Getting Better: Changes in Retiree Income Over Time

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This paper examines changes in retiree income over time using cross-sectional tax data from 2003 through 2017. Using 2016 cross-sectional data, Brady and Bass (2024) found that median spendable income fell by 1.0% per year of age, on average, from age 70 through age 98. That study also found that the incidence of non-Social-Security retirement income, which held steady at 70% or higher from age 71 through age 91, declined after age 91. These results raise the question of whether these age patterns reflect the typical experience of aging individuals or the different life experiences of each birth-year cohort. This study analyzes synthetic cohorts to disentangle age and cohort effects. We find the decline in income at older ages is a cohort effect. Controlling for birth year, median inflation-adjusted income does not decline with age. For example, individuals born in 1932 had roughly the same median income when aged 85 (in 2017) that they had back when they were aged 71 (in 2003), adjusted for inflation. Nonetheless, their age 71 median income was nearly 20% less than individuals aged 71 in 2017. Similarly, once we control for birth year, we see much more modest declines in the incidence of non-Social-Security retirement income after age 90. Rather than being a cause for concern, the decline in income with age observed in cross-sectional data is consistent with an improvement in retiree income. Our analysis shows that, on average, birth-year cohorts maintained their inflation-adjusted income in retirement but that more recent cohorts entered retirement with higher income.

The values plotted in the figures are available in an accompanying Excel spreadsheet.

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1. Introduction

This study uses administrative tax data to answer two questions about retirement in America. First, how does spendable income change across the life cycle as individuals move from working into retirement? Second, how does the composition of income change over the life cycle as workers move from relying primarily on earnings from labor to relying primarily on Social Security benefits, retirement plan distributions, and other income?

The motivation for trying to answer these questions is that proposals to overhaul the US Social Security system and the taxation of retirement plans are ubiquitous. We think such proposals to change the current system should be based on an accurate assessment of how the current system is performing.

Many proposals are motivated by a belief that the current system provides inadequate resources to retirees and that the voluntary component of our retirement system—employer-sponsored defined benefit (DB) and defined contribution (DC) plans and individual retirement arrangements (IRAs)—is primarily responsible for that failing.[1] The belief that the US retirement system produces inadequate retirement resources is based largely on research projecting that most Americans will not accumulate enough resources for retirement (see, for example, Munnell, Chen, and Siliciano 2021; and VanDerhei 2019). The belief that employer plans and IRAs are not doing enough to help workers prepare for retirement is based largely on analyses of household survey data that claim too few workers have access to retirement plans (see, for example, Munnell and Bleckman 2014) and too few retirees receive income from employer plans (see, for example, Social Security Administration 2016).

There is other research, however, that challenges these beliefs. Both Scholz, Sheshadri, and Khitatrakun (2006) and Hurd and Rohwedder (2015) conclude that most—though not all—American households appear to be adequately preparing for retirement. Further, studies that compare tax data to household survey data (Brady and Pierce 2012; Bee and Mitchell 2017;

[1] See, for example, a series of editorials in *Bloomberg News* in early 2022 (*Bloomberg News*. America's Retirement Crisis Is a Financial Crisis Too, March 28, 2022; Saving for Retirement Is Harder Than It Needs to Be, April 4, 2022; Piecemeal Reform Won't Solve the U.S. Retirement Crisis, April 11, 2022; and How to Fix the Broken U.S. Retirement-Savings System, April 18, 2022).

Brady and Bass 2021; Dushi and Trenkamp 2021; and Bee, et al. 2024) show that household surveys undercount retirement income—that is, distributions from employer-sponsored DB and DC retirement plans, IRAs, and annuities. These studies indicate that many more workers accumulate resources from employer plans and IRAs during their working career and many more retirees receive income from retirement plans than is indicated in household surveys.

This study uses similar methods to two previous studies and builds on their results. The first is Brady and Bass (2023a), which used administrative tax data to follow individuals from age 55, before they are eligible to claim Social Security retirement benefits and when retirement plan distributions are generally subject to an early withdrawal penalty, until age 72, after the ages at which delaying Social Security claiming no longer increases monthly benefits and required minimum distributions (RMDs) from IRAs and DC plans begin. The second is Brady and Bass (2024), which used administrative tax data to analyze income differences by age using cross-sectional data.

As a complement to these previous studies, this paper uses administrative tax data from a series of repeated cross-sections to create synthetic birth-year cohorts. We then analyze differences by age withing the synthetic cohorts as well as differences across cohorts controlling for age.

Our primary finding is that the decline in median spendable income after age 70 observed in cross-sectional data reflects differences across cohorts rather than a typical income pattern with age. Within cohorts, median spendable income is relatively flat after age 70. Instead, differences by age in the cross section are largely driven by differences across cohorts. Controlling for age, median total income in 2017 was 24% higher than in 2003 for individuals aged 67 or older.

We find more recent birth-year cohorts: are more likely to work at older ages and have higher labor income at older ages conditional on working; are more likely to delay claiming Social Security benefits and delay receiving income from employer-sponsored retirement plans and IRAs; are more likely to have income from employer plans and IRAs after age 70; and have higher amounts of both Social Security benefits and (non-Social Security) retirement income.

The paper is organized as follows. Section 2 describes the data we use in our analysis. Section 3 examines changes in spendable income by age. Section 4 analyzes changes in the composition of income by age. Section 5 concludes the analysis.

2. Description of Data

This study uses US Internal Revenue Service (IRS) administrative tax data from the 2003 through 2017 tax years. These data include information from both federal individual income tax returns filed by taxpayers and information returns issued by third parties and sent to both taxpayers and the IRS. Information returns are used to report income (such as Form W-2, which reports wages), expenses (such as Form 1098, which reports mortgage interest expense), and other tax-relevant information (such as Form 1099-Q, which reports distributions from qualified education savings plans).[2] We also incorporate Social Security Administration (SSA) data on gender, date of birth, and date of death (if applicable).

Our overall population of interest is US citizens and resident aliens[3] who—provided their gross income exceeded the filing thresholds—would have been required to file a Form 1040 (inclusive of Form 1040, Form 1040A, and Form 1040EZ), excluding residents of US territories.[4] This includes US citizens and resident aliens living in a state (inclusive of the 50 states and the District of Columbia), living outside the US, or living overseas as a member of the US armed forces. We exclude residents of US territories because bona fide residents of US territories generally do not file a Form 1040 with the IRS.[5]

[2] For a full listing of information returns used in this study and their description, see Table A.1 in the appendix.

[3] Resident aliens include individuals with a green card or who had a "substantial presence" in the US—inclusive of the 50 US states and the District of Columbia. For more information on US income tax treatment of both resident and nonresident aliens, see Internal Revenue Service (2018a).

[4] For more information on filing requirements, see Internal Revenue Service (2018b) and Internal Revenue Service (2018c).

[5] US citizens and resident aliens who are bona fide residents of Guam, the US Virgin Islands, and the Northern Mariana Islands are not required to file a Form 1040 with the IRS. US citizens and resident aliens who are bona fide residents of American Samoa and Puerto Rico are only required to file a Form 1040 if they received income from a source outside of the territory. For the definition of a bona fide resident and more information on filing requirements for individuals with income from US possessions, see Internal Revenue Service (2018d).

Our method for deriving our representative sample from tax data differs from the typical approach because we sample individuals rather than tax returns. We use the individual as our unit of observation because the focus of our larger research effort—using both cross-sectional data and panel data—is measuring changes in the amount and composition of income over the life cycle. It would be difficult, if not impossible, to use any other of unit of analysis to study differences in income by age.

Our method of estimating the US population from tax data builds on the work of many at the US Department of the Treasury Office of Tax Analysis (OTA), the Joint Committee on Taxation (JCT), and the Internal Revenue Service Statistics of Income Division (SOI)—in particular Cilke (2014) and Lurie and Pearce (2021).[6] A more complete description of our method and the resulting sample is provided in Brady and Bass (2023b).

As with other studies using tax data, a potential shortcoming of our method is that it does not include individuals untouched by the tax code. This would include individuals solely dependent on public assistance because the benefit payments are not reported to the IRS—neither on tax returns nor on information returns. Although this will not affect our conditional measures of median income, our measures of income incidence may be overstated. As discussed in more detail in the appendix, omitting these individuals from our population estimates is likely to overstate income incidence more for middle-aged individuals than for the elderly.

Another issue is that, to the extent that new information returns are created or compliance with information return reporting increases over time, more nonfilers may be identified in later tax years. To the extent that the newly identified nonfilers do not have measured income, income incidence may decline in later years, all else equal.

2.1 Creating Representative Cross-Sectional Samples

We create a representative sample of the US population in each year by combining three separate subsamples: one for filers (primary or secondary taxpayers listed on a return), inclusive of both non-dependent and dependent filers; one for dependent nonfilers; and one for non-

[6] Early work trying to measure the nonfiling population include Cilke (1998), Sailer and Weber (1998), Mortenson et al. (2009), and Lawrence et al. (2011). Examples of other recent studies using tax data to represent the US population include Saez (2016) and Larrimore et al. (2019).

dependent nonfilers. Tax returns allow us to identify filers and the dependents they claim. Information returns allow us to identify non-dependent nonfilers.

For analysis of annual income, we include in our annual population only those individuals who survived through December 31 of the tax year.

The composition of the population varies with age. Dependent nonfilers (individuals identified as a dependent on Form 1040 and who do not file a dependent return) represent most of the population at younger ages, with their share falling rapidly after age 15, remaining low through middle age, and then increasing again at older ages. Largely mirroring the decline in dependent nonfilers, filers (individuals who are primary or secondary taxpayers on Form 1040) increase rapidly as a share of the population after age 15 and the share remains high for those from their mid-20s through early 60s before falling off at older ages. Non-dependent nonfilers (individuals not identified on a tax return but who receive at least one information return) increase as a share of the population with age, with their share growth accelerating after age 60.

The inclusion of nonfilers in the sample is critical for measuring the income of the elderly. The nonfiler share of the population—inclusive of both dependent nonfilers and non-dependent nonfilers—increases rapidly at older ages (see Brady and Bass 2024).

2.2 Creating Synthetic Birth-Year Cohorts

Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007.[7] For example, for individuals born in 1983, the statistics for age 20 would be from 2003 and the statistic for age 34 would be from 2017. For individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017.

2.3 Marital Status

Individuals are categorized as either **joint** or **non-joint**. For individuals who file a return, married individuals filing a joint return are categorized as joint and all other filers (single, head of household, qualifying widow[er], and married filing separately) are categorized

[7] See the appendix for a discussion of why 2007 data are excluded from the charts.

as non-joint. We do not attempt to impute marital status for nonfilers, so all dependent nonfilers and non-dependent nonfilers are categorized as non-joint.

The joint share of the population in 2017 follows a hump-shaped pattern by age. The joint population share increases rapidly after age 18 through the mid-30s, peaks in the late-50s and early 60s before declining with age. In addition to spousal death, a portion of the decline in the joint population share among the elderly is attributable to a falling share of the population filing a return.

2.4 Income and Tax Measures

We derive our total income measure from tax data, but it differs from the tax code's definition of income because we are primarily focused on measuring income available to spend after paying taxes and saving for retirement. As such, we include some types of income excluded from taxable income—such as tax-exempt interest and the nontaxable portion of Social Security benefits. To the extent possible, we exclude from income all retirement plan contributions and include in income all non-rollover retirement plan distributions—regardless of whether contributions were from an employer or an employee, and regardless of their tax treatment.[8] This means we exclude from income not only tax-deferred employee contributions to employer plans and IRAs, but also Roth contributions and non-Roth after-tax contributions. It also means we include in income not only taxable non-Roth distributions, but also Roth distributions and the portion of non-Roth distributions that represents basis. Finally, because our spendable income measure does not account for state income taxes, we exclude state income tax refunds from our income measure.

The income and taxes of filers are primarily derived from tax returns while the income and taxes of nonfilers are derived solely from information returns. Table A.2 describes in detail how we calculate our income and tax measures for both filers and nonfilers.

Note that we do not impute taxes. For filers, income taxes are based on the tax amounts reported on Form 1040, and payroll taxes are based on both the amounts reported as withheld on Form W-2 and amounts reported on Form 1040 (for self-employment taxes, taxes on

[8] See Brady and Bass (2020) for a description of how we identify rollover distributions.

unreported tips, and uncollected payroll tax on wages). For nonfilers, both income and payroll taxes are based on the amounts reported as withheld on information returns.

Our measure of **total income** is the sum of six types of income: **labor** (wage and salary, self-employment earnings, unemployment compensation), **Social Security** (disability benefits and retirement benefits), **retirement** (IRA distributions and income from pensions and annuities),[9] **investment** (taxable interest, tax-exempt interest, dividends, gains/losses), **business/farm/rents/royalties** (business and farm income in excess of self-employment earnings; income from rents, royalties, partnerships, S-corps, and trusts), and **other** (net alimony [alimony received less alimony paid] and other income).[10]

Our measure of total income already accounts for all the savings we can identify using tax data. Neither employer nor employee contributions to pensions are included in our measure of total income.

As such, our measure of **spendable income** is calculated as total income less **total federal taxes**. Total federal taxes are comprised of **federal income taxes** and the employee share of **payroll taxes**. For filers, federal income taxes are taken from Form 1040 and payroll taxes are based on a combination of amounts withheld on information returns and Form 1040. For nonfilers, both federal income and payroll taxes are based on the amount withheld on information returns. We do not attempt to estimate state and local taxes. We also do not impute federal excise or corporate income tax burdens.

The primary measure of income we use to analyze the incidence and amount of income, in total and by type, is **per capita income**, which allocates the joint income of married couples equally to each spouse. For a primary or secondary taxpayer on a joint return, per capita income is the income derived from the tax return divided by two. For a primary taxpayer on a non-joint tax return, per capita income is simply the income derived from the tax return. Similarly, for

[9] Pension income includes income from both DB and DC pensions.

[10] Our income measure does not include public assistance income because benefit payments from such programs as Temporary Assistance to Needy Families (TANF), Supplemental Security Income (SSI), and Veteran Affairs (VA) are not reported to the IRS—neither on tax returns nor on information returns.

nonfilers (who are all assumed to be non-joint), per capita income is simply the income derived from the individual's information returns.

In addition to per capita income, we also report **own income** for labor, Social Security, and retirement income. For individuals with joint marital status, we use information returns to allocate income to the spouse who received the income. For individuals with a non-joint marital status (inclusive of filers with a non-joint return and all non-filers), there is no difference between own income and per capita income.

Importantly, neither per capita income nor own income adjusts for family or household size. All income reported on a tax return is allocated to filers—the primary taxpayer in the case of non-joint returns and the primary and secondary taxpayers in the case of joint returns. The number of dependents claimed on a tax return has no impact on either measure, as no filer income is allocated to dependents. Dependents have income only if they file their own return or have income reported on their own information returns.

2.5 Tax Rates

For individuals who have income, we calculate average effective tax rates. We categorize individuals as having income if they have nonzero per capita total income in any of our six broad income categories (labor, Social Security, retirement, investment, business/farm/rents/royalties, and other) or in any of the components of investment income (taxable interest, tax-exempt interest, dividends, and gains/losses). An individual's average effective tax rate is calculated as taxes paid divided by total income, with both taxes and income measured on a per capita basis. Average effective tax rates are calculated for federal income taxes, payroll taxes, and total federal taxes.

2.6 Medians and Percentile Measures

The medians presented in this study are approximate, as true medians could represent disclosure of an individual's tax data. To calculate approximate medians, we average the 48th, 49th, 50th, 51st, and 52nd percentile values and then round that average (to the nearest dollar for amounts less than $100, the nearest $10 for amounts from $100 to less than $10,000, the nearest $100 for amounts of $10,000 or more, and two decimal places for percentages). We then

only report these approximate medians for groups with 100 or more observations. We use the same method to report other percentile measures.

All dollar amounts in the study are presented in constant 2017 dollars.

3. Changes in Spendable Income

In this section, we examine differences in income incidence and amounts by age and differentiate between age-related differences (that is, changes in income that individuals typically experience with age) and cohort differences (that is, differences caused by the unique historical experience of each birth-year cohort).

Although we report changes in total income, we are primarily focused on changes in spendable income—that is, income available to spend after paying taxes and saving for retirement. Economic theory predicts that individuals generally attempt to maintain steady consumption over the life cycle.[11] We cannot measure consumption or spending with the tax data, but we can measure income available to spend.

To calculate spendable income, we subtract total federal taxes (payroll taxes plus individual income taxes) from total income. Our measure of total income already adjusts for retirement savings—it excludes all contributions to qualified retirement plans (inclusive of both tax-deferred and taxable contributions) and includes all non-rollover distributions from qualified plans (inclusive of both taxable and non-taxable distributions).

[11] Optimization over the life cycle generally requires that the marginal utility of consumption be equal in each time period. If certain other conditions are met, this would also imply that an individual would prefer to smooth consumption over time. See Engen, Gale, and Uccello (2005) and Scholz, Seshadri, and Khitatrakun (2006) for a more formal description of life-cycle models and for a discussion of retirement savings adequacy. To the extent that some spending—such as a portion of spending on clothing and travel—are properly characterized as a cost of working rather than consumption, and to the extent retirees substitute home production for market production—for example, preparing lunch at home versus purchasing lunch at a fast food establishment or cafeteria, consumption can be maintained even if spending declines at older ages. See Hurst (2008) for a discussion of consumption changes in retirement. In addition, retired people may maintain their marginal utility by diminishing their consumption and increasing their time devoted to leisure. At younger ages, life-cycle models typically predict that workers will take on debt because, to the extent earnings typically increase early in a worker's career, they may be able to finance consumption in every year of their life that is higher than what they earn early in their career. One reason younger workers may not borrow is that they lack access to credit (see Deaton 1991 for a discussion of liquidity constraints and their effect on life-cycle models). Another reason is that, although workers can expect earnings to increase, on average, future earnings are too uncertain for them to want to risk taking on debt (see Carroll 1997 for a discussion of "buffer-stock" savings and its effect on life-cycle models).

Our primary finding is that the decline in median spendable income after age 70 observed in cross-sectional data reflects differences across cohorts rather than a typical income pattern with age. Within cohorts, median spendable income is relatively flat after age 70. Instead, differences by age in the cross section are largely driven by differences across cohorts. Controlling for age, median total income in 2017 was 24% higher than in 2003 for individuals aged 67 or older.

We find that spendable income varies less over the life cycle than does total income because of the impact of taxes. Total federal taxes are a function of both the amount and the composition of income. Spendable income typically increases by less than total income early in life, as effective income tax rates generally increase with total income. During the transition into retirement, spendable income typically decreases by less than total income as effective tax rates fall. Payroll tax rates fall as the share of total income derived from labor declines. Income tax rates fall both because total income is lower and because only a portion of Social Security benefits are included in taxable income.

We also find that taxes, and especially tax policy changes enacted during the 2003 to 2017 period, caused spendable income to vary less than total income over the business cycle.[12] Controlling for birth year cohorts, total income of working age individuals fell relative to the typical age pattern in the wake of the Great Recession. Temporary reductions in effective federal tax rates, however, lessened the impact on spendable income.

3.1 Income Incidence by Age

In the 2017 cross-section, income incidence remains consistently high throughout adulthood (Figure 1, top panel).[13] The share of the population with income—inclusive of both filers and nonfilers with income—is very low for young children but increases rapidly for teenagers and young adults. From age 29 through age 79, 97% or more of the population had

[12] See the appendix for a discussion of the major tax changes that occurred from 2000 through 2017.

[13] Individuals are categorized as having income if they have nonzero per capita income in any of our six broad income categories (*labor*, *Social Security*, *retirement*, *investment*, *business/farm/rents/royalties*, and *other)* or in any of the components of *investment* income (taxable interest, tax-exempt interest, dividends, and gains/losses). For the derivation of these income measures, see Table A.2 in the appendix.

income—either directly or through a spouse. At ages 80 and older, 96% of the population, on average, had income.

In general, we see the same pattern of income incidence by age within each birth-year cohort—with incidence increasing rapidly early in life and then remaining consistently high during adulthood (Figure 1, middle and bottom panels). Controlling for age, however, there are noticeable reductions in income incidence between 2003 and 2017 for those younger than age 26 and older than age 76.

Controlling for age, the largest reductions in income incidence occurred individuals younger than age 26, with incidence as much as 12 percentage points lower in 2017 compared with the same aged individuals in 2003. For children, many of whom have only de minimis amounts of investment income, the decline in income incidence was largely explained by fewer reporting taxable interest income. Indeed, as illustrated in Figure A.4 in the appendix, there was a substantial drop in both the incidence and amount of taxable interest across all age groups between 2003 and 2017 associated with the lower interest rates. In addition, as discussed in the next section of the paper, there were substantial declines in labor income among teenagers and those in their early 20s, with labor incidence in 2017 not yet recovered from the impacts of the Great Recession.

Controlling for age, changes in income incidence between 2003 and 2017 were less than ± 1.0 percentage point for ages 26 through 76, but there were declines of 1.0 percentage points or more for older individuals. Some reduction in income incidence for older individuals between 2003 and 2017 could be attributable to the creation of new information returns and/or increased information return compliance by third party issuers that allowed us to better identify nonfilers without measurable income. We do not know why new forms or compliance would primarily reduce income incidence for the elderly. That said, the decline in income incidence among the elderly is correlated with a decline in the share of the population with Social Security benefits, both across and within individual birth-year cohorts. As there is no ready explanation of why Social Security income incidence would fall with age over this time period, we suspect the explanation is better identification of non-filers rather than an actual drop in income incidence.

3.2 Median Income Amounts by Age

Conditional on having income, median per capita total income follows a hump-shaped pattern with age in 2017 (Figure 2, top left panel). Median total income increases rapidly from age 16 through the mid-20s and then continues to rise briskly until the early 40s. It peaks just below $43,000 at ages 47 and 48. After peaking, it declines 10% by age 61 and then declines another 8% between age 61 and age 70. After age 70, median total income declines 1.3% per year, on average, through age 99.

Within birth-year cohorts during typical working ages (age 18 to age 65), median total income fluctuates with the business cycle, declining relative to the typical age pattern from 2006 through 2013 and then recovering (Figure 2, middle and bottom right panels).

Despite these fluctuations over the business cycle for working age individuals, median total income generally follows similar age patterns across cohorts when looked at over the entire 2003 to 2017 time period. Controlling for age, median total income in 2017 is modestly higher than in 2003 for individuals aged 35 to 50 (up 3% or less in 2017) and modestly lower than in 2003 for individuals aged 30 through 34 and aged 51 through 56 (down 2% or less in 2017). Working age individuals under age 30 in 2017 had more substantial declines in median income relative to their counterparts in 2003, with the largest percentage declines (over 7 percent) for those aged 18 and 19 in 2017, and the largest dollar declines (over $1,000) for those aged 26 to 29 in 2017.

At older ages, we do not see large fluctuations over the business cycle within birth-year cohorts, and instead observe steadily higher total income for more recent cohorts. Controlling for age, median total income in 2017 was 24% higher for individuals aged 66 or older, with the median at least 15% higher at any given age.

The result is that within-cohort total income changes among those aged 70 or younger generally follow the same age pattern observed in cross-sectional data. For those synthetic cohorts where we observe a peak in median total income, the maximum occurs between the ages of 46 and 53, with the exact age affected by the business cycle. Changes after the peak also are similar. For example, for the 1956 birth-year cohort, median total income declines by 8% from its maximum in 2006 (when aged 50) to 2017 (when aged 61), compared with a 10% drop

in median total income from its maximum to age 61 in the 2017 cross-section. For the six birth-year cohorts we observe from age 61 through age 70, the average decline in inflation-adjusted median total income is 9% over those ages, similar to the decline observed in the 2017 cross-section.

In contrast, within-cohort total income changes for those older than age 70 are substantially different than those observed in the cross section. Rather than persistently declining, cohort median total income is relatively flat with age, on net, after age 70. For example, for the 1933 birth-year cohort, median total income falls 2% between 2003 (when aged 70) and 2017 (when aged 84), compared with a 21% decline over those ages in the 2017 cross-section. For the 1928 birth-year cohort, inflation-adjusted median total income increases 4% between 2003 (when aged 75) and 2017 (when aged 89), compared with a 16% decline over those ages in the 2017 cross-section.

The age profile of median spendable income in 2017 (Figure 2, top left panel) is flatter than that of total income—particularly between age 61 and age 70—because of changes in taxes paid over the life cycle. As total income increases rapidly with age early in life, increased federal taxes temper the increase in spendable income. Median per capita spendable income peaks at just under 37,000 at age 47 and then declines by 9% through age 61. The largest difference between the two series is between age 61 and age 70, with median spendable income rising despite total income falling. After age 70, median spendable income declines a bit more slowly than total income, falling by about 1.1% per year of age, on average, through age 99.

Within birth-year cohorts during typical working ages, changes in median spendable income also illustrate the role tax policy played in smoothing out business-cycle fluctuations during this time (Figure 2, middle and bottom right panels). Compared to the typical age pattern, we see relatively modest changes in median spendable income in the wake of the Great Recession, despite large declines in median total income.

As with total income, within-cohort changes in spendable income among those aged 70 or younger generally follow the same age pattern observed in cross-sectional data. For example, for the 1956 birth-year cohort, inflation-adjusted median spendable income declines by 8% from its maximum in 2004 (when aged 48) to 2017 (when aged 61), compared with a 9% drop from

the maximum (at age 47) to age 61 in the 2017 cross-section. For the five birth-year cohorts we observe from age 61 through age 70, there is no change, on average, in inflation-adjusted median total income, compared with a 1% increase observed in the 2017 cross-section over those ages.

Also like total income, median spendable income is relatively flat with age after age 70 within cohorts. For example, for the 1933 birth-year cohort, median total income falls 1% between 2003 (when aged 70) and 2017 (when aged 84), compared with an 18% decline over those ages in the 2017 cross-section. For the 1928 birth-year cohort, inflation-adjusted median total income rises 4% between 2003 (when aged 75) and 2017 (when aged 89), compared with a 15% decline over those ages in the 2017 cross-section.

The largest differences in median spendable income by birth-year cohort are among the elderly. Controlling for age, median spendable income in 2017 was 23% higher than in 2003 for individuals aged 67 or older, with the median at least 15% higher at any given age.

3.3 Federal Tax Rates by Age

In the 2017 cross-section, total federal taxes as a share of total income were lower for retirees than they were for any other adults (Figure 3, top panel). From individuals in their late 20s to those in their early 60s, the combination of payroll and income tax typically exceeds 12.0% of total income, with median total federal tax rates peaking above 15.0% from age 52 to 56. For those older than age 60, median total tax rates fall quickly over the ages individuals typically transition into retirement, falling below 5.0% by age 68 and below 2.0% by age 75.

In 2017, most of the variation in tax rates over typical working ages is attributable to the changes in income taxes, as median payroll tax rates vary little. Median payroll tax rates are close to 7.65% from age 16 through age 55, with the typical individual getting nearly all their income from labor. By single year of age, more than half of individuals with income pay no federal income tax until age 19. The median income tax rate increases to nearly 5.0% for individuals aged 27 and remains about the same through age 37. For those older than age 37, median income tax rates again increase with age and continue to increase even after total income begins to decline in the late 40s.

Total federal tax rates decline as individuals transition into retirement. Median payroll tax rates fall rapidly for individuals older than age 61, as an increasing share of income is derived from sources—such as Social Security benefits and retirement plan distributions—not subject to payroll taxes. Income tax rates fall late in life because of changes in both the amount and the composition of income. Income tax rates typically decline at older ages because (1) total income generally declines during the transition into retirement, and (2) only a portion of Social Security benefits are included in taxable income.[14] In combination, these two changes reduce the share of total income subject to income tax and reduce the share of taxable income subject to higher marginal tax rates.

Within birth-year cohorts, we can see the impact of counter-cyclical tax policy on the effective tax rates of working age adults (Figure 3, middle and bottom panels). Controlling for age and relative to 2006, effective total federal tax rates declined by 2 percentage points or more on average from 2009 through 2012 for individuals aged 21 to 56. These reductions were primarily attributable to the Making Work Pay Tax Credit in 2009 and 2010, and the 2.0 percentage point reduction in the employee share of the Social Security payroll tax in 2011 and 2012.

Over the entire 2003 to 2017 period, however, median effective total federal tax rates increased for individuals aged 16 to 82.

3.4 Summary of Changes in Spendable Income

The primary finding is that the decline in median spendable income after age 70 observed in cross-sectional data reflects differences across cohorts rather than a typical income pattern with age. Within cohorts, median spendable income is relatively flat after age 70.

[14] The percentage of Social Security benefit payments included in gross income is based on a taxpayer's modified adjusted gross income (MAGI), which includes half of Social Security benefit payments plus other income included in gross income. For single, head of household, and qualifying widow(er) returns: if MAGI is $25,000 or less, no Social Security benefit payments are included in gross income; if MAGI is between $25,000 and $34,000, the lesser of 50% of Social Security benefit payments or 50% of MAGI in excess of $25,000 is included in gross income; if MAGI is in excess of $34,000, the lesser of 85% of Social Security benefit payments or 85% of MAGI in excess of $34,000 plus $4,500 [=50%*($34,000-$25,000)] is included in gross income. For joint returns, the MAGI thresholds are $32,000 and $44,000, respectively. These thresholds are not indexed for inflation. For more information on the taxation of Social Security benefits, see Internal Revenue Service (2018e).

Instead, differences by age in the cross section are largely driven by differences across cohorts. Controlling for age, median total income in 2017 was 24% higher than in 2003 for individuals aged 67 or older.

The age profile of spendable income is flatter than that of total income because of changes in effective tax rates over the life cycle. In particular, median total federal tax rates were lower for retirees than they were for any other adults.

Over the 2003 to 2017 period, tax policies—especially temporary changes in effect from 2009 through 2012—also caused spendable income to vary less than total income over the business cycle.

4. Changes in the Composition of Income

Throughout their lifetimes, most Americans get most of their income from three sources—labor income (wages, self-employment earnings, and unemployment compensation), Social Security income (disability, retirement, and survivor benefits), and retirement income (IRA distributions and pension and annuity income). All three of these income sources are ultimately derived from work—either as current compensation (labor income), deferred compensation (retirement income), or government benefits based on a worker's earnings history (Social Security income). The only groups that typically get more than a de minimis amount from other sources are older individuals in the highest income groups (Brady and Bass, 2024).

This section will focus on these three sources of income and look at how they change in importance with age. Broadly over the life cycle, there is a decline in the importance of labor income with age and an increase in the importance of Social Security and retirement income. The typical individual derives essentially 100% of their income from labor until around age 55 and derives none of their income from labor by the time they are aged 68. This process typically takes place over several years rather than at a single point in time.

We find younger birth-year cohorts: are more likely to work at older ages and have higher labor income at older ages conditional on working; are more likely to delay claiming Social Security benefits and delay receiving income from employer-sponsored retirement plans

and IRAs; are more likely to have income from employer plans and IRAs after age 70; and have higher amounts of both Social Security benefits and (non-Social Security) retirement income.

4.1 Labor Income

In the 2017 cross-section, incidence of own labor income peaks in the mid-20s and then declines slowly with age before dropping more rapidly as individuals transition into retirement (Figure 4, top left panel). Own labor incidence increases rapidly after age 15, hitting 88% or higher from age 23 through age 28. The share of the population working then declines with age—at first slowly and then accelerating beginning in the late 40s. The sharpest declines in work occur in the 60s and early 70s, with own labor income incidence falling from 66% at age 61 to 17% at age 75.

Compared with own incidence, own or spouse labor income incidence in the 2017 cross-section peaks later, remains steadier through middle age, and then declines more slowly with age until later in life (Figure 4, top right panel). This is because the share of the population who only receive labor income through a spouse increases with age, peaking at 13% from age 63 through age 68. As a result, own or spouse labor incidence is 92% from age 26 through age 42 and is 90% or higher through age 49. As with own incidence, own or spouse labor income incidence declines sharply in the 60s and early 70s, falling from 78% at age 61 to 25% at age 75.

Within birth-year cohorts, the age pattern of labor income incidence is similar to that observed in cross-sectional data (Figure 4, middle and bottom panels). For example, for the 1956 birth-year cohort, own labor income incidence fell 16 percentage points and own or spouse incidence fell by 14 percentage points from 2003 (when age 47) to 2017 (when age 61). This compares with declines of 16 and 13 percentage points, respectively, in the 2017 cross section over those same ages. For the 1942 birth-year cohort, own labor income incidence fell 45 percentage points and own or spouse incidence fell by 51 percentage points from 2003 (when aged 61) to 2017 (when aged 75). This compares with declines of 49 and 52 percentage points, respectively, in the 2017 cross section over those same ages.

Controlling for age, the largest differences in labor income incidence are among young adults and the elderly.

Looking at working age individuals aged 55 or younger and comparing individuals of the same age across years, both own and own or spouse labor income incidence fell after the Great Recession but then increased again by 2017.

For individuals aged 24 to 55, own labor income incidence by age changed only modestly over the business cycle and was little changed, on net, between 2003 and 2017 (within ± 0.5 percentage points). That said, there was a consistent decline in own or spouse labor incidence for these age groups between 2003 and 2017, down 1.2 percentage points, on average. This was likely related to a decline in the share of the population filing a joint return between 2003 and 2017.

The largest changes observed—in decline, recovery, and on net—were for teenagers and young adults. Own labor incidence of individuals aged 14 through 21 in 2017 was 2 to 9 percentage points lower than their counterparts in 2003, with the largest declines among individuals aged 16 to 18. For example, among those aged 17 in any given year, own labor incidence fell from 57 percent, on average, from 2003 through 2006, to 37% in 2010 and 2011, and had only rebounded back to 48% by 2017.

Older age groups, in contrast, did not experience declines in labor income incidence in the wake of the Great Recession and had consistently higher incidence in 2017 than their counterparts in 2003. The biggest increases were among individuals aged 62 to 67, with own incidence 4.7 percentage points higher and own or spouse incidence 3.6 percentage points higher, on average, in 2017. Individuals aged 70 to 79 in 2017 had own incidence 1.7 percentage points higher and own or spouse incidence 3.0 percentage points higher, on average, than those of the same ages in 2003.

Conditional on having labor income, median labor income follows a hump shape with age in the 2017 cross-section (Figure 5, top panel). Median own labor income increases rapidly from the mid-teens through the late-30s and then remains fairly steady through the late 50s. In 2017, median own labor income is $40,000 or higher from age 38 through age 59, with peak earnings of $43,900 at ages 47 and 48. As own labor incidence declines at older ages, the median income of those who continue to work also falls, from $38,400 at age 61 to $11,500 at age 75. Median per capita labor income follows a similar path as own income through age 47 but then

declines more rapidly through age 61, as the share of married individuals with only spousal labor income increases.

During typical working ages, median labor income fluctuates with the business cycle within birth-year cohorts, declining relative to the typical age pattern from 2006 through 2013 and then recovering (Figure 5, middle and bottom panels). Controlling for age, median own labor income fell in the wake of the Great Recession for individuals aged 60 or younger. On net, over the entire 2003 to 2017 period, median own labor income fell for individuals younger than 35 and between age 50 and age 55 but increased for individuals aged 35 to 49 and older than age 55. The biggest percentage declines in median own labor income by age were for individuals aged 17 to 19 (down 7.4 percent, on average) and the biggest dollar declines were among individuals aged 26 to 28 (down nearly $1,300, on average). The biggest increases by age, in both percentage and dollar terms, were for individuals aged 41 to 44 (up 4.0% or just over $1,600, on average). Controlling for age, median per capita labor income fluctuated similarly over the business cycle but, on net, increased between 2003 and 2017 for all ages from 35 through 60.

Among individuals older than age 60, we see little if any decline in median own labor income relative to the typical age pattern after the Great Recession, and substantial increases over the entire 2003 to 2017 period. Controlling for age, median own labor income of workers aged 62 to 67 in 2017 was more than $9,000 higher, on average, than their counterparts in 2003. On a percentage basis, individuals aged 64 to 66 in 2017 had median own labor income more than 50% higher than their counterparts in 2003, and individuals aged 67 to 74 in 2017 had median own labor income more than 40% higher. Increases in median per capita labor income were similar.

4.2 Social Security Income

In the 2017 cross-section, own incidence of Social Security income follows different patterns for three different groups: children, disabled adults, and retirees (Figure 6, top panel).[15]

Among children, own Social Security incidence peaks at 10% of the population at age 18. Children generally receive benefits if they have a parent who either receives Social Security benefits or is deceased. To receive benefits, children need to be either (a) younger than age 18, (b) younger than age 19 and still attending primary or secondary school, or (c) any age with a disability that began before age 22.[16] The share of children receiving benefits increases with age to 10% at age 18 and then declines rapidly, hitting 0.6% at age 21. Children with Social Security are about evenly split between those receiving disability benefits and those receiving retirement or survivor benefits.[17]

In the early 20s, the share of the population directly receiving Social Security benefits begins to grow again with age, albeit slowly, hitting 12% at age 59. Nearly all the growth in own Social Security incidence over these ages represents individuals receiving disability benefits. At age 59, nearly all Social Security beneficiaries receive disability payments.

After age 59, growth in own Social Security income incidence accelerates—first at age 60, when individuals with a deceased spouse can generally first claim survivor benefits,[18] and again at age 62, the early claiming age for retirement benefits. At age 70, 94% of the population receives their own Social Security income. By single year of age, the largest percentage point increases in own incidence occur at age 62 (when it increases from 16% to 33 percent) and the full benefit retirement age of 66 (when it increases from 58% to 80 percent).[19]

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[15] In this paper, own Social Security income refers to any benefits sent directly to an individual and which would be reported as being sent to the individual on Form SSA-1099. These would include an individual's own benefits—that is, disability and retirement benefits to which the individual is entitled based on their own work history. It would also include benefits paid to children or spouses (including survivors) based on the work history of a parent or spouse.

[16] For a more detailed discussion of benefit eligibility for children, see https://www.ssa.gov/pubs/EN-05-10085.pdf.

[17] The tax data allow us to identify disability benefits but do not allow us to distinguish between retirement and survivor benefits.

[18] Disabled widows/widowers and those with a child younger than age 16 can claim survivor benefits before age 60.

[19] Age 66 was the full benefit retirement age for individuals born from 1943 through 1954 (age 74 through age 63 in 2017). The full benefit retirement age increases ratably to age 67 for those born in 1960 or later (aged 57 or younger in 2017). It had been aged 65 for individuals born in 1937 or earlier (aged 80 or older in 2017).

When looking more broadly at the share of the population who received Social Security either directly or through a spouse, we see a similar pattern of incidence by age except during middle age (Figure 5, top panel). Through age 43, less than 1.0% of the population did not receive Social Security benefits but had a spouse who did—either because the spouse received disability benefits or because the spouse was older and had already claimed retirement benefits. After age 43, spousal only Social Security income incidence increases with age, peaking at 12% of the population at age 61. This share then declines with age as the share of married individuals with their own Social Security benefits increases. After age 70, 1.0% or less of the population receives Social Security income only indirectly through a spouse.

Within birth-year cohorts, changes in own Social Security income incidence follow the same general age pattern as in the cross-section, especially at ages 61 and younger and ages 70 and older (Figure 6, middle and bottom panels). There have been substantial changes in the share of the population claiming Social Security benefits at ages 62 through 70, however, with younger birth-year cohorts delaying claiming.

More recent cohorts are less likely to claim at age 65 or younger and more likely to claim at age 66 or older.[20] For example, own Social Security income incidence increased 29 percentage points between ages 61 and 62 for the 1942 birth year cohort, from 15% at age 61 (in 2003) to 44% at age 62 (in 2004), but only increased by 17 percentage points for the 1955 birth year cohort, from 16% at age 61 (in 2016) to 33% at age 62 (in 2017). Similarly, own Social Security income incidence increased 17 percentage points between ages 64 and 65 for the 1939 birth-year cohort but only increased by 7 percentage points for the 1952 birth-year cohort. In contrast, own Social Security income incidence only increased by 5 percentage points between ages 65 and 66 for the 1938 birth-year cohort, while it increased by 20 percentage points for the 1951 birth-year cohort.

As a result, individuals aged 62 to 69 in 2017 were less likely to receive Social Security benefits than their counterparts in 2003. Controlling for age, the largest differences were for

[20] Age 65 was the full benefit retirement age for individuals born in 1937 or earlier (aged 66 or older in 2003; aged 80 or older in 2017). The full benefit age increased in 2 month increments to age 66 for individuals born from 1943 through 1954 (aged 49 through 60 in 2003; aged 63 through 74 in 2017). It was again increased in 2 month increments to age 67 for individuals born in 1960 or later (aged 43 or younger in 2003; aged 57 or younger in 2017).

individuals aged 65, with own Social Security income incidence falling from 88% in 2003 to 58% in 2017. These differences disappeared by age 70 however, with no incidence differences between 2003 and 2017, on average, for individuals aged 70 through 74. Changes in own or spouse incidence generally follow the same pattern, with individuals aged 62 to 69 in 2017 less likely to receive Social Security benefits than their counterparts in 2003.

For those receiving Social Security benefits in the 2017 cross-section, median Social Security income generally increases with age, with both median own and per capita income above $16,000 from age 70 through age 78 (Figure 6, top panel). Median own Social Security income is substantially lower at ages when incidence either drops rapidly (age 19 through age 21) or increases rapidly (age 62 through age 66), as at those ages many of the individuals exiting or entering the benefit rolls would have received less than a full year of benefits. This effect is less notable for median per capita income during the 60s because some individuals claiming benefits mid-year had a spouse who was already receiving Social Security income. After age 78, both own and per capita median Social Security income decline only modestly with age.

The age pattern in the cross-section masks differences across cohorts as well as changes within cohorts by age (Figure 6, middle and bottom panels).

Controlling for age, more recent cohorts of retirees have higher benefits. For individuals aged 70 through 77 in 2017, both median own and median per capita Social Security income were more than 20% higher than that of their counterparts in 2003. Differences between 2017 and 2003 persist at older ages but are not as large.

There are several possible explanations as to why more recent cohorts would have higher Social Security benefits. One is that average real earnings have increased over time which, all else equal, would result in more recent cohorts having higher benefits. Another factor is that the maximum amount of annual earnings on which taxes were collected—and, thus, the maximum amount of annual earning on which benefit calculations were based—increased substantially in the 1970s and early 1980s, from roughly 125% of the average wage index (AWI) in 1972 to roughly 235% of AWI in 1983. All else equal, this change would increase benefits for those who earned above 125% of AWI in any given year. Further, it would have a greater effect

on the benefits of individuals in their 70s in 2017, as they would have been subject to the higher cap for a larger share of their working years.

Within cohorts, both median own and per capita Social Security income increases with age. For example, for the 1932 birth year cohort, median own Social Security income increases 16% between age 71 (in 2003) and age 85 (in 2017).

Again, there are several possible explanations for why median Social Security benefits would increase with age within cohorts. One reason would be selective survival. That is, to the extent that those with higher lifetime earnings live longer, surviving members of a cohort would have higher benefits, on average, than those who did not survive. Another reason would be survivors benefits. To the extent that higher earners within a married couple are more likely to die in any year, the surviving spouse would have higher own and per capita Social Security benefits than they would have had if their spouse were still alive.[21]

4.3 Retirement Income

In the 2017 cross-section, incidence of retirement income (IRA distributions plus pension and annuity income) increases with age, with 71% or more of the population receiving retirement income directly or through a spouse from age 71 through age 91 (Figure 8, top panel).

The increase in incidence of own retirement income accelerates after age 55. The largest percentage point increases in incidence were at certain ages related to pension rules. The first of these ages was age 60, immediately following the elimination of the early withdrawal penalty at age 59½ (when own incidence increases from 20% to 25 percent). The second was age 65, the normal retirement age for many DB pensions (when own incidence increases from 37% to 43 percent). And the final big increase was from age 69 to age 71, around age 70½, after which distributions generally were required from IRAs and DC plans (when own incidence increases

[21] Individuals with a deceased spouse get the greater of their own earned benefit or their survivors benefit. For individuals who have attained the full retirement age for survivors (which ranges from 66 years and 2 months for those born in 1957 to 67 years for those born in 1962 or later), survivor benefits are equal to 100% of their deceased spouse's benefit.

from 52% to 65 percent).[22] On average from age 72 through age 95, 67% of the population received retirement income directly.

When looking more broadly at the share of the population who received retirement income either directly or through a spouse, incidence was higher but generally followed the same pattern by age. From age 71 through age 91 in 2017, 71% or more of the population received retirement income directly or through a spouse.

Within birth-year cohorts, changes in retirement income incidence generally follow the same general age pattern, but there are notable differences across birth-year cohorts (Figure 8, middle and bottom panels).[23]

Controlling for age, those younger than age 70 in 2017 were less likely to receive retirement income than their counterparts in 2003, although these differences largely disappeared for those aged 70 to 74. The biggest differences were in the ages leading up to the traditional retirement age. For those aged 55 through 65 in 2017, own retirement income incidence was 5.0 percentage points lower, on average, than for those same ages in 2003, and per capita retirement income incidence was 7.0 percentage points lower.

In contrast, those aged 75 or older in 2017 were more likely to receive retirement income than their counterparts in 2003. For example, 72% of both 84- and 89-year-olds in 2017 received retirement income, either directly or through a spouse. In 2003, only 65% of 84-year-olds and 55% of 89-year-olds did.

For those with the income in the 2017 cross-section, median retirement income grows slowly with age after age 20, with the growth accelerating around age 50 (Figure 9, top panel). Median per capita retirement income peaks at $16,100 at age 71. Own retirement income peaks at $17,600 at age 68 and age 69, prior to required distributions from most IRAs and DC plans,

[22] In 2017 and earlier years, starting in the tax year an individual turns aged 70½ distributions were required from (i) traditional IRAs and (ii) defined contribution plans after separation from employment. Distributions were not required for those aged 70½ or older from (i) Roth IRAs or (ii) defined contribution plans prior to separation from employment.

[23] One notable exception is that retirement income incidence declined in 2009 for all birth-year cohorts aged 70 or older, related to the suspension of required distributions.

and then falls to $16,800 by age 71. Both own and per capita income then decline slowly with age thereafter.

As with median Social Security income, the age pattern in the cross-section masks differences across cohorts as well as changes within cohorts by age (Figure 9, middle and bottom panels).

Controlling for age, more recent cohorts generally receive more retirement income (that is, income from employer plans and IRAs), with the exception of individuals aged 51 through 63 in 2017. For example, median per capita retirement income for individuals aged 75 in 2017 was $4,100 more than it was for those aged 75 in 2003, an increase of 36 percent. Median per capita retirement income for individuals aged 85 in 2017 was $5,400 more than it was for those aged 85 in 2003, an increase of 65 percent.

Within cohorts, median own and per capita retirement income increases with age after age 70, similar to the changes with age seen for Social Security income. For example, for the 1932 birth year cohort, median own retirement income increases by 12% between age 71 (in 2003) and age 85 (in 2017).

4.4 Labor+SS+Retire Income

This section looks at the income individuals get from the combination of labor, Social Security, and retirement income. For brevity and clarity, we refer to the income received from these three sources as **Labor+SS+Retire** income in the discussion below.[24]

When the incidence and amounts of labor, Social Security, and retirement income are examined separately, it may be difficult to make sense of the results—especially during the transition into retirement.

A more coherent picture emerges when looking at the share of the population with income from at least one of these three sources: in the 2017 cross-section, incidence is high and fairly stable during prime working years and then increases further in retirement (Figure 10, top panels).

[24] When choosing our shorthand for these broad income categories, we admittedly prioritized clarity over eloquence. This is because our previous attempts to create an eloquent shorthand for Labor+SS+Retire income (such as "work-related income" and "income derived from work") caused considerable confusion among readers.

In 2017, the share of the population with their own income from at least one of these three sources is much higher after age 61. Own Labor+SS+Retire income incidence peaks at 89% in the mid-20s and then declines slowly with age to 85% at age 61. Associated with claiming of Social Security benefits, own incidence increases sharply after age 61, averaging 96% for those aged 66 or older.

In contrast, the share of the population receiving this income either directly or through a spouse increases much less dramatically after age 61. Own or spouse Labor+SS+Retire income incidence is more stable than own incidence during prime working years, equal to 92% or more of the population from age 26 through age 61 and averaging 94 percent. Own or spouse incidence also increases after age 61, albeit less dramatically than own incidence, averaging 96% for those aged 66 or older.

Although the decline in own Labor+SS+Retire income incidence prior to age 61 is largely accounted for by those who have a spouse with the income, the data indicate that some portion of the population has only intermittent work prior to claiming Social Security or receiving retirement income. In particular, Social Security benefits are only available to those who have worked, or had a spouse who worked, long enough to qualify for benefits. In the case of Social Security retirement benefits, the equivalent of 10 years of work is required. The increased incidence in Labor+SS+Retire income after age 61 indicates that some individuals/couples worked long enough to be eligible for benefits but were not employed consistently prior to claiming those benefits.

The age patterns of Labor+SS+Retire income incidence have remained stable across birth-year cohorts except for the youngest cohorts (Figure 10, middle and bottom panels). Controlling for age, own Labor+SS+Retire income incidence for individuals aged 15 through 20 in 2017 was 6 percentage points lower, on average, than it was for their counterparts in 2003.

In the 2017 cross-section, median own and per capita Labor+SS+Retire income follow a similar path through age 61, but per capita amounts decline more slowly immediately after age 61 and more quickly after age 70 (Figure 11, top panels). After age 70, median per capita Labor+SS+Retire declines 1.5% per year, on average.

Within birth-year cohorts we see age patterns similar to the cross-section for working age individuals, but substantially different for the elderly (Figure 11, middle and bottom panels). In particular, median Labor+SS+Retire income does not decline substantially after age 70—it is typically flat or increasing slightly with age.

Instead, differences at older ages in the cross-section primarily reflect differences across birth-year cohorts, with more recent cohorts having higher median Labor+SS+Retire income. Controlling for age, individuals aged 70 or older in 2017 had median per capita Labor+SS+Retire income that was at least 22% higher than their counterparts in 2003.

4.5 Summary of Changes in the Composition of Income over the Life Cycle

Throughout their lifetimes, most Americans get most of their income from three sources ultimately derived from work—labor, Social Security, and retirement income. Broadly over the life cycle, there is a decline in the importance of labor income with age and an increase in the importance of Social Security and retirement income. The typical individual derives essentially 100% of their income from labor until around age 55 and derives none of their income from labor by the time they are aged 68.

Although patterns of work and retirement over the life cycle have been generally consistent over time, we find some important difference across cohorts.

We find younger birth-year cohorts are more likely to work at older ages and have higher labor income at older ages conditional on working. For example, controlling for age, the share of individuals aged 62 to 67 in 2017 with their own labor income was nearly 5 percentage points higher, on average, than their counterparts in 2003, and their median own labor income was more than $9,000 higher, on average.

We find younger birth-year cohorts are more likely to delay claiming Social Security benefits and delay receiving income from employer-sponsored retirement plans and IRAs. For example, controlling for age, individuals aged 65 in 2017 had own Social Security income incidence 30 percentage points lower than those age 65 in 2003 (58% versus 88 percent) and had own retirement income incidence that was 4 percentage points lower (43% versus 47 percent). For those aged 70 to 74 in 2017, however, there was no difference, on average, in either

incidence measure relative to their counterparts in 2003. In fact, for individuals aged 75 or older in 2017, incidence of retirement income was higher than it was for their counterparts in 2003.

Finally, we find that younger birth-year cohorts have higher amounts of both Social Security income and retirement income. For example, median per capita Social Security income was $3,050 more and median per capita retirement income was $4,100 more for individuals aged 75 in 2017 than it was for those aged 75 in 2003, increases of 23% and 36% respectively. Median per capita Social Security income was $780 more and median per capita retirement income was $5,400 more for individuals aged 85 in 2017 than it was for those aged 85 in 2003, increases of 5.4% and 65% respectively.

5. Conclusion

In this study, we use administrative tax data to build a series of repeated cross-sections and use that date to create synthetic birth-year cohorts. These data allow us to analyze differences by age within the synthetic cohorts as well as differences across cohorts controlling for age. This study complements Brady and Bass (2023a), which used panel data to follow individuals from age 55 to age 72, and Brady and Bass (2024) which uses cross-sectional data to analyze differences income across all age groups.

Our primary finding is that the decline in median spendable income after age 70 observed in cross-sectional data reflects differences across cohorts rather than a typical income pattern with age. Within cohorts, median spendable income is relatively flat after age 70. Instead, differences by age in the cross section are largely driven by differences across cohorts. Controlling for age, median total income in 2017 was 24% higher than in 2003 for individuals aged 67 or older.

We find younger birth-year cohorts: are more likely to work at older ages and have higher labor income at older ages conditional on working; are more likely to delay claiming Social Security benefits and delay receiving income from employer-sponsored retirement plans and IRAs; are more likely to have income from employer plans and IRAs after age 70; and have higher amounts of both Social Security benefits and (non-Social Security) retirement income.

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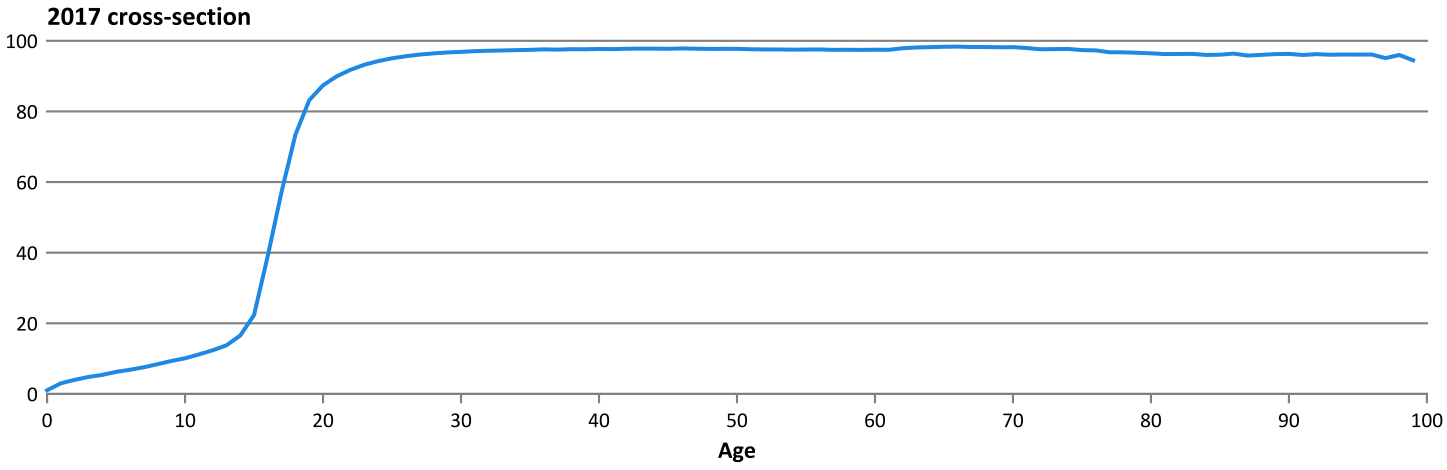
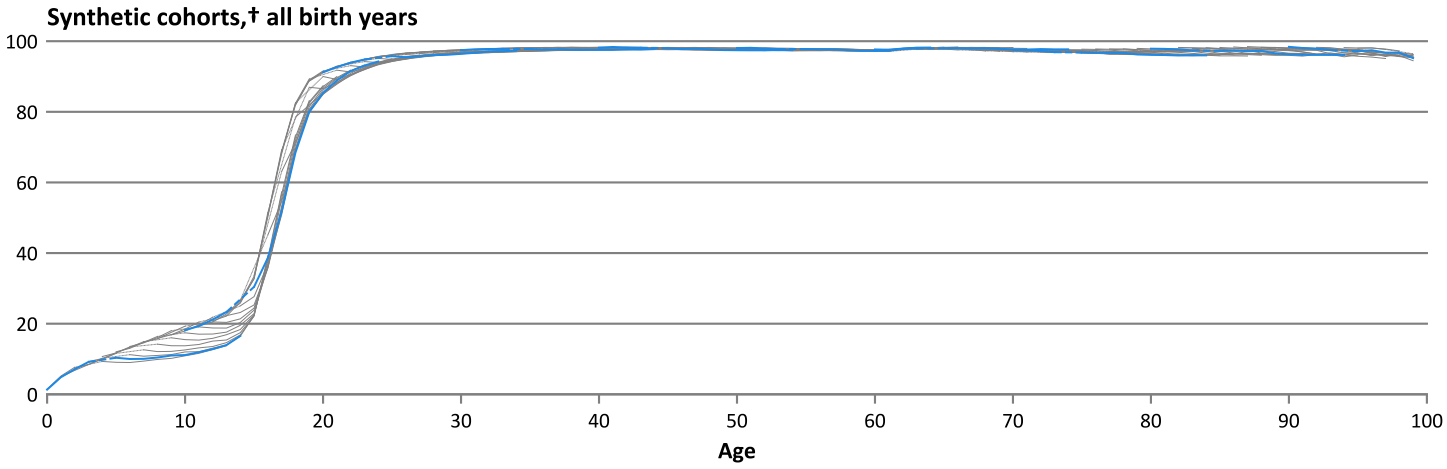
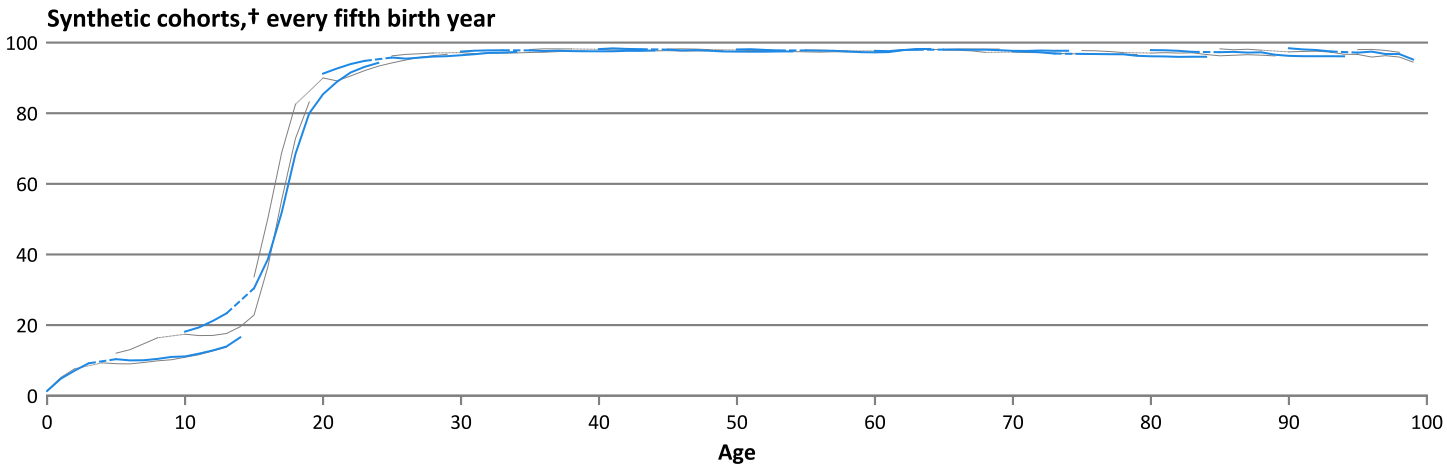
Figure 1

More Recent Cohorts Less Likely to Have Income Before Age 26

Own or spouse income incidence* by age, thousands of constant 2017 dollars







*Individuals are categorized as having income if they have non-zero per capita income in at least one of six broad income categories (labor, Social Security, retirement, investment, business/farm/rents/royalties, or other) or in any of the components of investment income (taxable interest, tax-exempt interest, dividends, or gains/losses).

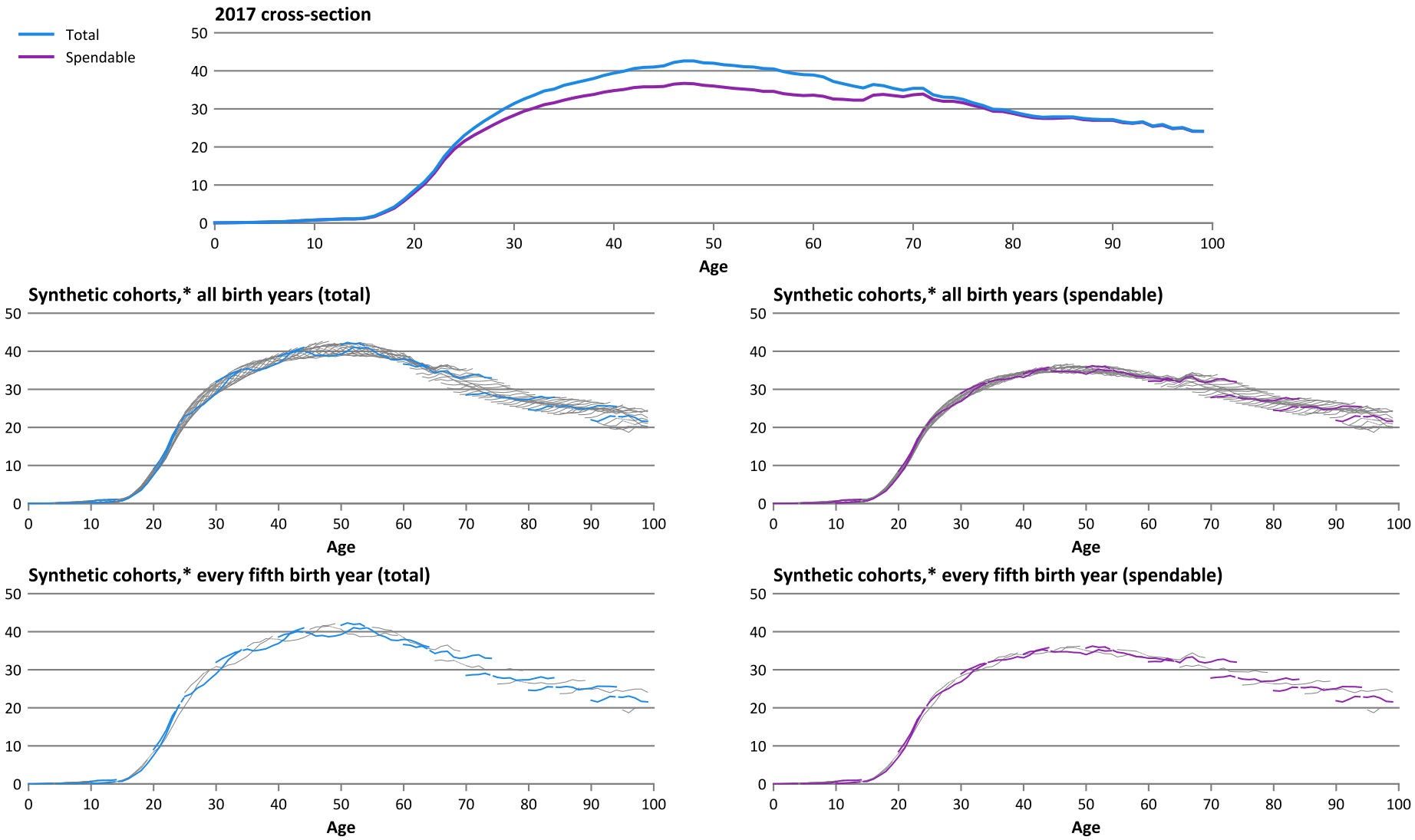
†Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Blue lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 2

Spendable Income Fluctuates Less than Total Income over Both the Lifecycle and Business Cycle

Conditional median per capita income by age, thousands of constant 2017 dollars



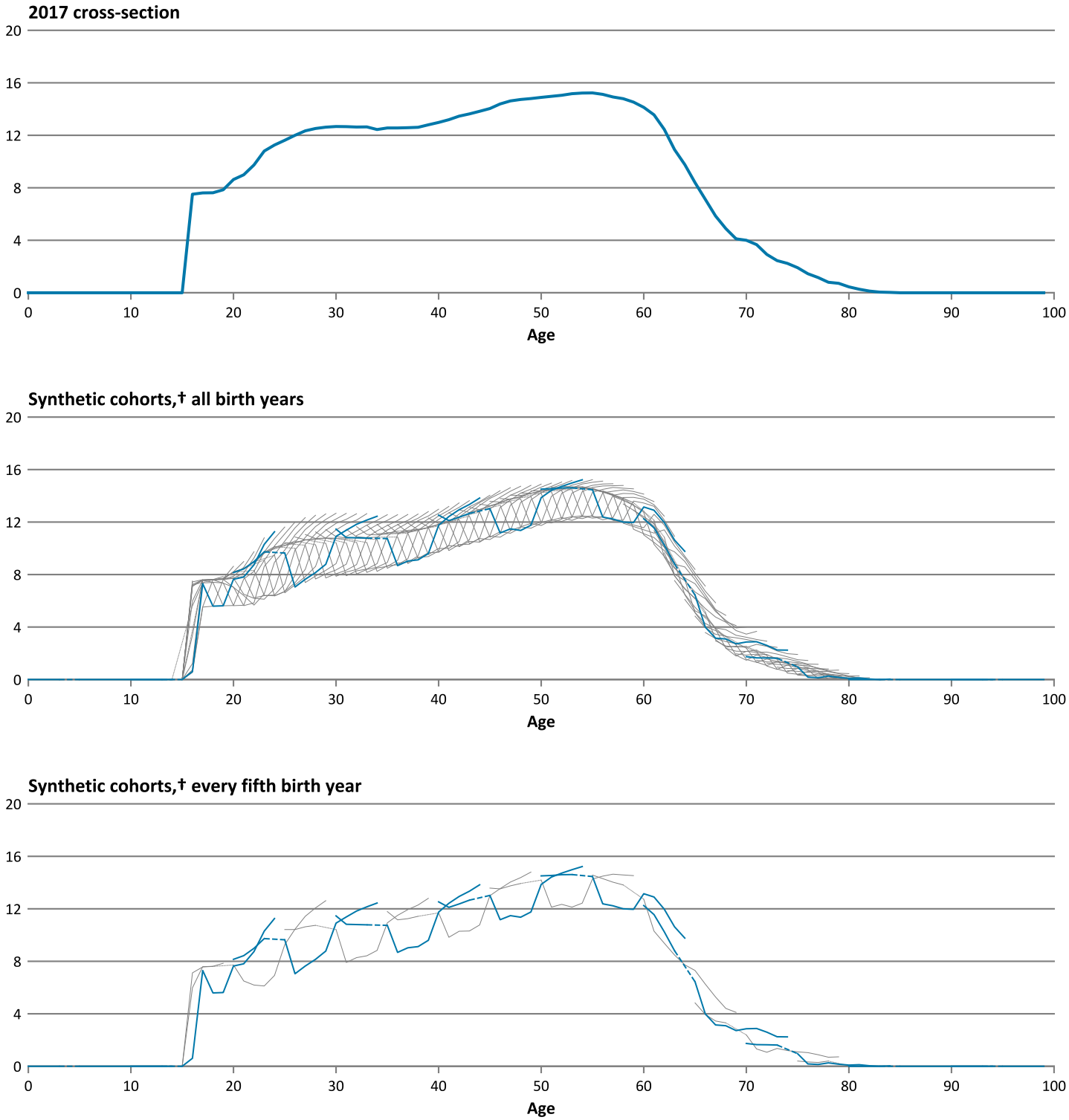
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Blue and purple lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 3

Median Effective Tax Rates Fell From 2009 Through 2012

Median total federal tax rate* by age, percentage



*Tax rates are calculated for each individual as their average effective tax rate—that is, the rates are calculated as taxes paid divided by total income. Medians are the median rate across individuals with total income, regardless of whether they have federal income or payroll taxes.

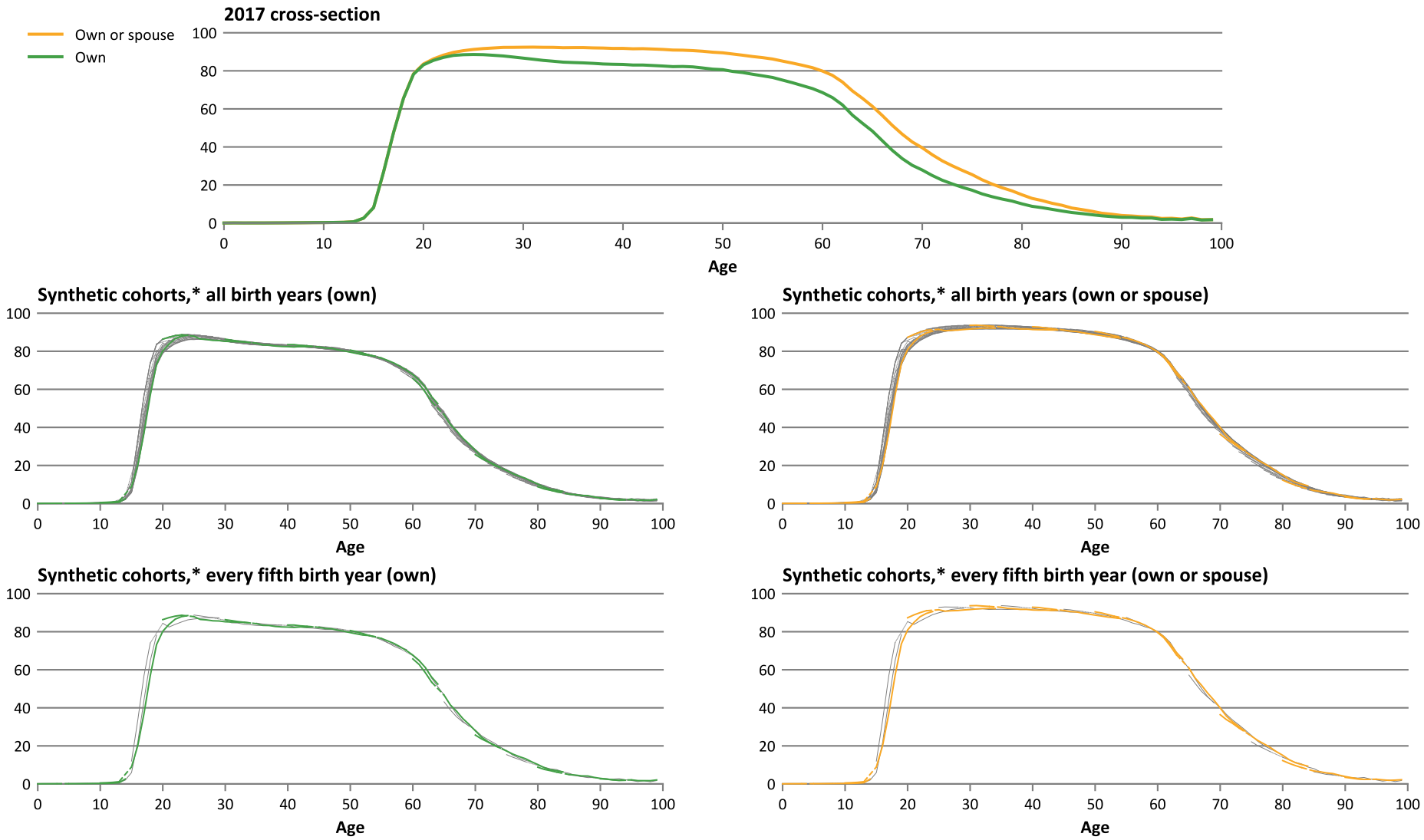
†Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Blue lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 4

More Recent Cohorts More Likely to Work When Older

Labor income incidence by age, percentage



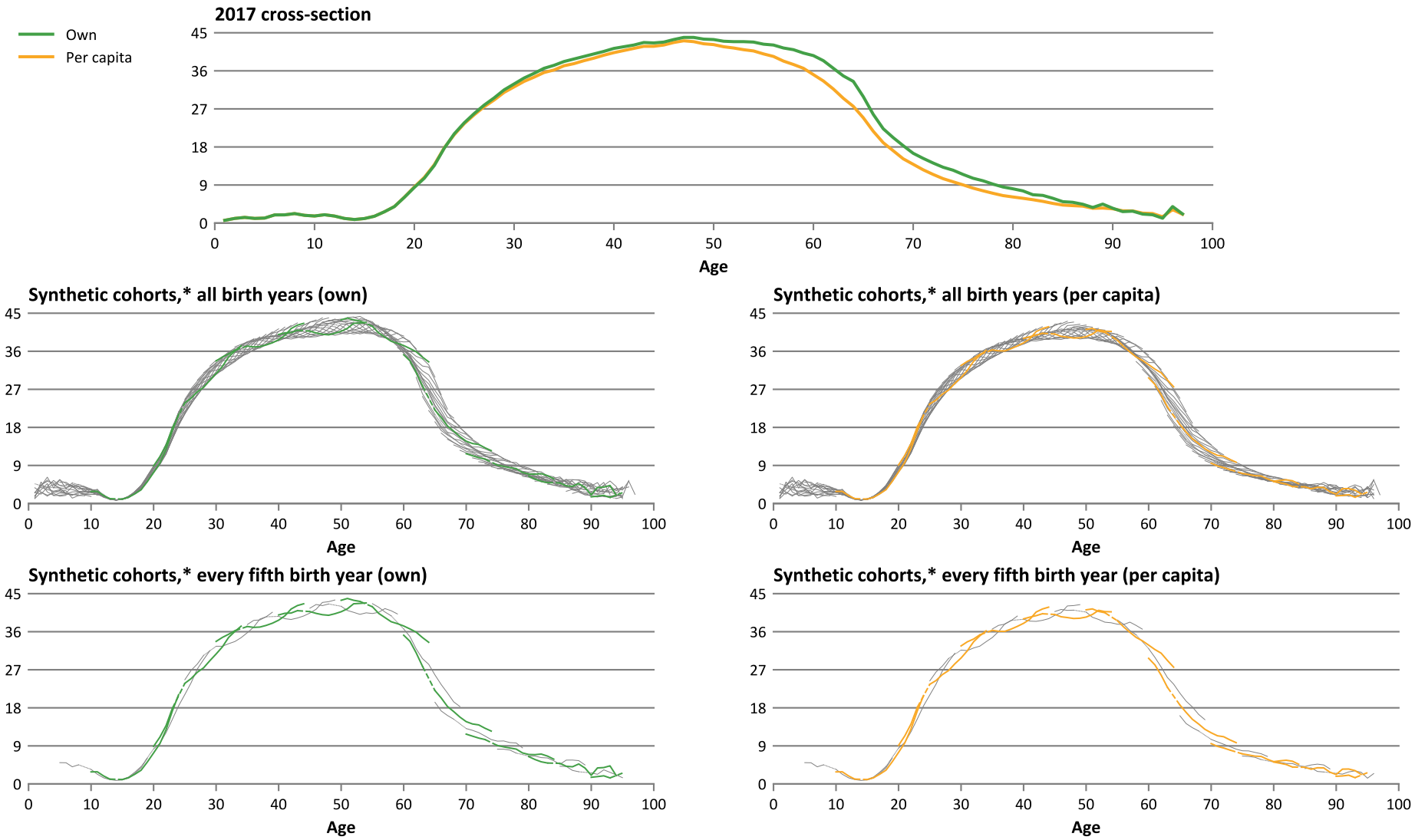
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 5

Conditional on Working, More Recent Cohorts Have Higher Earnings When Older

Conditional median labor income by age, thousands of constant 2017 dollars



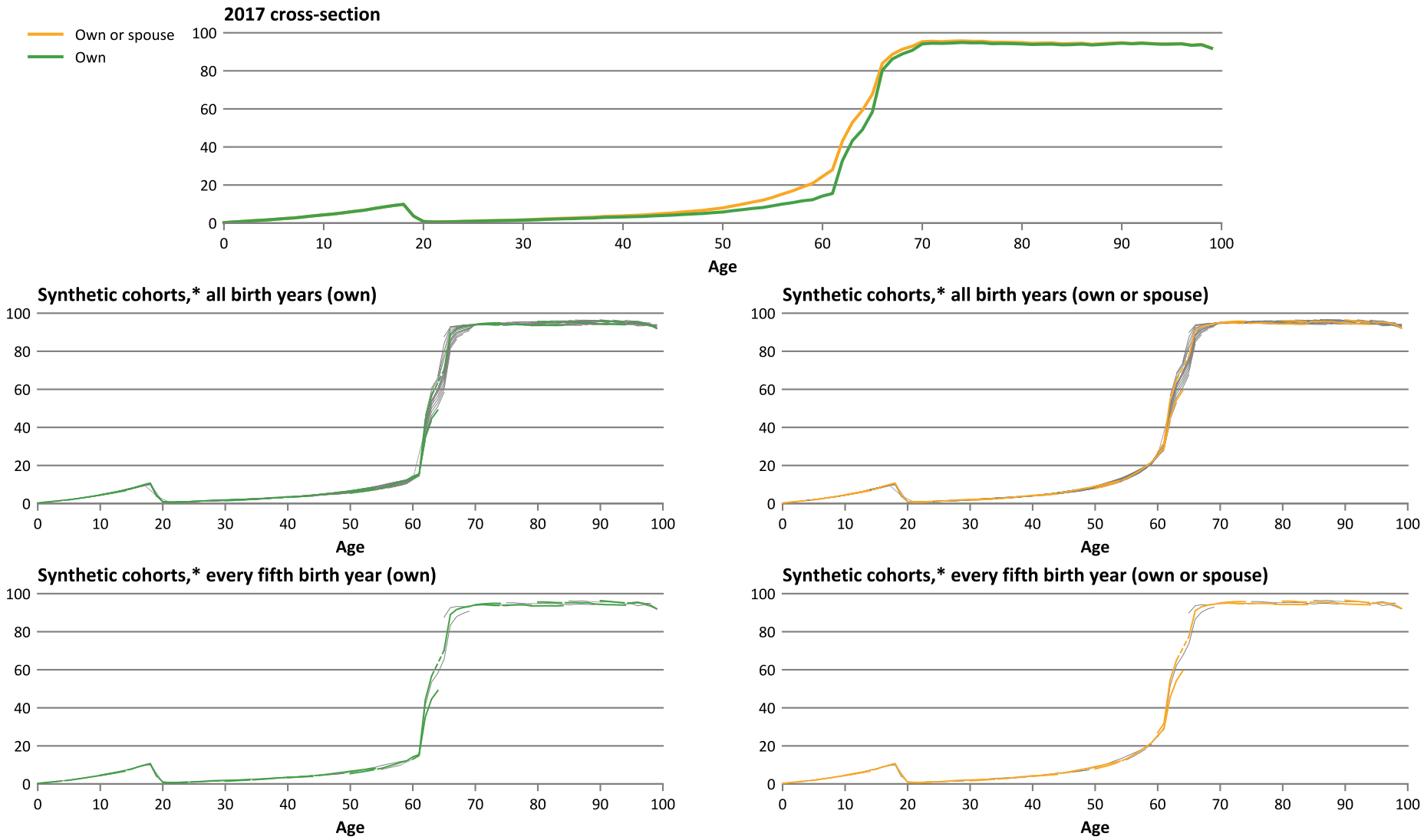
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 6

More Recent Cohorts Delaying Claiming of Social Security Benefits

Social Security income incidence by age, percentage



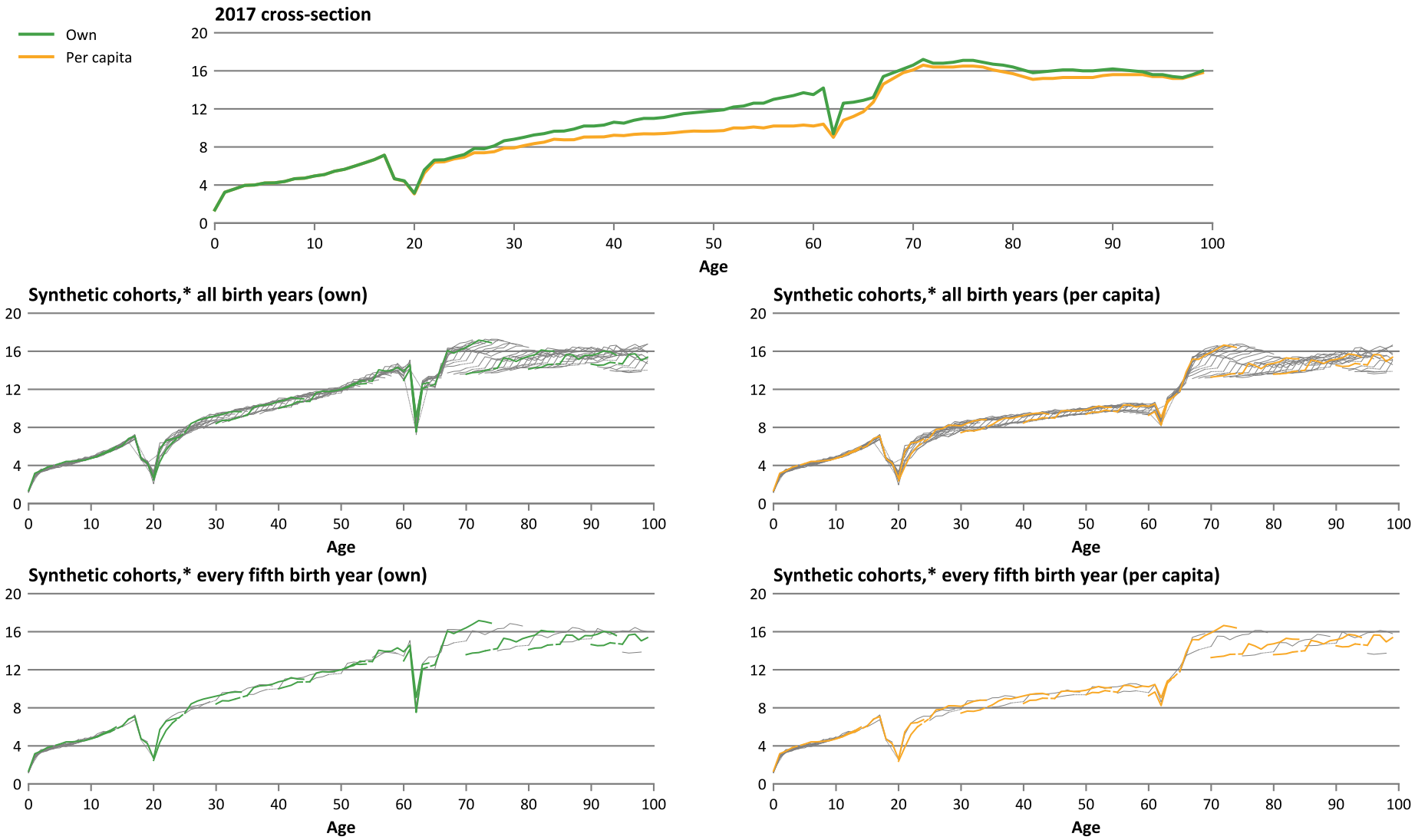
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 7

Median Social Security Benefits Increase with Age Within Cohorts; Are Higher for More Recent Cohorts

Conditional median Social Security income by age, thousands of constant 2017 dollars



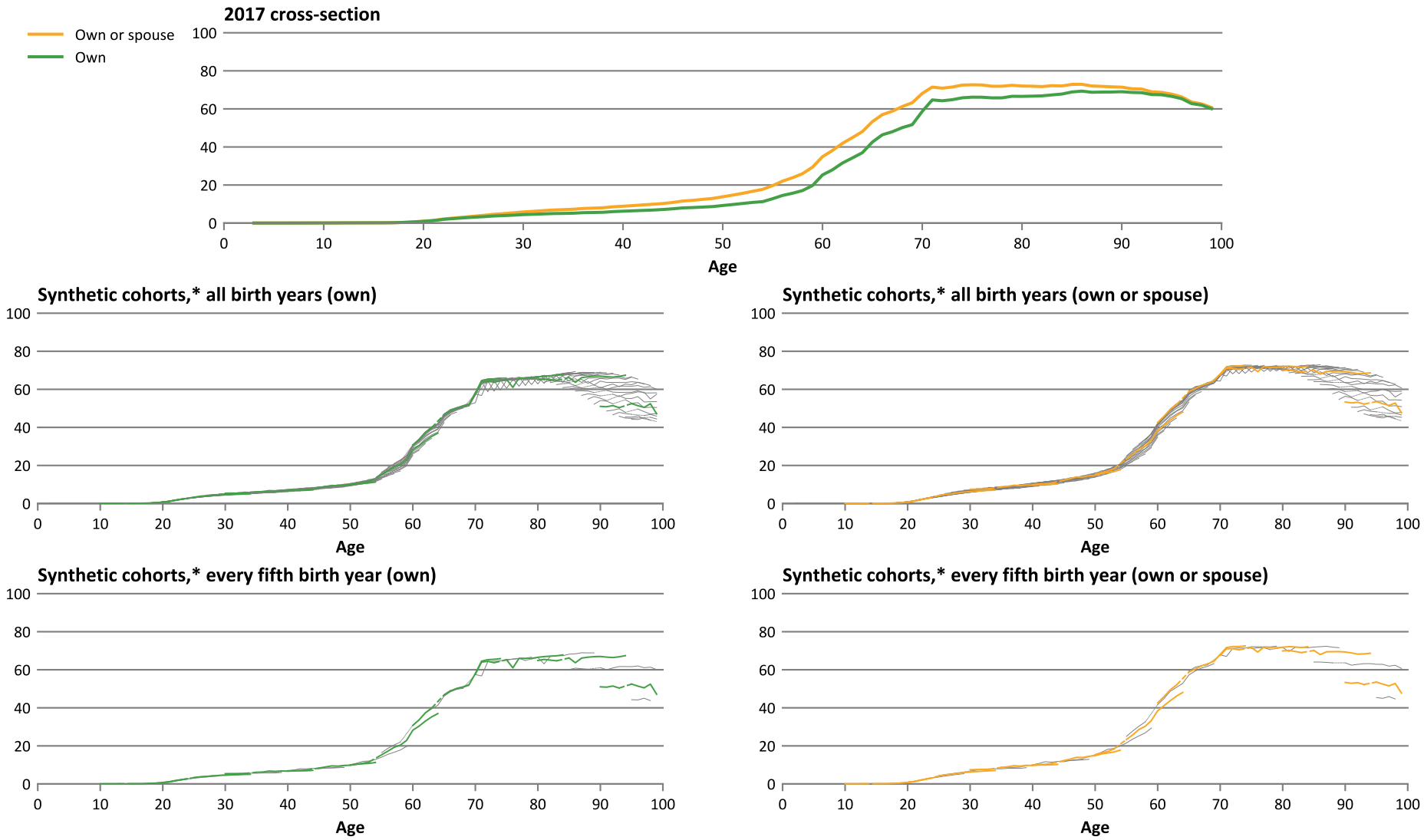
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 8

More Recent Cohorts More Likely to Have Income from Retirement Plans After Age 70

Retirement income incidence by age, percentage



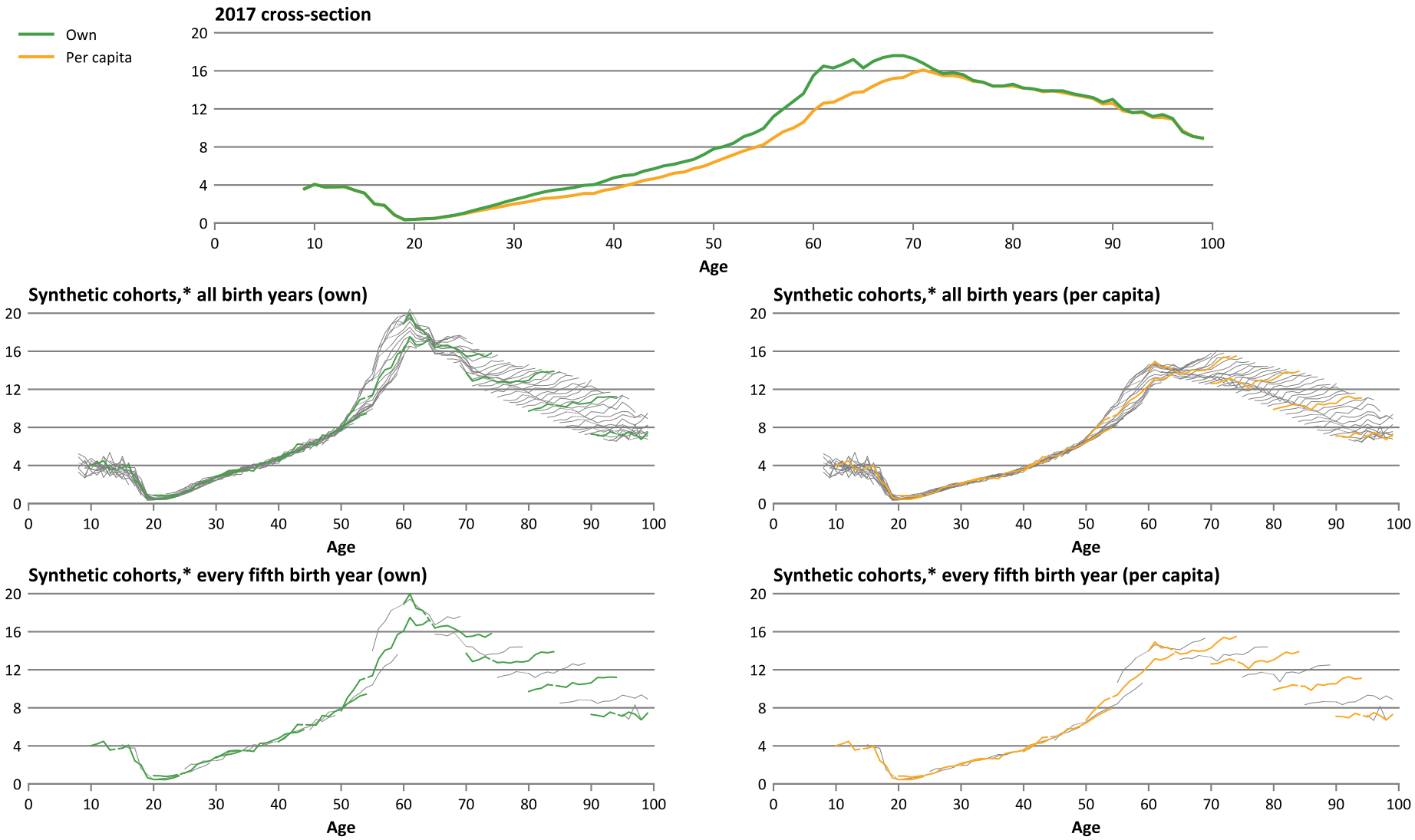
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 9

Median Retirement Plan Income Generally Increases with Age Within Cohorts; Is Higher for More Recent Cohorts

Conditional median retirement income by age, thousands of constant 2017 dollars



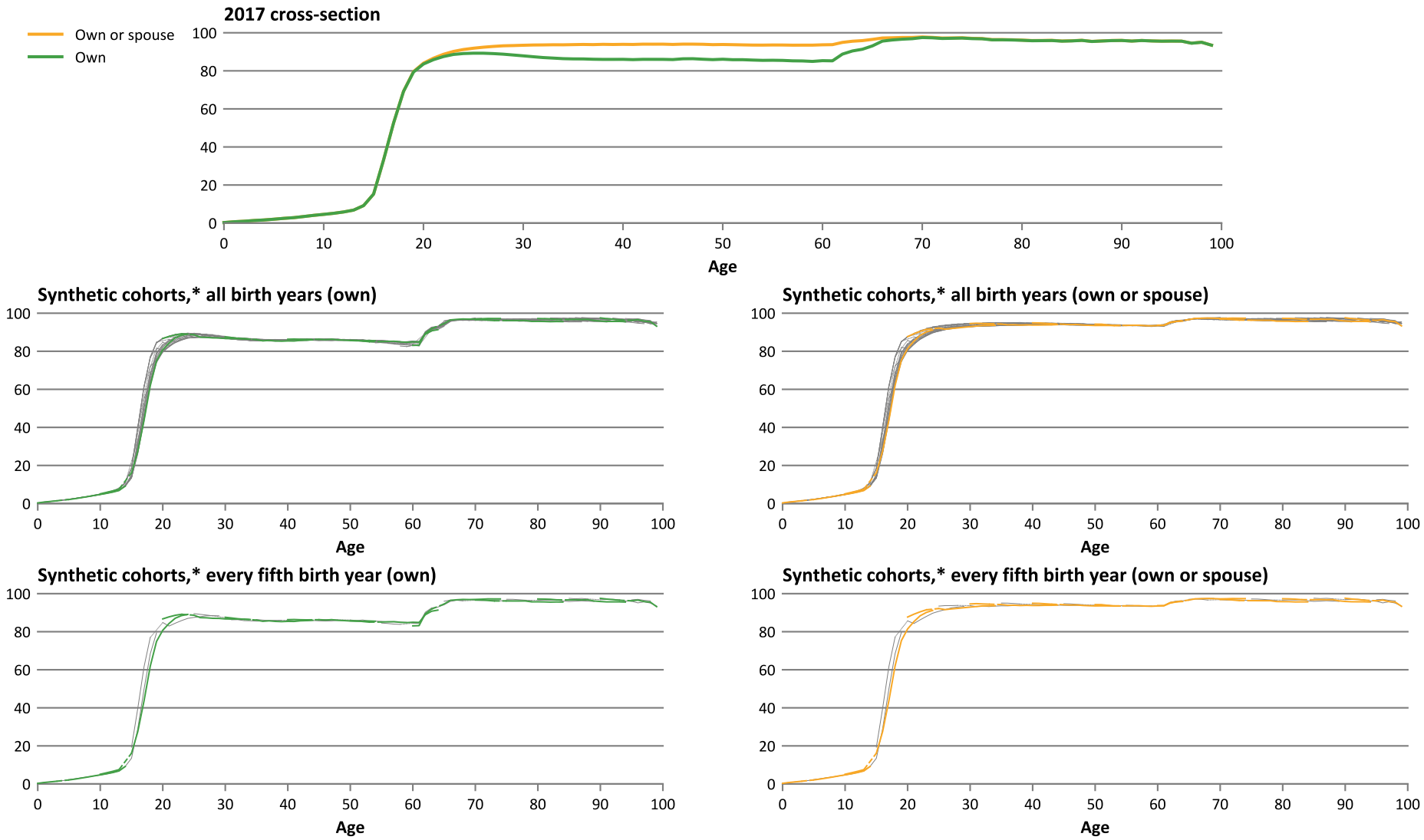
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 10

Incidence of Labor+SS+Retire Income Higher After Age 61

Labor+SS+Retire income incidence by age, percentage



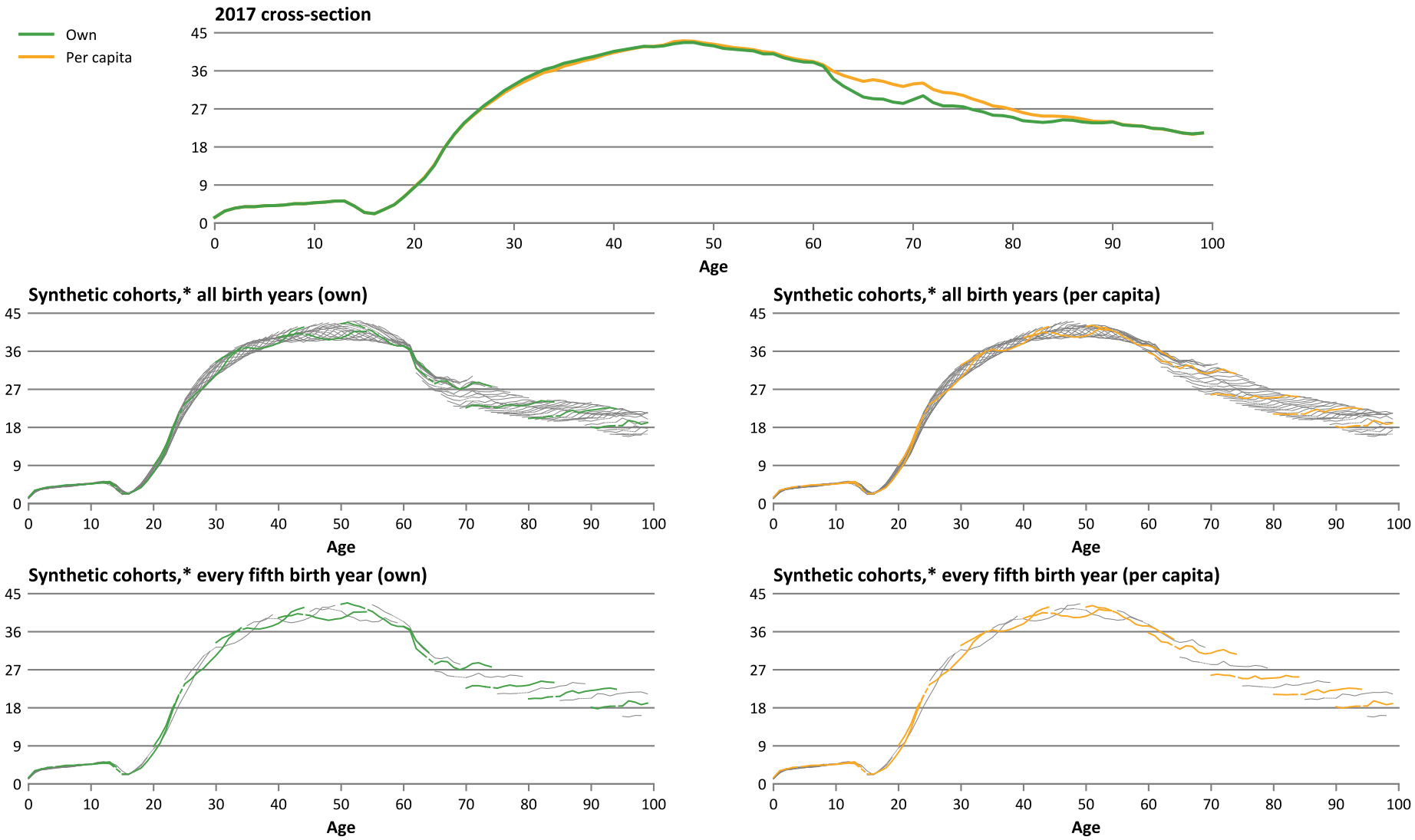
*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Figure 11

More Recent Cohorts Have Higher Median Labor+SS+Retire Income When Older

Conditional median Labor+SS+Retire income by age, thousands of constant 2017 dollars



*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Green and yellow lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data

Appendix

Tax Law Changes over the Study Period

There were many legislative changes between 2000 and 2017. These include the reduction in statutory income tax rates that occurred in steps after 2000 (partially reversed in 2013) and the addition of new taxes to finance Medicare—the additional Medicare tax and the Net Investment Income Tax. Some changes were temporary—such as the Make Work Pay Tax Credit in 2009 and 2010 and the 2.0 percentage point reduction in the employee share of the Social Security payroll tax in 2011 and 2012. Other changes—such as the increase in the child tax credit (CTC) and changes to the earned income tax credit (EITC)—only affected taxpayers with qualified dependent children.

We summarize the most prominent changes to federal income and payroll taxes that occurred from 2000 through 2017 below.

Selected Legislation that Affected Federal Individual Taxation from 2000 through 2017

Acronym	Full Name
EGTRRA	Economic Growth and Tax Relief Reconciliation Act of 2001
JGTRRA	Jobs and Growth Tax Relief Reconciliation Act of 2003
ESA	Economic Stimulus Act of 2008
EESA	Emergency Economic Stabilization Act of 2008
ARRA	American Reinvestment and Recovery Act of 2009
ACA	Affordable Care Act of 2010
TRUIRJCA	Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010
ATRA	American Taxpayer Relief Act of 2012

Legislative Changes to Statutory Tax Rates on Ordinary Taxable Income[1]

2000 ordinary statutory tax rates

- 15 percent
- 28 percent
- 31 percent
- 36 percent
- 39.6 percent

EGTRRA

- Effective 2002:
  - Created new 10 percent statutory tax rate bracket.
- Phased in through 2005:
  - Expanded 15 percent tax bracket for joint filers so income range was double that of single filers.
  - Lowered other statutory tax rates:
    - 28 percent to 25 percent
    - 31 percent to 28 percent
    - 36 percent to 33 percent
    - 39.6 percent to 35 percent

JGTRRA

- Effective 2003:
  - Accelerated phased-in tax rate schedule changes in EGTRRA.

ATRA

- Effective 2013:
  - Created new 39.6 percent statutory tax rate bracket.

[1] For historical annual data on tax rates and brackets, see Tax Foundation (2021).

Legislative Changes to Statutory Tax Rates on Capital Gains and Qualified Dividends

2000 capital gains statutory tax rates

- 10 percent for taxpayers in the 15 percent ordinary statutory tax rate bracket.
- 20 percent for taxpayers in or above the 28 percent ordinary statutory tax rate bracket.

JGTRRA

- Effective 2003:
  - Qualified dividends taxed at capital gains tax rates.
  - Reduced 10 percent capital gains rate to 5 percent.
  - Reduced 20 percent capital gains rate to 15 percent.
- Effective 2008:
  - Reduced 5 percent capital gains rate to zero.

ATRA

- Effective 2013:
  - Created new 20 percent statutory capital gains tax rate bracket for taxpayers in the new 39.6 percent ordinary statutory tax rate bracket.

Legislation Creating Additional Medicare Tax and Net Investment Income Tax

We count these taxes as federal income taxes rather than payroll taxes. Although these taxes are used to fund Medicare, they are based on annual income and calculated, reported, and collected on Form 1040.

2000 tax law

- Neither tax existed.

ACA

- Effective 2013:
  - *Additional Medicare Tax:* 0.9 percent tax on earned income (wage and salary income plus self-employment income) above $200,000 for single filers or $250,000 for joint filers (not indexed for inflation)
  - *Net Investment Income Tax:* 3.8 percent tax on the portion of net investment income (capital gains, dividends, taxable interest, rental and royalty income, and certain other investment income) that, when combined with other income included in modified adjusted gross income (MAGI), exceeds $200,000 for single filers or $250,000 for joint filers (not indexed for inflation)

Legislative Changes to the Child Tax Credit (CTC)[2]

2000 CTC

- $500 per child credit that was generally non-refundable but was partially refundable if a taxpayer had three or more qualifying children.
- The credit amount was reduced by 5 percent of adjusted gross income (AGI) in excess of $75,000 for non-joint filers or by 5 percent of AGI in excess of $110,000 for joint filers (not indexed for inflation).

EGTRRA

- Effective 2002:
  - Increased the per child credit to $600.
  - Made the credit partially refundable regardless of the number of children.
- Increased the per child credit incrementally until it was equal to $1,000 in 2010.

JGTRRA

- Effective 2003 and 2004:
  - Increased the per child tax credit to $1,000.

Subsequent legislation

- $1,000 credit amount extended for additional years and eventually made permanent.
- Eligibility for the refundable portion of the credit was expanded.

Legislative Changes to the Earned Income Tax Credit (EITC)[3]

2000 EITC

- A credit that phases in with earned income and phases out with the greater of earned income or adjusted gross income (AGI).
- The EITC credit formula differs for taxpayers with (1) no children; (2) one child; and (3) two or more children.

EGTRRA

- Increased—in steps in 2002, 2005, and 2008—the income levels at which credits begin phasing out for married couples.

ARRA

- Effective 2009:
  - Further increased the income levels at which credits begin phasing out for married couples.
  - Created a new higher credit for taxpayers with 3 or more children.

Subsequent legislation

- EGTRRA and ARRA changes made permanent.

[2] For a detailed legislative history of the CTC, see Crandall-Hollick (2021).

[3] For a detailed legislative history of the EITC, see Crandall-Hollick (2022).

Legislation Creating Temporary Tax Reductions for Workers

ARRA: Making Work Pay Tax Credit

- Effective 2009 and 2010:
  - Refundable credit equal to 6.2% of earned income up to $400 single, $800 joint
  - Income limited, with maximum credit phased out:
    - Between $75,000 and $95,000 of MAGI for non-joint
    - Between $150,000 and $190,000 of MAGI for joint

TRUIRJCA: Payroll tax cut

- Effective 2011 & 2012:
  - Employee share of the Social Security payroll tax cut 2.0 percentage points, from 6.2 percent to 4.2 percent.
  - Social Security payroll tax for self-employed workers cut 2.0 percentage points, from 12.4 percent to 10.4 percent.

Note on 2008 Recovery Rebate Payments

In our study, we treat recovery rebates like means tested government transfers—such as Supplemental Security Income (SSI) or Veteran Administration (VA) benefits—and neither include the rebates in our measure of income nor deduct the rebates from taxes paid.[4] We do not attempt to impute recovery rebate checks received in 2008 based on 2007 income tax returns, nor do we deduct recovery rebates claimed on 2008 tax returns from our measure of federal income taxes.

ESA:

- Authorized for Recovery Rebates to be sent out in early 2008.
  - Although sent out in early 2008 to anyone who filed a tax return in 2007, the rebates were technically a credit against 2008 taxes.
  - This allowed those who did not get a check in 2008, or who did get a check but would have gotten a bigger rebate based on their 2008 income, to claim a credit when they filed their 2008 tax return.
- Amount of the payment was based on income—2007 income for rebates sent out in early 2008 or 2008 income for those who claimed the credit on their 2008 tax return.
  - Most received $600 non-joint, $1,200 joint, plus $300 for each child eligible for the regular (that is, non-refundable portion of the) CTC.
  - The amount could be reduced for those with very low income.
  - The amount was reduced by 5% of AGI in excess of $75,000 for non-joint filers or by 5% of AGI in excess of 150,000 for joint filers.

[4] Our income measure does not include public assistance income because benefit payments from such programs as Temporary Assistance to Needy Families (TANF), Supplemental Security Income (SSI), and Veteran Affairs (VA) are not reported to the IRS—neither on tax returns nor on information returns.

Table A.1

List of Information Returns Used to Identify Nonfilers

Form number	Form name
Forms used to identify nonfilers and measure nonfiler income	
Income reporting forms	
Form W2	Wage and Tax Statement
Form W2-G	Certain Gambling Winnings
Form SSA-1099	Social Security Benefit Statement
Form 1065	Partner's Share of Income, Deductions, Credits, etc.
Form 1099-DIV	Dividends and Distributions
Form 1099-G	Certain Government Payments
Form 1099-INT	Interest Income
Form 1099-MISC	Miscellaneous Income
Form 1099-R	Distributions From Pensions, Annuities, Retirement or Profit-Sharing Plans, IRAs, Insurance Contracts, etc.
Form 1120-S	Shareholder's Share of Income, Deductions, Credits, etc.
Qualified account contribution reporting forms	
Form 5498	IRA Contribution Information
Forms used to identify nonfilers but not used to measure nonfiler income	
Income reporting forms	
Form 1041	Beneficiary's Share of Income, Deductions, Credits, etc.
Form 1042-S[a]	Foreign Person's U.S. Source Income Subject to Withholding
Form 1099-C	Cancellation of Debt
Form 1099-OID	Original Issue Discount
Form 1099-PATR	Taxable Distributions Received From Cooperatives
Form 8805[a]	Foreign Partner's Information Statement of Section 1446 Withholding Tax
Expenses and charitable contribution reporting forms	
Form 1098	Mortgage Interest Statement
Form 1098-T	Tuition Statement
Form 1098-E	Student Loan Interest Statement
Form 1098-C	Contributions of Motor Vehicles, Boats, and Airplanes
Transaction and financial account reporting forms	
Form 1099-A	Acquisition or Abandonment of Secured Property
Form 1099-B	Proceeds From Broker and Barter Exchange Transactions
Form 1099-CAP	Changes in Corporate Control and Capital Structure
Form 1099-K	Payment Card and Third Party Network Transactions
Form 1099-S	Proceeds From Real Estate Transactions
Form 8288-A[a]	Statement of Withholding on Dispositions by Foreign Persons of U.S. Real Property Interests
Form 8300	Report of Cash Payments Over $10,000 Received in a Trade or Business
FinCEN Form 103	Currency Transaction Report by Casinos
FinCEN Form 104	Currency Transaction Report
FinCEN Form 105	Report of International Transportation of Currency or Monetary Instruments
FinCEN Form 114	Report of Foreign Bank and Financial Accounts (FBAR)

Continued next page (notes at end of table)

Table A.1 (continued)

List of Information Returns Used to Identify Nonfilers

Form number	Form name
Forms used to identify nonfilers but not used to measure nonfiler income (continued)	
Qualified account distribution, transaction, and contribution reporting forms	
Form 1099-Q	Payments From Qualified Education Programs Under Sections 529 and 530
Form 1099-SA	Distributions From an HSA, Archer MSA, or Medicare Advantage MSA
Form 3921	Exercise of an Incentive Stock Option Under Section 422 (b)
Form 3922	Transfer of Stock Acquired Through an Employee Stock Purchase Plan Under Section 423 (c)
Form 5498-ESA	Coverdell ESA Contribution Information
Form 5498-SA	HSA, Archer MSA, or Medicare Advantage MSA Information
Other forms	
Form DS-11	Application for a US Passport
Form 1097-BTC	"Bond Tax Credit"
Form 1098-Q	"Qualifying Longevity Annuity Contract Information"
Form 1099-H	"Health Coverage Tax Credit (HCTC) Advance Payments"
Form 1099-LTC	"Long-Term Care and Accelerated Death Benefits"
Form 8596	"Information Return for Federal Contracts"
SCIR	State Corporate Information Return
SIIR	State Individual Information Return
SSSTIR	State, Sales, Service or Transaction Information Return
SWIP	State Withholding Information Return

[a] Other nonfilers with Form 1042-S, Form 8805, or Form 8288-A are assumed to be foreign citizens and excluded from the other nonfiler sample.

Table A.2

Definitions of Income and Tax Measures

Income/tax type	Definition for filers[a]	Definition for nonfilers[a]
Total income	*Labor* + *Social Security* + *retirement* + *business/farm/rents/royalties* + *investment* + *other*	
Positive total income	Calculated as total income above, with any income component that is negative set equal to zero	
Income originating from work	*Labor* + *Social Security* + *retirement*	
Total spendable income	**Total income – total taxes**	
Spendable income originating from work	**Income originating from work – total taxes on income originating from work**	
Components of Income		
Labor	Wage and salary + self-employment + unemployment compensation – health savings account deduction reported on Form 1040 (line 25) – self-employed health insurance deduction reported on Form 1040 (line 29) – self-employed SEP, SIMPLE, and qualified plans deduction reported on Form 1040 (line 28) – IRA deduction reported on Form 1040 (line 32) – Form 5498 Box 1 (IRA contributions) to traditional IRAs in excess of IRA deduction reported on Form 1040 – Form 5498 Box 1 (IRA contributions) to Roth IRAs	Wage and salary + self-employment + unemployment compensation – Form 5498 Box 1 (IRA contributions) to traditional IRAs – Form 5498 Box 1 (IRA contributions) to Roth IRAs
Wage and salary	Wages, salaries, tips, etc. reported on Form 1040 (line 7) – Roth contributions reported in Form W-2 Box 12	Form W-2 Box 1 (wages, tips, other compensation) + Form W-2 Box 8 (allocated tips) – Roth contributions reported in Form W-2 Box 12
Self-employment	Net self-employment earnings from Schedule SE (Section A line 4 or Section B Part I line 4a).	Business and farm * 92.35%
Unemployment compensation	Unemployment compensation reported on Form 1040 (line 19)	Form 1099-G Box 1 (unemployment compensation)

Continued next page (notes at end of table)

Table A.2 (continued)

Definitions of Income and Tax Measures

Income/tax type	Definition for filers[a]	Definition for non-filers[a]
Social Security	The greater of: • Social Security benefits reported on Form 1040 (line 20a), or • Form SSA-1099 Box 5 (net benefits)	Form SSA-1099 Box 5 (net benefits)
Retirement	IRA distributions + pensions and annuities	
IRA distributions	Non-rollover IRA distributions reported on Form 1040 (lines 15a and 15b)[b]	Non-rollover IRA distributions reported on Form 1099-R[b]
Pensions and annuities	Non-rollover distributions from pensions and annuities reported on Form 1040 (lines 16a and 16b)[b]	Non-rollover distributions from pensions and annuities reported on Form 1099-R[b]
Investment	Taxable interest + tax-exempt interest + dividends + gains (or losses)	
Taxable interest	Taxable interest reported on Form 1040 (line 8a) – penalty on early withdrawal of savings reported on Form 1040 (line 30)	Form 1099-INT Box 1 (interest income) + Form 1099-INT Box 3 (interest on US Savings Bonds and Treas. obligations) + Form 1120-S Box 4 (interest income) + Form 1065 Box 5 (interest income) – Form 1099-INT Box 2 (early withdrawal penalty)
Tax-exempt interest	Tax-exempt interest reported on Form 1040 (line 8b)	Form 1099-INT Box 8 (tax-exempt interest) + Form 1099-DIV Box 10 (exempt-interest dividends)
Dividends	Ordinary dividends reported on Form 1040 (line 9a)	Form 1099-DIV Box 1a (total ordinary dividends) + Form 1120-S Box 5a (ordinary dividends) + Form 1065 Box 6a (ordinary dividends)
Gains (or losses)	Capital gain (or loss) reported on Form 1040 (line 13) + other gains reported on Form 1040 (line 14)	Form 1099-DIV Box 2a (total capital gain distr.)
Business/farm/ rents/royalties	Business and farm + rents, royalties, etc. – self-employment – deductible portion of self-employment tax reported on Form 1040 (line 27)	Business and farm + rents, royalties, etc. – self-employment – 0.5*self-employment tax

Continued next page (notes at end of table)

Table A.2 (continued)

Definitions of Income and Tax Measures

Income/tax type	Definition for filers[a]	Definition for non-filers[a]
Business and farm	Business income on Form 1040 (line 12) + farm income on Form 1040 (line 18)	Form 1099-MISC [Boxes: 5 (fishing boat proceeds); 6 (medical and health care payments); 7 (nonemployee compensation); 10 (crop insurance proceeds); 14 (gross proceeds paid to an attorney)] + Form 1099-G [Boxes: 6 (taxable grants); 7 (agriculture payments); 9 (market gain)] + Form 1065 Box 4 (guaranteed payments)
Rents, royalties, etc.	Rental real estate, royalties, partnerships, S corporations, trusts, etc. on Form 1040 (line 17)	Form 1099-MISC Box 1 (rents) + Form 1099-MISC Box 2 (royalties)
Other	Other income reported on Form 1040 (line 21) + alimony received reported on Form 1040 (line 11) – alimony paid reported on Form 1040 (line 31a)	Form 1099-MISC Box 3 (other income) + Form 1099-MISC Box 8 (substitute payments in lieu of dividends or interest) + Form 1099-G Box 5 (RTAA payments) + Form W2-G Box 1 (gross winnings)
Taxes		
Total taxes	***Payroll taxes* + *federal income taxes***	
Total taxes on income originating from work	***Payroll taxes* + *federal income taxes on income originating from work***	
Payroll taxes	OASDI tax on wages + HI tax on wages + (0.5 * self-employment tax)	
OASDI tax on wages	Form W-2 Box 4 (Social Security tax withheld) + (6.2% * unreported tips reported on Form 4137 line 6) + (6.2% * wages reported on Form 8919 line 6), subject to maximum withholding ($7,886 in 2017)	Form W-2 Box 4 (Social Security tax withheld), subject to maximum withholding ($7,886 in 2017)
HI tax on wages	Form W-2 Box 6 (Medicare tax withheld) + (1.45% * unreported tips reported on Form 4137 line 6) + (1.45% * wages reported on Form 8919 line 6)	Form W-2 Box 6 (Medicare tax withheld)
Self-employment tax	Deductible portion of self-employment tax reported on Form 1040 (line 27) * 2	Minimum of 15.3% * self-employment or federal income tax withheld on Form 1099-MISC and Form 1099-G

Continued next page (notes at end of table)

Table A.2 (continued)

Definitions of Income and Tax Measures

Income/tax type	Definition for filers[a]	Definition for non-filers[a]
Federal income taxes	Total tax reported on Form 1040 (line 63) – self-employment tax – payroll taxes on wages not reported on Form W-2 – credits treated as tax payments[c]	Sum of federal income tax withheld on Form W-2, Form SSA-1099, Form 1099-R, Form 1099-INT, and Form 1099-DIV + federal income tax withheld on Form 1099-MISC and Form 1099-G in excess of self-employment tax + Form W-2 Social Security tax withheld in excess of OASDI tax on wages
Federal income taxes on income originating from work	*Federal income taxes* * (**income originating from work** / **total income**)	

Notes

[a] The line numbers referenced in the definitions refer to form for tax year 2016.

[b] Non-rollover distributions exclude rollovers, Roth conversions, and Section 1035 exchanges of annuity contracts. In addition, we exclude from retirement income any amounts attributable to the recharacterization of IRA contributions, the return of excess contributions, or distributions related to prohibited transactions. For a detailed explanation of how we reconcile information reported by taxpayers on Form 1040 and associated Forms and Schedules with information reported by recordkeepers on Form 1099-R and Form 5498, see Brady and Bass (2020a).

[c] In 2016, credits treated as tax payments included the earned income credit (Form 1040 line 66a), additional child tax credit (line 67), American opportunity credit (line 68), and the net premium tax credit (line 69).

Form 1095 Data

Brady and Bass (2024), following Lurie and Pearce (2021), utilized a newly available tax form, Form 1095 (inclusive of Forms 1095-A, 1095-B, and 1095-C, which provide information on health insurance coverage), to identify individuals otherwise untouched by the federal tax system, including those whose only income is from public assistance. This allowed us to better reflect the full population and more accurately measure the incidence of income. However, Form 1095 data only became available in 2014 and thus would introduce a break in the implied panel design used for this paper. Relative to our prior work which included Form 1095 data, their exclusion here increases our income incidence measures, for both total income and its components, but otherwise the results of the two studies are consistent (See Figure A.3).

Exclusion of 2007 Data

Although the sample analyzed includes data from tax years 2003–2017, data for 2007 are excluded. Our study combines Form 1040 for tax filers with information returns, but generally uses the amount reported on Form 1040 if the two sources differ. Information returns are then used to allocate income between spouses, reconcile differences between the two sources, and determine the type/character of the income received. For tax year 2007, the Economic Stimulus Act of 2008 provided a tax rebate of up to $600 per taxpayer ($1,200 for joint filers) and $300 for each child of the taxpayer. This rebate was only available for individuals who filed Form 1040 with at least $3,000 of qualifying income, which significantly increased tax filing rates.[5] Importantly, the IRS released guidance directing individuals who otherwise were not required to file a return to only report income amounts necessary to meet the $3,000 threshold (for example, Veterans Affairs or Social Security benefits, and wage income if necessary).[6] This resulted in a significant decline in the incidence and amounts of many income categories for individuals who otherwise would not have filed a return for tax year 2007.

[5] An estimated 10.9 million tax returns (7 percent of all returns filed for 2007) were filed solely for the purpose of claiming the economic stimulus payment. See Internal Revenue Service (2009).
[6] See the IRS news release at www.irs.gov/pub/irs-news/esp_p4664revised.pdf.

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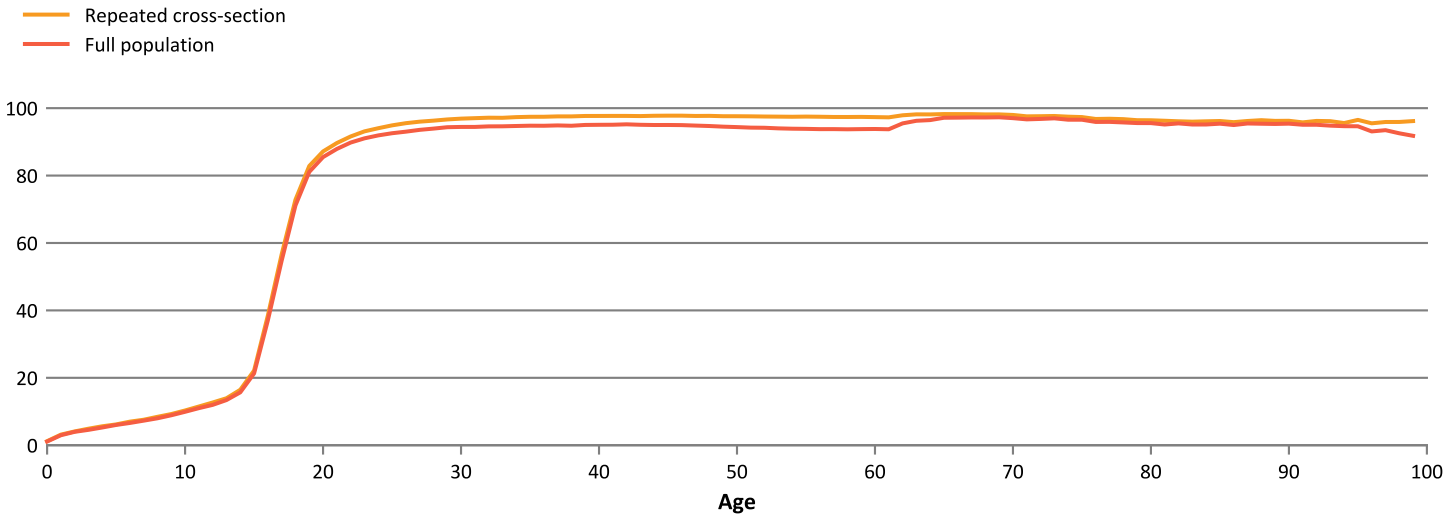
Figure A.3

Lack of Form 1095-Only Individuals Increases Measured Income Incidence

Total income incidence for repeated cross-section and full population, 2016

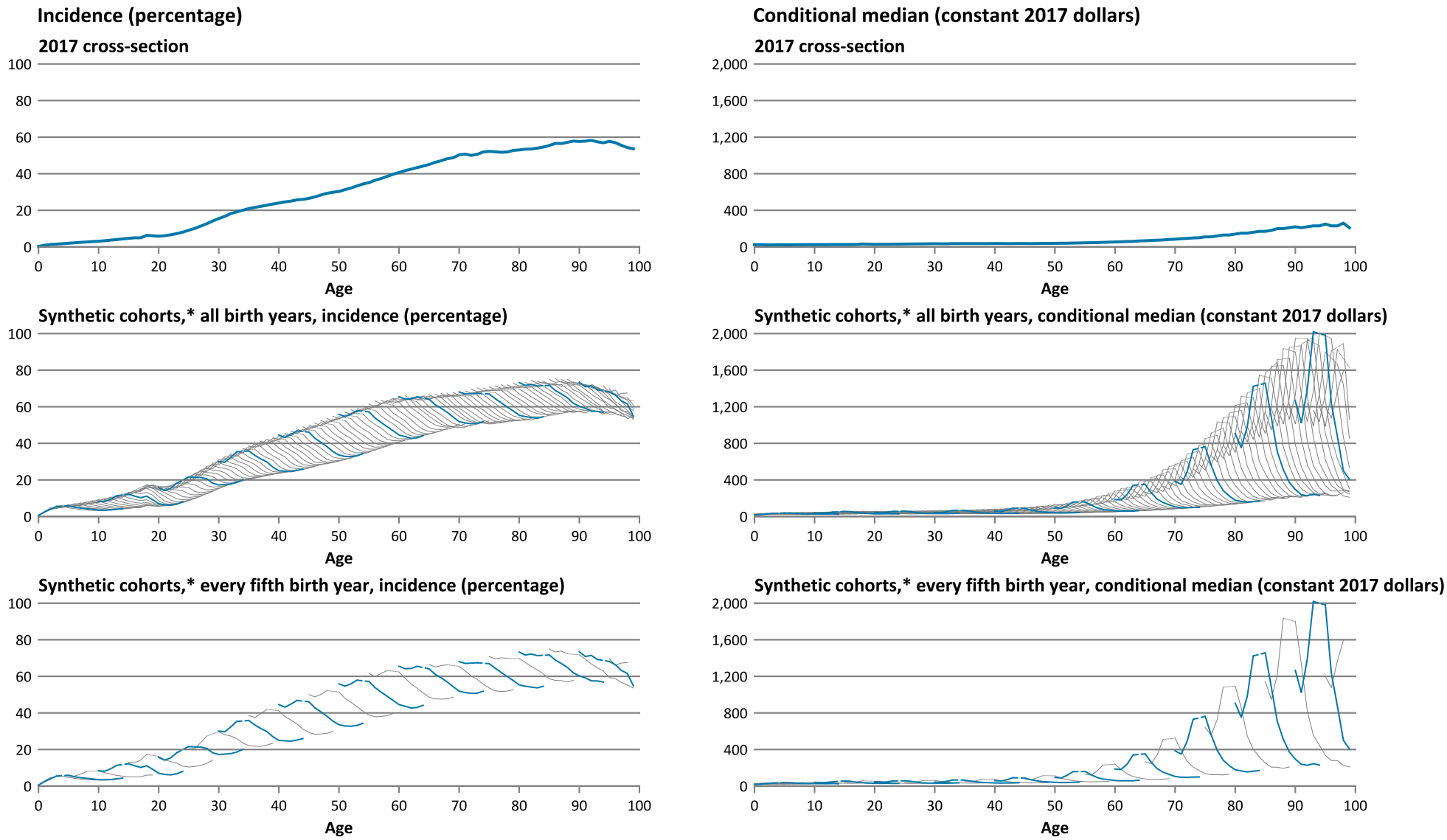


Source: Authors' tabulation of IRS data. See Brady and Bass (2024).

Figure A.4

Incidence and Amount of Taxable Interest Declined in the Wake of the Great Recession

Per capita taxable interest incidence and conditional median by age



*Synthetic birth-year cohorts use data from tax years 2003 through 2017, excluding 2007. For example, for individuals born in 1963, the statistic for age 40 would be from 2003 and the statistic for age 54 would be from 2017. Blue lines highlight every 10th birth cohort (individuals aged 0, 10, 20, etc. in 2003).

Source: Authors' tabulation of IRS data