

# **Trends in Retirement Income Adequacy: Evidence from IRS Tax Data**

**John Beshears**

Harvard University and NBER

**James J. Choi**

Yale University and NBER

**David Laibson**

Harvard University and NBER

**Shanthi Ramnath**

U.S. Department of the Treasury

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Concerns that Americans are not saving enough for retirement, and that this problem is getting worse over time, are common. For example, Munnell, Hou, and Sanzenbacher (2018) estimate that the fraction of working-age American households that will have inadequate income in retirement to maintain their pre-retirement standard of living has grown from 31% in 1983 to 40% in 1998 to 50% in 2016. The alleged decline in economic security in retirement has been attributed to declines in the personal savings rate, the prevalence of defined benefit pensions, and the real interest rate. On the other hand, Biggs (2019) argues that there is no retirement savings crisis. Among other things, he points out that over time, the over-65 poverty rate has fallen and median income in retirement has risen.

In this paper, we examine trends in retirement income across the 1930-1941 birth cohorts using a 5% random sample from IRS tax data, comprising 22.6 million person-years. An advantage of our analysis is that we do not rely upon survey reports of income, whose accuracy has been a subject of concern (e.g., Bee and Mitchell, 2017; Chen, Munnell, and Sanzenbacher, 2018).

## 1. Data description and variable construction

We construct a panel of older tax units<sup>1</sup> using tax data from 2000 to 2016 and the Death Master File from the Social Security Administration (SSA). The SSA data include information on date of birth, sex, and date of death. We draw a 5% random sample of people born between 1930 and 1941 based on the last three digits of a person's Social Security number. We drop individuals from the panel after they die. We also drop

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<sup>1</sup> We will use the terms "tax unit" and "household" interchangeably throughout this paper.

individuals who never have any income during our sample period, since these individuals are likely to have died before our sample period and may not be recorded as deceased in the Death Master File.

We define two income measures using tax return (self-reported) data and information return (third-party reported) data: pre-tax household income and after-tax household income. All dollar amounts are deflated to 2010 dollars using the Consumer Price Index.<sup>2</sup>

Pre-tax household income includes taxable income sources such as wages, unemployment benefits, capital gains, taxable interest, distributions from pension accounts, and net alimony income, as well as certain non-taxable sources including tax-exempt interest, employee contributions to defined contribution retirement plans, and Social Security benefits. Specifically, we define total household income—with the form from which each income item is obtained listed in parentheses—as the sum of wage income (Form W-2); distributions from defined benefit and defined contribution plans, including non-taxable distributions but excluding direct rollovers, Section 1035 exchanges, withdrawals of impermissible contributions, and recharacterized contributions (Form 1099-R); unemployment benefits (Form 1040/Form 1099G); Social Security benefits (Form SSA-1099); interest income (Form 1040/Form 1099INT); dividend income (Form 1040/Form 1099DIV); net alimony (Form 1040); net income from sole proprietorships, S-Corporations, and partnerships (Form 1040/Form 1099MISC); and capital gains realizations (Form 1040). For non-filers, we use information returns to

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<sup>2</sup> So that no statistic reported in this paper is derived from only a single individual, reported percentiles are the average of the ten tax units that are closest to the given percentile.

obtain wage, Social Security income, pension withdrawal, interest, non-employee compensation, and dividend information. If a filer reports no income in a certain category but an information return indicates otherwise, we use income in that category from the information return. Our measure of pre-tax household income does not capture Supplemental Security Income (SSI), private insurance payouts, SNAP, WIC, TANF, and VA benefits, and child support income, which are not reported in tax filings.

After-tax income is pre-tax household income plus any earned income tax credit reported on the 1040 minus tax liability.

To adjust income for household size, we consider whether the initially sampled individual declared a spouse when filing his or her tax return. We divide income by the square root of the number of people in the tax unit (either 1 or 2, as we do not consider dependents) to obtain an equivalent income measure, following OECD (2008, 2011). We consider the tax unit's age to be the age of the initially sampled individual, without regard to the age of his or her spouse.

## 2. Results

We first analyze trends in household equivalent income percentiles at ages 70 and 80. Figures 1-4 show that, consistent with Bee and Mitchell's (2017) analysis of the tax data, late-life equivalent income (in 2010 dollars) has not generally been falling with time.

Looking at pre-tax income in Figure 1, we see that from 2000 to 2011, age 70 equivalent real income rose from \$30,710 to \$33,908 at the median, from \$15,341 to \$17,225 at the 25th percentile, and from \$51,360 to \$56,522 at the 75th percentile. The total percentage growth is progressive in the middle of the distribution: 12.3% at the

25th percentile, 10.4% at the median, and 10.1% at the 75th percentile. The progressive pattern holds when comparing the extremes, where the 10th percentile grew 10.5% and the 90th percentile grew at 8.7%. After-tax numbers in Figure 2 are nearly identical to the pre-tax numbers at the median and below, reflecting the light taxation of income in retirement, while after-tax income above the median is somewhat lower than pre-tax income. The trends in after-tax income are qualitatively similar—rising equivalent real income at age 70 over time, with generally progressive growth rates throughout the population.

Figure 3 shows that the trends in pre-tax equivalent income at age 80 exhibit a different pattern than at age 70 (although note that the calendar years covered by the data are different). From 2010 to 2016, income rose 8.4% at the 75th percentile, only 5.0% at the median, and fell by 0.8% at the 25th percentile. The fanning out of outcomes is even more pronounced at the extremes: a 12.2% increase at the 90th percentile and a 6.6% decline at the 10th percentile. The progressivity of the tax system did not undo the regressive growth pattern of pre-tax income. After-tax income growth rates from 2010 to 2016 were -6.1%, -0.8%, 4.8%, 6.9%, and 11.1% and the 10th, 25th, 50th, 75th, and 90th percentiles, respectively.

Even if income at a given age trends higher over time, it does not necessarily follow that households are doing a better job at saving for retirement. Economic optimality is judged by households' ability to maintain their pre-retirement standard of living, not only the absolute standard of living they enjoy in retirement. In Figures 5 and 6, we plot percentiles of ratios of equivalent after-tax real income averaged over ages

70-73 or 76-79 to equivalent after-tax real income averaged over ages 65-67. We focus on averages across multiple years because income is quite volatile from year to year.

We see that at the median and the 75th percentile, the 70-73 to 65-67 ratio has not changed significantly from 2003-2005 to 2009-2011 (these years refer to the age 70-73 years). However, at the 10th, 25th, and 90th percentiles, the ratio has fallen by 4-7 percentage points. Looking at the income replacement ratio later in life, we see that the 76-79 to 65-67 income ratio has been flat or rising at or above the median, but has fallen by 2 percentage points at the 10th and 25th percentiles from the 2009-2011 to the 2012-2014 window. Overall, the picture that is painted is one where income replacement rates have not worsened over time for households at or above the median, but have deteriorated for households below the median.

Another way to assess how the left tail is doing over time is to see how the percentage of tax units at each given age that are completely dependent upon Social Security has changed over time. We define complete Social Security dependence as having less than \$100 (in 2010 dollars) in non-Social Security income *and* zero balances in the IRA. Figure 7 shows that this percentage not only increases with age within each given calendar year, but has also been increasing over time at ages 70, 75, and 80.

The decline in the prevalence of defined benefit pensions is often cited as a reason to be concerned about late-life income adequacy. Not only do defined contribution pensions fail to provide the longevity insurance that characterize defined benefit pensions, but the greater discretion employees have on how much to save and

withdraw from defined contribution pensions raises the possibility that more will make unwise choices that leave them destitute late in life.

Figures 8 and 9 provide evidence against the notion that the rise in Social Security dependence is linked to declines in pension coverage or adequacy. The fraction of tax units that receive a positive amount of pension income (either in the form of a defined benefit payout or a defined contribution withdrawal) at a given age has remained nearly flat across calendar years. Averaging calendar years together, 56% of 65 year olds, 65% of 70 year olds, 69% of 75 year olds, 69% of 80 year olds, and 68% of 85 year olds receive at least some pension income. Nor has the amount of pension income received fallen. Figure 10 shows that at the 75th percentile (where those receiving no pension income are included in computing percentiles), the amount of equivalent real pension income received at each given age has been rising over time.

## Conclusion

Our results paint a mixed picture of how retirement income adequacy has evolved for Americans in the 21st century. On the one hand, absolute levels of equivalent income at age 70 have risen across the income distribution. On the other hand, equivalent income at age 80 has fallen for households below the median, and the ratio of equivalent income averaged over ages 70-73 or ages 76-79 to equivalent income averaged over ages 65-67 has deteriorated for households below the median.

Ultimately, consumption determines welfare, not income. Therefore, falling income replacement ratios need not imply lesser consumption smoothing. However, we also find that the fraction of households who are completely dependent on Social Security—having no assets and no non-Social Security income—at ages 70, 75, and 80

has been rising over time. Without an asset buffer, these households have limited ability to accommodate expenditure shocks without resorting to expensive borrowing. Indeed, these households most fit the description of those who have “outlived their savings.” The fact that the prevalence of these households has been rising may be the most concerning finding in this paper.

## References

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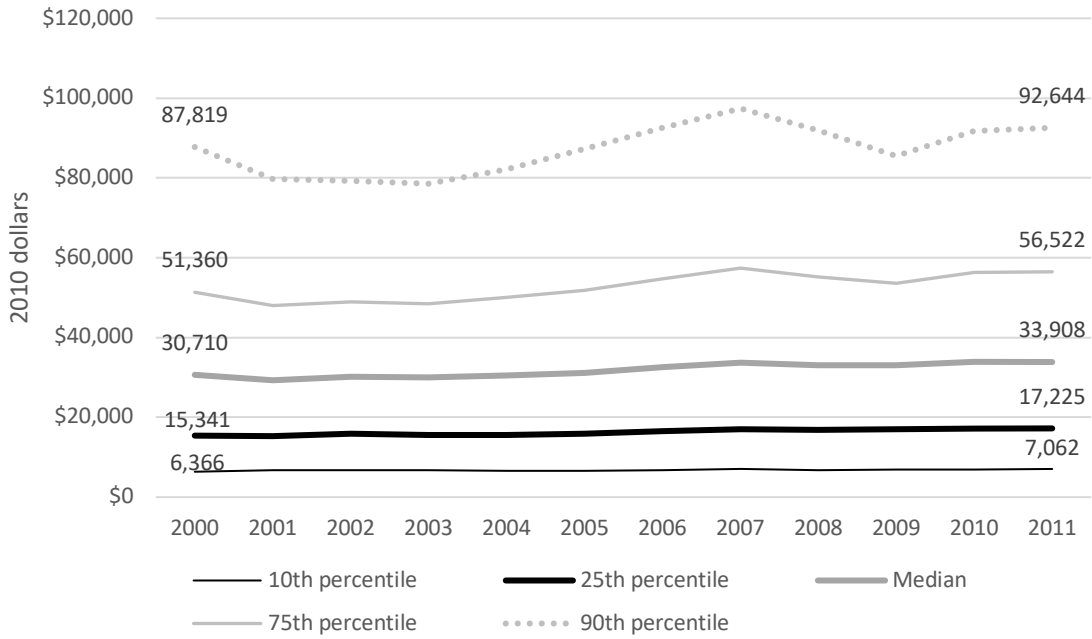
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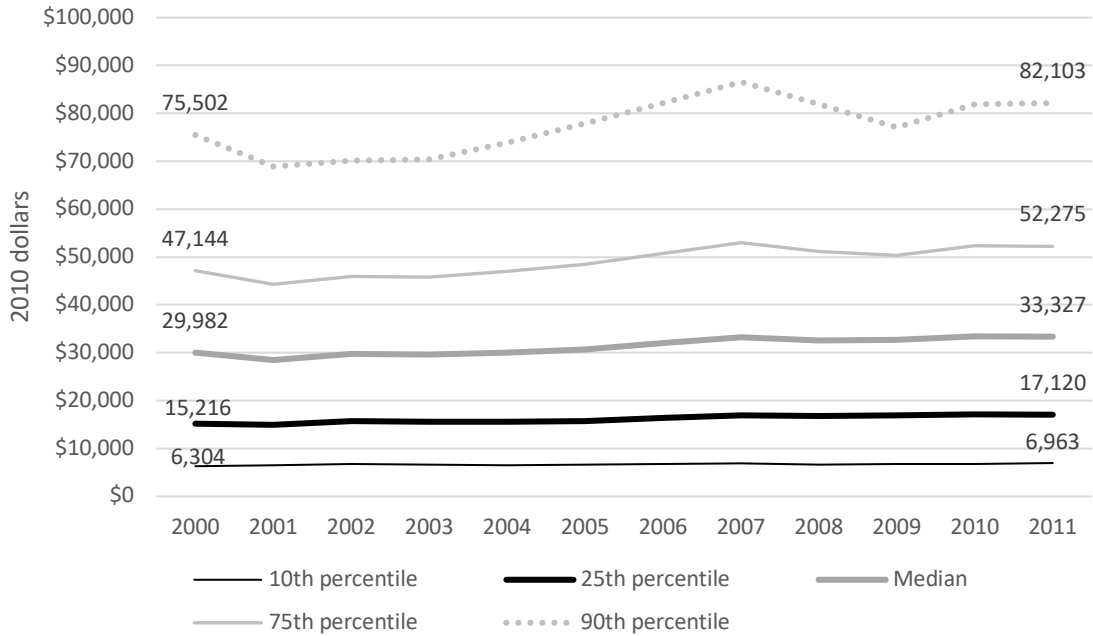
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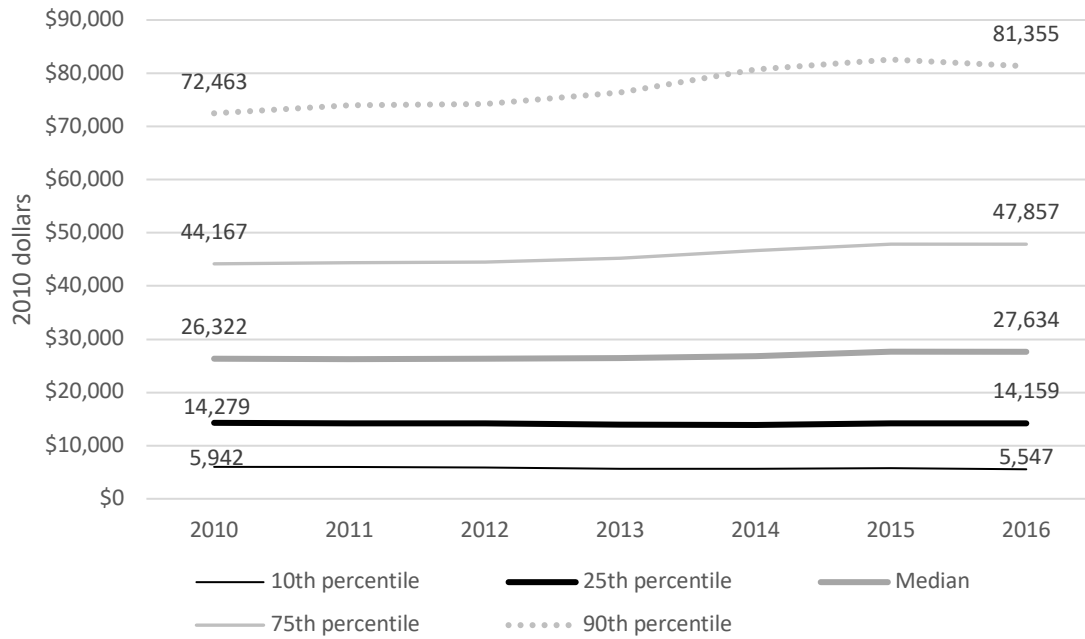
**Figure 1. Pre-tax equivalent income percentiles, age 70**



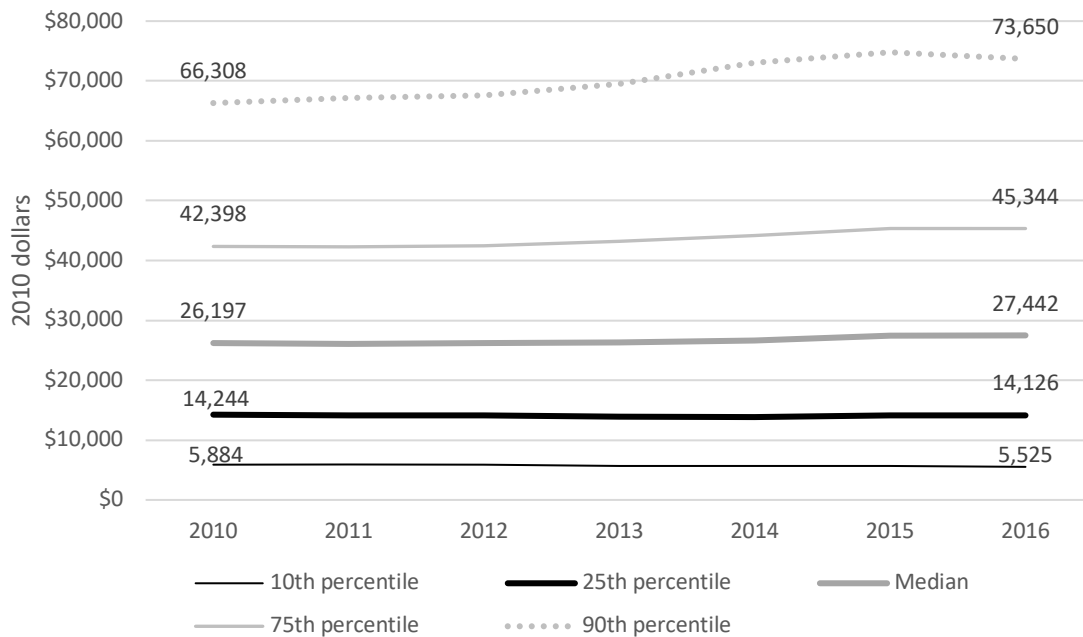
**Figure 2. After-tax equivalent income percentiles, age 70**



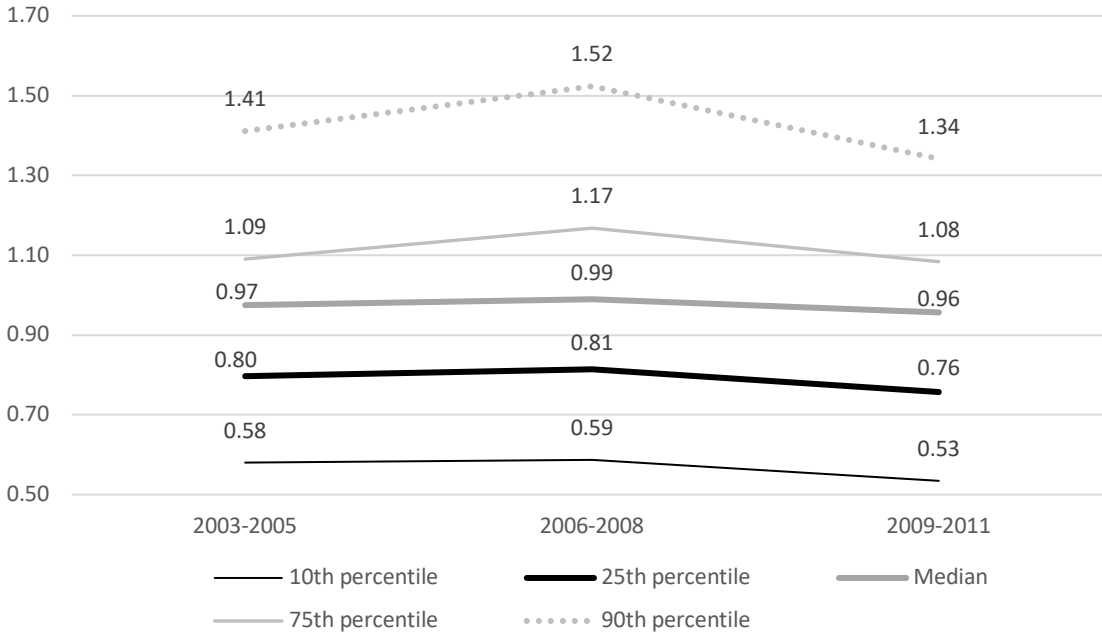
**Figure 3. Pre-tax equivalent income percentiles, age 80**



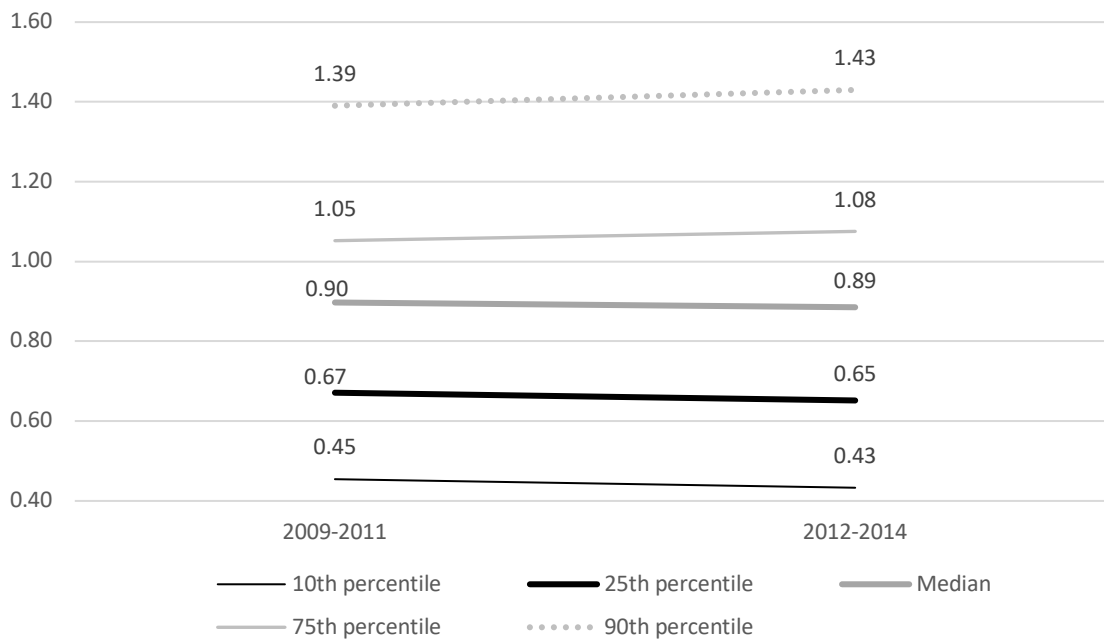
**Figure 4. After-tax equivalent income percentiles, age 80**



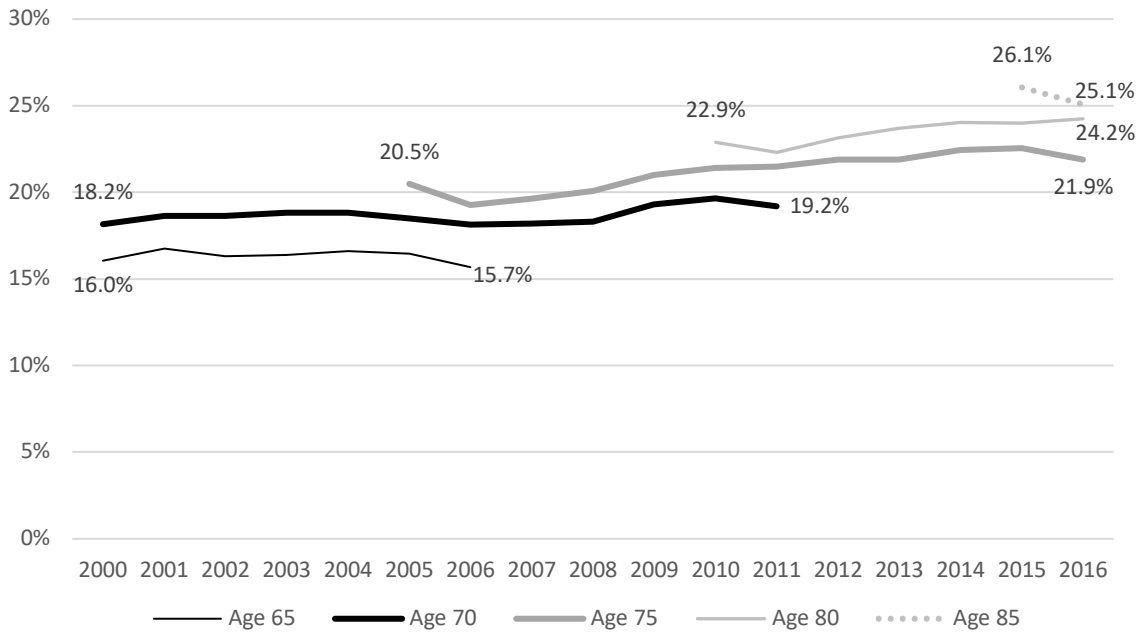
**Figure 5. Ratio of after-tax equivalent income at ages 70-73 to ages 65-67**



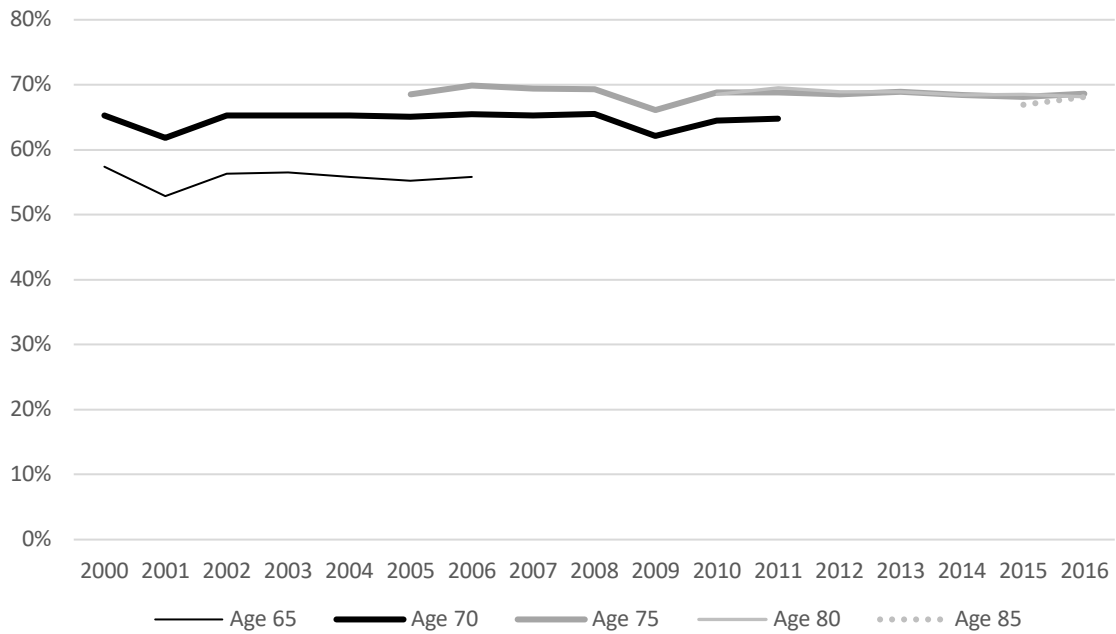
**Figure 6. Ratio of after-tax equivalent income at ages 76-79 to ages 65-67**



**Figure 7. Percent of tax units completely dependent on Social Security**



**Figure 8. Percent of tax units with positive pension income**



**Figure 9. 75th percentile of equivalent pension income**

