HOW SENIORS CHANGE THEIR ASSET HOLDINGS DURING RETIREMENT

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CRR WP 2009-31
Released: December 2009
Draft Submitted: December 2009

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Abstract

We use the 1998-2006 waves of the Health and Retirement Study (HRS) to investigate how households change their asset holdings at older ages. We find a notable increase in the net worth of older households between 1998 and 2006, with most of the growth due to housing. Our results indicate that, through 2006, older households did not spend all of their capital gains. This asset accumulation provides older households with a financial cushion for the turbulence experienced after 2007. The wealth distribution is highly skewed, and the age patterns of asset accumulation and decumulation vary considerably by income group. High-income seniors increase assets at older ages. Middle-income seniors reduce their assets in retirement, but at a rate that for most seniors will not deplete assets within their expected life. Many low-income seniors accumulate fewer assets and spend their financial assets at a rate that will mostly deplete them at older ages, leaving low-income seniors with only Social Security and DB pension income at older ages.

Introduction

This paper uses the biannual Health and Retirement Study (HRS) over the period 1998 through 2006 to investigate how seniors change their asset amounts and portfolio allocations at older ages. The paper begins with a simple exploration of household balance sheets by age, cohort, year, and income level. It then uses multivariate regressions to examine the age patterns of asset holdings controlling for income, health and marital status.

Our interest is primarily to describe the adequacy of wealth in retirement and how it changes with age. Of particular interest is the spending rate of non-annuitized assets, given the rising share of total assets that are non-annuitized. We are also interested in whether differences in the tax treatment of retirement accounts compared to other assets affect households' choice in the type of asset they use to support consumption at older ages. Specifically, do households minimize tax liabilities by spending first from assets outside of retirement accounts before touching assets in retirement accounts?

While not our primary goal, this paper also provides some evidence toward the validity of the life-cycle model augmented for uncertain lifespan, health shocks, and bequests.

Over the past 25 years, the percentage of workers covered by a traditional defined benefit (DB) pension plan that pays a lifetime annuity has been steadily declining. Between 1980 and 2008, the proportion of private wage and salary workers participating in DB pension plans fell from 38 to 20 percent. In contrast, the percentage of workers covered by a defined contribution (DC) pension plan has been increasing over time. Between 1980 and 2008, the proportion of private wage and salary workers participating in only DC pension plans increased from 8 to 31 percent (U.S. Bureau of Labor Statistics 2008; U.S. Department of Labor 2002). This trend is likely to continue in the future (Butrica, Iams, Smith, and Toder 2009).

The decline in annuitized pension income is happening at the same time that Social Security replacement rates are falling due to the scheduled increase in the Social Security normal retirement age, rising taxation of Social Security income as tax

thresholds are not scheduled to increase with inflation, and Medicare premiums that are likely to increase as medical inflation outpaces other price increases (Munnell 2008). Moreover, life expectancy is likely to continue rising because of improvements in medical technology. These trends mean that seniors will have to manage a growing share of non-annuitized retirement assets for more years of old age.

We have a special interest in the composition of wealth and will focus on what happens to 401(k) and similar DC accounts at older ages. If the accounts are exhausted well before death, it may suggest a lack of prudent planning and that the shift from annuitized DB to non-annuitized DC accounts has had a significant cost on economic well-being at older ages—a trend that will get worse as DC assets increasingly replace DB assets for future retirees. If the spend-out rate is very slow—and previous research implies that that might be the case—the implications are more ambiguous. On the one hand, people may be forgoing consumption by mistake. Or they may have a strong bequest motive. They may also be influenced by tax policy. Accumulations to 401(k) plans and other similar retirement accounts are only taxable upon withdrawal.[1] People may opt to delay using money from DC retirement accounts—from which the full withdrawals are taxed—and instead live on accounts from which only the capital gains are taxable, even though such accounts are not usually called "retirement accounts." However, tax law does not allow one to delay withdrawals of 401(k) and similar accounts forever. There are some complicated exceptions, but for the most part, people must begin withdrawals at age 70-1/2. On the other hand, lower tax rates on dividends and capital gains compared to other income may induce wealthy seniors to hold more assets outside retirement accounts.

Section 1 of this paper provides some background on historic trends and previous research. Section 2 describes the data and outlines our sample selection. Section 3 examines the balance sheet for older households by year and income. It also examines the age patterns for the different components of net worth (including net housing, retirement accounts, and other net assets) by cohort and income. Section 4 of the paper uses

[1] Unfortunately, the data do not allow us to differentiate holdings of this type of traditional DC plan from Roth-type accounts where the contribution was not deductible but withdrawals are tax free. However, in the period studied, Roth accounts were relatively new, and probably had not yet accumulated large amounts of assets.

multivariate regressions to estimate the age patterns for each asset class, controlling for income, health status, marital status, and year. We use fixed-effect regression models that control for non-changing household-specific characteristics, such as race, education, birth year, and saving behaviors. In section 5, we allow the age coefficients to vary by income group and retirement account ownership. Section 6 presents some discussion on the sensitivity of our results to different assumptions, and section 7 concludes.

We find a notable increase in the net worth of older households between 1998 and 2006, with most of the growth due to increases in the value of housing. Importantly, our results indicate that, through 2006, older households did not spend all their capital gains. This asset accumulation provides older households with a financial cushion for the turbulence experienced after 2007. The wealth distribution is highly skewed, and the age patterns of asset accumulation and decumulation vary considerably by income group. High-income seniors increase assets with age until their late 80s. Middle-income seniors reduce their assets beginning in their mid-60s, but at a rate that for most seniors will not deplete assets within their expected life. Many low-income seniors accumulate fewer assets and spend their financial assets at a rate that will mostly deplete them at older ages, leaving low-income seniors with only Social Security and DB pension income at older ages. The shift from DB to DC pensions could put more low-income seniors at risk of poverty in the future in absence of a strong Social Security support system.

1. Background

The past ten years has seen violent fluctuations in financial markets and a remarkable boom and bust in housing markets. First, the dot com bubble on the stock market between 1998 and 2000 was followed by a crash between 2000 and 2002, and then a period of recovery that started in 2003 and ended badly in 2008 (Figure 1). And second, housing values rose into 2006, when homes were worth 173 percent of their 1998 value, and after a brief period of stability suffered an abrupt fall. These events had a profound impact on the balance sheets of the retired population and of those nearing retirement. Detailed data from the Health and Retirement Surveys (HRS) for 1998 through 2006 allows us to examine the balance sheets of the population through the housing and stock market boom of the early 21st century, but not the effects of the

housing bust and turmoil in financial markets that followed. Nevertheless, there is much that is interesting in the story through 2006.

The substitution of DC for DB pensions provides both advantages and disadvantages for today's workers. The easy portability of DC plans increases flexibility by reducing the degree to which workers are tied to particular jobs. Moreover, DB plans often penalize workers who wish to work to an older age.[2] But the shift from DB to DC plans has a downside. Every worker must become an investment manager. That means learning how to cope with risks and how to trade them off against expected rates of return. Some of the biggest challenges posed by DC plans arise upon retirement. While DB plans generally provide an annuity, the owner of a DC plan must decide whether to annuitize some or all of the balance or to self-insure against the risk of living longer than expected. Historically, annuitization rates have been very low (Johnson, Burman, and Kobes 2004). People in good health are much more likely to buy an annuity than those experiencing health problems and sellers have to protect themselves by charging a higher price. Because of this selection, average people have to pay above fair value for an annuity. The inability to buy an annuity at a fair price means that very few people take this option.

When people arrive at retirement with wealth that is not annuitized, they must decide on a spending plan that takes account of the fact that they may live longer than expected. In doing their planning, they face considerable uncertainty about things like the rate of return on their non-annuitized wealth and how much they will have to spend for out-of-pocket health costs, including the highly expensive possibility that they will end up needing long-term care. Because life expectancy is uncertain and because most people are risk averse, economists generally believe that people will plan to reduce consumption as they age. It is a variant on the proposition that one should eat, drink, and be merry for tomorrow you may be dead.

If people spend too much and exhaust their non-annuitized wealth before death, they will have to bring their consumption down to a floor determined by their Social Security benefits, other possible welfare payments, and any defined benefit pension that

[2] DB pensions discourage work at older ages because the increase in DB pension income from delayed retirement is often not enough to compensate for the lost year of pension benefits.

they might have earned in the past. For the bottom quintile of the income distribution, Social Security benefits are, by themselves, usually sufficient to maintain pre-retirement consumption for someone who paid Social Security taxes for most of their life. Even in the second quintile, Social Security can finance a very large portion of pre-retirement consumption (Penner 2008). Consequently, even if all non-annuitized wealth is spent, people in this quintile might not experience a huge fall in living standards. The need to develop a prudent spending plan is mainly important for the top three quintiles of the income distribution.

For the more affluent, overspending can imply a significant fall in living standards if non-annuitized wealth is exhausted before death. On the other hand, under-spending means that people are accidently foregoing the pleasure of spending as much as they can afford. A number of studies show that having a bequest motive is consistent with low spending rates among the older population.[3]

Previous literature suggests that people are, in fact, very conservative in formulating their spending plans during retirement. Hurd and Rohwedder (2008) estimate that 87 percent of surviving spouses end up with some wealth at death. Put another way, an average couple could afford to spend $98,000 in the year after retirement and still have a 95 percent chance of the surviving spouse dying with some wealth, but they choose to spend only $42,000. Single people do less well, but more than 50 percent die with some wealth.

Anderson, French, and Lam (2004) examine total wealth for 1993 to 2000 AHEAD respondents age 70 and older and find that total wealth increases with age, but they say nothing about how assets vary by income or asset type.

Love, Palumbo, and Smith (2008) investigate wealth holding at different ages after retirement and their findings also suggest that retirees tend to be extremely conservative. They examine what they call “annualized comprehensive wealth.” That is defined to be holdings of financial and nonfinancial wealth plus the expected present value of Social Security benefits, welfare payments and other defined benefit payments,

[3] See, for example, Love, Palumbo, and Smith (2008), and Anderson, French, and Lam (2004).

all divided by the number of years of expected life. This measure of wealth actually declines less fast than expected life, so that annualized wealth actually increases as people age. The increase is less for the less affluent, but nevertheless the trajectory is upward.

Many studies suggest that most current retirees are doing well (Gustman and Steinmeier 1999; Haveman et al. 2006; Haveman et al. 2007), pre-retirees are accumulating enough wealth to finance a comfortable retirement (Keister and Deeb-Sossa 2001), and future retirees are likely to receive at least as much income as previous generations (Butrica, Iams, and Smith 2003; Butrica and Uccello 2004; Smith 2002b). Scholz, Seshadri, and Khitatrakun (2006) find that over 80 percent of pre-retirees born between 1931 and 1941 have accumulated *more* wealth than their optimal savings targets. And that for the fewer than 20 percent of households who are not meeting their targets, the deficits are relatively small. Scholz and Seshadri (2008) find similar results for other birth cohorts.

Smith and Toder (1999) examined asset changes after retirement and found almost no reduction in financial assets among older households, except for a large drop in financial assets associated with the death of individuals and spouses. Yang (2006) also found that people retain a significant amount of assets at older ages.

2. Description of Data

We use data from the 1998 to 2006 HRS. The HRS is an ongoing nationally representative longitudinal survey of older Americans living in the community that collects detailed information on income, assets, health, and other topics. The survey began in 1992 with interviews of a large sample of adults born between 1931 and 1941. Spouses of age-eligible respondents were also interviewed, regardless of age. The survey reinterviews respondents every other year. In 1993, the survey began interviewing adults born before 1924 (AHEAD cohort). In 1998, the HRS added cohorts born between 1924 and 1930 (CODA cohort) and cohorts born between 1942 and 1947 (WB cohort), and the timing of the AHEAD cohort was delayed to 1998. With the addition of these cohorts, the

HRS now includes biannual data for a sample of adults born before 1948 (age 51 and older in 1998).[4] The survey allows us to follow sample households over time.

We primarily use the RAND Version I file, but augment this data with employer-provided defined contribution pension information from the core data. Our study population is limited to households born before 1947 (age 60 and older in 2006). We restrict the sample to age-eligible households for each HRS cohort. For married couples, we report the age of the financial respondent. If the financial respondent is not age-eligible for the cohort, we report the age of the age-eligible respondent. We construct a balanced panel with households that are interviewed in all waves and survive to 2006. Our analysis sample includes 8,050 households.[5]

We report three main categories of assets: primary home equity, retirement accounts (employer-provided 401(k), 403(b), IRA, and Keogh), and other net assets (non-home real estate, farm and business equity, saving, checking, certificate of deposit, money market accounts, stocks, bonds, and other saving less unsecured debt). We also report Social Security and DB pension wealth in our balance sheet analysis, but our primary focus is on the non-annuitized assets.[6] All assets and income are reported in 2008 CPI-U adjusted dollars. In order to mitigate the impact of extreme outliers, we censor asset values above the 99th percentile.[7]

While we believe the HRS data is the best available data for our analysis due to its size, timeliness, and longitudinal nature, it is important to note that wealth data reported by individuals are extremely variable and have large reporting errors (McNeil and Lamas 1988; Haider et al 2000; Smith 2002a). Wealth data also suffer from regression-to-the-mean in which respondents that overstate assets in one period are likely to report lower assets in the next period and vice versa. In spite of these limitations, Smith, Michelmore, and Toder (2008) find that the distribution of assets on the HRS compares favorably to

[4] Cohorts born between 1953 and 1948 were added to the HRS in 2004, but are not included in our analysis.
[5] We drop 1,348 households that either die before 2006 or are not interviewed in all waves from 1998 to 2006.
[6]Social Security and DB pension wealth are based on self-reported benefits using annuity factors that account for marital status, age, cohort, race, and education. For individuals that do not collect benefits before the end of the panel, we use the HRS Cross-wave Social Security and DB pension wealth data.
[7]For each asset above the 99th percentile, we assign the value at the 99th percentile. Assets below the 1st percentile are assigned the value of the 1st percentile. The percentiles are constructed within year, cohort group, and income quintile. We exclude vehicle assets from this analysis.

the Survey of Consumer Finance (generally regarded to be the best source of asset data) by age and cohort within our broad asset categories. They also confirm the noisiness of asset values in the HRS and other survey data.

3. Balance Sheet Results

In this section, we examine household asset amounts and ownership rates by asset type and year. We begin with a detailed examination of mean assets for the "typical" older household, defined as households in the middle income quintile within five-year cohort group in 2006. Households may be in different income quintiles in earlier years, but we classify them based on their 2006 income. We then examine more aggregated assets separately for all households and for low-, middle-, and high-income households.[8]

Balance sheet of typical older households. Between 1998 and 2006, the typical older household had substantial assets. Average total wealth in 1998 for middle-income households born before 1947 was over $800,000 with about 60 percent in annuitized assets (Social Security and DB pensions) and 40 percent in non-annuitized assets (Table 1). The value of annuitized assets declined over time as households aged, reducing the expected number of years over which the annuity payments would be collected. In contrast, the value of non-annuitized assets increased 20 percent during the same period. Overall, the reduction in annuitized assets exceeded the increase in non-annuitized assets and **total wealth** declined about 12 percent over the 8-year period to about $715,000.

This paper focuses on the non-annuitized wealth. These non-annuitized assets were very much affected by the fluctuations in financial markets and the housing boom—the HRS does not yet allow us to observe the effects of the 2008 stock market crash and bursting of the housing bubble. For middle-income households age 60 and older in 2006, **net worth** (the portion of wealth that excludes annuitized assets) rose about 20 percent between 1998 and 2006, with the vast majority of the gains due to increases in net housing. We expect much of these gains to evaporate with the collapse in housing prices.

[8] We use the mean rather than the median, because medians are zero for many asset types.

Net housing grew nearly 60 percent between 1998 and 2006 with steeper gains in the latter years. Households benefited from the housing boom—home values increased 45 percent. Additionally, the outstanding value of home mortgages fell 14 percent over the period. While some households increased home debt either through reverse mortgages or equity withdrawals over this period, a larger share of older households paid down their mortgages as they aged.

Retirement account balances fell about 6 percent over the period. Annual values reflect the turbulence of the stock market combined with contributions and withdrawals to these accounts. A closer look to the components of retirement accounts shows that most of the retirement wealth is held in IRA accounts, as older households either saved directly into IRAs or rolled-over employer-provided DC balances into IRAs. From 1998 to 2006, IRA balances grew while DC accounts fell, reflecting some additional roll-overs that happened during this period. This paper analyzes the combined balance of IRA and DC accounts.

Other net assets increased about 6 percent over the 8-year period. This category combines a wide assortment of assets—transaction accounts, fixed income instruments, stocks, and other net property. Within other net assets, liquid assets (checking, saving, CDs, bonds, and other saving, less unsecured debt) increased 15 percent, net other property increased 11 percent, stocks decreased 5 percent, and business equity decreased 4 percent. Unsecured debt (primarily credit card debt) declined substantially (27 percent). This debt represented less than 1 percent of average household net worth in 2006; however, based on the authors' tabulations, the HRS has substantially lower debt values and debt ownership compared to the Survey of Consumer Finance for the same cohorts and years.

The changes in mean assets combine both changes in asset ownership and asset valuation. For example, **gross primary housing** increased about 45 percent from 1998 to 2006 (Table 1). This increase was primarily due to the housing boom. But **homeownership** rates fell from 86 percent in 1998 to 81 percent in 2006 as some older households sold their primary home (Table 2). The increase in average gross primary housing underestimates the effects of the housing boom as more households had zero values in primary housing in latter years, pulling the means down.

Table 2 shows the ownership rates of middle-income households for the different components of wealth. The share of households with outstanding mortgage debt declined from 40 percent in 1998 to 32 percent in 2006. This reduction in the percent of households with mortgages indicates that most older households were not using their homes to finance non-housing consumption, at least through 2006. However, it is worth noting that in 2006, when households in our sample were 60 or older, about 40 percent of middle-income homeowners had not fully paid down their mortgages.

The share with **retirement accounts** dropped from 60 percent in 1998 to 51 percent in 2006 as many older households depleted their retirement accounts, or shifted funds to other assets. The share with **other net assets** remains stable over the period at about 97 percent, but the mix of assets within this category shifted slightly away from stocks, property, and business and toward safer and more liquid assets such as transaction accounts, bonds, and other savings. Note that stock ownership rates did not substantially fall between 2000 and 2002 despite the sharp decline in stock values during this period as most stock holders held onto these assets through the turbulent market.

Balance sheet of older households by income. Asset amounts vary significantly by household income quintile. Household asset distributions are very skewed. In 1998, the top income quintile had over twice the total wealth of the middle-income quintile and over 4 times the wealth of low-income households (Table 3). An important part of the difference in the asset holdings across income groups is due to **other net assets**, which combine transaction accounts, fixed income instruments, stocks, business equity, and other net property. In 1998, the amount held in these assets by high-income households was nearly 4 times the amount held by the middle quintile and more than 13 times of that held by low-income households. And the differences increased over time. During the 1998 to 2006 period, **net worth** (the sum of home equity, retirement accounts, and other net assets) increased by 61 percent for high-income households, 20 percent for the middle quintile, and only 12 percent for those in the lowest quintile.

Retirement account balances track the stock market to some extent. For example, balances rose between 1998 and 2000 and fell between 2000 and 2002 in all income groups, but the overall period trend differs by income group. Retirement accounts

increased by 18 percent for high-income households, but fell 6 percent for middle-income households, and fell 29 percent for low-income households.

Trends in **other net assets** also vary by income group. Other net assets increased 71 percent between 1998 and 2000 for high-income households, increased by only 6 percent for middle-income households, and fell 16 percent for low-income households. Combined retirement accounts and other net assets fell 21 percent for the low-income group, increased 2 percent for the middle-income group, and increased 58 percent for the high-income group. We infer that the spending patterns in retirement are different by income group. Based on income status in 2006, low-income households are more likely to spend their saving in retirement. Middle-income households hold saving fairly flat, while high-income households continue to accumulate assets into retirement.

Asset ownership rates also vary by household income (Table 4). In 1998, homeownership rates were above 85 percent for the middle and top quintiles, but only 64 percent for those in the bottom income quintile. For high-income households, **homeownership** rates declined slightly between 1998 and 2006. The drop was more pronounced for low- and middle-income households with a 5 percentage point decline in the study period. While few seniors sell their homes as they age, those that do are more likely to be from low- and middle-income households.

Table 4 also shows large differences in **retirement account** ownership and DB pension coverage across income groups, with ownership and coverage rates increasing with income. Among high-income households in 1998, 72 percent had retirement account assets and 78 percent had DB pension wealth, while of low-income households only 26 percent had retirement accounts and 40 percent had DB pension wealth. The share of households with retirement accounts fell over time in all income groups, but the drop was larger for the low- and middle-income groups than for the high-income group. Again, this is evidence that low- and middle-income seniors use retirement account assets to support retirement consumption to a greater extent than high-income seniors.

Balance sheet of older households by cohort. Asset values also vary by birth year. In general, older cohorts have fewer assets than younger cohorts. Real earnings and living standards have increased over time, so at any given age we should expect younger households to have accumulated more assets because they had higher

lifetime earnings than older cohorts. Moreover, many in the younger cohorts were still working and accumulating assets over the study period. Additionally, older cohorts have had more years to spend down their assets after retirement than younger cohorts.

On the other hand, wealthier households tend to live longer than less wealthy households (mortality bias), providing a reason that surviving older households might have more assets than younger households. Our sample includes households who were alive during 1998 to 2006. The young group includes some households that will not survive to age 85. But in the old group, all have survived to age 85. Overall, the forces pushing asset values down with age clearly dominated those pushing asset values upward.

The historic shift from DB to DC pensions also means that different cohorts might have a different asset mix. Older cohorts are more likely to have DB pensions. Older cohorts might also be more likely to hold financial assets outside of retirement accounts than younger cohorts because they might not have had access to defined contribution plans earlier in their life.

We summarize the asset holdings of each cohort in a set of charts that show average asset values and ownership rates by age for the full sample and separately for bottom-, middle-, and top-income quintile households. Figure 2 shows **total wealth** (annuitized plus non-annuitized wealth) holdings of our sample. Total wealth rises in all income groups from age 50 to the early-60s and declines after that. These declines were due in large part to the drop in the value of annuitized wealth (DB and Social Security) as households age.[9]

The left column of Figure 3 shows the average value of **net worth** (sum of net housing, retirement accounts, and other net assets) by age group for different income groups. The right column shows the corresponding net wealth ownership rates. Figure 3 shows distinct patterns in net worth for each income group. For low-income households, net worth generally declined as households aged. For those in the middle-income quintile, net worth increased until the late 70s and then declined. For the top-income quintile, net worth rose at all ages. Between 15 and 25 percent of households in the bottom quintile

[9] All households in our sample have some wealth, so figure 2 does not show ownership rates.

did not have any non-annuitized assets. In contrast, nearly all households in the middle and top quintiles had positive net worth.

Figure 4 shows the average value and ownership rates of **net housing** by age for different income groups. This figure suggests that much of the increase in net worth (Figure 3) was due to the housing bubble. Net home values increased for all cohort groups at all ages. Homeownership rates were about 20 percentage points lower for low-income than for high-income seniors. In all income groups, homeownership rates fell at older ages as some seniors sold their houses, but the drop in ownership was greater for low-income than for high-income households.

Age and cohort patterns are quite different for **retirement accounts** (Figure 5). Early cohorts had relatively little access to retirement accounts. IRAs and 401(k) plans were enabled by legislation from the 1970s but became popular in the 1980s and 1990s (Munnell and Sundén 2004). Our sample shows a significant decline in retirement account ownership rates with age that partly reflects cohort differences in lifetime access to these accounts and partly reflects depletion of retirement accounts with age (right column of Figure 5). The retirement account age profiles indicate different rates of asset decumulation across income groups. Retirement account balances of low-income households declined steadily from their mid 50s. Balances for those in the middle and top quintiles of income, on the other hand, rose until their late 60s and declined after that.

Figure 6 shows average **other net assets** by age and income group. Between 1998 and 2006, other net assets increased steadily for most cohorts. A closer look by income quintile suggests that these increases were due mostly to the increase in other net assets for households in the top quintiles of income. Other net assets increased with age for high-income seniors, remained fairly level for middle-income seniors, and fell for most low-income seniors. The changes in other net asset values over time and age group reflect the combined effect of asset returns, potential shifts from retirement accounts to non-retirement accounts, and shifts due to the sale of property including primary homes. The ownership rates (right column of Figure 6) show that virtually all middle- and high-income seniors have some other net assets while only about 80 percent of low-income seniors do.

While younger cohorts had more access to retirement accounts, older cohorts had more access to **DB pensions** (Figure 7). In 1998, 74 percent of households born before 1922 had DB pension wealth, while only 59 percent of households born from 1942 to 1946 did. Average DB pension wealth declined with age for all older households. Many private sector pensions are not indexed to inflation and wealth falls with each monthly payout.[10] DB rates for low-income seniors are lower than for higher-income seniors, but for older cohorts, between 40 and 50 percent of low-income seniors had some DB income. Among the youngest cohorts, who have had the longest time to have accumulated DC assets, only 35 percent had any DC accounts. The value of their accumulated DC wealth is less than half the value of young DB account holders. Low participation rates in retirement accounts among low-income workers will erode retirement incomes of future low-income seniors.

The simple balance sheet analysis presented in this section is consistent with previous research. The majority of seniors hold a substantial amount of assets in retirement. Between 1998 and 2006, non-annuitized wealth increased for most seniors, largely due to significant increases in housing values over the period. Seniors did shift their asset holdings away from stocks, business, and non-residential property as they aged and moved assets into safer, more liquid assets such as CDs, bonds, and transaction accounts. High-income seniors accumulated other net assets at older ages. For middle-income seniors, other net assets remained fairly level with age. Finally, low-income seniors substantially reduced their other net assets as they aged.

In 2006, the majority of seniors near or at retirement had substantial assets—outside the primary home. Low-income households had about $50,000 in financial assets (retirement accounts plus other net assets), middle-income households had about $200,000 and high-income households had about $1,100,000 (Table 3). A quick examination indicates that these households are spending these assets carefully.

Following Love, Palumbo, and Smith (2008), Figures 8 and 9 show the evolution of the annuity value that could be purchased with total wealth and with only financial assets, respectively, by age and income group. A declining annuity value with age

[10] Households may lose DB wealth over time when a DB covered worker dies without survivor benefits. The age slopes in DB ownership in figure 6 are more a result of different DB coverage rates within cohort group rather than an age trend.

indicates that households on average consume their assets at a rate that would deplete them before death, while a rising annuity value indicates that households consume assets at a rate that would leave them with a balance at death (given expected life expectancy). The annuitized value of total wealth (Figure 8) increased as households aged across all income categories. The annuitized value of retirement accounts and other net assets (Figure 9) shows that the annuity value increased over the retirement years for those in the middle and top of the income distribution, but declined rapidly from the mid-50s to the early 80s for those in the bottom of the income distribution. Those in the bottom income quintile have little net worth, but those who worked a large portion of their adult lives within the Social Security system tend to receive adequate replacement rates from that source alone.

4. Regression Analysis

The previous section showed that there are important differences in the age-patterns of asset decumulation by income. In this section, we use multivariate fixed-effect regressions to better tease out these differences. We are also interested in the differential spending patterns for assets held inside and outside of retirement accounts and whether the different tax treatment of these asset types caused households to consume them differently.

We use fixed-effects regression models that control for non-changing household-specific characteristics, such as race, education, birth year, and saving behaviors.[11] In the fixed-effects specification, age slopes are estimated within each household as assets change with income, health status, marital status, and year. Table 5 shows the descriptive statistics of the pooled dataset used in our regressions.

Dependent variables. We examine asset holdings at different ages separately for net worth (excluding annuitized assets), home equity, retirement accounts, and other net assets.

[11] In the fixed-effect model, non-changing characteristics such as birth year, education, race, and lifetime earnings are included in the household identifier rather than in the independent variables as in ordinary least square regressions.

Explanatory variables: sources of income. We use three main sources of income—Social Security, pension income, and income from earnings.[12] In our regressions, we scale these values to $10,000 units. In the pooled sample, the mean income from Social Security is $8,800 per year, the mean pension benefit is $7,200 per year, and the mean earnings is $21,800 per year—the sample includes households in their 50s who are still working.

Explanatory variables: demographics. We control for the health of the household by including an indicator of whether either the respondent or spouse reported being in "fair" or "poor" health. We also include a dummy variable for marital status which takes the value of 1 for single households. Single status is non-changing for individuals that remain single or married across the eight years of the survey. In the fixed-effects model, the parameter estimate for "poor health" measures the effect of a change from good health to poor health on the dependent variable, and the parameter estimate for "single" measures the effect of divorce or death of a spouse on the dependent variable.[13]

Explanatory variables: year. We include year dummies that are intended to capture broad changes over time that are likely to affect all households, such as the variation due to stock market fluctuations and the housing boom.

Explanatory variables: age group. The age groups are our main variables of interest. We include 5-year age groups. The coefficients of these variables should help us isolate the age-profiles of asset accumulation isolating the effects from all other variables.

Table 6 shows the regression results of our baseline model separately for net worth, home equity, retirement accounts, and other net assets. All else equal, **income** at older ages has a positive effect on net worth. Not surprisingly, households with higher retirement incomes were generally able to accumulate more wealth before retirement than lower-income households. Higher incomes also allow households to support basic consumption without tapping into their non-annuitized wealth. A $10,000 increase in Social Security benefits is associated with an increase in net worth of about $33,500

[12] We exclude asset income in the regressions because it is a function of the dependent variables.
[13] About 20 percent of person-years had a change in health status and about 7 percent changed couple status. About 60 percent of health changes were from good to poor and about 80 percent of couple status changes were from married to single.

(Table 6). Earned income has about a third of that effect. Pension benefits have a more modest, insignificant effect on net worth.

The impact of income varies by asset type. Earnings have a positive effect on retirement account assets, while Social Security and pensions have a negative effect (controlling for age and year). Retirement assets accumulate while households work and decline when they retire and receive Social Security benefits. Also, households with larger DB pension income are less likely to have had access to employer-sponsored DC pensions and will have accumulated lower retirement account assets than households without DB pensions. Increases in all sources of income increase other net assets. Interestingly, only changes in Social Security income affect net housing. Most homeowners with mortgages continue to pay down their home debt with age and eventually pay off their mortgage in retirement. The ratio of principal payment to interest payment increases sharply towards the end of the financing term of the mortgage. The positive effect of Social Security, controlling for other effects, on home equity may reflect higher principal repayment rates among Social Security beneficiaries with higher benefits than among non-beneficiaries and lower-value beneficiaries.

Health changes have a significant effect on asset accumulations. When the health of a household member deteriorates, net worth decreases by about $14,000. Health shocks introduce additional out-of-pocket expenditures that require households to dip into their assets. Health problems can signal shortening life expectancies to which the household might respond by accelerating their asset consumption.

The regression coefficients also indicate that a change in **marital status** (going from married to divorced or widowed from one wave to the next) reduces household net worth by about $64,400.

The **year** dummies (1998 is the omitted year) largely reflect the swings of housing prices and the stock market. The year coefficients for net housing are positive and rising with year, primarily reflecting the dramatic effect of the housing bubble. Year coefficients for both retirement accounts and net financial assets fall between 2000 and 2002 due to the stock market crash. For retirement accounts, year coefficients increase between 2002 and 2004, but fall again in 2006, while year coefficients for net assets increase every year after 2002. The increase in other net assets after 2002 partly reflects

the increase in other residential property. Between 1998 and 2006, net worth increased by about $89,200 ($43,600 from housing, $2,700 from retirement accounts, and $43,000 from other net assets).

The **age coefficients** (the omitted category is age 50-54) show that households accumulate assets until their late 60s, after which their net worth begins to decline. Controlling for income and time period, **net housing** increases gradually until the early 80s but then drops at older ages. **Retirement accounts** increase until the late 60s and then declines as households withdraw assets from accounts as required by IRS rules. **Other net assets** increase from age 50 to age 60 and then remain relatively flat until the late 80s and then decline.

We estimate the same fixed-effect models using a natural logarithmic transformation for both the asset and income variables (Table 7). The log transformation is useful both because it helps normalize positively skewed data (typical for wealth and income data) and the coefficients can be interpreted as the percent change in the dependent variable with a one unit change in the explanatory variable. Because income and assets can be zero (or negative) and the log is undefined at zero, we add $1 to incomes and $1,000 to assets before making the log transformation.

The log models have similar results as the linear models. Note, however, that the log specification shows larger percent changes with age for retirement account assets than for the other types of assets. This partly reflects lower asset values in the denominator and a higher share of active saving and dissaving in retirement accounts than in other asset types. Between ages 50 and 69, average retirement accounts increased about 29 percent and fell sharply after age 70. Note that the age coefficients are not statistically significant above age 75, reflecting the small share of households in these age groups with any retirement accounts.

5. Regression Analysis – Interactions

Does income change the age profiles? In this section, we focus on the age pattern of asset accumulation and decumulation and how it varies by income. Because age-wealth profiles vary by income level (as we saw in figures 3-6), we allow the regression age slopes to vary by income group. For figures 3-6, middle-income is limited to households in the middle (3^{rd}) income quintile in 2006. For the regression analysis, middle-income

pools households in the 2nd through 4th income quintiles. Low-income includes households in the bottom quintile, and high-income includes households in the top income quintile. We also limit the net home and retirement account models to include only asset holders, defined as ever owning the asset between 1998 and 2006.[14] This removes from the model-estimates households that never had access to these assets over the estimation period and whose age profiles are necessarily zero. Detailed fixed-effects regressions estimates are in Appendix Tables A1 and A2, but we use the charts below to describe estimated age patterns.

Figure 10 shows the estimated age profiles by income group and asset type shown as a percent relative to 50- to 54-year-olds (the omitted age group). Overall, the results indicate that age patterns vary greatly across income groups. In terms of net worth, only low- and middle-income households deaccumulate net worth with age. Remarkably, high-income households do not experience marked reductions in their asset holdings, even at older ages. High-income households are able to support retirement consumption from earnings and annuitized income, leaving their financial assets virtually untouched. These high-income households are also more likely to have bequest motives since they don't have to worry about affording the basic necessities of life compared to lower-income households.

Low-income households reduce their **net housing** rapidly after age 60, while middle- and high-income households experience reductions of net housing only at older ages. The **retirement account** balances and the value of **other net assets** decrease steadily for low-income households from their mid 50s. For middle-income households, retirement accounts increase until their mid 60s and decrease at older ages. High-income households accumulate retirement assets until age 70 and deaccumulate their retirement assets in their 70s and 80s. They accumulate **other net assets** well into their old age. The lower percent increase at age 55 to 59 for high-income compared to middle-income groups could reflect the impact of contribution limits and anti-discrimination rules that limit the amount highly-compensated workers can contribute to their employer 401(k) accounts that are not a factor for low- and middle-income households.

[14] All households have some net worth and other net assets, though both may be zero or negative.

Much of the difference in assets by income group reflects employment differences by income group. Low-income seniors are less likely to work at older ages due to unemployment, disability, or other factors than higher-income seniors. They accumulate fewer assets and spend virtually all of what little assets they have to support retirement consumption. Middle-income seniors work and accumulate assets through their early- to mid-60s and then consume assets throughout their retirement years. High-income seniors accumulate assets throughout most of their golden years (many of these seniors continue working until advanced ages). Their assets do not decline until very old age. These high-income seniors will certainly die with substantial unspent assets.

Do households with retirement accounts spend assets inside and outside of accounts differently*?* The differential tax treatment of assets inside and outside of retirement accounts may induce retirement account holders to spend assets inside and outside of retirement accounts differently. To answer this question, we compare the implied age slopes for retirement accounts, other net assets, and financial assets (the sum of retirement accounts and other net assets) for each income group (Figure 11).

High-income households accumulate assets in both retirement accounts and in other net assets. Financial assets rise with age until about age 80 and then decline slightly. The absolute accumulation in other net assets is greater than the accumulation in retirement accounts because starting balances are higher for other net assets. The rate of accumulation, however, is much higher for retirement accounts than for other net assets from age 60 to age 70, before IRS requires retirement account distributions. The different age slopes imply that these households prefer saving in the tax-sheltered accounts than in unsheltered accounts. However, we interpret this result with caution because the result is influenced by the magnitude of the starting values (a $1,000 increase to a $1,000 account is a large percent change while a $1,000 increase to a $100,000 account is a small percent change). After age 70, high-income seniors appear to take minimum distributions from retirement accounts and continue to accumulate other net assets with age until age 80. After age 80, other net assets and financial assets decline slightly.

Our original hypothesis was that high-income households would spend first from their other net assets and then from their retirement accounts until age 70, and then make only minimum distributions from retirement accounts, with the balance accumulating in

other net assets. It would be easier to make a statement about spending preferences if high-income seniors consumed their assets. Instead, they accumulate assets both inside and outside of retirement accounts until their late 70s before they finally fall. Figure 11 shows a slight saving preference rather than a spending preference, with high-income seniors saving a larger percent inside of retirement accounts than outside of retirement accounts. Reductions in retirement accounts are determined more by minimum distribution requirements after age 70 than by consumption needs.

For **middle-income households**, both the dollar and percent accumulation are greater for retirement accounts than for other net assets. Retirement account balances grow from age 50 to about age 65 and then decline at older ages. Before age 65, these households do most of their retirement saving in their tax-sheltered accounts. After age 65, middle-income account-holders spend from both retirement accounts and other net assets, but the rate of decline is much greater in the retirement accounts. As with the high-income group, the absolute decumulation is greater from other net assets than from retirement accounts, but the percent decumulation is greater for retirement accounts than other net assets. Note that average retirement account balances in table 3 include both retirement account holders and nonholders. Average account balances are higher when limited to account holders as shown in Figure 11.

The linear model for middle-income households shows an increase in retirement account assets between ages 50 and 69 and a slight decrease in other net assets over the same age range. The inflection point (the point where retirement account spending falls) occurs at age 70 when minimum distribution rules require retirement account withdrawals. This supports our hypothesis that seniors spend first from assets outside of retirement accounts before spending assets inside retirement accounts.

While the HRS does not collect information about income taxes, a simple calculation of household federal income tax liability using HRS reported income and the standard deduction (including the aged deduction) with no adjustments shows that all retirement account holders in the 4^{th} and 5^{th} income quintiles have tax liability between ages 65 and 70 before any taxable retirement account withdrawals (Table 8). Ninety percent of middle-quintile retirement account holders have positive tax liability between ages 65 and 70 if they withdraw no retirement accounts, but the rate rises to 97 percent if

they withdraw 10 percent of their retirement accounts. While only 30 percent of 2nd quintile retirement account holders have a positive income tax liability without retirement account withdrawals in this age range, 77 percent would have a tax liability if they withdrew 10 percent of their retirement account balances. Most middle-income (2nd-4th quintile) retirement account holders are either paying federal income tax or would pay tax if they made even modest withdrawals from their retirement accounts between ages 65 and 69. These tax simulations overstate tax liabilities because they do not account for itemized deductions, dependents, and other adjustments. However, they do show that retirement account withdrawals do have tax implications for the majority of retirement account holders.

For **low-income households**, both retirement account and other net assets increase only to age 59 and then both fall. As shown in Figures 5 and 6, retirement accounts and other net asset values are low for this group and retirement account ownership rates decline rapidly with age. Note that low-income does not necessarily mean low-assets. Households can have large asset amount that do not generate countable income (checking accounts, stocks, and other real estate, for example). Figure 11 includes only households with retirement accounts. The average retirement account holdings among asset holders is higher than the average account holding including non-owners as is shown in Figure 5.

Most low-income households do not pay federal income tax in retirement and their asset spending should not be influenced by tax rules. The log model in Figure 11 shows that low-income households spend retirement account assets from age 60 on at a rate that will deplete these assets at older ages, but their asset amounts are small. They also spend other net assets, but at a slower rate.

6. Discussion

One of the reasons that households end up being high-income in 2006 is that they accumulated more assets at older ages. Similarly low-income households accumulated less assets. By classifying households income-status based on 2006 income, we increase the estimated age slopes (both negative and positive) compared to estimates based on a

classification based on 1998 income. Our estimated age slopes are fairly similar for middle- and high-income groups when we classify income based on 1998 income status, but age slopes actually rise with age for the low-income group.

We examined the sensitivity of the regression results to our income classification of 2nd quintile households. The main results classified them as middle-income, but we also estimated age slopes when classified as low-income. The age slope for retirement accounts increased more through age 69 for the middle-income group and increased through age 65 for the low-income group, and the results were virtually unchanged for the high-income group. The overall conclusions are not sensitive to this change.

We also estimated age slopes using age splines instead of age dummies. The results were similar. We opted to show the age dummies because they are easier to interpret.

7. Conclusions

This paper was, in part, motivated by a concern that, as DC retirement plans substituted for DB plans, seniors will not possess the investment management skills necessary to spend their non-annuitized assets wisely. Whether we examine the data crudely or with the help of regression equations, it seems apparent that this is not a major concern for the middle-income quintile and above, because they adopt very cautious spending plans at older ages. The top quintile actually accumulates wealth, at least until their eighties. The middle quintile may start to spend down wealth a bit earlier, on average, but the data suggest that they will still have a substantial amount of assets when they die. The low amount of spending relative to asset values in the top 60 percent of the income distribution might be explained by a strong bequest motive or by a reaction to the

risk that households may face very high health or other unavoidable expenditures. However, it is hard to avoid the suspicion that many households may be overly cautious and may be forgoing consumption that is easily affordable.

Although the data appear to be reassuring as we transit from DB to DC plans, it must be emphasized that we are looking at averages or the results of regressions. There are undoubtedly some in each quintile who are quite different from the average and who are spending irresponsibly. And there are others at the other extreme who are most certainly depriving themselves unnecessarily. Both extremes could be helped by financial education and some investment counseling.

The picture is quite different in the bottom quintile of the distribution where there are few non-annuitized assets and the small amounts that are available are spent fairly quickly. This is not alarming for those who have had fairly steady employment through their lives, because Social Security benefits can provide adequate replacement rates at the bottom, especially for couples. But, of course, many are at the bottom because they have not had steady employment throughout their lives. Poor health, divorce, job lay-offs, and death of a spouse can have detrimental effects on assets both in the accumulation and decumulation phase (Johnson, Mermin, and Uccello 2006).

Social Security will become less generous over time as the full retirement age is increased and a higher and higher portion of benefits is devoted to the payment of Part B and Part D Medicare premiums. Moreover, the program is unsustainable in its current form; there will have to be reforms eventually; and some of those reforms will very probably reduce the growth of benefits.

Because of the heavy dependence of the poor on Social Security, there are good arguments for retaining a more generous base of retirement support as the system is reformed. Options that have often been discussed include a minimum Social Security benefit, a somewhat more generous SSI program, and a system of "progressive" indexing that would slow down the growth of benefits for the more affluent while holding the poor harmless.

Another motivation of the paper was to see if we could discern the impact of first allowing tax deductions for contributions to DC plans, then taxing withdrawals, and finally requiring withdrawals after age 70-1/2. Income tax considerations of this type are of no interest at the bottom of the distribution since low-income households do not pay any income taxes. However, at the top, they should be a matter of grave concern. Our hypothesis was that households would first draw on those assets where withdrawals were not taxable and only later start withdrawing from taxable accounts. Of course, after age 70-1/2, they would have no choice but to start making taxable withdrawals.

It is a bit difficult to discern the effects of tax law in the highest income group, because they continue to accumulate all types of non-annuitized assets until very late in life. However, there is some indication that they accumulate tax-deferred assets disproportionately until age 70 and that they are drawn down after that.

In the middle-income quintile, the effects of tax law seem more apparent. There is a tendency to make nontaxable withdrawals first and to not make taxable withdrawals until they are required. Despite forced withdrawals, the taxable assets are not depleted before death.

The data used in this paper come from a period in which the price of housing boomed and stock markets fluctuated violently as the dot com bubble grew and then burst at the turn of the century. After that there was a rapid recovery through 2006. Our data do not cover the subsequent collapse of housing and financial markets, and that is unfortunate because our results may be changed significantly once post-crash, HRS 2008 data can be examined. However, there are some reassuring signs in the data through 2006. The total wealth of the older population grew through the period, primarily because of the rise in housing values. Clearly, the older population did not rush out and spend all the capital gains that they enjoyed through 2006. That may be a sign of inertia or the result of a wise forecast that the gains would not persist. Whatever it was, it put the older population in a much better position to withstand the crash that followed.

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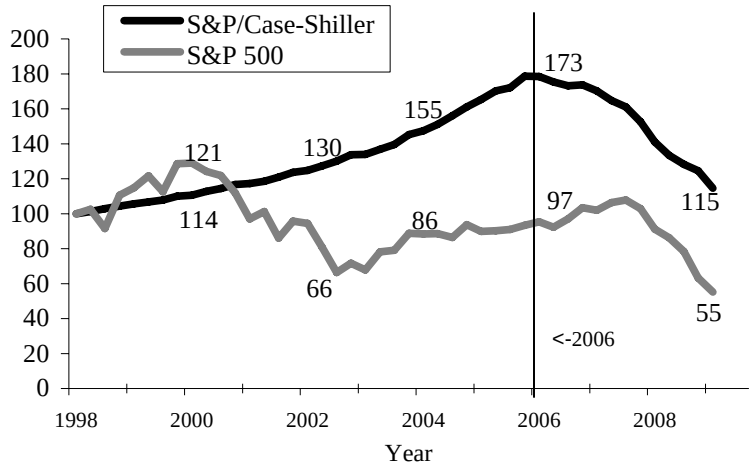
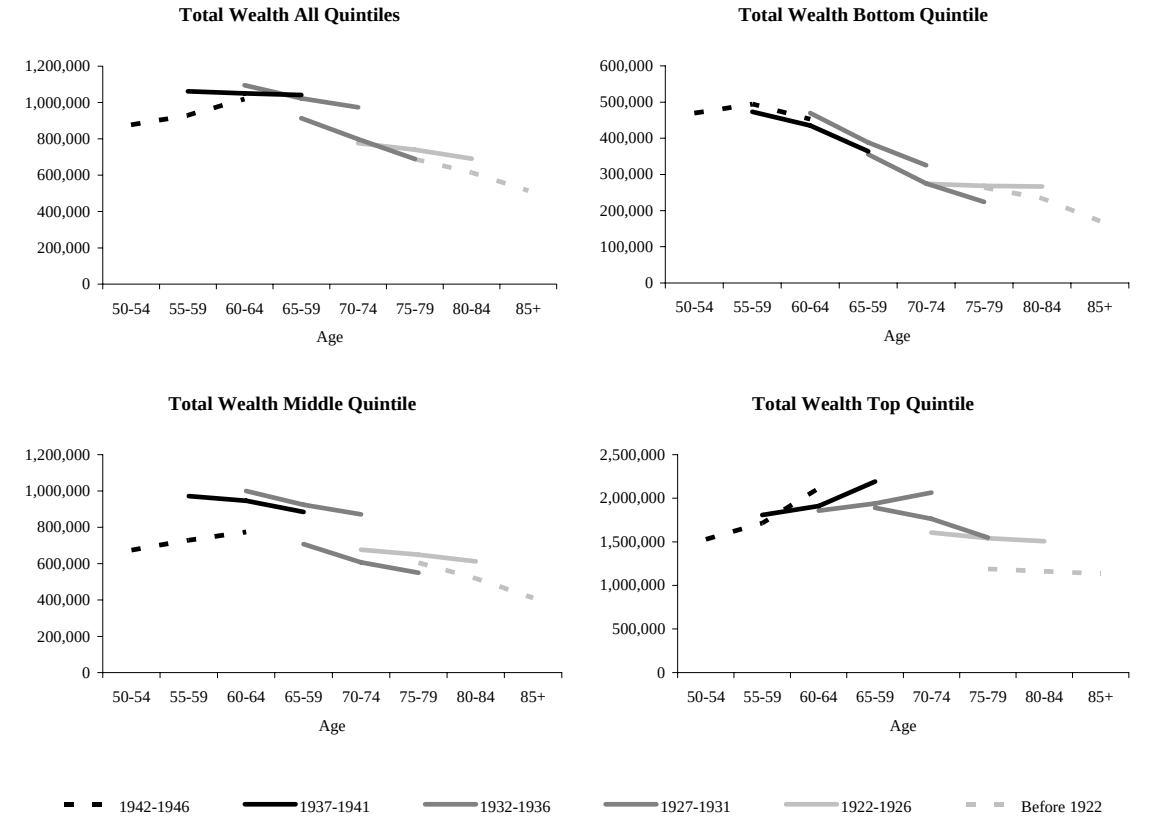
Figure 1. Housing and Stock Market Evolution, 1998-2006 (1998=100, real values)



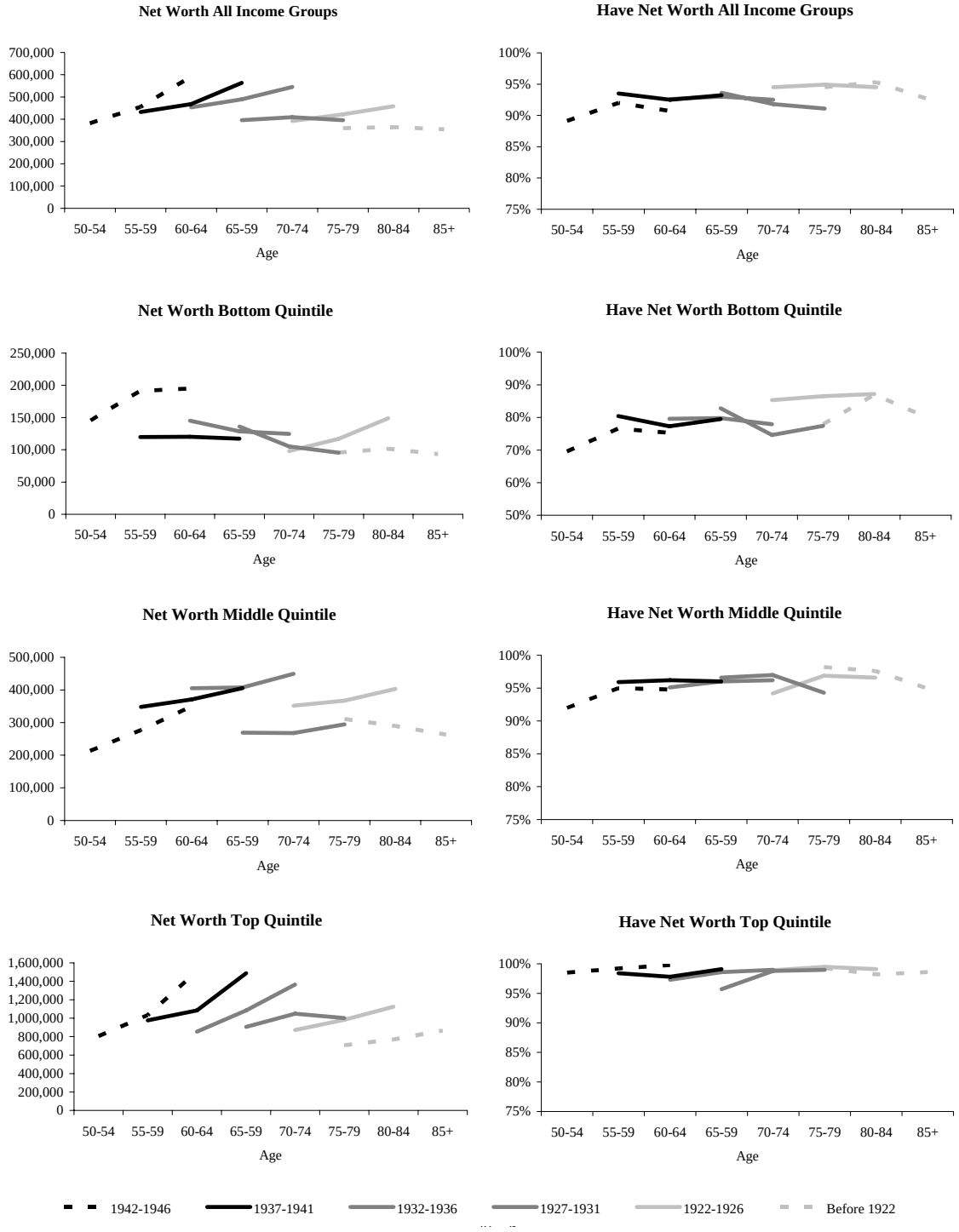
Source: Standard & Poor's (2009).

Figure 2. Average Total Wealth for Households Born Before 1947 by Per-Capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).
Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Net worth is the sum of net housing, retirement accounts, and other net assets. Annuitized assets is the net present value of Social Security, DB, and other annuity income. Total wealth is the sum of net worth and annuized assets. Amounts are in 2008 dollars.

Figure 3. Average Net Worth and Share with Positive Net Worth for Households Born Before 1947 by Per-Capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).

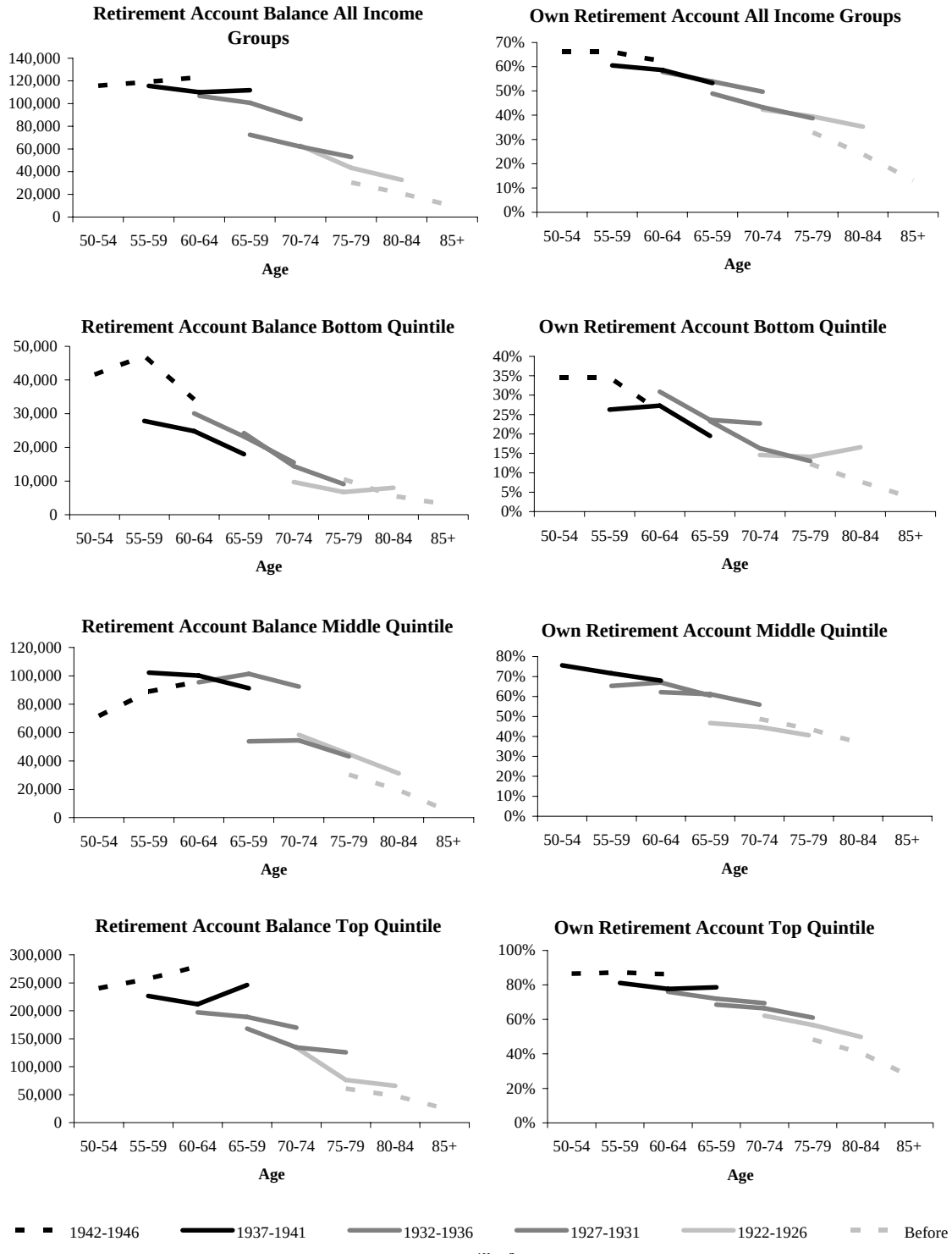
Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Net worth is the sum of net housing, retirement account, and other net assets in 2008 dollars.

Figure 4. Average Net Home Value and Homeownership Rates for Households Born Before 1947 by Per-Capita Income, Cohort, and Age

Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Net home is private home value less home debt in 2008 dollars.

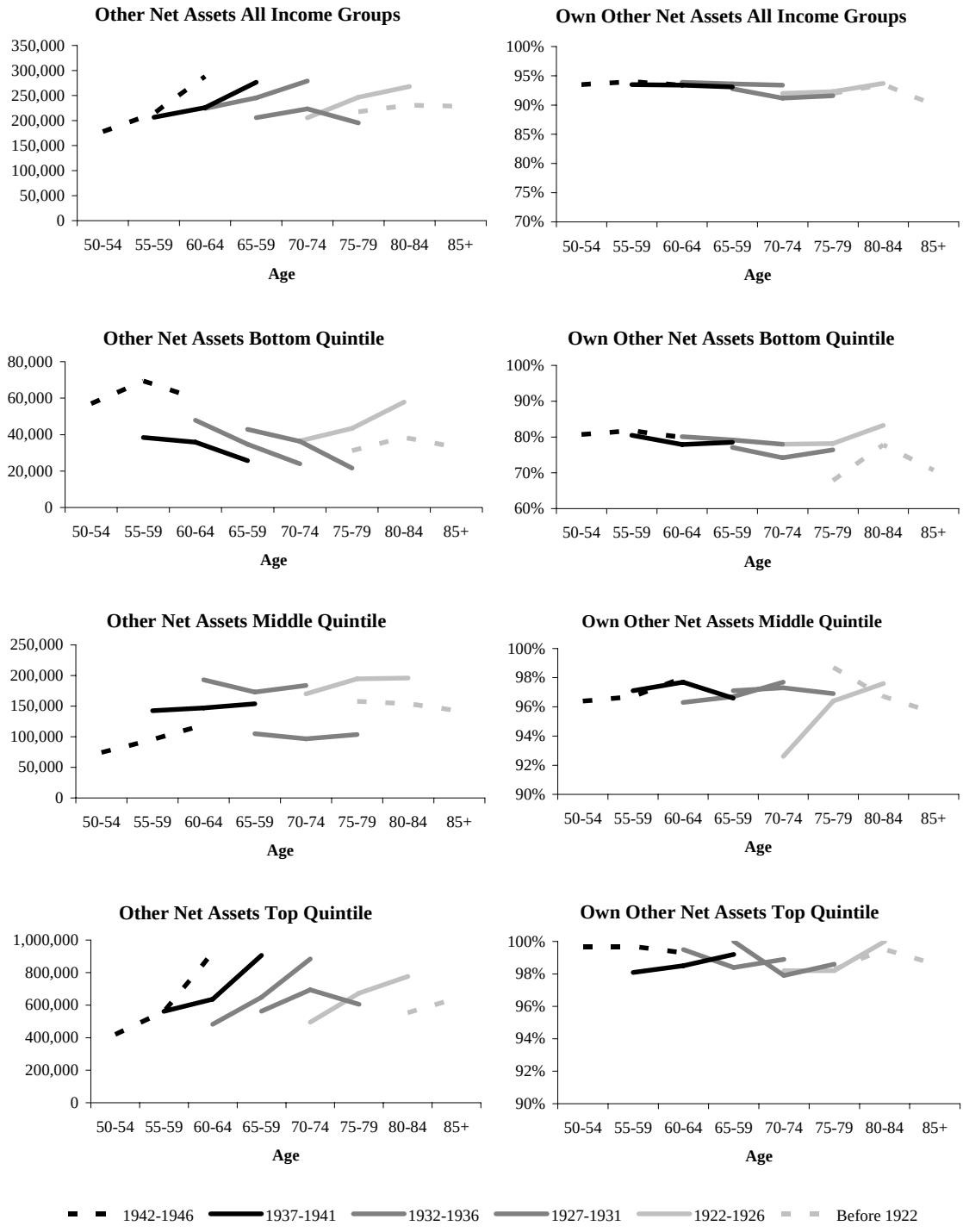
Figure 5. Average Retirement Account Balance and Ownership Rate for Households Born Before 1947 by Per-capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Retirement accounts include IRAs, Keoghs, and employer DC plans in 2008 dollars.

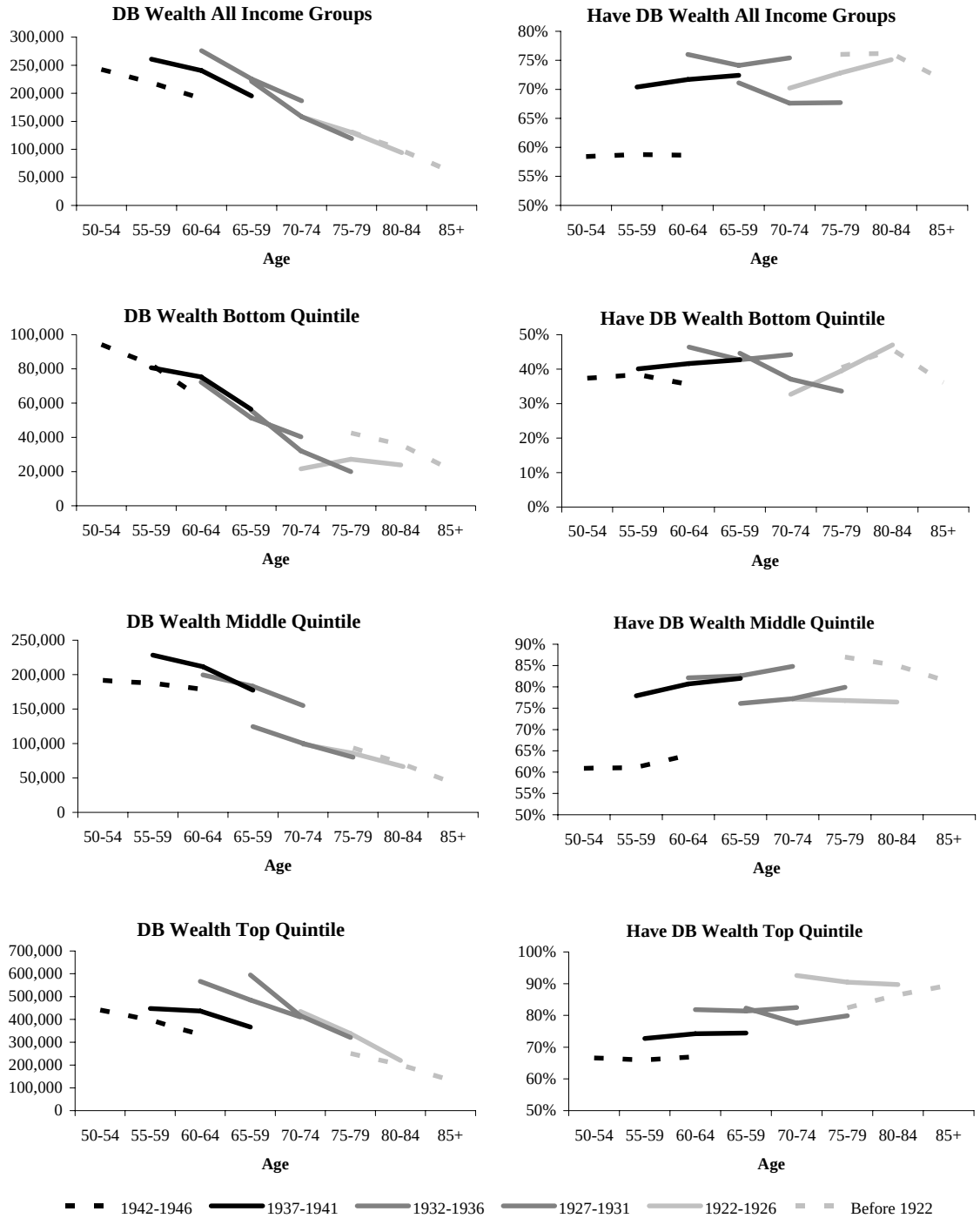
Figure 6. Average Other Net Assets and Ownership Rate for Households Born Before 1947 by Per-Capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).

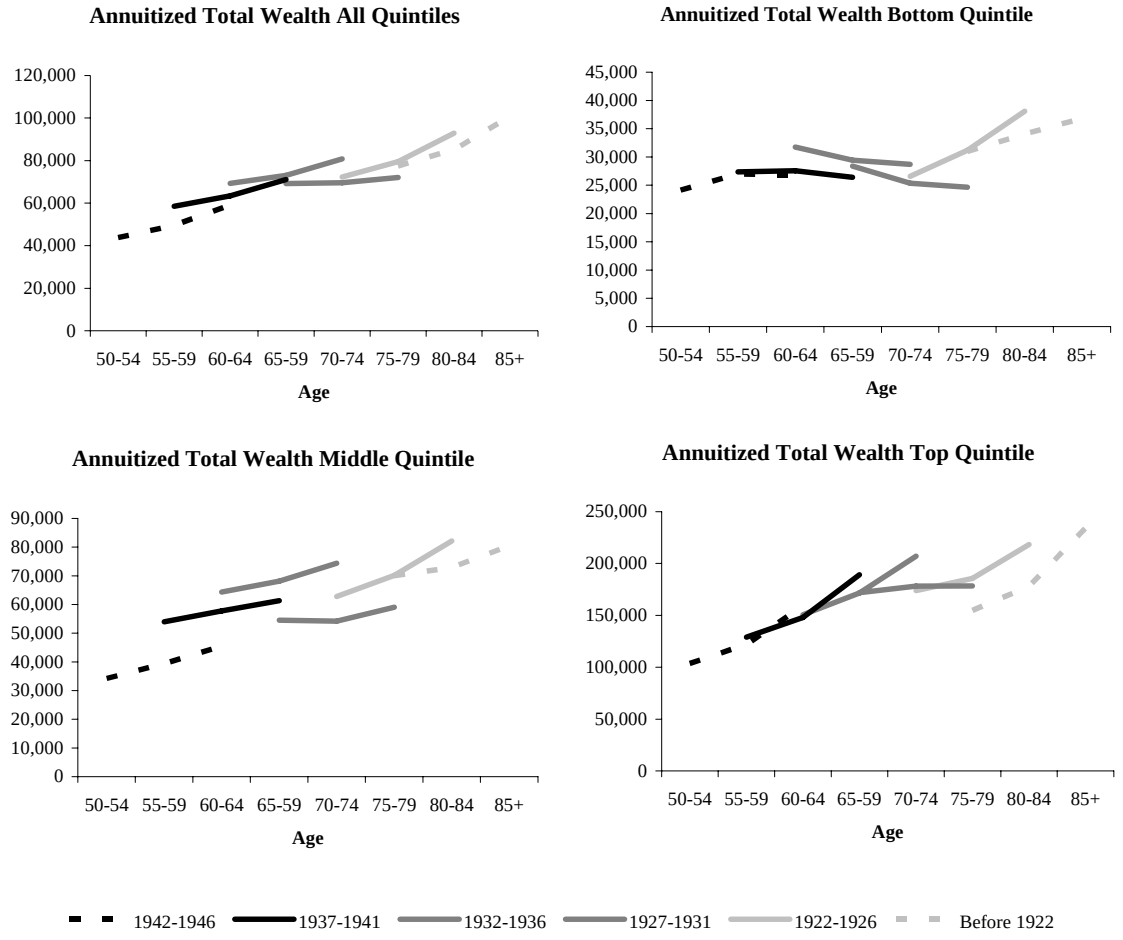
Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Other net assets is the sum of transaction accounts, CDs and bonds, stocks, other property, farm and business equity, less unsecured debt in 2998 dollars.

Figure 7. Average DB Pension Wealth and Ownership Rate for Households Born Before 1947 by Per-Capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).
Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. DB wealth is the net present value of defined benefit pension and annuity income in 2008 dollars.

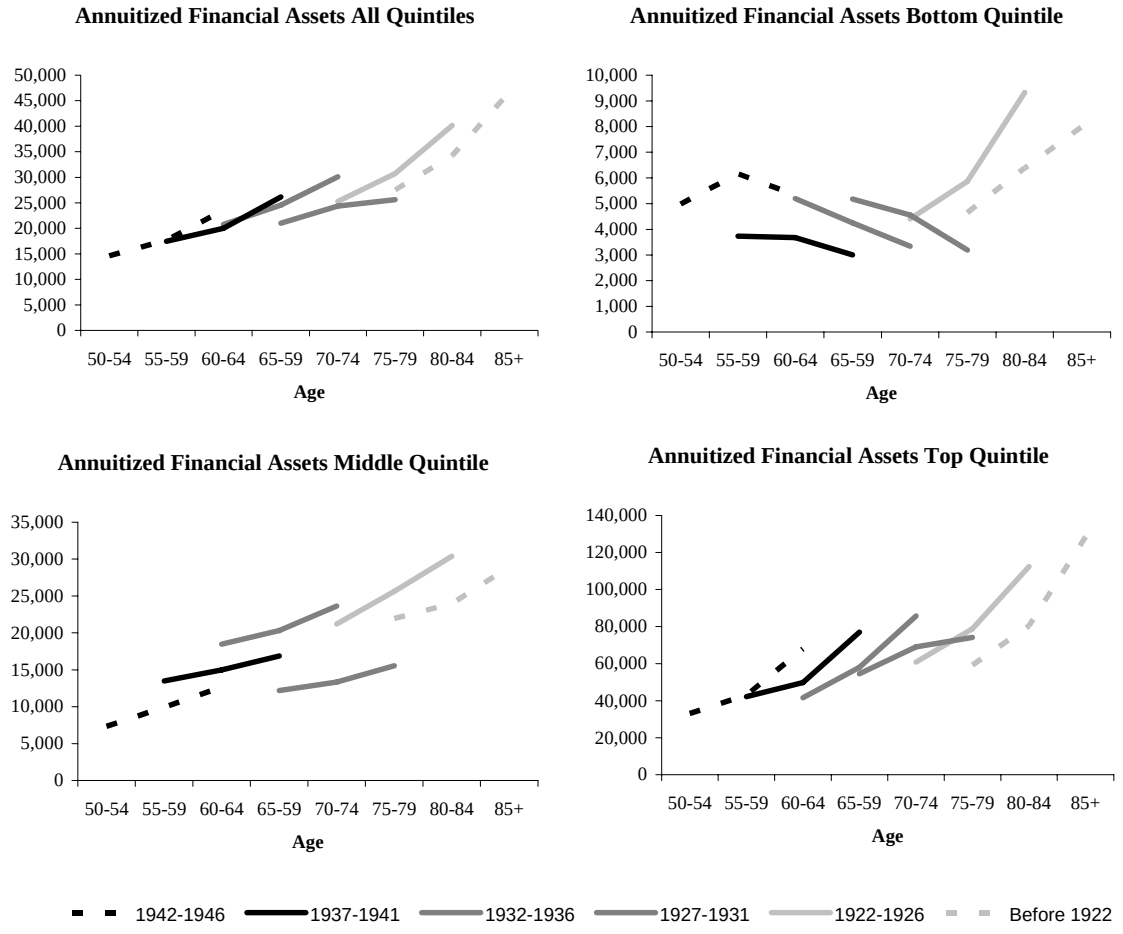
Figure 8. Average Value of Annuity that Can Be Purchased with Total Wealth for Households Born Before 1947 by Per-Capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Annuity factors are based on a price adjusted annuity that varies by age, cohort, education, and race. Total wealth is the sum of net housing, retirement accounts, other net assets, DB wealth, and Social Security wealth in 2008 dollars.

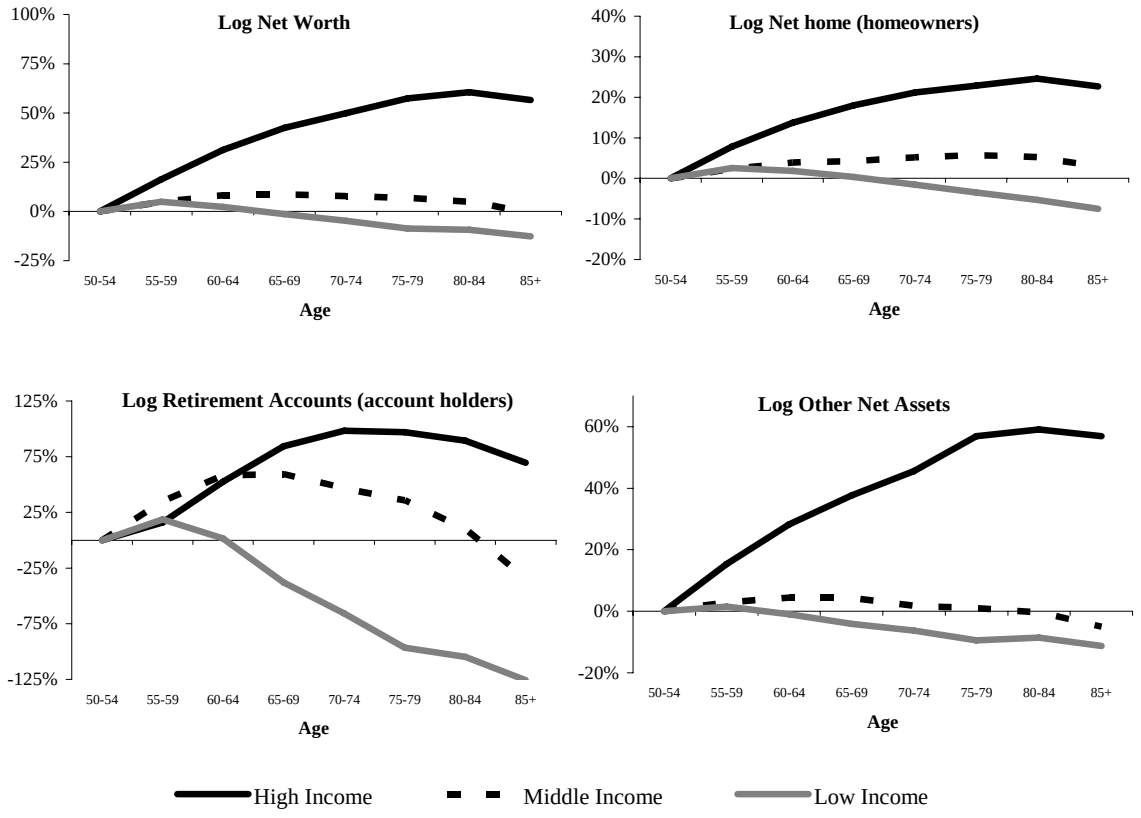
Figure 9. Average Value of Annuity that Can Be Purchased with Financial Assets for Households Born Before 1947 by Per-capita Income, Cohort, and Age



Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by cohort. Annuity factors are based on a price adjusted annuity that varies by age, cohort, education, and race. Financial assets is the sum of retirement accounts and other net assets in 2008 dollars.

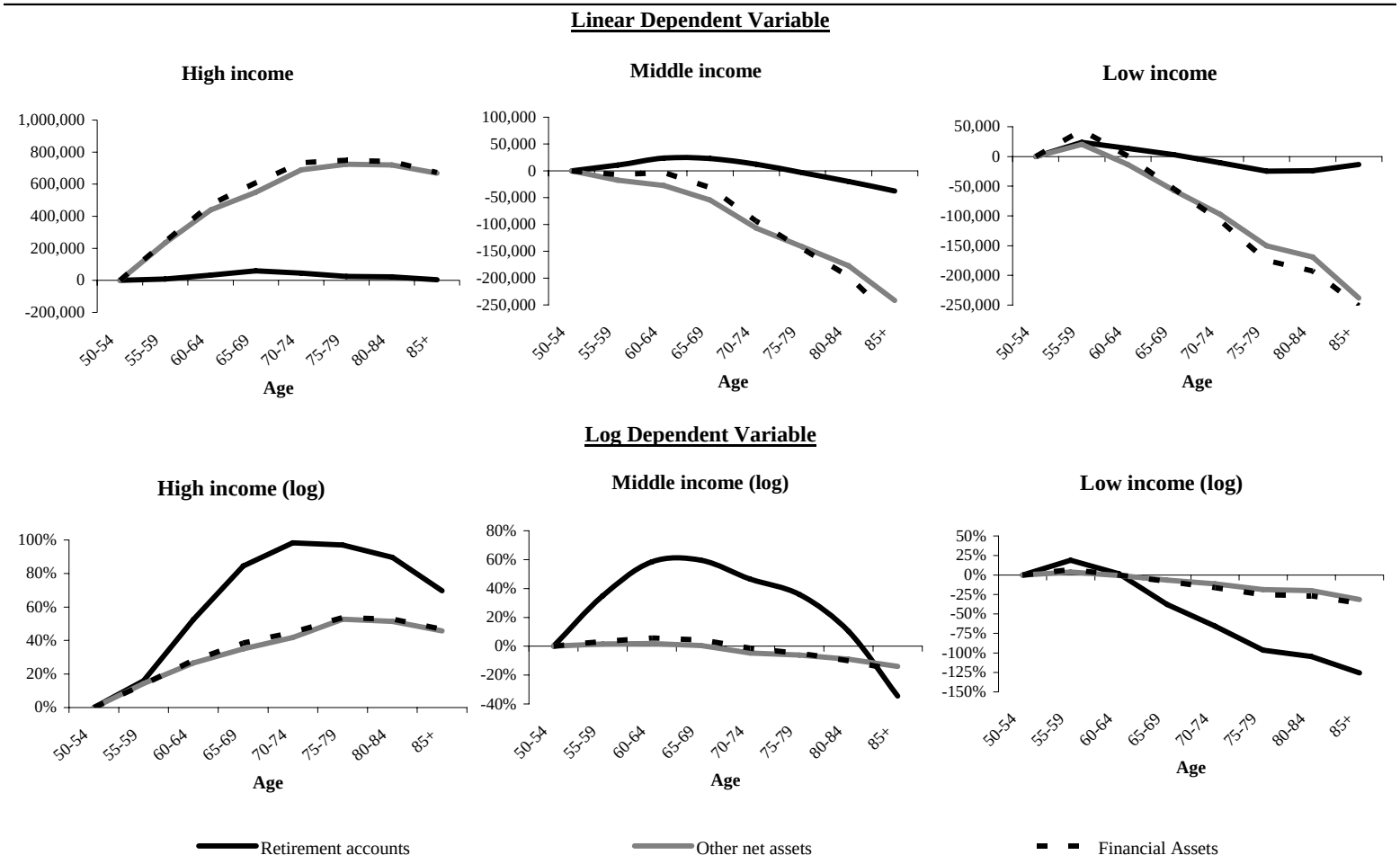
Figure 10. Implied Age-Group Coefficients from Fixed-Effects Regressions by Asset Type and Per-Capita Income with Log Dependent Variables



Source: Authors' calculations using the HRS (1998-2006).

Notes: Analysis based on 40,250 unweighted person-year observations born before 1947. Net worth is the sum of net housing, retirement accounts, and other net assets. Net housing model is limited to households that owned a home at any time from 1998 to 2006. Retirement account model is limited to households that owned a retirement account at any time from 1998 to 2006. Per-capita income quintile is based on the 2006 value by cohort. High-income includes households in the top quintile. Low-income includes households in the bottom quintile. Middle-income includes households in the middle three quintiles.

Figure 11. Implied Age-Group Coefficients from Fixed-Effects Regressions for Retirement Accounts and Other Net Assets by Per-Capita Income For Retirement Account Holders



Source: Authors' calculations using the HRS (1998-2006).

Notes: Analysis based on 24,255 unweighted person-year observations (4,855 unique households) born before 1947 with retirement account assets in any year from 1998 to 2006. Financial assets is the sum of retirement accounts and other net assets. Per-capita income quintile is based on the 2006 value by cohort. High-income includes households in the top quintile. Low-income includes households in the bottom quintile. Middle-income includes households in the middle three quintiles.

Table 1. Wealth holdings, Households Born Before 1947 (Age 60+ in 2006), Mean for Middle Quintile of Income

	Year					1998-2006	Average annual
	1998	2000	2002	2004	2006	change	change
NET HOUSING	101,195	106,035	123,004	136,302	161,768	59.9%	6.0%
Primary housing	127,429	130,988	146,775	162,049	184,344	44.7%	4.7%
Primary residence mortgage	26,234	24,953	23,771	25,747	22,576	-13.9%	-1.9%
RETIREMENT ACCOUNTS	70,858	85,861	63,407	83,285	66,315	-6.4%	-0.8%
IRAs and Keoghs	49,160	64,141	49,112	54,556	52,011	5.8%	0.7%
Defined contribution	21,698	21,720	14,295	28,729	14,304	-34.1%	-5.1%
OTHER NET ASSETS	141,798	141,143	138,223	132,985	149,900	5.7%	0.7%
Liquid Assets	45,300	45,196	48,459	49,302	52,250	15.3%	1.8%
Transaction accounts	24,716	23,472	25,965	28,872	25,301	2.4%	0.3%
CDs and Bonds	17,346	18,466	18,437	16,333	23,396	34.9%	3.8%
Other savings	6,768	6,619	6,567	7,119	6,118	-9.6%	-1.3%
Unsecured debt	3,530	3,361	2,510	3,022	2,565	-27.3%	-3.9%
Stocks	40,502	45,545	38,163	37,844	38,691	-4.5%	-0.6%
Net other property	36,143	31,988	33,098	26,931	39,969	10.6%	1.3%
Other residential property	9,563	10,049	13,302	11,092	15,985	67.2%	6.6%
Non-residential property	27,950	23,160	20,588	16,189	24,070	-13.9%	-1.9%
Other residential debt	1,370	1,221	792	350	86	-93.7%	-29.3%
Business equity	19,853	18,414	18,503	18,908	18,990	-4.3%	-0.6%
NET WORTH	**313,851**	**333,039**	**324,634**	**352,572**	**377,983**	**20.4%**	**2.4%**
ANNUITIZED ASSETS	499,970	455,535	416,554	376,165	337,283	-32.5%	-4.8%
Defined benefit wealth	180,403	165,661	152,322	138,012	124,812	-30.8%	-4.5%
Social Security wealth	319,567	289,874	264,232	238,153	212,471	-33.5%	-5.0%
TOTAL WEALTH	813,821	788,574	741,188	728,737	715,266	-12.1%	-1.6%

Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 7,925 unweighted person-year observations (1,585 unique households) born before 1947 with 2006 per-capita income in the middle income quintile. Net worth is the sum of net housing, retirement accounts, and other net assets. Annuitized assets is the net present value of Social Security, DB, and other annuity income. Total wealth is the sum of net worth and annuized assets.

Table 2. Percent of Middle-Income Households Born Before 1947 (Age 60+ in 2006) with Assets and Debt by Type and Year

	Year					1998-2006 percentage point change	Average annual percentage point change
	1998	2000	2002	2004	2006		
NET HOUSING	86%	85%	84%	83%	81%	-4.6%	-0.6%
Primary housing	86%	85%	85%	84%	81%	-4.4%	-0.6%
Primary residence mortgage	40%	39%	35%	34%	32%	-8.3%	-1.0%
RETIREMENT ACCOUNTS	60%	57%	54%	55%	51%	-9.3%	-1.2%
IRAs and Keoghs	47%	46%	45%	45%	41%	-6.0%	-0.8%
Defined contribution	27%	22%	20%	22%	17%	-9.7%	-1.2%
OTHER NET ASSETS	97%	97%	97%	98%	97%	-0.4%	-0.1%
Transaction accounts	89%	91%	91%	94%	92%	2.2%	0.3%
CDs and Bonds	30%	33%	32%	27%	32%	2.0%	0.3%
Other savings	15%	16%	15%	16%	16%	1.1%	0.1%
Unsecured debt	31%	32%	27%	29%	27%	-3.8%	-0.5%
Stocks	37%	37%	35%	35%	30%	-7.0%	-0.9%
Net Other Property	26%	26%	23%	22%	22%	-4.5%	-0.6%
Other residential property	11%	11%	11%	11%	12%	0.3%	0.0%
Non-residential property	19%	18%	16%	14%	14%	-5.6%	-0.7%
Other residential debt	3%	3%	2%	1%	1%	-1.9%	-0.2%
Business equity	10%	8%	8%	9%	8%	-2.0%	-0.3%
NET WORTH	96%	95%	96%	96%	96%	-0.4%	-0.1%
ANNUITIZED ASSETS	100%	100%	100%	100%	100%	0.0%	0.0%
Defined benefit wealth	76%	76%	76%	76%	76%	0.0%	0.0%
Social Security wealth	100%	100%	100%	100%	100%	0.0%	0.0%
TOTAL WEALTH	100%	100%	100%	100%	100%	0.0%	0.0%
Share of homeowners with debt	47%	46%	41%	41%	39%	-7.7%	-1.0%

Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 7,925 unweighted person-year observations (1,585 unique households) born before 1947 with 2006 per-capita income in the middle income quintile. Net worth is the sum of net housing, retirement accounts, and other net assets. Annuitized assets is the net present value of Social Security, DB, and other annuity income. Total wealth is the sum of net worth and annuized assets.

Table 3. Wealth Holdings, Households Born Before 1947 (Age 60+ in 2006) by Per-Capita Income Quintile and Year ($2008)

	Year					1998-2006 change	Average annual change
	1998	2000	2002	2004	2006		
All							
NET HOUSING	108,620	115,950	133,420	151,834	178,644	64%	6%
RETIREMENT ACCOUNTS	83,583	94,509	78,843	90,524	84,706	1%	0%
OTHER NET ASSETS	207,459	233,894	229,197	233,597	280,380	35%	4%
NET WORTH	399,662	444,353	441,460	475,956	543,730	36%	4%
ANNUITIZED ASSETS	518,864	473,587	437,867	396,626	355,440	-31%	-5%
TOTAL WEALTH	918,526	917,940	879,327	872,582	899,170	-2%	0%
Bottom Income Quintile							
NET HOUSING	57,921	59,612	68,695	74,623	85,419	47%	5%
RETIREMENT ACCOUNTS	23,525	25,850	17,282	29,002	16,805	-29%	-4%
OTHER NET ASSETS	39,294	55,156	44,618	39,735	33,027	-16%	-2%
NET WORTH	120,739	140,618	130,595	143,360	135,251	12%	1%
ANNUITIZED ASSETS	277,303	251,669	233,792	210,797	187,516	-32%	-5%
TOTAL WEALTH	398,042	392,287	364,387	354,156	322,768	-19%	-3%
Middle Income Quintile							
NET HOUSING	101,195	106,035	123,004	136,302	161,768	60%	6%
RETIREMENT ACCOUNTS	70,858	85,861	63,407	83,285	66,316	-6%	-1%
OTHER NET ASSETS	141,798	141,143	138,222	132,985	149,900	6%	1%
NET WORTH	313,851	333,039	324,633	352,572	377,984	20%	2%
ANNUITIZED ASSETS	499,970	455,535	416,554	376,165	337,283	-33%	-5%
TOTAL WEALTH	813,821	788,574	741,187	728,737	715,266	-12%	-2%
Top Income Quintile							
NET HOUSING	178,871	197,616	228,385	272,958	309,103	73%	7%
RETIREMENT ACCOUNTS	164,734	197,636	164,318	174,182	194,595	18%	2%
OTHER NET ASSETS	524,882	640,463	621,021	660,357	898,042	71%	7%
NET WORTH	868,487	1,035,715	1,013,724	1,107,497	1,401,740	61%	6%
ANNUITIZED ASSETS	797,015	726,953	674,903	618,525	555,858	-30%	-4%
TOTAL WEALTH	1,665,502	1,762,668	1,688,627	1,726,022	1,957,598	18%	2%

Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Per-capita income quintile is based on 2006 value by year and cohort. Net worth is the sum of net housing, retirement accounts, and other net assets. Annuitized assets is the net present value of Social Security, DB, and other annuity income. Total wealth is the sum of net worth and annuized assets.

Table 4. Percent of Households Born Before 1947 (Age 60+ in 2006) with Assets by Per-Capita Income Quintile, Asset Type, and Year

	Year					1998-2006 percentage point change	Average annual percentage point change
	1998	2000	2002	2004	2006		
All							
NET HOUSING	82%	81%	81%	80%	77%	-4.5%	-0.6%
RETIREMENT ACCOUNTS	53%	52%	50%	50%	46%	-7.2%	-0.9%
OTHER NET ASSETS	93%	93%	93%	94%	93%	0.0%	0.0%
NET WORTH	92%	93%	93%	93%	92%	-0.4%	-0.1%
Defined benefit wealth	69%	69%	69%	69%	69%	0.0%	0.0%
Social Security wealth	100%	100%	100%	100%	100%	0.0%	0.0%
TOTAL WEALTH	100%	100%	100%	100%	100%	0.0%	0.0%
Share of homeowners with debt	47%	45%	42%	41%	39%	-7.6%	-0.9%
Bottom Income Quintile							
NET HOUSING	64%	64%	64%	62%	59%	-4.8%	-0.6%
RETIREMENT ACCOUNTS	26%	24%	23%	21%	17%	-8.6%	-1.1%
OTHER NET ASSETS	77%	77%	80%	79%	78%	0.9%	0.1%
NET WORTH	78%	79%	80%	79%	78%	0.1%	0.0%
Defined benefit wealth	40%	40%	41%	40%	40%	0.0%	0.0%
Social Security wealth	100%	100%	100%	100%	100%	0.0%	0.0%
TOTAL WEALTH	100%	100%	100%	100%	100%	0.0%	0.0%
Share of homeowners with debt	37%	34%	31%	29%	29%	-7.9%	-1.0%
Middle Income Quintile							
NET HOUSING	86%	85%	84%	83%	81%	-4.6%	-0.6%
RETIREMENT ACCOUNTS	60%	57%	54%	55%	51%	-9.3%	-1.2%
OTHER NET ASSETS	97%	97%	97%	98%	97%	-0.4%	-0.1%
NET WORTH	96%	95%	96%	96%	96%	-0.4%	-0.1%
Defined benefit wealth	76%	76%	76%	76%	76%	0.0%	0.0%
Social Security wealth	100%	100%	100%	100%	100%	0.0%	0.0%
TOTAL WEALTH	100%	100%	100%	100%	100%	0.0%	0.0%
Share of homeowners with debt	47%	46%	41%	41%	39%	-7.7%	-1.0%
Top Income Quintile							
NET HOUSING	90%	89%	91%	89%	88%	-1.2%	-0.2%
RETIREMENT ACCOUNTS	72%	71%	70%	71%	68%	-3.6%	-0.4%
OTHER NET ASSETS	99%	99%	99%	99%	99%	0.5%	0.1%
NET WORTH	98%	99%	99%	99%	99%	1.3%	0.2%
Defined benefit wealth	78%	77%	78%	77%	78%	-0.1%	0.0%
Social Security wealth	99%	99%	99%	99%	99%	0.0%	0.0%
TOTAL WEALTH	100%	100%	100%	100%	100%	0.0%	0.0%
Share of homeowners with debt	54%	53%	50%	49%	45%	-9.4%	-1.2%

Source: Authors' calculations using the Health and Retirement Study (1998-2006).

Notes: Analysis is based on 7,925 unweighted person-year observations (1,585 unique households) born before 1947 with 2006 per-capita income in the middle income quintile. Net worth is the sum of net housing, retirement accounts, and other net assets. Defined benefit and Social Security wealth reflect ownership of DB and Social Security wealth. Total wealth is the sum of net worth and annuized assets.

Table 5. Descriptive Statistics for Regression Sample

	Mean	Standard deviation	Percent non-zero
Dependent variables			
Net worth	460,699	880,799	0.97
Net housing	137,829	217,495	0.80
Retirement accounts	86,408	208,800	0.50
Other net assets	236,462	692,734	0.93
Explanatory variables			
Income			
Social Security ($10,000)	0.88	0.83	0.67
Pensions ($10,000)	0.72	2.34	0.41
Earnings ($10,000)	2.18	4.38	0.46
Demographics			
Poor health	0.33	0.47	0.33
Single	0.43	0.49	0.43
Year dummies			
Year 1998	0.20	0.40	0.20
Year 2000	0.20	0.40	0.20
Year 2002	0.20	0.40	0.20
Year 2004	0.20	0.40	0.20
Year 2006	0.20	0.40	0.20
Age groups			
Age 50-54	0.05	0.21	0.05
Age 55-59	0.16	0.36	0.16
Age 60-64	0.22	0.41	0.22
Age 65-69	0.19	0.39	0.19
Age 70-74	0.14	0.34	0.14
Age 75-79	0.10	0.30	0.10
Age 80-84	0.09	0.28	0.09
Age 85+	0.06	0.24	0.06

Source: Authors' calculations using the Health and Retirement Study (1998-2006).
Notes: Analysis is based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Income and assets are 2008 CPI-U adjusted dollars.

Table 6. Fixed-Effects Linear Regression Coefficients, Balanced Panel, All Households Born Before 1947 (Age 60+ in 2006)

	Linear Dependent Variable							
	Net worth		Net housing		Retirement accounts		Other net assets	
Variable	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Social Security ($10,000)	33,392	8,410 ***	14,927	2,843 ***	-1,026	2,167	19,491	6,914 ***
Pensions ($10,000)	2,767	2,428	625	452	-54	708	2,195	2,235
Earnings ($10,000)	10,056	3,657 ***	-519	721	3,728	1,123 ***	6,847	2,541 ***
Poor health	-14,186	7,250 **	-3,643	1,646 **	-3,031	1,629 *	-7,511	6,465
Single	-64,359	12,123 ***	-17,908	3,554 ***	-13,116	3,496 ***	-33,336	9,994 ***
Omitted: Year 1998								
Year 2000	24,536	5,459 ***	1,729	1,178	8,937	1,933 ***	13,870	4,750 ***
Year 2002	7,517	7,657	10,167	1,907 ***	-4,719	2,249 **	2,070	6,903
Year 2004	38,355	9,835 ***	24,284	2,487 ***	6,579	2,916 **	7,493	8,714
Year 2006	89,207	14,355 ***	43,628	3,966 ***	2,677	3,367	42,902	13,141 ***
Omitted: Age 50-54								
Age 55-59	91,259	25,466 ***	28,845	6,139 ***	8,948	7,407	53,467	21,752 **
Age 60-64	154,162	36,034 ***	48,342	8,977 ***	18,432	8,009 **	87,388	31,866 ***
Age 65-69	157,044	36,576 ***	48,076	9,762 ***	20,874	8,829 **	88,095	32,213 ***
Age 70-74	153,475	41,142 ***	52,413	11,094 ***	13,396	9,717	87,666	36,729 **
Age 75-79	137,856	43,490 ***	54,773	12,493 ***	3,666	10,842	79,416	38,734 **
Age 80-84	140,383	46,850 ***	55,416	13,887 ***	-1,751	12,061	86,718	41,697 **
Age 85+	82,210	51,492	38,818	15,605 **	-5,566	13,314	48,958	45,994
Constant	236,969	33,428 ***	62,426	8,012 ***	62,856	9,126 ***	111,686	28,510 ***
Dependent variable mean	460,699		137,829		86,408		236,462	
Observations	40,250		40,250		40,250		40,250	
R-Squared								
within	0.02		0.05		0.01		0.01	
between	0.12		0.04		0.18		0.06	
overall	0.07		0.04		0.11		0.03	

Source: Authors' calculations using the HRS (1998-2006).

Notes: Analysis based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Net worth is the sum of net housing, retirement accounts, and other net assets.
*** p<.01, ** p<.05, * p<.10.

Table 7. Fixed-Effects Log Regression Coefficients, Balanced Panel, All Households Born Before 1947 (Age 60+ in 2006)

	Log Dependent Variable							
	Net worth		Net housing		Retirement accounts		Other net assets	
Variable	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Social Security ($10,000)	0.0020	0.0007 ***	0.0014	0.0003 ***	-0.0037	0.0035	0.0017	0.0009 **
Pensions ($10,000)	0.0009	0.0006	0.0006	0.0003 *	-0.0144	0.0031 ***	0.0017	0.0007 **
Earnings ($10,000)	0.0023	0.0006 ***	-0.0002	0.0003	0.0214	0.0028 ***	0.0022	0.0007 ***
Poor health	-0.0180	0.0040 ***	-0.0048	0.0018 ***	-0.0296	0.0186	-0.0138	0.0048 ***
Single	-0.0841	0.0093 ***	-0.0305	0.0038 ***	-0.2102	0.0369 ***	-0.0549	0.0107 ***
Omitted: Year 1998								
Year 2000	0.0185	0.0038 ***	0.0023	0.0013 *	-0.0157	0.0188	0.0147	0.0046 ***
Year 2002	0.0091	0.0051 *	0.0137	0.0021 ***	-0.1453	0.0237 ***	0.0048	0.0061
Year 2004	0.0383	0.0067 ***	0.0275	0.0028 ***	-0.0606	0.0285 **	0.0128	0.0076 *
Year 2006	0.0596	0.0082 ***	0.0476	0.0039 ***	-0.1646	0.0349 ***	0.0201	0.0096 **
Omitted: Age 50-54								
Age 55-59	0.0745	0.0137 ***	0.0341	0.0056 ***	0.1678	0.0638 ***	0.0552	0.0151 ***
Age 60-64	0.1176	0.0158 ***	0.0538	0.0068 ***	0.2912	0.0714 ***	0.0832	0.0175 ***
Age 65-69	0.1317	0.0180 ***	0.0616	0.0080 ***	0.2886	0.0812 ***	0.0917	0.0203 ***
Age 70-74	0.1342	0.0206 ***	0.0707	0.0090 ***	0.2225	0.0928 **	0.0876	0.0236 ***
Age 75-79	0.1376	0.0240 ***	0.0750	0.0104 ***	0.1634	0.1066	0.1007	0.0278 ***
Age 80-84	0.1336	0.0275 ***	0.0746	0.0119 ***	0.0818	0.1213	0.1011	0.0323 ***
Age 85+	0.0882	0.0313 ***	0.0555	0.0137 ***	0.0349	0.1374	0.0648	0.0367 *
Constant	13.1502	0.0178 ***	13.3628	0.0076 ***	8.7809	0.0812 ***	12.6068	0.0201 ***
Observations	40,250		40,250		40,250		40,250	
Households	8,050		8,050		8,050		8,050	
R-Squared	0.08		0.05		0.11		0.05	

Source: Authors' calculations using the HRS (1998-2006).

Notes: Analysis based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Net worth is the sum of net housing, retirement accounts, and other net assets.

*** p<.01, ** p<.05, * p<.10.

Table 8. Estimated Percent of Retirement Account Holders Born before 1947 (Age 60+ in 2006) with Federal Income Tax Liabilities With and Without Retirement Account Withdrawals by Age and Per-Capita Income Quintile

	Age								
	50-54	**55-59**	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85+**	**All**
				No Retirement Account Withdrawals					
Income Quintile									
Bottom	68%	50%	28%	3%	0%	1%	0%	0%	22%
2nd	100%	99%	87%	30%	7%	2%	4%	1%	57%
3rd	100%	100%	100%	90%	61%	33%	31%	19%	82%
4th	100%	100%	100%	100%	98%	92%	86%	61%	97%
Top	100%	100%	100%	100%	100%	100%	100%	99%	100%
All	97%	95%	89%	75%	65%	58%	57%	51%	80%
				Include a 10 Percent Retirement Account Withdrawal in Taxable Income					
Income Quintile									
Bottom	81%	74%	63%	53%	60%	70%	57%	39%	63%
2nd	100%	100%	96%	77%	72%	71%	70%	41%	86%
3rd	100%	100%	100%	97%	90%	84%	80%	63%	95%
4th	100%	100%	100%	100%	100%	98%	97%	78%	99%
Top	100%	100%	100%	100%	100%	100%	100%	99%	100%
All	98%	97%	95%	90%	89%	89%	86%	73%	92%

Source: Authors' estimated federal income tax liability using HRS reported income and the standard deductions (including aged deductions).

Notes: Analysis is based on 24,255 unweighted person-year observations (4,855 unique households) born before 1947 with retirement account assets in any year from 1998 to 2006. Per-capita income quintile is based on 2006 value by cohort.

Appendix

Table A1. Fixed-Effects Linear Regression Coefficients Including Age-Income Interaction Terms, Balanced Panel, All Households Born Before 1947 (Age 60+ in 2006)

	Linear Dependent Variable									
	Net worth			Net housing of Homeowners			Retirement accounts of account holders			Other net assets		
Variable	Coefficient	Standard Error		Coefficient	Standard Error		Coefficient	Standard Error		Coefficient	Standard Error	
Social Security ($10,000)	26,309	8,061	***	12983	3121	***	-1,338	2,893		14,803	6,517	**
Pensions ($10,000)	954	2,322		236	437		-225	905		868	2,174	
Earnings ($10,000)	9,059	3,955	**	-692	781		3,758	1,197	***	6,120	2,729	**
Poor health	-11,280	7,131		-4035	1879	**	-4,883	2,885	*	-5,249	6,376	
Single	-66,685	12,009	***	-22938	3937	***	-23,914	6,058	***	-34,823	9,886	***
Omitted: Year 1998												
Year 2000	26,068	5,444	***	2880	1379	**	13,999	3,259	***	15018	4714	***
Year 2002	10,918	7,787		14040	2219	***	-9,305	3,993	**	4429	7047	
Year 2004	43,985	9,676	***	31464	2906	***	9,316	5,239	*	11335	8563	
Year 2006	94,834	14,076	***	54415	4632	***	2,522	6,282		46700	12876	***
Omitted: Age 50-54												
Age 55-59	22,850	17,928		19556	9205	**	10,694	9,796		-4692	13688	
Age 60-64	47,867	22,381	**	35673	14451	**	23,680	10,775	**	-7029	16778	
Age 65-69	24,002	26,256		28051	14614	*	22,899	12,804	*	-24953	20791	
Age 70-74	-12,021	31,062		30313	15706	*	12,487	15,109		-57361	25611	**
Age 75-79	-40,755	36,583		32032	17034	*	-3,342	17,692		-79049	31092	**
Age 80-84	-74,091	42,493	*	27366	18598		-20,016	20,570		-100494	36732	***
Age 85+	-136,822	48,830	***	7701	20385		-37,534	23,073		-141586	42791	***
Low Income*Age 55-59	3,607	24,473		-6075	12376		13,098	26,300		12540	16914	
Low income*Age 60-64	-55,127	26,306	**	-30274	17673	*	-10,096	23,750		-7105	17749	
Low income*Age 65-69	-82,398	26,729	***	-41556	17289	**	-20,219	24,669		-18882	18147	
Low income*Age 70-74	-91,952	27,619	***	-61571	18033	***	-23,147	25,085		-11002	18801	
Low income*Age 75-79	-112,187	29,102	***	-82304	19213	***	-21,415	25,978		-18203	20123	
Low income*Age 80-84	-102,622	31,330	***	-94958	20069	***	-4,046	26,762		-4769	22788	
Low income*Age 85+	-83,638	32,964	**	-94787	21988	***	24,183	28,625		9341	23806	
High income*Age 55-59	293,447	101,980	***	50138	15971	***	-2,160	25,522		244642	88581	***
High income*Age 60-64	556,737	159,514	***	88633	21030	***	8,913	28,598		456966	144310	***
High income*Age 65-69	753,596	155,909	***	135807	21285	***	36,322	30,040		584036	140648	***
High income*Age 70-74	931,437	165,436	***	160942	23058	***	32,821	31,213		741495	149899	***
High income*Age 75-79	1,005,919	165,602	***	176248	24824	***	27,499	33,395		807514	149444	***
High income*Age 80-84	1,155,976	175,392	***	203549	26760	***	41,479	34,409		923375	159083	***
High income*Age 85+	1,145,862	175,486	***	203431	28747	***	41,441	36,927		916403	158366	***
Constant	257,473	31,274	***	81570	8717	***	105,706	11,853	***	126303	26521	***
Observations	40,250			35,050			24,255			40,250		
Households	8,050			7,010			4,851			8,050		
R-Squared	0.15			0.09			0.09			0.11		

Source: Authors' calculations using the HRS (1998-2006).
Notes: Analysis based on 40,250 unweighted person-year observations (8,050 unique households) born before 1947. Net worth is the sum of net housing, retirement accounts, and other net assets. Per-capita income quintile is based on the 2006 value by cohort. High-income includes households in the top quintile. Low-income includes households in the bottom quintile. Middle-income includes households in the middle three quintiles.
*** p<.01, ** p<.05, * p<.10.

Table A2. Fixed-Effects Log Regression Coefficients Including Age-Income Interaction Terms, Balanced Panel, All Households Born Before 1947 (Age 60+ in 2006)

	Log Dependent Variable							
	Net worth		Net housing of Homeowners		Retirement accounts of account holders		Other net assets	
Variable	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Social Security ($10,000)	0.0014	0.0007 *	0.0012	0.0004 ***	-0.0015	0.0048	0.0012	0.0008
Pensions ($10,000)	0.0003	0.0006	0.0003	0.0003	-0.0207	0.0043 ***	0.0011	0.0007
Earnings ($10,000)	0.0013	0.0006 **	-0.0006	0.0004	0.0228	0.0040 ***	0.0014	0.0007 *
Poor health	-0.0166	0.0040 ***	-0.0056	0.0020 ***	-0.0369	0.0328	-0.0123	0.0047 ***
Single	-0.0850	0.0092 ***	-0.0360	0.0041 ***	-0.3956	0.0649 ***	-0.0554	0.0106 ***
Omitted: Year 1998				**				
Year 2000	0.0190	0.0038 ***	0.0034	0.0015 ***	-0.0555	0.0319 *	0.0152	0.0046 ***
Year 2002	0.0100	0.0051 *	0.0173	0.0025 ***	-0.2962	0.0420 ***	0.0056	0.0061
Year 2004	0.0402	0.0067 ***	0.0341	0.0033 ***	-0.1640	0.0516 ***	0.0144	0.0076 *
Year 2006	0.0611	0.0082 ***	0.0576	0.0046 ***	-0.3487	0.0654 ***	0.0213	0.0096 **
Omitted: Age 50-54				***				
Age 55-59	0.0474	0.0162 ***	0.0236	0.0076 ***	0.3489	0.1030 ***	0.0295	0.0179 *
Age 60-64	0.0821	0.0184 ***	0.0390	0.0093 ***	0.5850	0.1178 ***	0.0446	0.0204 **
Age 65-69	0.0868	0.0205 ***	0.0427	0.0105 ***	0.5947	0.1360 ***	0.0436	0.0230 *
Age 70-74	0.0775	0.0230 ***	0.0521	0.0118 ***	0.4657	0.1609 ***	0.0175	0.0262
Age 75-79	0.0685	0.0264 ***	0.0573	0.0136 ***	0.3577	0.1927 *	0.0095	0.0305
Age 80-84	0.0496	0.0302	0.0529	0.0156 ***	0.1025	0.2278	-0.0038	0.0354
Age 85+	-0.0044	0.0342	0.0294	0.0179 *	-0.3449	0.2741	-0.0501	0.0403
Low Income*Age 55-59	0.0014	0.0293	0.0022	0.0138	-0.1604	0.2513	-0.0144	0.0288
Low income*Age 60-64	-0.0594	0.0298 **	-0.0207	0.0154	-0.5703	0.2416 **	-0.0537	0.0299 *
Low income*Age 65-69	-0.1001	0.0309 ***	-0.0389	0.0161 **	-0.9729	0.2635 ***	-0.0845	0.0309 ***
Low income*Age 70-74	-0.1253	0.0320 ***	-0.0671	0.0170 ***	-1.1223	0.2814 ***	-0.0798	0.0321 **
Low income*Age 75-79	-0.1556	0.0342 ***	-0.0921	0.0187 ***	-1.3228	0.3172 ***	-0.1040	0.0347 ***
Low income*Age 80-84	-0.1427	0.0364 ***	-0.1055	0.0201 ***	-1.1499	0.3762 ***	-0.0821	0.0381 **
Low income*Age 85+	-0.1220	0.0388 ***	-0.1046	0.0225 ***	-0.9117	0.4577 **	-0.0625	0.0403
High income*Age 55-59	0.1147	0.0389 ***	0.0549	0.0152 ***	-0.1897	0.1628	0.1240	0.0441 ***
High income*Age 60-64	0.2297	0.0433 ***	0.0986	0.0174 ***	-0.0602	0.1779	0.2379	0.0487 ***
High income*Age 65-69	0.3371	0.0450 ***	0.1376	0.0197 ***	0.2496	0.1927	0.3331	0.0515 ***
High income*Age 70-74	0.4217	0.0483 ***	0.1596	0.0219 ***	0.5167	0.2090 **	0.4380	0.0558 ***
High income*Age 75-79	0.5052	0.0529 ***	0.1716	0.0237 ***	0.6120	0.2381 ***	0.5590	0.0633 ***
High income*Age 80-84	0.5554	0.0562 ***	0.1935	0.0256 ***	0.7932	0.2705 ***	0.5950	0.0680 ***
High income*Age 85+	0.5702	0.0615 ***	0.1975	0.0287 ***	1.0421	0.3373 ***	0.6191	0.0743 ***
Constant	13.1665	0.0172 ***	13.3903	0.0082 ***	9.9232	0.1073 ***	12.6218	0.0194 ***
Observations	40,250		35,050		24,255		40,250	
Households	8,050		7,010		4,851		8,050	
R-Squared	0.24		0.11		0.06		0.22	

Source: Authors' calculations using the HRS (1998-2006).

Notes: Analysis based on 40,250 unweighted person-year observations born before 1947. Net worth is the sum of net housing, retirement accounts, and other net assets. Net housing model is limited to households that owned a home at any time from 1998 to 2006. Retirement account model is limited to households that owned a retirement account at any time from 1998 to 2006. Per-capita income quintile is based on the 2006 value by cohort. High-income includes households in the top quintile. Low-income includes households in the bottom quintile. Middle-income includes households in the middle three quintiles.

*** p<.01, ** p<.05, * p<.10.

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