measure that considers families to be poor if they are in asset poverty and income poverty simultaneously (Radner and Vaughan 1987; Haveman and Wolff 2004; Gornick, Sierminska, and Smeeding 2009; Azpitarte 2012).

The second strategy for incorporating assets into poverty measurement is to rely on an income-based poverty measure, but to include a portion of asset principal in family resources. However, accurately estimating the size of this portion is crucial. The most generous estimates arise from an approach that assumes that families could draw down *all* available assets to meet their current needs, leaving no assets for use in later years. We call this the "rainy-day" approach. In practice, many aged people have accumulated assets as precautionary savings in anticipation of a major transitory expenditure, medical or otherwise, and then draw from their assets as needed (Poterba, Venti, and Wise 2011). Thus, the rainy-day approach may be realistic for estimating the asset principal of the aged, to the extent that family expenditures are transitory.

If the rainy-day approach provides the most generous estimate of assets to be included in family resources, what would be a reasonable conservative alterative? One promising approach is to estimate the amount the family would receive if they were to annuitize readily available assets (Weisbrod and Hansen 1968; Van den Bosch 1998; Short and Ruggles 2004–2005; Zagorsky 2004–2005; Brandolini, Magri, and Smeeding 2010). In this approach, a family is considered nonpoor if family resources, plus a hypothetical annuity from available assets, exceed the designated poverty threshold. This approach assumes that families are better off smoothing their consumption of assets as they age, and that they consequently plan on making

equal-value withdrawals each year for the rest of their lives. Thus, the annuity approach asks whether a family would be in poverty in a given year if they were to withdraw assets in such a way that it would not affect future withdrawals. In practice, such a conservative annuity approach is more appropriate to the extent that family expenditures, such as MOOP costs, recur.

In this article, we incorporate asset principal into the SPM following a conservative annuity approach and expand on its previous applications by developing lower and upper bounds for the annuitized payment amounts. We discuss the calculation of the lower- and upper-bound annuity withdrawal rate below. To contextualize our bounded annuity approach, we compare the resulting SPM poverty rates with those that result from using the rainy-day approach, which assumes that the aged could exhaust all assets to meet current needs, as defined by the SPM poverty threshold.

We recognize that *types* of assets vary in the degree to which they are readily available. We thus use four definitions of available assets, with each of the first three categories subsumed by the category that follows it: (a) liquid assets, such as saving and checking accounts; (b) financial assets (liquid assets plus near-liquid assets such as individual retirement accounts [IRAs], stocks, bonds, and certificates of deposit [CDs]); (c) financial assets plus primary residence assets (the latter value estimated using a hypothetical reverse mortgage); and (d) all financial and real assets (the latter including second homes and other real estate).

Finally, any attempt to incorporate asset principal into poverty measurement requires an assumption about the extent to which families save assets to bequeath after death. In the annuity approach, Weisbrod and Hansen (1968) originally assumed exhaustion of assets at the expected end of life, and thus no bequests. To the other extreme, Wolff (1990) calculated annuities to be paid out like bond coupons, leaving principal assets unchanged. We argue that in practice, bequest motives likely influence the extent to which the aged draw assets down (Lockwood 2012). However, the approaches to asset inclusion described here are before-the-fact in that they ask whether the aged have sufficient available assets they *could* draw down, in a sustainable way, to cover needs unmet by income. Thus, we assume no bequests in our calculations. In other words, we do not consider a family to be poor if they have the means to be well off but choose not to draw their assets down (or spend their income) because of bequest motives.

Lower-Bound Annuity

For the lower-bound annuity withdrawal rate, we assume that individuals invest their financial assets with an average real rate of return *i,* and that this rate can be maintained over time.[5] If we assume that an individual withdraws W dollars at the beginning of the year and that interest is collected at the end of the year, the balance of the asset accounts would be expressed as

$$A_1 = A_0\left(1+i\right) - W\left(1+i\right),$$

where A_0 is the value of the financial assets in the current year and A_1 is the value of the financial assets at the end of the year. We assume that the individual wants the balance to go to zero (that is, no bequest) at the end of the year of his or her death. Consequently, the amount an individual could withdraw each year while alive would be expressed as

$$A_D = A_0\left(1+i\right)^D - W\sum_{t=1}^{D}\left(1+i\right)^t = 0,$$

where D is the number of years the individual expects to live. Solving this equation for the withdrawal rate w*,

$$w^* = \frac{W}{A_o} = \frac{\left(1+i\right)^D}{\sum_{t=1}^{D}\left(1+i\right)^t}.$$

To construct a lower-bound withdrawal rate, we assume that individuals expect to live to age 120 and plan to deplete their assets at the time of their death. We assume an interest rate of 1.88 percent, which is 120 percent of the average federal midterm rate for 2001–2011. Because the Internal Revenue Service uses 120 percent of the federal midterm rate to calculate annual minimum IRA distributions, we use it as the benchmark interest rate for our calculations.[6]

Upper-Bound Annuity

The lower-bound calculation assumes that individuals will always receive a return of i on their investments. That assumption overlooks investment risk. One way to reduce both the personal risk of outliving one's funds and the investment risk is to purchase a fixed-payment annuity and thereby shift the risk to the insurance firm that issues the annuity. For the firm, the basic cost of the annuity is to make payments to an individual who buys an annuity policy for A_0 dollars. The insurance firm invests the money collected from the policyholder and promises to make future annual payments until the policyholder dies.

How large are the payments our hypothetical firm can or will promise to the policyholder? Let us assume that the only cost to the firm is in making the promised annual payments for as long as the policyholder lives. When the annuitant dies, the firm pockets any remaining account balance. Neither the insurance firm nor the individual knows when the individual will die, but by selling a significant number of policies, the firm can limit its risk (this is an example of the central limit theorem). On some of the policies, the firm will profit; but on other policies, it will lose.

To determine how much the firm will, on average, make or lose from the sale of a policy, let us begin by constructing an account balance A for an individual who dies D years after taking out the policy, with the firm investing the premium funds at a rate i. The balance would be expressed as

$$A_D = A_0\left(1+i\right)^D - W\sum_{t=1}^{D}\left(1+i\right)^t$$

$$= A_0\left[\left(1+i\right)^D - w\sum_{d=1}^{D}\left(1+i\right)^d\right].$$

In general, the asset value at the time of an annuitant's death will depend on how long he or she lives (D), what was paid for the annuity (A_0), the rate of return (i) the insurer can get for the funds (we assume it is the same rate the annuitant can get, but it is most likely higher), and the cash flow rate the company has promised (w).

What cash flow rate will the firm offer? As a first approximation, if the firm assumes perfect competition in the annuity markets, it will offer a rate that generates an expected balance at the time of the policyholder's death that is equal to zero. This is called the actuarially fair cash flow rate (w^{**}). For an initial payment of the insurance firm of A_0 dollars, this is expressed as

$$\sum_{d=1}^{\infty} p_d A_d = A_0\left[\sum_{d=1}^{\infty} p_d\left(1+i\right)^d - w^{**}\sum_{d=1}^{\infty} p_d \sum_{t=1}^{d}\left(1+i\right)^t\right] = 0,$$

where p_d is the probability of dying d years into the future.

We use the actuarially fair cash flow rate w^{**} of our hypothetical insurance firm as an upper-bound withdrawal rate. In practice, no firm would offer such a rate because it would not enable the firm to be compensated for taking on a risk that can't be hedged by selling numerous policies, to cover the costs of selling and administering the policies, and to profit; but such a calculation provides a useful upper bound. We again assume a 1.88 percent interest rate. We use life expectancy data derived from Internal Revenue Service mortality tables based on age and sex to calculate p_d.[7] For married or partnered couples, we compute individual withdrawal rates for each spouse or partner and apply the average to the couple.

Data

We use data from the 2010 Health and Retirement Study (HRS), a nationally representative survey of noninstitutionalized aged individuals and couples living in the United States. By focusing on a year shortly after the Great Recession, when asset values were compressed, we provide conservative estimates of the impact of including asset principal on SPM estimates. The HRS began in 1992 with a sample of individuals born during the period 1931–1941. HRS resurveys this original cohort every 2 years and periodically refreshes the sample with new cohorts to fill in gaps as members of the earlier cohorts age. The 2010 HRS (wave 10) data contain information for 13,591 noninstitutionalized Americans aged 56 or older. From that sample, we exclude 3,662 persons who were aged 56–64 in 2010 and an additional 226 persons who did not respond to HRS survey wave 9 in 2008.[8] Those restrictions reduce the potential sample by 28.6 percent (26.9 percent because of age, 1.7 percent because of nonresponse) and leave us with 9,702 remaining observations.[9]

The HRS uses a number of data-collection innovations that make it preferable to other data sets for examining the financial well-being of older Americans. For example, to increase the accuracy of income and asset information, the HRS designates the individual who handles household finances to answer its finance-related questions. In addition, the HRS employs an "unfolding brackets" question sequence when respondents do not indicate an exact amount for an income or asset query. This methodology reduces the severity of distortion by replacing nonresponses with a relatively restricted range of values (for example, $2,500 to $5,000).[10] The HRS further improves the accuracy of information on income derived from assets by asking for the income amount immediately after asking about the value of the assets themselves. Using this sequence is shown to reduce the problem of underreporting income from assets (Roemer 2000).[11]

Given that the SPM has not yet, to our knowledge, been implemented using HRS data, we must first ensure that we accurately account for the aged population who are in SPM poverty. To do this, we construct the SPM using HRS data and compare the results with those produced when using data from the Current Population Survey (CPS), which are typically used to construct the SPM.[12] We make this comparison in the following section. Throughout our analysis, we focus on two mutually exclusive subgroups of the aged population that the SPM defines as poor. Both subgroups are unable to meet their MOOP expenses. Members of the first subgroup, those in "medical poverty," still have sufficient resources to meet their nonmedical needs. Members of the second group, those in "nonmedical poverty," do not. In other words, the group we call the "medical poor" would not be in SPM poverty were it not for their medical expenses.[13]

Medical and Nonmedical Poverty

We compare the OPM and the SPM poverty rates based on HRS and CPS data in Table 1. Relative to CPS data, HRS data reveal a lower medical poverty rate but a higher nonmedical poverty rate. What explains this discrepancy? We believe that the enhanced income data collection in the HRS results in its lower estimate of the medical poverty rate. In auxiliary analyses, we found similar distributions of MOOP expenses in the HRS and CPS data sets; therefore, the smaller percentage of the aged "pushed" into poverty by MOOP expenses in the HRS sample reflects the smaller percentage of the HRS sample who are classified as "near poor" before subtracting MOOP expenses from their family resources.[14] On the other hand, we find that the nonmedical poverty rate is higher in the HRS because many aged persons in that sample live with family members (such as an adult child) for whom we have relatively little income information. Unlike its exhaustive collection of data on the respondent's income and assets, the HRS asks only a handful of questions that assess the income and assets of other family members.[15] If we restrict the sample to aged persons not living with other family members, the HRS no longer overestimates nonmedical poverty rates relative to the CPS (6.6 percent and 7.7 percent, respectively; not shown). Although the HRS and CPS samples differ, we believe they are sufficiently similar for our purposes. With these caveats in mind, we examine the asset portfolios of different groups of aged HRS respondents in the context of the SPM.

Asset Holdings of the Aged Poor

We compare the asset holdings of the nonmedical and medical poor with those of the aged sample overall. We focus on two types of financial assets (liquid and near-liquid assets) and two types of real assets (primary-home and other real assets). Liquid assets include the value of deposit accounts such as checking, savings, and money market accounts. Near-liquid assets include the net values of (a) stocks, mutual funds, and investment trusts; (b) bonds and bond funds; (c) time deposits such as CDs, government savings bonds, and Treasury Bills (T-bills); (d) IRA or Keogh accounts; and (e) all other nonpension, nonliquid savings.[16] Our valuation of primary-home assets, described below, follows a calculation recommended by O'Grady and Wunderlich (2012). Other real assets include the value of secondary homes and other real estate, minus the value of mortgages or other contracts on those properties. We do not include the net value of business or transportation assets such as cars, trucks, or recreational vehicles in other real assets.

We reduce the value of asset holdings by any applicable withdrawal penalties. We estimate a penalty of 6 months' interest for the withdrawal of CDs,

Table 1.
OPM and SPM poverty rates for the population aged 65 or older, by survey data source, 2009

	HRS		CPS	
Measure	Poverty rate	Standard error	Poverty rate	Standard error
OPM	9.1	0.6	8.9	0.2
SPM	14.6	0.7	15.5	0.2
Medical poor	5.2	0.3	7.1	0.2
Nonmedical poor	9.4	0.6	8.5	0.2

SOURCE: Authors' calculations using data from 2010 HRS (wave 10) and 2010 CPS.

NOTES: Sample sizes: HRS = 9,702; CPS = 21,836.

SPM total poverty rates do not necessarily equal the sum of rounded components.

government savings bonds, and T-bills.[17] To estimate the value of assets in IRA or Keogh accounts, we subtract federal and state taxes (at the family's marginal tax rates) and assume that the entire account balance is taxable. We assume no early withdrawal penalties on IRA or Keogh accounts because all sample members are aged 65 or older. We also assume that the reported values of stocks, mutual funds, investment trusts, bonds, and bond funds already account for any withdrawal penalties. We are relatively confident in this assumption because the HRS asks respondents to report these values after having "paid off anything [they] owed on them." We assume no withdrawal penalty for miscellaneous assets.

We approximate the value of primary-home assets by estimating the value of a hypothetical reverse mortgage. To determine reverse-mortgage eligibility and to estimate value, we follow the rules established by the Federal Housing Authority's reverse mortgage program, the Home Equity Conversion Mortgage.[18] A family is eligible for a reverse mortgage if they own and live in their primary residence; if the residence is valued at greater than 40 percent of any mortgages or other home loans; and if the residence is not a mobile home, a retirement home, an assisted living residence, or in a nursing home. The value of the reverse mortgage equals the home value multiplied by a "Principal Limit Factor" published by the Department of Housing and Urban Development, minus the origination fees, closing fees, initial mortgage insurance premium, present-value set-aside for monthly administration fees, mandatory counseling fee, and any outstanding mortgages or home loans. We assign to eligible sample members a reverse mortgage amount if the calculated value is greater than zero. Appendix B presents a detailed description of the reverse mortgage calculation.

Table 2 provides the asset-holding rates among all aged persons and among the nonmedical and medical poor, as reported in the 2008 HRS (wave 9).[19] Of the four asset categories of primary interest, liquid financial assets are the most prevalent (and, by definition, the most readily accessible). A majority of the nonmedical poor, 65.3 percent, have some liquid assets. A larger majority of the medical poor (86.8 percent) have liquid assets. Although majorities of those in SPM poverty possess liquid assets, the value of those assets is generally low, as we show later.

The aged in SPM poverty may draw from near-liquid financial assets, if available. However, only 26.5 percent of the nonmedical poor have such assets. The medical poor fare better: 54.7 percent have

Table 2.
Percentage of the population aged 65 or older holding selected types of assets: Overall and for the nonmedical and medical poor, 2008

Asset type	Overall	Nonmedical poor	Medical poor
Financial assets	91.2	68.1	88.8
Liquid assets	88.2	65.3	86.8
Near-liquid assets	65.7	26.5	54.7
Stocks	31.2	10.5	19.3
Bonds	8.4	2.7	6.4
CDs and other time deposits	30.1	10.9	26.1
IRA/Keogh accounts	43.8	12.3	34.2
Other savings	18.5	5.5	10.3
Liquid assets but no near-liquid assets	25.5	41.6	34.1
Real assets	68.2	42.9	62.0
Primary home	60.5	38.6	57.3
Other real assets	25.5	9.0	18.1
Second home	15.4	6.2	10.2
Other real estate	15.3	3.9	10.9
Real assets but no financial assets	3.3	11.0	4.8
Any financial or primary-home assets	94.1	77.7	93.6
Any financial or real assets	94.5	79.1	93.7
Sample size	9,702	1,063	503

SOURCE: Authors' calculations using data from 2008 HRS (wave 9).

NOTE: All differences between the nonmedical poor and the medical poor are statistically significant at the 0.05 level.

near-liquid assets. The difference in financial asset-holding rates between the nonmedical and the medical poor is telling. Although 88.8 percent of the medical poor possess financial assets, only 68.1 percent of the nonmedical poor do. This suggests that, regardless of the *value* of financial assets available to those who hold them, nearly one-third of the nonmedical poor have no financial assets available to supplement their family income.

The aged may also draw from primary-home assets. For the aged population overall, primary-home assets are nearly as common as holdings of any near-liquid assets. Primary-home assets are held by 38.6 percent of the nonmedical poor and by 57.3 percent of the medical poor. Among the medical poor, 93.6 percent have either financial or primary-home assets from which they can draw, but only 77.7 percent of the nonmedical poor have this option.

The aged may also sell off other real assets, such as secondary homes, that are available. A surprising proportion of the SPM poor—specifically, the medical poor—have secondary homes or other real estate. Less surprising is that the proportions of aged persons holding these types of real assets are lower among the SPM poor than among the aged overall.

We now turn to the *value* of assets held by the aged in SPM poverty. Table 3 presents data on the distribution of liquid assets, financial assets (liquid or near-liquid), financial or primary-home assets, and all assets (financial or real) at selected deciles for the aged population overall and for those who are in nonmedical and medical poverty.[20] Not surprisingly, as SPM resources increase, individuals are not only more likely to have assets, but the value of their holdings also increases.

Although 65.3 percent of the nonmedical poor have liquid financial assets, the average amount is modest ($8,536). The median amount ($300) is almost nonexistent, meaning that most of the nonmedical poor do not have sizable liquid assets to meet their needs. The addition of near-liquid assets does not substantially increase asset values for many of the nonmedical poor; half of them have no more than $500 in combined financial assets of any kind. If we also include primary-home assets, the nonmedical poor have an average of $98,312 in assets, and half of them have assets of less than $5,738.

The medical poor have greater asset holdings than the nonmedical poor have. At the 30th percentile, an individual in medical poverty has $1,000 in liquid assets, $3,000 in combined financial assets, and $15,676 in combined financial and primary-home assets. At the median, an individual in medical poverty has $5,000 in liquid assets, $20,000 in combined financial assets, and $72,715 in combined financial and primary-home assets—the latter value being more than 12 times the amount of combined financial and primary-home assets held by an aged individual in nonmedical poverty at the median.

Although many individuals in SPM poverty have few assets available, a small proportion—particularly among those in medical poverty—may have substantial assets from which they could draw to cover their needs.

Medical and Nonmedical Poverty After Including Annuitized Assets

We next assess the extent to which asset holdings of the aged could reasonably be included in their family resources under the bounded annuity approach. Both the lower- and upper-bound annuities in this approach are hypothetical. Recall that for the lower bound, we assume the annuity strategy of a highly risk-averse individual who withdraws assets with the expectation of complete asset exhaustion by age 120. For the upper bound, we assume that a hypothetical insurance firm distributes withdrawals based on the actuarially fair cash-flow rate; this firm is not compensated for taking on risk, has no costs (other than monthly or yearly withdrawals), and no profits. The "true" annuity amount is between these bounds.

Table 4 shows the upper- and lower-bound annuities we calculated for the nonmedical poor, the medical poor, and the aged population overall. We calculated annuities using (a) only liquid assets, (b) all financial assets, (c) all financial and primary-home assets, and (d) all financial and real assets. If the nonmedical poor were to annuitize only their liquid assets, the median value would be very low—between $9 and $20 annually. If they were to annuitize all financial assets, the median annuity would increase to between $17 and $37. Drawing from all financial and primary-home assets would increase the median annuity to between $209 and $462. Drawing from all assets would further increase the median annuity to between $296 and $616. The estimated annuities for the medical poor are much greater than those for the nonmedical poor. The median annuity drawn only from liquid assets for the medical poor would be between $167 and $386. The annuity would increase to between $707 and $1,557 if it were to be drawn from all financial assets, and

Table 3.
Value of assets held by the population aged 65 or older, by asset category and selected percentile: Overall and for the nonmedical and medical poor, 2008 (in 2008 dollars)

Percentile	Overall	Nonmedical poor	Medical poor
		Liquid assets	
10th	0	0	0
30th	2,000	0	1,000
50th (median)	8,000	300	5,000
70th	20,000	2,000	18,000
90th	85,000	16,700	55,000
Average	32,390	8,536	26,756
Percentage with no holdings	11.8	34.7	13.2
		All financial assets	
10th	41	0	0
30th	8,000	0	3,000
50th (median)	58,875	500	20,000
70th	195,150	5,700	105,000
90th	638,985	100,800	361,866
Average	246,128	62,545	147,075
Percentage with no holdings	8.8	31.9	11.2
		All financial or primary-home assets	
10th	500	0	200
30th	32,577	150	15,676
50th (median)	123,993	5,738	72,715
70th	302,439	50,496	191,432
90th	773,863	248,003	489,167
Average	311,597	98,312	202,536
Percentage with no holdings	5.9	22.3	6.4
		All financial or real assets	
10th	539	0	205
30th	40,699	200	20,000
50th (median)	145,000	9,935	79,143
70th	355,120	60,441	223,252
90th	977,426	287,927	610,599
Average	416,649	114,145	236,923
Percentage with no holdings	5.5	20.9	6.3

SOURCE: Authors' calculations using data from 2008 HRS (wave 9).

to between $2,244 and $4,969 if it were to be drawn from all financial and primary-home assets.

We next recalculate the 2009 SPM poverty rates with the inclusion of calculated asset annuity values. Because we assume that the aged withdraw and then annuitize available assets, we (a) include estimated annuity values in family income, (b) exclude HRS-reported 2009 income from assets in our annuity calculations (to avoid double counting), and (c) recalculate taxes to reflect the effects of these changes in family income. If estimated annuities include primary-home assets, our tax recalculations assume that the annuitant no longer pays interest on primary-home mortgages because all existing mortgages and home loans on the primary residence must be paid off before one can receive a reverse mortgage. If estimated annuities include secondary homes and real estate other than the primary residence, we assume these assets have been sold, meaning that the annuitant no longer receives rent from, nor pays real estate taxes on, these properties. Finally, we assume that families do not annuitize assets if doing so results in a net loss to family resources.

Table 4.
Median value of the annuitized assets held by the population aged 65 or older, by potential annuity value and asset category: Overall and for the nonmedical and medical poor, 2008 (in 2008 dollars)

Potential annuity value	Overall	Nonmedical poor	Medical poor
		Liquid assets	
Lower bound [a]	241	9	167
Upper bound [b]	514	20	386
		All financial assets	
Lower bound [a]	1,870	17	707
Upper bound [b]	3,998	37	1,557
		All financial and primary-home assets	
Lower bound [a]	3,978	209	2,244
Upper bound [b]	8,435	462	4,969
		All financial and real assets	
Lower bound [a]	4,576	296	2,703
Upper bound [b]	9,926	616	5,954

SOURCE: Authors' calculations using data from 2008 HRS (wave 9).

NOTE: Annuitized asset values are estimated assuming a constant real interest rate of 1.88 percent.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

The nonmedical poor can use annuitized assets to pay for either nonmedical needs or MOOP expenses. After including asset annuities in family resources, the nonmedical poor may remain classified as nonmedical poor (that is, still unable to afford either their nonmedical needs or their MOOP expenses), may be reclassified as medical poor (that is, able to afford their nonmedical needs but not their MOOP expenses), or may be reclassified as not SPM poor. For the medical poor, the only question is whether they remain classified as medical poor after the inclusion of annuitized assets or become reclassified as not SPM poor. Table 5 presents the percentage distributions of the nonmedical and medical poor by whether (and how) they are reclassified when different types of annuitized assets are counted as part of family resources.

Recall that in our sample, 9.4 percent of the aged overall are in nonmedical SPM poverty (Table 1). Table 5 shows that if annuities from liquid financial assets alone were included in family resources, between 93.2 percent and 96.2 percent of the aged in nonmedical poverty would retain that classification. However, 2.8–2.9 percent of them would be reclassified as medical poor. The remaining 1.0–3.9 percent of the nonmedical poor would be reclassified as not SPM poor. If annuities from all financial assets were included in family resources, 83.2–88.7 percent of the nonmedical poor would retain that classification, 4.9–5.2 percent would be reclassified as medical poor, and 6.4–11.6 percent would no longer be considered SPM poor. Finally, if annuities based on available financial and primary-home assets were included, 70.5–80.1 percent of the nonmedical poor would remain classified as such, 6.3–7.2 percent would be reclassified as medical poor, and 12.7–23.2 percent would be reclassified as not SPM poor.

The inclusion of annuities, particularly the inclusion of annuities from all financial and primary-home assets, has a much larger influence on the measurement of medical poverty. The medical poor comprise 5.2 percent of the aged population (Table 1). If annuities from liquid assets alone were included, 11.0–17.9 percent of the aged medical poverty population would no longer be considered SPM poor (Table 5). If annuities from all financial assets were included, 30.8–45.2 percent of this group would no longer be classified as SPM poor. If annuities from financial and primary-home assets were included, 44.5–60.0 percent

Table 5.
Poverty classifications of the population aged 65 or older if annuitized assets are included in estimated family resources, by potential annuity value and asset category, 2009

Potential annuity value and asset category	Nonmedical poor				Medical poor		
		If assets are included				If assets are included	
	Total	Same	Medical poor	Not SPM poor	Total	Same	Not SPM poor
				Percentage distribution			
Lower bound [a]							
Liquid assets	100.0	96.2	2.8	1.0	100.0	89.0	11.0
All financial assets	100.0	88.7	4.9	6.4	100.0	69.2	30.8
All financial and primary-home assets	100.0	80.1	7.2	12.7	100.0	55.5	44.5
All financial and real assets	100.0	78.3	7.7	13.9	100.0	53.1	46.9
Upper bound [b]							
Liquid assets	100.0	93.2	2.9	3.9	100.0	82.1	17.9
All financial assets	100.0	83.2	5.2	11.6	100.0	54.8	45.2
All financial and primary-home assets	100.0	70.5	6.3	23.2	100.0	40.0	60.0
All financial and real assets	100.0	68.7	6.3	25.0	100.0	37.5	62.5
				Standard error			
Lower bound [a]							
Liquid assets	. . .	0.7	0.7	0.4	. . .	1.7	1.7
All financial assets	. . .	1.7	1.0	1.2	. . .	2.9	2.9
All financial and primary-home assets	. . .	1.7	1.0	1.5	. . .	2.6	2.6
All financial and real assets	. . .	1.7	1.1	1.5	. . .	2.7	2.7
Upper bound [b]							
Liquid assets	. . .	1.0	0.7	0.8	. . .	2.0	2.0
All financial assets	. . .	1.9	0.9	1.6	. . .	2.8	2.8
All financial and primary-home assets	. . .	2.1	0.9	1.7	. . .	2.7	2.7
All financial and real assets	. . .	2.1	1.0	1.8	. . .	2.9	2.9

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Annuitized asset values are estimated assuming a constant real interest rate of 1.88 percent.

Rounded components of percentage distributions do not necessarily sum to 100.0.

. . . = not applicable.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

would no longer be categorized as SPM poor. The effect of counting financial and primary-home assets is larger for the medical poor than for the nonmedical poor for two reasons. First, as noted earlier, the aged who are in medical poverty have, on average, more financial assets than do the nonmedical poor, meaning that their withdrawal amounts, whether lower- or upper-bound, are larger. Second, necessary expenses for the medical poor tend to be lower than those for the nonmedical poor because the medical poor, by definition, have their nonmedical needs met by their SPM resources.

Table 6 shows the SPM poverty rates for the aged with the inclusion of asset principal using our annuity method. Including liquid-asset annuities in estimated family resources would leave 8.8–9.1 percent of the aged population classified as nonmedical poor and 4.5–4.8 percent classified as medical poor. The overall SPM aged poverty rate would decrease slightly, from 14.6 percent to 13.3–13.9 percent, a 0.7 to 1.3 percentage point decrease. The reduction in the SPM poverty rate would be greater with the inclusion of all financial assets. Among the aged population, 7.9–8.4 percent would be in nonmedical

Table 6.
SPM poverty rates for the population aged 65 or older if annuitized assets are included in estimated family resources, by potential annuity value and asset category: Overall and for the nonmedical and medical poor, 2009

Potential annuity value and asset category	Overall	Nonmedical poor	Medical poor
		Poverty rate	
Excluding annuitized assets	14.6	9.4	5.2
Including annuitized assets			
Lower bound [a]			
Liquid assets	13.9	9.1	4.8
All financial assets	12.4	8.4	4.0
All financial and primary-home assets	11.1	7.6	3.5
All financial and real assets	10.9	7.4	3.5
Upper bound [b]			
Liquid assets	13.3	8.8	4.5
All financial assets	11.2	7.9	3.3
All financial and primary-home assets	9.3	6.7	2.7
All financial and real assets	9.0	6.5	2.5
		Standard error	
Excluding annuitized assets	0.6	0.6	0.3
Including annuitized assets			
Lower bound [a]			
Liquid assets	0.7	0.6	0.3
All financial assets	0.6	0.6	0.3
All financial and primary-home assets	0.6	0.5	0.3
All financial and real assets	0.6	0.5	0.3
Upper bound [b]			
Liquid assets	0.6	0.5	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.5	0.2

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Annuitized asset values are estimated assuming a constant real interest rate of 1.88 percent.

Rounded nonmedical and medical poverty rates do not necessarily sum to overall poverty rate.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

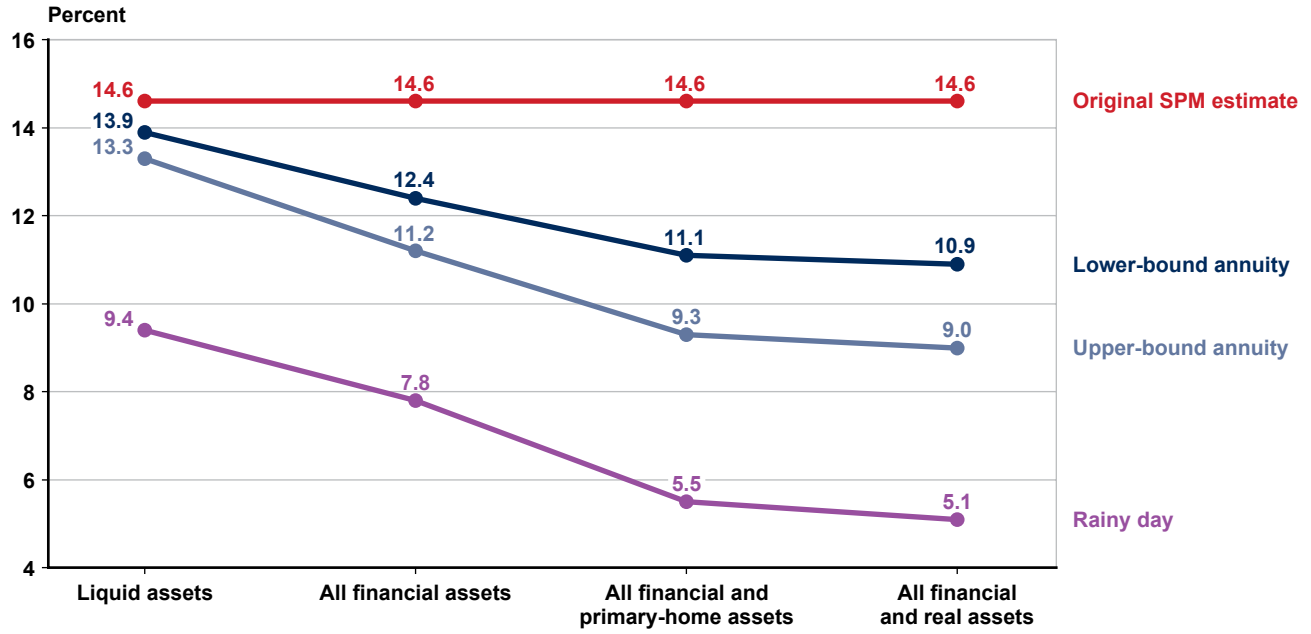
b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

poverty, and 3.3–4.0 percent would be in medical poverty. The overall SPM aged poverty rate would decrease from 14.6 percent to 11.2–12.4 percent, representing a decline of 2.2 to 3.4 percentage points. If the aged were to annuitize financial and primary-home assets, 6.7–7.6 percent of them would be in nonmedical poverty, 2.7–3.5 percent would be in medical poverty, and the overall SPM aged poverty rate would decrease by 3.5 to 5.3 percentage points to 9.3–11.1 percent. The inclusion of annuities from all financial and real assets would decrease SPM poverty rates only slightly more.

The SPM Under the Bounded Annuity and Rainy-Day Approaches

To contextualize our bounded annuity approach, which presents conservative estimates of the portions of assets from which the aged might draw to meet expenses, we compare its SPM poverty-rate results with those estimated using the rainy-day approach, in which the aged may draw *all* of their assets down to meet current needs. Chart 1 displays the results. The rainy-day SPM poverty rate would be 9.4 percent for aged individuals who drew from liquid assets only, 7.8 percent for

Chart 1.
SPM poverty rates for the population aged 65 or older, 2009: Original estimate and recalculations under three alternative methodologies, by asset category included in estimated family resources



SOURCES: Census Bureau; authors' calculations using data from 2010 HRS (wave 10).

those who drew from all financial assets, 5.5 percent for those who drew from financial and primary-home assets, and 5.1 percent for those who drew from all financial and real assets. Across all configurations of available assets, the rainy-day approach decreases the SPM poverty rate by an average of 3.7 percentage points (standard deviation = 0.3) more than the upper-bound annuity approach. Although the rainy-day approach likely overstates the effect of asset holdings, the bounded annuity approach may understate it; the actual effect of asset holdings is likely between the two.

Sensitivity Analyses

In this section, we discuss sensitivity aspects of two major assumptions in our annuity calculations: first, that individuals expect to live to age 120; and second, of a constant real interest rate of 1.88 percent.

The lower-bound annuity calculations assume that individuals expect to live to age 120. Our decision to use age 120 to represent an extremely risk-averse life expectancy is arbitrary. Because the purpose of a lower bound is to delineate the least return to asset annuitization, we decided to err on the side of extreme risk aversion. To assuage concerns that a life expectancy of age 120 is *too* risk averse, we also calculate changes to the SPM poverty rate using ages 110 and 100 as the life expectancies for the lower-bound annuity calculations. Table 7 shows the effects of these alternative life expectancies on the nonmedical and medical poor in terms of whether and how they are reclassified when annuitized asset values are included in family resources, and Table 8 shows how the alternative life expectancies affect SPM poverty rate estimates. When including annuities from all financial and real assets, an assumed life expectancy of age 110 decreases the lower-bound SPM poverty rate by 0.4 percentage points, from 10.9 percent (Table 6) to 10.5 percent (Table 8), and a life expectancy of age 100 decreases the lower-bound SPM poverty rate by 1.0 percentage point (to 9.9 percent). Thus, even a 20-year difference in life expectancy (from 120 to 100) changes the lower-bound SPM poverty rate by only 1.0 percentage point.

There is also a degree of arbitrariness in our selection of a constant real interest rate, despite our attempt to approach the issue systematically. To address the potential arbitrariness, we calculate changes to the SPM if we estimate annuity values based on constant real interest rates as low as 0.5 percent and as high as 4.0 percent. Tables 9 and 10 repeat Tables 5 and 6 with the assumed interest rate of 0.5 percent and Tables 11 and 12 do the same with the assumed interest rate of 4.0 percent. When including annuities from all

Table 7.
Poverty classifications of the population aged 65 or older if annuitized assets are included in estimated family resources under alternative lower-bound definitions, by asset category, 2009

Definition and asset category	Nonmedical poor				Medical poor		
		If assets are included				If assets are included	
	Total	Same	Medical poor	Not SPM poor	Total	Same	Not SPM poor
				Percentage distribution			
Life expectancy = 100							
Liquid assets	100.0	94.9	2.9	2.3	100.0	84.2	15.8
All financial assets	100.0	85.5	5.4	9.1	100.0	61.6	38.4
All financial and primary-home assets	100.0	74.3	7.9	17.8	100.0	47.2	52.8
All financial and real assets	100.0	72.6	7.9	19.5	100.0	45.6	54.4
Life expectancy = 110							
Liquid assets	100.0	95.5	3.3	1.3	100.0	87.3	12.7
All financial assets	100.0	87.4	5.2	7.4	100.0	65.9	34.1
All financial and primary-home assets	100.0	78.4	7.4	14.2	100.0	51.4	48.6
All financial and real assets	100.0	76.6	7.9	15.5	100.0	49.2	50.8
				Standard error			
Life expectancy = 100							
Liquid assets	. . .	0.8	0.6	0.5	. . .	1.9	1.9
All financial assets	. . .	1.7	0.9	1.3	. . .	2.8	2.8
All financial and primary-home assets	. . .	1.8	1.0	1.6	. . .	2.5	2.5
All financial and real assets	. . .	1.8	1.0	1.6	. . .	2.5	2.5
Life expectancy = 110							
Liquid assets	. . .	0.8	0.7	0.4	. . .	1.9	1.9
All financial assets	. . .	1.7	1.0	1.2	. . .	2.9	2.9
All financial and primary-home assets	. . .	1.7	0.9	1.5	. . .	2.5	2.5
All financial and real assets	. . .	1.7	1.1	1.5	. . .	2.6	2.6

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Annuitized asset values are estimated assuming a constant real interest rate of 1.88 percent.

Rounded components of percentage distributions do not necessarily sum to 100.0.

. . . = not applicable.

Table 8.
SPM poverty rates for the population aged 65 or older if annuitized assets are included in estimated family resources under alternative lower-bound definitions, by asset category: Overall and for the nonmedical and medical poor, 2009

Definition and asset category	Overall	Nonmedical poor	Medical poor
		Poverty rate	
Excluding annuitized assets	14.6	9.4	5.2
Including annuitized assets			
Life expectancy = 100			
Liquid assets	13.6	9.0	4.6
All financial assets	11.8	8.1	3.7
All financial and primary-home assets	10.2	7.0	3.2
All financial and real assets	9.9	6.9	3.1
Life expectancy = 110			
Liquid assets	13.8	9.0	4.8
All financial assets	12.1	8.2	3.9
All financial and primary-home assets	10.7	7.4	3.3
All financial and real assets	10.5	7.2	3.3
		Standard error	
Excluding annuitized assets	0.6	0.6	0.3
Including annuitized assets			
Life expectancy = 100			
Liquid assets	0.7	0.6	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.4	0.2
Life expectancy = 110			
Liquid assets	0.7	0.6	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.5	0.2

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Annuitized asset values are estimated assuming a constant real interest rate of 1.88 percent.

Rounded nonmedical and medical poverty rates do not necessarily sum to overall poverty rate.

Table 9.

Poverty classifications of the population aged 65 or older if annuitized assets are included in estimated family resources and a constant real interest rate of 0.5 percent is assumed, by potential annuity value and asset category, 2009

Potential annuity value and asset category	Nonmedical poor				Medical poor		
		If assets are included				If assets are included	
	Total	Same	Medical poor	Not SPM poor	Total	Same	Not SPM poor
				Percentage distribution			
Lower bound [a]							
Liquid assets	100.0	96.6	2.6	0.8	100.0	89.8	10.2
All financial assets	100.0	90.1	5.7	4.2	100.0	72.5	27.5
All financial and primary-home assets	100.0	82.6	8.4	9.0	100.0	59.9	40.1
All financial and real assets	100.0	81.2	8.9	9.8	100.0	57.1	42.9
Upper bound [b]							
Liquid assets	100.0	93.7	2.4	3.8	100.0	82.1	17.9
All financial assets	100.0	83.5	5.2	11.3	100.0	55.2	44.8
All financial and primary-home assets	100.0	70.9	7.0	22.1	100.0	41.5	58.5
All financial and real assets	100.0	69.1	6.9	24.1	100.0	40.1	59.9
				Standard error			
Lower bound [a]							
Liquid assets	. . .	0.7	0.6	0.4	. . .	1.7	1.7
All financial assets	. . .	1.5	1.2	0.9	. . .	2.8	2.8
All financial and primary-home assets	. . .	1.5	1.1	1.1	. . .	2.7	2.7
All financial and real assets	. . .	1.6	1.2	1.2	. . .	2.8	2.8
Upper bound [b]							
Liquid assets	. . .	0.9	0.5	0.8	. . .	2.0	2.0
All financial assets	. . .	1.9	0.9	1.6	. . .	2.9	2.9
All financial and primary-home assets	. . .	2.1	1.1	1.8	. . .	2.7	2.7
All financial and real assets	. . .	2.1	1.0	1.8	. . .	2.7	2.7

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.0.

. . . = not applicable.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

Table 10.
SPM poverty rates for the population aged 65 or older if annuitized assets are included in estimated family resources and a constant real interest rate of 0.5 percent is assumed, by potential annuity value and asset category: Overall and for the nonmedical and medical poor, 2009

Potential annuity value and asset category	Overall	Nonmedical poor	Medical poor
		Poverty rate	
Excluding annuitized assets	14.6	9.4	5.2
Including annuitized assets			
Lower bound [a]			
Liquid assets	14.0	9.1	4.9
All financial assets	12.8	8.5	4.3
All financial and primary-home assets	11.7	7.8	3.9
All financial and real assets	11.4	7.7	3.8
Upper bound [b]			
Liquid assets	13.3	8.8	4.5
All financial assets	11.2	7.9	3.3
All financial and primary-home assets	9.5	6.7	2.8
All financial and real assets	9.2	6.5	2.7
		Standard error	
Excluding annuitized assets	0.6	0.6	0.3
Including annuitized assets			
Lower bound [a]			
Liquid assets	0.7	0.6	0.3
All financial assets	0.7	0.6	0.3
All financial and primary-home assets	0.6	0.5	0.3
All financial and real assets	0.6	0.5	0.3
Upper bound [b]			
Liquid assets	0.7	0.5	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.5	0.2

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

Rounded nonmedical and medical poverty rates do not necessarily sum to overall poverty rate.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

Table 11.

Poverty classifications of the population aged 65 or older if annuitized assets are included in estimated family resources and a constant real interest rate of 4.0 percent is assumed, by potential annuity value and asset category, 2009

Potential annuity value and asset category	Nonmedical poor				Medical poor		
		If assets are included				If assets are included	
	Total	Same	Medical poor	Not SPM poor	Total	Same	Not SPM poor
				Percentage distribution			
Lower bound [a]							
Liquid assets	100.0	95.0	3.4	1.6	100.0	85.6	14.4
All financial assets	100.0	86.1	5.7	8.2	100.0	63.8	36.2
All financial and primary-home assets	100.0	76.1	7.6	16.3	100.0	48.6	51.4
All financial and real assets	100.0	74.1	7.9	18.0	100.0	46.7	53.3
Upper bound [b]							
Liquid assets	100.0	92.7	3.2	4.1	100.0	81.5	18.5
All financial assets	100.0	82.8	4.5	12.6	100.0	53.7	46.3
All financial and primary-home assets	100.0	69.2	6.0	24.7	100.0	39.3	60.7
All financial and real assets	100.0	67.4	6.1	26.5	100.0	36.8	63.2
				Standard error			
Lower bound [a]							
Liquid assets	. . .	0.8	0.7	0.5	. . .	1.9	1.9
All financial assets	. . .	1.8	1.0	1.2	. . .	2.9	2.9
All financial and primary-home assets	. . .	1.9	1.1	1.7	. . .	2.6	2.6
All financial and real assets	. . .	2.0	1.2	1.7	. . .	2.7	2.7
Upper bound [b]							
Liquid assets	. . .	1.0	0.7	0.8	. . .	2.1	2.1
All financial assets	. . .	2.0	0.8	1.8	. . .	2.8	2.8
All financial and primary-home assets	. . .	2.1	0.8	1.8	. . .	2.6	2.6
All financial and real assets	. . .	2.2	0.8	1.9	. . .	2.9	2.9

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.0.

. . . = not applicable.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

Table 12.
SPM poverty rates for the population aged 65 or older if annuitized assets are included in estimated family resources and a constant real interest rate of 4.0 percent is assumed, by potential annuity value and asset category: Overall and for the nonmedical and medical poor, 2009

Potential annuity value and asset category	Overall	Nonmedical poor	Medical poor
		Poverty rate	
Excluding annuitized assets	14.6	9.4	5.2
Including annuitized assets			
Lower bound [a]			
Liquid assets	13.7	9.0	4.7
All financial assets	12.0	8.1	3.8
All financial and primary-home assets	10.4	7.2	3.2
All financial and real assets	10.1	7.0	3.1
Upper bound [b]			
Liquid assets	13.2	8.7	4.5
All financial assets	11.0	7.8	3.2
All financial and primary-home assets	9.1	6.5	2.6
All financial and real assets	8.8	6.4	2.5
		Standard error	
Excluding annuitized assets	0.6	0.6	0.3
Including annuitized assets			
Lower bound [a]			
Liquid assets	0.7	0.6	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.5	0.2
Upper bound [b]			
Liquid assets	0.7	0.5	0.3
All financial assets	0.6	0.5	0.3
All financial and primary-home assets	0.5	0.5	0.2
All financial and real assets	0.5	0.5	0.2

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

Rounded nonmedical and medical poverty rates do not necessarily sum to overall poverty rate.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

financial and real assets, a real interest rate of 0.5 percent increases the lower-bound SPM poverty rate by 0.5 percentage points, from 10.9 percent (Table 6) to 11.4 percent (Table 10), and increases the upper-bound SPM poverty rate by 0.2 percentage points from 9.0 percent (Table 6) to 9.2 percent (Table 10). A real interest rate of 4.0 percent (Table 12) decreases the lower-bound SPM poverty rate by 0.8 percentage points (from 10.9 percent to 10.1 percent), and decreases the upper bound by 0.2 percentage points (from 9.0 percent to 8.8 percent). Again, major changes in the assumed real interest rate have surprisingly minimal effects on SPM poverty rates.

Conclusion

How many of the aged in the United States are in poverty, and how many of those individuals are in poverty because of MOOP spending? The OPM is not equipped to answer those questions. However, the SPM, by accounting for MOOP expenditures, indicates that a much greater share of the aged population lives in poverty than is estimated by the OPM. When poverty calculations account for MOOP expenses, the "golden years" seem not as golden as had been thought.

The substantial difference between the OPM and SPM poverty rates for the aged has led scholars to question the approach with which the SPM accounts for MOOP expenditures, and specifically the extent to which individuals may be able to cover medical and other expenses. Central to this debate is the treatment of assets, especially for aged persons, who may have accumulated substantial asset holdings specifically for retirement. The aged may use those assets to finance living expenses, yet the SPM does not incorporate asset holdings into its poverty estimates. By not accounting for asset principal, does the SPM overestimate the proportion of the aged population living in poverty, specifically those who are poor because of MOOP expenses?

In this article, we used a lower- and upper-bound annuity approach to incorporate asset principal into SPM family resource estimates, assuming that aged persons draw down their asset principal through consistent yearly withdrawals (annuities) with no planned asset bequests after death. To do so, we first determined the extent to which the aged in SPM poverty have asset holdings to draw from. In general, aged persons who are in medical poverty (meaning that they are able to cover basic living expenses but unable to cover MOOP expenses without falling into poverty) have more financial and real asset holdings than those in nonmedical poverty have. We then calculated lower and upper bounds for potential annuitized asset withdrawals. For the lower bound, we assumed that individuals expect to live to age 120 and withdraw a fixed amount each year to extinguish their assets upon their death. For the upper bound, we assumed that individuals receive fixed annuity distributions from a hypothetical insurance firm that plans to break even on the individuals' assets after their death. We recalculated family resources with the inclusion of annuitized withdrawals based on liquid financial assets, all financial assets, financial and primary-home assets, and all financial and real assets, and reported the subsequent changes in estimated SPM poverty rates.

We found that by including annuitized assets in estimated family resources, the proportion of the aged population that is considered to be in medical poverty would be significantly smaller. Specifically, if their financial assets were annuitized, between 30.8 percent and 45.2 percent of the aged who are classified as medical poor would be reclassified as not SPM poor, and the overall SPM aged poverty rate would decrease by 2.2 to 3.4 percentage points. If primary-home assets were also annuitized, between 44.5 percent and 60.0 percent of the aged in medical poverty would be reclassified as not SPM poor, and the SPM poverty rate would decrease by 3.5 to 5.3 percentage points. The 2009 official poverty rate for the aged in the HRS was 9.1 percent. With financial and primary-residence assets included in estimated family resources, the recalculated SPM poverty rate is slightly higher than the OPM rate, suggesting that the SPM drastically overstates poverty among the aged by accounting for MOOP expenditures yet ignoring asset principal.

The bounded annuity approach assumes that aged persons prioritize a sustained drawdown of asset principal over the rest of their lives rather than meeting their current needs. As a result, the bounded annuity approach is a conservative estimate of the value of the assets to be included in family resources. In reality, many aged persons are likely to draw down their asset principal *in response to* a health-related or other financial shock (Poterba, Venti, and Wise 2011). If the shock is large enough, they may draw down their assets in a lump sum. Our rainy-day approach reflects such a circumstance. Although the bounded annuity and rainy-day approaches represent two opposing strategies for including assets in income-based poverty

measurement, we suggest the bounded annuity approach as more appropriate for researchers who desire a conservative estimate of the portion of asset holdings to include in family resources.

These analyses have some important limitations. Although the HRS provides detailed information on the assets and income of the aged, information on the assets and income of family members with whom the aged live is less accurate. About 23.2 percent of the aged in the HRS sample live with other family members, meaning that our conclusions may underestimate the effect of including annuitized assets on the SPM poverty rate for the entire aged population if those who live with other family members have substantially lower asset holdings than do those who do not live with other family members. On the other hand, our calculations using HRS data may overstate SPM poverty and thus overstate the effect of including asset annuities on SPM poverty status. To assuage these latter concerns, in Tables 13 and 14 we recalculate Tables 5 and 6 to show the SPM poverty-rate effects of including annuitized asset values in estimated family resources if we restrict the sample to aged persons who do not live with other family members (that is, the

Table 13.
Poverty classifications of the population aged 65 or older if annuitized assets are included in estimated family resources and the sample is restricted to individuals who do not live with other family members, by potential annuity value and asset category, 2009

	Nonmedical poor				Medical poor		
		If assets are included				If assets are included	
Potential annuity value and asset category	Total	Same	Medical poor	Not SPM poor	Total	Same	Not SPM poor
				Percentage distribution			
Lower bound [a]							
Liquid assets	100.0	94.4	4.1	1.6	100.0	89.6	10.4
All financial assets	100.0	82.2	8.2	9.6	100.0	69.3	30.7
All financial and primary-home assets	100.0	72.3	10.0	17.7	100.0	55.8	44.2
All financial and real assets	100.0	69.8	10.5	19.7	100.0	53.9	46.1
Upper bound [b]							
Liquid assets	100.0	89.9	4.1	6.0	100.0	82.4	17.6
All financial assets	100.0	74.4	7.7	17.9	100.0	54.1	45.9
All financial and primary-home assets	100.0	61.3	8.8	29.9	100.0	39.4	60.6
All financial and real assets	100.0	59.7	8.3	32.0	100.0	37.5	62.5
				Standard error			
Lower bound [a]							
Liquid assets	. . .	1.2	1.2	0.6	. . .	1.9	1.9
All financial assets	. . .	2.8	1.8	2.0	. . .	3.0	3.0
All financial and primary-home assets	. . .	2.8	1.5	2.4	. . .	3.0	3.0
All financial and real assets	. . .	2.8	1.7	2.4	. . .	3.2	3.2
Upper bound [b]							
Liquid assets	. . .	1.7	1.2	1.4	. . .	2.1	2.1
All financial assets	. . .	3.0	1.5	2.5	. . .	3.0	3.0
All financial and primary-home assets	. . .	3.1	1.5	2.5	. . .	2.9	2.9
All financial and real assets	. . .	3.1	1.5	2.6	. . .	3.1	3.1

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.0.

. . . = not applicable.

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

subgroup for whom we have the most reliable income and asset data). The substantive results hold in this restricted sample; when annuitized assets are included in family resources, similar percentages of the aged in medical poverty are reclassified as not SPM poor, and we find a similar percentage point decrease in the SPM poverty rate. However, future research should seek to better understand the impact of including asset principal on SPM poverty estimates, particularly among the aged who live with other family members.

The SPM makes a number of updates to the OPM, yet its accuracy can still be improved. In this article, we address a specific problem: how to incorporate asset principal into family resource estimates, given its importance to the well-being of the aged. Following a conservative approach to asset annuitization, we show that if the aged were to draw from their asset principal in a consistent way, the SPM poverty rate, and in particular the medical poverty rate, would be substantially lower. This finding suggests that the SPM, as currently measured, overstates the poverty rate of the aged, yet it may be improved by including a portion of asset principal in family resource estimates as calculated using a bounded annuity approach.

Table 14.
SPM poverty rates for the population aged 65 or older if annuitized assets are included in estimated family resources and the sample is restricted to individuals who do not live with other family members, by potential annuity value and asset category: Overall and for the nonmedical and medical poor, 2009

Potential annuity value and asset category	Overall	Nonmedical poor	Medical poor
		Poverty rate	
Excluding annuitized assets	12.2	6.6	5.6
Including annuitized assets			
Lower bound [a]			
Liquid assets	11.5	6.2	5.3
All financial assets	9.9	5.4	4.5
All financial and primary-home assets	8.6	4.8	3.8
All financial and real assets	8.3	4.6	3.7
Upper bound [b]			
Liquid assets	10.8	5.9	4.9
All financial assets	8.5	4.9	3.6
All financial and primary-home assets	6.8	4.0	2.8
All financial and real assets	6.6	3.9	2.7
		Standard error	
Excluding annuitized assets	0.7	0.5	0.4
Including annuitized assets			
Lower bound [a]			
Liquid assets	0.7	0.5	0.4
All financial assets	0.6	0.4	0.4
All financial and primary-home assets	0.5	0.4	0.3
All financial and real assets	0.5	0.4	0.3
Upper bound [b]			
Liquid assets	0.7	0.5	0.4
All financial assets	0.5	0.4	0.3
All financial and primary-home assets	0.4	0.4	0.3
All financial and real assets	0.4	0.4	0.3

SOURCE: Authors' calculations using data from 2010 HRS (wave 10).

a. The lower bound reflects a risk-averse annuitization strategy in which an individual withdraws assets gradually enough to avoid asset exhaustion before reaching age 120.

b. The upper bound reflects a successful high-risk, high-reward annuitization strategy in which an individual enters an annuity contract with a hypothetical insurance firm that distributes annual payments based on an actuarially fair cash-flow rate. The firm is assumed to be uncompensated for taking on risk, to have no costs other than annuity distributions, and to have no profits.

Appendix A: Calculating SPM Poverty Rates Using HRS Data

The SPM defines a "family unit" as all persons living at the same address who are related by marriage, blood, or adoption, plus any unrelated children cared for by the family and any cohabitants and their children (Short 2011). SPM family units are easily identified in the HRS, as unmarried partners are treated the same as spouses. About 3 percent of respondents in the HRS data are unmarried partners.

Construction of the Poverty Threshold

A family is considered to be poor if the value of their total resources is less than a threshold amount. Since the 1960s, OPM thresholds have been based on the cost of food and updated for inflation (Fisher 1998). By contrast, the SPM threshold is based on contemporary expenditures for a core basket of goods chosen to reflect actual family expenditures on all necessities, rather than focusing only on nutritional requirements (Johnson, Rogers, and Tan 2001).[21] The SPM thresholds represent combined family expenditures for food, clothing, shelter, and utilities (FCSU) and a small additional amount to cover other necessary expenses such as household supplies and personal care items. The thresholds are updated over time as spending levels change.

The Bureau of Labor Statistics (BLS) uses 5 years of quarterly Consumer Expenditure Survey data to calculate the FCSU expenditures of families in the 30th through 36th percentiles. BLS uses the average of these FCSU expenditures to produce the yearly SPM thresholds for consumer units with two children. BLS calculates separate poverty thresholds by housing tenure (homeowners with mortgages, homeowners without mortgages, and renters).[22] In 2009, the SPM threshold for a two-adult, two-child family was $24,450 for homeowners with a mortgage, $20,590 for homeowners without a mortgage, and $24,301 for renters.[23] We adjust for different family types using a three-parameter scale developed by Betson (1996) and used by the Census Bureau. Table A-1 presents those parameters.

After adjusting for family size and composition, we then adjust the shelter and utility portion of the poverty thresholds to account for geographic differences in housing costs, following a procedure described in Renwick (2011). The geographic adjustment of the housing and utility portion of the SPM thresholds is

$$Threshold_{ijt} = \frac{\left[HousingShare_t \times \frac{MGRD2B_{ij}}{MGRD2B_n} + \left(1 - HousingShare_t\right)\right] \times Threshold_t}{NF},$$

where *MGRD2B* is the median gross rent for a "decent" 2-bedroom unit; *HousingShare* is the percentage of the threshold reserved for housing and utility expenses; *NF* is the normalization factor; *i* is state of residence; *n* denotes the entire United States; *j* is either the specific metro area, "other" metro area, or "other" nonmetro area; and *t* represents housing tenure. The normalization factor ensures that the average geographic threshold adjustment is equal to 1, meaning that the average poverty threshold is not affected by geographic adjustment.

We use American Community Survey (ACS) data for 2006–2010 to compute the median gross rent for a 2-bedroom unit for specific metro areas, unidentified metro areas by state, and unidentified nonmetro areas by state.[24] We follow Census Bureau practice by restricting gross rents to 2-bedroom apartments with complete kitchen and plumbing facilities. Because the HRS restricted-use geographic data are available at the county level, we use a Census Bureau metro area/county crosswalk to merge the ACS metro-level cost data to the HRS data.

Construction of Family Resources

Family resources include all cash income plus in-kind benefits that the family may use to meet their FCSU needs, minus MOOP expenditures, work and childcare expenditures, child support expenditures, and taxes (Short 2011).

Table A-1.
Three-parameter incidence scale

Family unit type	Equation
One or two adults	(*Number of adults*)$^{0.5}$
Single parent	(*Number of adults* + [0.8 × *first child*] + [0.5 × *number of other children*])$^{0.7}$
All others	(*Number of adults* + [0.5 × *number of other children*])$^{0.7}$

SOURCE: Betson (1996).

Family income. HRS collects data from individual respondents on earnings in the form of wage and salary income, bonuses, overtime pay, commissions, tips, earnings from a second job, military reserve earnings, professional practice or trade income, and self-employment earnings. Individual HRS respondents also report income from pensions and annuities; Social Security disabled-worker, retired-worker, and spouse or survivor benefits; Supplemental Security Income; unemployment and worker's compensation benefits; and veteran's benefits. From couples, HRS collects data on income from welfare, food stamps, business or farm income (if not counted in self-employment income), gross rent, and interest from dividends, bonds, checking and savings accounts, and CDs. Finally, HRS respondent couples are asked to report the combined sum of all other income to account for "private disability insurance payments, consulting fees, rent from your home or second home, odd jobs, and so forth," and from "an inheritance, a trust fund, or an insurance settlement." We also include recurring payments the family receives from children or other relatives living outside of the household.

HRS collects information on work earnings for each family member in the household, and includes a catch-all question for all other income for all family members in the household. We replicate the technique described in St. Clair and others (2011) to impute missing values.

In-kind benefits. The SPM counts the following five sources of in-kind benefits in its definition of resources: the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps); the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); housing subsidy programs; free and reduced-price school lunch programs; and the Low Income Home Energy Assistance Program (LIHEAP). In the HRS, only SNAP benefits and housing subsidies are reported. Therefore, we lack data on WIC, school lunch programs, and LIHEAP. We assume that the lack of data on WIC and on participation in school lunch programs is unproblematic given the age of our sample. We also view the absence of data on LIHEAP benefits as unproblematic given that LIHEAP benefits make no practical difference in poverty rates (Short 2011). About 4 percent of respondents in our sample live in subsidized housing. To approximate the value of their housing subsidies, we subtract rental payments from the shelter and utilities portion of the poverty threshold. The HRS does not collect information on receipt of government rental subsidies for respondents who do not reside in public housing complexes. However, our analyses of CPS data reveal that more than 90 percent of government-supported housing benefits received by individuals older than 65 came in the form of public housing.

MOOP expenditures. HRS collects information on out-of-pocket expenditures for prescription drugs and each of the following services: hospital visits, nursing home care, doctor visits, dental care, outpatient surgery, home health care, and use of special facilities.[25] Respondents report those MOOP expenses for the period since their previous interview, which for most respondents occurred 2 years prior. We divide the amount reported for the reference period by the number of years to approximate MOOP expenses in the previous calendar year.

MOOP expenditures also include health insurance premiums. HRS collects data on the amounts paid by each respondent in premiums for Medicare Advantage, Medicare Part D, and each of up to three other health care plans, as well as for premiums for long-term care coverage. Unlike the reference period for HRS questions on medical services, the period for premiums refers to current payment amounts. We assume that the respondent paid a similar premium in the previous calendar year.[26] Similar to its questions on income, the HRS uses an unfolding-brackets methodology to narrow the range of MOOP expenses (both for insurance premiums and for medical services) in following up on initial-nonresponse items.

For aged individuals with Medicare Part B coverage, the premium is deducted from their Social Security income. Short (2011) found it particularly difficult to determine Part B premiums, given that some CPS respondents reported their gross Social Security income (before the Part B premium was deducted) and others did not. This is not an issue in the HRS, as all respondents are asked to report net Social Security income received (that is, after the Part B premium deduction).

Work-related expenditures. In 2009, the median weekly amount of work-related expenditures for earners aged 18 or older was $33.00, according to the Survey of Income and Program Participation (SIPP). In accordance with National Academy of Sciences panel recommendations, we estimated respondents' work-related expenditures by multiplying the number of weeks worked by 85 percent of the median weekly expenditure. HRS asks working respondents for the number of weeks usually worked per year in primary

and secondary jobs. Ninety-nine percent of these respondents know the total weeks worked. We categorize the remaining working respondents by work status (full-time, part-time, and no answer) and impute the number of weeks worked based on the mean number of weeks worked for full-time, part-time, and all workers in similar years of CPS data. If a respondent holds two jobs, we calculate work expenditures for both.

Childcare expenditures. We assume that all families with children younger than 15 (and with no nonworking family members older than 21, who could presumably provide childcare in the home) incur childcare expenses. To approximate the amounts, we multiply a "base amount" of 85 percent of the childcare expenses for female-headed households reported in SIPP for spring 2010 by the number of weeks worked by the worker with fewest weeks, subject to a cap of the annual earnings of the household's lowest earner.

Taxes. The amount of taxes paid are not reported to the HRS. Consequently, we impute taxes for each taxpayer using the TAXSIM (v9) simulation software from the National Bureau of Economic Research. We assume that all married respondents file jointly and that partnered or single respondents file separately. We simulate taxes paid in the year prior to the interview. For the majority of respondents, this refers to 2009; however, a handful of respondents were interviewed at the beginning of 2011, making their simulated tax payments for 2010.

The TAXSIM (v9) software uses 21 components to estimate federal and state tax liabilities: tax year, state, marital status, number of dependent exemptions, number of taxpayers aged 66 or older in the family unit, wage and salary income of taxpayer, wage and salary income of spouse, dividend income, other property income, taxable pensions, gross Social Security benefits, other nontaxable transfer income, rent paid, real estate taxes paid, other itemized deductions (including preference shares of medical expenses), child care expenses, unemployment compensation, number of dependents younger than 17, other deductions (including deductible medical expenses not previously included, home mortgage interest, and charitable contributions), short-term capital gains or losses, and long-term capital gains or losses. We do not include reported taxable IRA distributions in the "other property income" category, nor do we include short- or long-term capital gains or losses.

Appendix B: Home Equity Conversion Mortgage Calculation

We calculate the amount available to a family from a hypothetical reverse mortgage as the initial principal limit (described below) minus origination fees, closing fees, initial mortgage insurance premium, the present value of a set-aside for monthly administration fees, a mandatory counseling fee, and any mortgages or home loans on the property. We follow procedures described in Warshawsky and Zohrabyan (2016).

We determine the initial principal limit by multiplying the lesser of the home value or $625,500 by a Principal Limit Factor.[27] That factor, which is published on the Department of Housing and Urban Development website, is a function of the expected mortgage interest rate (that is, the sum of the 10-year constant-term Treasury rate and an average lender's margin, plus an ongoing mortgage insurance premium) and the age of the asset holder.[28] In 2009, the average 10-year constant-term Treasury rate was 3.26 percent. We assume an average lender's margin of 2.5 percent and an ongoing mortgage insurance premium of 1.25 percent.

From the initial principal limit, we subtract financing fees (origination fees, closing fees, initial mortgage insurance premium), the present value of the set-aside amount for monthly administration fees, and any outstanding mortgages and home loans. Origination fees equal 2 percent of the home value if less than $200,000, and 1 percent of the value if above $200,000, with a lower limit of $2,500 and an upper limit of $6,000. To approximate closing fees, we use the formula derived by Warshawsky and Zohrabyan (2016):

$$CF = 2021.7 + 0.0039 \times \min\left(HOMEVALUE, 625500\right).$$

We assume an initial mortgage insurance premium of 2.5 percent if mortgages and home loans equal 33 percent of the home value or more, and 0.5 percent of the home value otherwise. We calculate the present value of a set-aside amount for monthly administrative fees, assuming a monthly payment of $35 until the asset holder reaches age 100, discounted at the expected rate of 7.01 percent (3.26 + 2.5 + 1.25). We assume a mandatory counseling fee of $125.

Notes

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[1] Some scholars argue that consumption-based poverty measures are more appropriate than income-based measures for capturing well-being (Meyer and Sullivan 2003, 2011, 2012). The argument is three-pronged: (1) conceptually, consumption-based measures better capture the standard of living for those who draw on their assets to smooth consumption or who have access to credit; (2) consumption-based measures better capture well-being empirically, especially among those with few resources (see Brewer, Goodman, and Leicester 2006); and (3) consumption is more accurately reported than income for disadvantaged families (however, see Bavier 2006). The comparative analysis of consumption-based and income-based poverty measures is an important topic for ongoing research.

[2] The SPM definition of family resources differs from that of the OPM in other ways as well. Those ways include (a) the addition of the market value of in-kind benefits, (b) the subtraction of other nondiscretionary expenses such as work-related and childcare costs, and (c) an accounting of the impact of income and payroll taxes. The SPM poverty thresholds are (a) based on current consumer expenditures on food, clothing, shelter, and utilities, plus a small amount for other necessary expenses; (b) adjusted according to a family's housing tenure (renters, homeowners with mortgages, and homeowners without mortgages); and (c) geographically adjusted to account for cost of living differences across the United States. The SPM family unit includes cohabiting unmarried partners and partners' children. These definitions were the culmination of decades of debate on how to improve the OPM (for example, Citro and Michael 1995; National Research Council 2005; and Interagency Technical Working Group on Developing a Supplemental Poverty Measure 2010).

[3] Scholars also find that the MOOP-expense subtraction does not improve the prediction of material hardship (Levy 2009; Meyer and Sullivan 2012).

[4] Beyond this debate, the subtraction of MOOP expenditures from family resources solves a practical problem because the alternative approach of including expected medical *needs* in the poverty threshold presents technical difficulties (Bavier 2006; Korenman and Remler 2013). Furthermore, subtracting MOOP expenditures from family resources records the actual amount spent; even if MOOP expenditures are discretionary, the resulting drain on family resources is real (Betson 2000).

[5] This is a significant assumption for two reasons. First, interest rates fluctuate over time, and rates differ depending on where assets are held. Second, past returns are a good predictor of future returns. We assume we know the future returns on the person's assets.

[6] The midterm rate is based on the 1-month average of market yields from obligations of maturities of 3 to 9 years. Federal midterm rates can be found at https://apps.irs.gov/app/picklist/list/federalRates.html.

[7] For the underlying mortality data, see Internal Revenue Service (2017).

[8] The average family resources of HRS wave 9 respondents did not differ significantly from those of nonrespondents ($46,192 and $42,412, respectively; $p = 0.15$, two-tailed t-test).

[9] One observation was removed because it was the lone observation in its sampling stratum.

[10] For instance, if the financial respondent does not know or refuses to indicate the value of an income or asset, HRS asks: "Would it be less than $2,000, $2,000, or more than $2,000?" If the respondent answers more than $2,000, HRS asks: "Would it be less than $5,000, more than $5,000, or what?" This process continues until the "true" amount is confined to a fairly limited income or asset bracket.

[11] For more advantages of the HRS, see Juster and others (2007).

[12] HRS and CPS samples are similar; the main difference between the surveys is HRS's better collection of family income data. A detailed comparison of the HRS and the CPS samples in terms of their demographic and social characteristics, family income, family MOOP expenditures, and SPM family resources prior to the subtraction of MOOP expenses is available on request (kchavez@wustl.edu). Appendix A provides a detailed description of the construction of the SPM using HRS data.

[13] Aged persons in nonmedical poverty possess family resources of less than the SPM poverty threshold before MOOP expenses are subtracted, while the family resources of those in medical poverty equal or exceed the threshold before MOOP expenses are subtracted.

[14] A "near-poor" family has resources of at least 100 percent but less than 150 percent of the SPM poverty threshold.

[15] To assess job-related income of each family member, HRS asks the financial respondent: "About how much money did [the family member] earn from all jobs in [last calendar year]?" To assess all other income of family members, HRS asks the financial respondent: "Not including job income, about how much in total did other members of your family living (here/there) receive in [last calendar year] from Social Security, pensions, welfare, interest, gifts, or anything else, (before taxes and other deductions)?"

[16] We do not include employer pensions in near-liquid *assets* for the annuity process because of high survey nonresponse for pension amounts. However, 2009 reported *income* from pensions is included in all calculations.

[17] Respondents report only the combined value of these assets. We assume the penalty for early withdrawal of these assets is equal to the average penalty for early CD withdrawal (see http://www.bankrate.com/finance/cd/cd-early-withdrawal-penalties-sock-1.aspx).

[18] Warshawsky and Zohrabyan (2016) provide a detailed examination of the use of reverse mortgages to enhance retirement security.

[19] Unlike the HRS income questions, which refer to the previous calendar year, asset questions refer to the time of the survey.

[20] The asset distributions for the aged in nonmedical poverty are surprisingly similar to those for the aged in OPM poverty. Among the aged in OPM poverty, the average value of liquid assets is $7,979, the median value is $200, and 36.2 percent have no holdings. The average value of financial assets is $56,428, the median value is $224, and 34.5 percent have no holdings. The average value of any financial or primary-home assets is $88,947, the median value is $6,106, and 23.6 percent have no holdings

[21] The SPM eliminates age-based differences in poverty thresholds, another significant change affecting the aged population.

[22] For details on the BLS procedures, see http://www.bls.gov/pir/spmhome.htm#threshold.

[23] For a detailed discussion of the BLS thresholds, see Garner (2010).

[24] We downloaded these data from the Integrated Public Use Microdata Series website (Ruggles and others 2015).

[25] The Center for the Study of Aging at the RAND Corporation provides imputations for missing MOOP expenditure values.

[26] We cap premiums at the 99th percentile.

[27] The Housing and Economic Recovery Act of 2008 raised the Home Equity Conversion Mortgage limit to $625,500.

[28] We use the age of the younger individual for married or partnered couples.

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