THE WEALTH OF GENERATIONS

LUIS BAULUZ
TIMOTHY MEYER

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Luis Bauluz† Timothy Meyer‡

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Abstract

This paper uses historical survey microdata to study the life-cycle wealth accumulation across U.S. birth cohorts over the last six decades. We uncover two key new trends: a marked steepening of the life-cycle wealth profile and increased dissaving among older adults. Using a theoretical model and wealth accumulation decompositions, we argue that these new trends were driven by the boom in asset prices since the 1980s: valuation gains led to higher life-cycle wealth and allowed households to increase consumption in retirement. Looking at aggregates, we find that shifts in the life-cycle wealth profile explain a large share of the increase in the aggregate wealth-income ratio. At the same time, the higher consumption by older adults is the most important force behind the decline in the aggregate saving rate since the mid-1980s.

JEL classification: D15, D31, E21, E44
Keywords: Intergenerational inequality, wealth accumulation, lifecycle

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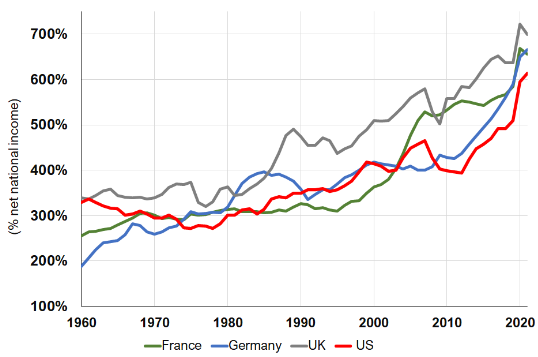
† CUNEF Universidad, and World Inequality Lab, luis.bauluz@cunef.edu.
‡ University of Bonn, timothy.meyer@uni-bonn.de

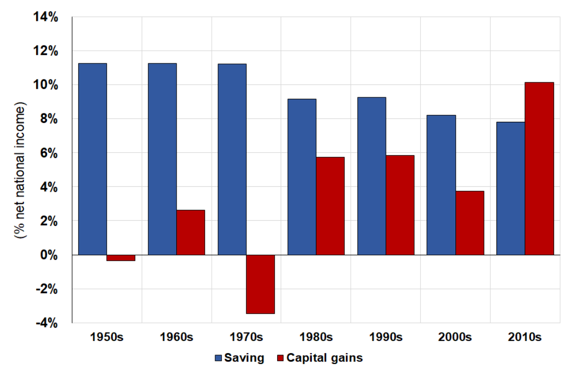
1 Introduction

Since the 1980s, rich countries have witnessed an increase in wealth-to-income ratios (Figure 1a), wealth inequality (Figure 1c), and a boom in asset prices (Figure 1b). While classic models put the life-cycle at the heart of wealth, saving and inequality (Modigliani 1986), we know little about the long-run behavior of these trends in connection to the life-cycle of consecutive generations.

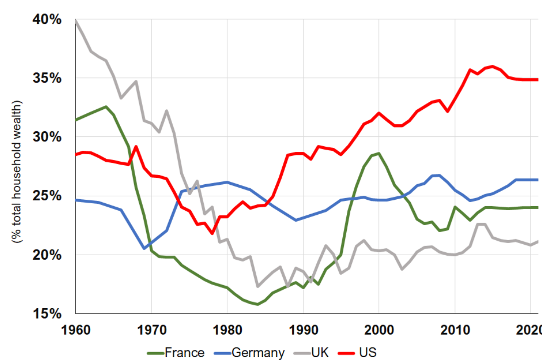
Figure 1: Aggregate wealth, sources of wealth growth and wealth inequality



(a) Aggregate household wealth



(b) Sources of wealth growth: annual saving and capital gains



(c) Top-1% wealth share

Notes: This figure shows results for the U.S. and the three largest European economies: France, Germany and U.K. Panel (a) shows aggregate household wealth, expressed as % of national income (source: World Inequality Database). Panel (b) decomposes annual aggregate household wealth growth into private saving (i.e., household plus corporate saving) and capital gains. Numbers are decennial averages, expressed as a % of national income, and correspond to the unweighted average of the four countries (source: Piketty and Zucman 2014, extended by Bauluz et al. 2022). Panel (c) shows the share of household wealth owned by the wealthiest 1% individuals (source: World Inequality Database based on the works of Albers et al. (2020) for Germany, Garbinti et al. (2020) for France, Alvaredo et al. (2018) for the U.K. and Saez and Zucman (2016) for the U.S.).

This paper studies, for the first time, the life-cycle wealth accumulation of subsequent birth cohorts in the U.S., providing (i) new insights on the life-cycle of U.S. individuals in the past six decades as well as (ii) a micro view on the evolution of aggregate wealth and saving. We undertake this analysis using the Survey of Consumer Finances Plus ("SCF+"), which harmonizes modern waves of the Survey of Consumer Finances -covering the period 1983-2019- with archival data from historical waves available since the 1950s (Kuhn et al. 2020). The SCF+ is unique in that it provides detailed long-run microdata on household assets, debts and income, together with rich demographic characteristics, most importantly age. We construct a set of historical distributional financial accounts by harmonizing these series to make them consistent with national accounts (Batty et al. 2019; Feiveson and Sabelhaus 2019; Alvaredo et al. 2021). As a result, the distributional results of this paper (on wealth, saving, etc.) map to their corresponding macroeconomic aggregate.

In the first part of the paper, we conduct a descriptive investigation to study the life-cycle wealth profile of U.S. birth cohorts born after 1900. Our analysis reveals two important trends in life-cycle wealth accumulation over time. First, we observe a *marked steepening of the life-cycle wealth-income profile for more recent cohorts* (finding 1.1). While all cohorts start with roughly comparable wealth around age 30, more recent cohorts retiring after the 1980s experience around 50% higher wealth by the age of retirement, rising from 5 to 6 times the cohorts' own income to 8 to 9 times.[1]

Notably, we identify that the steeper wealth profile occurs only in the top half of the within-cohort wealth distribution, particularly among the wealthiest top-10%, while the bottom-50% of recent cohorts instead reach progressively lower levels than their predecessors. Consequently, each new cohort is becoming internally more unequal than the previous ones. As a result, we document that wealth inequality within generations and across age groups is currently at its peak since World War II.

Second, we uncover a persistent *stability of post-retirement wealth over time* (finding 1.2).

[1]Throughout the paper, we normalize wealth numbers dividing them by the cohort's own income, making the cross-cohort analysis of life-cycle wealth quantitatively comparable. If, alternatively, we would compare the wealth levels of distant cohorts, we would also reach the conclusion that newer cohorts reach higher wealth, but this would conflate long-run income growth with changes in the life-cycle profile of the cohort.

A well-documented phenomenon is the minimal decrease in individuals' wealth holdings after retirement in recent decades —a behavior that diverges from the fundamental predictions of the life-cycle model, and which is termed in the literature as the "retirement savings puzzle" (French et al. 2023). Our analysis highlights that this behavior is not unique to contemporary cohorts, but rather persists irrespective of the level of wealth achieved and variations in the economic environment experienced by different cohorts upon retirement.

The second part of the paper studies the drivers of these facts. We empirically decompose the life-cycle wealth growth of subsequent cohorts into subcomponents (saving, asset prices, and gifts and inheritances), and introduce a model that connects the shifts in these drivers across generations.

To distinguish the role of different drivers of life-cycle wealth, we rely on an accounting framework that divides wealth growth into saving, capital gains, and inheritances (Wolff 1999; Saez and Zucman 2016; Feiveson and Sabelhaus 2019). This decomposition allows us to identify that the sources of the life-cycle wealth growth have varied markedly for different generations, revealing two important results.

First, we find that *capital gains since the 1980s are a key driver of the steeper life-cycle wealth of recent cohorts* (finding 2.1). In contrast, older cohorts, who accumulated wealth before the 1980s, did so almost exclusively through saving. Through a counterfactual analysis that eliminates capital gains, we find that the life-cycle profiles of more recent cohorts are considerably closer to those of past generations. This highlights the pivotal role of asset prices in explaining the steeper wealth profile of recent cohorts post-1980s.

Second, we uncover a phenomenon we term as a *life-cycle saving reshuffling*, reflecting a *shift towards increased saving during middle age, followed by decreased saving in old age* (finding 2.2). Looking at old-aged individuals across cohorts, we observe minimal wealth reduction post-retirement, both before and after the 1980s. However, this does not imply a lack of dissaving among these individuals. In fact, we find that recent cohorts engage in substantial dissaving amid positive valuation gains, a stark contrast to the slightly positive saving experienced by the older cohorts post-retirement. Conversely, during middle age, our analysis reveals that newer cohorts display higher levels of saving compared to their older counterparts. In total, the overarching trend over recent decades points to increased saving in middle age and a substantial decline in saving during old age.[2]

We study which mechanisms can generate those two findings through an overlapping generations model, in which the young save for retirement and the old dissave to consume. In the model, an increase in either longevity or inequality (with non-homothetic preferences) leads to a rise in the aggregate asset demand from the young, resulting in higher asset prices. The upswing in asset prices, in turn, allows older individuals to consume the valuation gains by selling their assets, resulting in dissaving. On the other side, these assets are acquired by younger cohorts, who increase their saving. As a result, the model generates an intergenerational wealth transfer from the young buyers to the old sellers in the form of higher capital gains (Fagereng et al., 2022). The overall effect is an increase in the wealth-income ratio of the younger cohorts, as well as a life-cycle saving reshuffling, consistent with the trends we document (i.e., findings 2.1 and 2.2).

The third step of the paper connects the changing life-cycle wealth patterns with two macroeconomic aggregates: household wealth and private saving. The development of both indicators has been linked to key macroeconomic trends, such as the structural decline in natural interest rates or changes in the labor shares (e.g., Mian et al. 2021b; Auclert et al. 2021; Kopecky and Taylor 2022; Piketty and Zucman 2014). Using a shift-share methodology, our microdata allow us to decompose long-run shifts in aggregate wealth and private saving across three components: (i) life-cycle wealth or saving profiles, (ii) income inequality and (iii) the population's age structure.

Regarding aggregate wealth, we find that *the combined increase in income inequality and life-cycle wealth profiles can account for most of the rise in aggregate wealth-income ratios since 1980* (finding 3.1). Although the influence of aging has been relatively smaller, its importance has

[2] Results looking at within-cohort wealth groups indicate that capital gains and saving shifted with different intensities for upper and bottom groups. Capital gains explain a greater share of the wealth accumulation for the bottom-90% in recent years while saving has become relatively more important for the top. Moreover, we find that inheritances play a more modest role in the wealth accumulation of different cohorts, but their importance has increased over time. Note, however, that our analysis does not intend to discern the share of lifetime wealth that is inherited relative to self-made, as in the Kotlikoff–Summers–Modigliani controversy (Kotlikoff and Summers (1981); Kotlikoff (1988); Modigliani (1986); Modigliani (1988)). For that purpose, one would need to distinguish capital gains on inherited and self-made assets, which is beyond the scope of our paper.

notably risen in recent years and we expect it to intensify in the decades ahead.[3]

Our analysis of private saving uncovers a striking trend in its evolution since the 1980s: *the emergence of a marked saving polarization* (finding 3.2). We observe a strong increase in saving among the middle-aged rich, paralleled by equally substantial dissaving among the elderly (both the elderly rich and non-rich). The shift-share analysis allows us to discern the primary drivers behind this saving polarization. We find that changes in life-cycle saving profiles account for nearly all of the decline in saving among the elderly and approximately half of the increase among the middle-aged rich, while rising income inequality explains the remaining half.

In essence, we find that (i) the "saving glut of the rich" since the 1980s (as previously documented by Mian et al. (2021b), Saez and Zucman (2016) and Bauluz et al. (2022)) is more accurately characterized as the "saving glut of the middle-aged rich" and (ii) dissaving by the old has emerged as the main force exerting downward pressure on aggregate saving in recent years. Our results indicate that the "asset market meltdown" of the elderly (a concept popularized by Poterba (2001)) operates through a novel channel: not only due to an increase in the elderly population share but predominantly through a decrease in their saving rates, which we link to the post-1980s asset-price boom.[4]

The last step of the paper acknowledges the complexity of measuring wealth and its decomposition. We conduct a thorough check of the data sources and methods used to construct our benchmark results. Our analysis underscores that the overall trends are robust to alternative data treatments, including different measures of capital gains and adjustments made to the survey data.

Our findings have implications for the future and for policymaking. In line with predictions from common life-cycle models, we show that life-cycle wealth and saving profiles shape broader macro-economic trends while redistributing resources across generations. The rise in capital gains since the 1980s appears at the core of the change in life-cycle profiles. Understanding their key

[3]Given the current population trends (which predict low fertility in a context where the baby boom generation will almost entirely retire in the coming years), we forecast demographics to play a larger role in the future, as predicted in Auclert et al. (2021).

[4]The "asset market meltdown hypothesis" suggests that as societies age and the proportion of retired individuals increases, aggregate saving is likely to decline due to lower saving rates among the elderly compared to younger and middle-age adults (Poterba 2001; Abel 2001; Goodhart and Pradhan 2020).

driving forces (such as income inequality, life expectancy, capital regulation, or other relevant factors) becomes of prime importance going forward.

Literature. Our paper is related to four strands in the literature. First, our paper extends the body of research on wealth accumulation over the life-cycle, aiming to reconcile the life-cycle hypothesis (Modigliani 1986) with observed age-wealth profiles (as summarized, for instance, by Attanasio and Weber (2010)). Building on existing work focusing on life-cycle wealth and saving profiles for single cohorts (Shorrocks 1975; Blundell et al. 1994; Attanasio and Hoynes 2000; Gourinchas and Parker 2002; Dynan et al. 2009; Feiveson and Sabelhaus 2019; Ozkan et al. 2023), we investigate how the life-cycle has evolved over six decades in the U.S.[5] To the best of our knowledge, only France has comparable long-run data on life-cycle wealth (where we document similar trends in the appendix). Complementing our analysis, Sturrock (2023) analyses the growing gap across cohorts in the U.K. in a full quantitative model. Closest to us is the independent work by Jaeger and Schacht (2022), which uses the SCF+ to study trends in the *median* wealth for cohorts born since the 1940s. In contrast, our analysis covers all cohorts born since 1900, explores within-cohort groups, employs a theoretical model, and establishes links between the life-cycle and aggregate wealth and saving.[6]

Our paper speaks to the literature on saving after retirement (De Nardi et al. 2016). Much discussion in the literature relates to the stability of wealth holdings in cohorts retiring in recent years (e.g., Love et al. 2009; De Nardi et al. 2010; Blundell et al. 2016; Poterba et al. 2018; Ameriks et al. 2020), an aspect that has been often interpreted as a lack of dissaving. Our contribution to this literature is threefold. First, we study the persistence of this phenomenon. Second, we dissect

[5] Looking at more recent years (starting in the 1990s or 2000s), various papers document life-cycle wealth profiles for cohorts in various countries, including England (Cribb 2019 or Sturrock 2023), Germany (Bartels and Morelli 2021), Spain (Artola-Blanco et al. forthcoming), and the U.S. (Gale and Pence 2006; Dettling et al. 2014; Gale et al. 2020). Consistent with our long-term data for the U.S., these studies generally find increased wealth around retirement for more recent cohorts. In contrast to these works, our study takes a comprehensive long-term perspective to analyze trends in life-cycle wealth. We also undertake a detailed decomposition of intergenerational wealth differences to discern the relative importance of various drivers, including saving, asset prices, and inheritances.

[6] In Appendix B.4, we also look at the evolution of wealth for different age groups and within-age groups over time (instead of following a given cohort over time). By taking a longer-run perspective, our results also inform recent debates about wealth differences between "millennials" and "baby boomers" (e.g., Gale et al. 2020; Sabelhaus and Volz 2022a; Paz-Pardo 2021). We show that the age-wealth gap emerged in the 1980s and is linked to the steepening of the life-cycle wealth profile.

the sources of post-retirement wealth growth into saving, inheritances, and asset prices (similar to Feiveson and Sabelhaus (2019), who focus on a single cohort), and show that the dynamics underlying the stable wealth after retirement have changed over time.[7] Last, we present a theoretical framework that connects the changing roles of these drivers across cohorts, informing debates on post-retirement consumption behavior.

Our paper equally speaks to the ongoing debates on the dynamics of aggregate wealth and saving, which are often linked to key economic trends such as the decline of natural interest rates or the fall of labor shares (e.g., Carvalho et al. 2016; Rachel and Summers 2019; Eggertsson et al. 2019; Goodhart and Pradhan 2020; Gagnon et al. 2021; Mian et al. 2021b; Kopecky and Taylor 2022; Bauluz et al. 2022; Piketty and Zucman 2014; Karabarbounis and Neiman 2014). Following a well-established tradition that employs a shift-share methodology to understand these macroeconomic aggregates (Summers and Carroll 1987; Mankiw and Weil 1989; Auerbach and Kotlikoff 1990; Poterba 2001; Bosworth et al. 1991; Beaudry et al. 2023), we investigate how shifts in life-cycle wealth impact their longer-term evolution. Our work finds its closest companions in Auclert et al. (2021) and Mian et al. (2021c), both using the SCF+. While Auclert et al. (2021) dissect the influence of age groups on aggregate wealth (holding fixed life-cycle wealth profiles), and Mian et al. (2021c) study the effects of income inequality and the population's age structure on aggregate saving, we focus on the role of life-cycle saving and wealth profiles—a dimension that proves central in comprehending the shifts in aggregate wealth and saving.

Finally, our paper relates to the literature studying the factors shaping the long-run dynamics of the wealth distribution in the U.S. We look at the U.S. post-1980s wealth boom (Piketty and Zucman 2014) and rise in wealth concentration (Saez and Zucman 2016; Kuhn et al. 2020; Smith et al. 2023; Bartscher et al. 2020; Greenwald et al. 2019; Blanchet and Martínez-Toledano 2023) from a cohort and within-cohort perspectives. We construct new series of cohort-specific household wealth that are consistent with aggregate wealth statistics (Batty et al. 2019; Piketty et al.

[7] The definition of saving and income we use is consistent with macroeconomic aggregates. Accordingly, withdrawals of funded pensions (e.g., a 401(k) pension plan) used for consumption are treated as dissaving (i.e., liquidation of existing assets) and not as an income flow (Bosworth et al. 1991; Piketty et al. 2018; Alvaredo et al. 2021).

2018; Alvaredo et al. 2021). Furthermore, we provide a new database of saving, capital gains and inheritances in specific assets (housing, business assets, fixed-income assets, equity), for different cohorts and within-cohort groups. Importantly, the capital gains we compute are consistent with market data for returns on different assets (Jordà et al. 2019).

The rest of the paper proceeds as follows. Section 2 introduces the key concepts, methods, and data sources used. Section 3 presents new facts on the life-cycle profile of subsequent generations and on the distribution of wealth within cohorts. Section 4 decomposes generations' wealth growth across saving, capital gains and inheritances, and introduces a theoretical model that connects these drivers across generations. We examine the link between life-cycle wealth and trends in aggregate wealth and saving flows in section 5. In section 6, we discuss the sensitivity of our results to a range of factors. Section 7 concludes.

2 Concepts, data and methodology

In this paper, we use concepts and definitions of household wealth, income and saving from the international system of national accounts (SNA 2008) and harmonize the distributional data to make it consistent with the balance sheet and flow accounts of the household sector. This section provides an overview of the main concepts used in this paper, the underlying data, and the methodology to decompose changes in cohorts' wealth into saving, asset prices and wealth transfers. In section 6, we discuss the robustness of our results to the methods and data used in our analysis.

2.1 Main concepts

Our concept of household wealth follows standard definitions. Household wealth (often referred to as household net wealth or net worth) comprises the total value of non-financial assets and financial assets owned by households, minus any outstanding liabilities. To decompose household wealth into different types of non-financial assets, financial assets and liabilities, we adhere to the classification of asset types in the SNA-2008. In line with the principles of the Distributional National

Accounts project (Piketty et al. 2018; Alvaredo et al. 2021), unfunded pensions are excluded from the concept of wealth, as these are not linked to existing assets. Unfunded pensions encompass pay-as-you-go social security pensions and unfunded defined-benefit pensions.[8]

Our concept of saving is commonly known as "private saving" in the literature (e.g., Auerbach 1988; Poterba 2001; Piketty and Zucman 2014; Mian et al. 2021b). It encompasses the saving of the household sector (which involves the acquisition of assets net of debt accruals), along with the saving of privately owned corporations, often referred to as retained earnings. Households essentially own corporations, so corporate saving is considered a saving flow for the equity owners and treated as saving in equity (Miller and Modigliani 1961). We distribute corporate savings to households based on the share of the corporate sector that is privately owned, accounting for global cross-ownership of corporations.[9]

Our definition of household income follows efforts by Fed researchers (Dettling et al., 2015) to align the SCF with national accounts. Household income is pre-tax and post-transfers and includes labor and business income, capital income, and transfer income. Consistent with macroeconomic aggregates, withdrawals of funded pensions used for consumption are treated as dissaving (i.e., liquidation of existing assets) and not as an income flow.

2.2 Data

The main data source we rely on is the Survey of Consumer Finances + (SCF+). This dataset combines and harmonizes historical SCF waves dating back to the 1950s with the contemporary

[8]While unfunded pensions influence private saving decisions (e.g., Engelhardt and Kumar 2011) and one might consider including them in the definition of wealth, it is important to note that other future government payments also affect private saving behavior, which makes conceptually challenging to delineate a concept of wealth that goes beyond marketable assets and debts. Furthermore, calculations involving unfunded pension assets, which typically involve discounting future payments, are inherently fragile. For these reasons, we do not account for unfunded pensions in our definition of assets, an approach standard in the inequality literature (e.g., Saez and Zucman 2016; Smith et al. 2023; Kuhn et al. 2020; Mian et al. 2021c). Previous studies for the U.S. that impute social security pensions tend to report lower levels of wealth inequality, although the impact on trends varies depending on the specific assumption on the discount rates implemented in these papers (Sabelhaus and Volz 2022b; Catherine et al. 2020; Bönke et al. 2020).

[9]Specifically, we deduct the portion owed to foreign entities from the retained earnings of domestic corporations, while incorporating the share of foreign retained earnings that is owed to resident households. We carry out this adjustment by leveraging recent data on net reinvested earnings from the World Inequality Database (Alvaredo et al. 2021).

SCF data available since 1989 and administered by the Federal Reserve Board (Kuhn et al. 2020).[10] The contemporary SCF provides an accurate representation of the wealth distribution, particularly for the upper parts of that distribution, due to the oversampling of very wealthy households. While the historical SCF lacks the same oversampling strategy, Kuhn et al. (2020) have shown that it is still very precise when analyzing larger wealth groups like the top-10% or the bottom-50%.

Our analysis uses survey waves starting from 1960 onwards, where age is reported as a continuous variable and not in discrete bins.[11] This is crucial for studying the evolution of birth cohorts, which are defined by the age of individuals at the time of the survey. We restrict the sample to adults aged 20 and older and split wealth equally between couples (consistent with Saez and Zucman (2016) or Smith et al. (2023)).[12]

The SCF+ includes data on all major asset categories (cash, deposits, bonds, equity, etc.) except for defined benefit pensions, which are missing for the entire survey, and defined contribution pensions, which are missing in the historical waves. For the years 1989-2019, we impute funded defined benefit pensions using the procedure outlined by Henriques Volz and Sabelhaus (2019).[13] For the historical waves, we take a different approach to impute pension assets (both defined contribution and defined benefit). We use the age - wealth distribution of pension assets in the modern waves and shift it downwards following changes in life expectancy. It is worth mentioning that funded pensions constitute nearly 30% of household wealth today but less than 10% in this period (see Appendix Figures A1a and A1b). As we show in the robustness section 6, the inclusion of pensions does not alter the trends we document in a significant manner.[14]

[10] Another dataset with U.S. microdata on individual income, assets and debts is the one from Piketty et al. (2018), which is available on an annual basis since 1962. Unfortunately, the age variable only covers two large age groups until 1978 (20 to 64 and 65+) and three since 1979, not allowing the analysis of birth cohorts over time.

[11] Our main analysis omits the 1977 wave, in which we find an anomalous drop in equity holdings (see also Auclert et al. (2021)). We show this explicitly in Appendix A.3, where we also show our main results including the 1977 wave.

[12] To determine individuals' ages, we use the age of the household head for single individuals. In the case of married couples, we assume that both adults are of the same age since only the age of the household head is available in the historical SCF waves. In the modern SCF waves, the average age distance between couples is 2.5 years. In section 6 we show that our findings also hold when not splitting wealth between couples.

[13] While Henriques Volz and Sabelhaus (2019) imputed both funded and unfunded defined benefit pensions, our interest lies solely on marketable assets. To address this, we set the funded share of defined benefits equal to the share of funded defined benefit pensions among defined benefit pensions in the aggregate.

[14] Investment funds are also not recorded in the data before 1971, constituting less than 1% of total wealth from 1960 to 1970. Given their limited contribution, we opt not to address this missing data. Similarly, offshore assets are

In the next step, we harmonize the SCF with macroeconomic aggregates from official balance sheets. Making the SCF consistent with macroeconomic data is the aim of several studies, notably the Distributional Financial Accounts (Batty et al. 2019). The SCF is generally found to align well with wealth aggregates. We categorize assets and liabilities using the guidelines established by the international system of national accounts (SNA 2008), distinguishing six broad asset categories: fixed-income assets (including bonds, deposits, and currency), equity, investment funds, pension and life insurance assets, housing and business assets. Additionally, we differentiate two types of liabilities: short-term and long-term debt. The precise mapping of SCF asset categories to their SNA 2008 equivalents is detailed in Table A1 in the appendix. Subsequently, we rescale the SCF components to be consistent with their aggregate counterparts. This harmonization process parallels the approach taken by Batty et al. (2019) and Feiveson and Sabelhaus (2019) in reconciling the SCF with macroeconomic data, and several other studies within and outside the United States (e.g., Albers et al. 2020; Blanchet and Martínez-Toledano 2023).

After aligning the survey microdata with macroeconomic accounts, we proceed to "unveil" indirectly held assets through investment and pension funds, an approach used in previous studies (e.g., Saez and Zucman (2016), Mian et al. (2021b) or Bauluz et al. (2022)). We decompose intermediated financial assets into two broad categories: fixed-income assets and equity. This categorization is based on the asset portfolio of pension and investment funds, as documented in the Financial Accounts, and we allocate indirectly held assets in the survey accordingly. This distinction is important for understanding the roles of saving and asset prices in wealth growth dynamics because equity and fixed-income assets exhibit distinct price behaviors.[15] By unveiling indirectly held assets, we simplify the financial portfolio of U.S. households into two primary asset categories: fixed-income assets and equity.

Our concept of household income follows Fed researchers (Dettling et al., 2015) harmonizing the SCF with national accounts. Kuhn et al. (2020) show that the SCF+ income aligns with

absent from both the national accounts and the SCF+, and we do not attempt any corrections in this regard.

[15]Currently, pension and investment funds represent approximately half of the financial portfolio of U.S. households (Figure B12), with equity held through these funds providing substantial valuation gains in recent decades.

aggregates household income over time in trend and levels. In particular we subtract from national accounts those components not included in the SCF, most importantly imputed rents on owner occupied housing and supplements to wages. Appendix A.1 provides more details. Importantly, our results use income as a denominator only, to show wealth accumulation and its components as a fraction of income earned by the cohort.

2.3 Wealth accumulation: saving, capital gains and intercohort transfers

We employ a well-established accounting framework to decompose the wealth growth of cohorts into three key components: saving, capital gains (representing asset prices), and wealth transfers (comprising inheritances and inter-vivos gifts). This framework is often referred to as the "synthetic saving method" (e.g., Saez and Zucman (2016); Garbinti et al. (2020); Kuhn et al. (2020)). It relies on an accounting equation that establishes a relationship between changes in wealth and these three potential drivers. The central idea is to employ information on capital gains and wealth transfers to obtain saving flows as the residual in the cohort's budget constraint. To ensure the distributional outcomes correspond to macroeconomic aggregates, we follow a two-step process, examining aggregate wealth accumulation and then cohort-level accumulation.

In the initial step, we break down household wealth accumulation at the aggregate level using asset-specific accumulation equations (e.g., Artola-Blanco et al. (2020); Bauluz et al. (2022)). This process decomposes the growth of each asset class into two components: a volume effect, reflecting saving, and a price effect, accounting for capital gains or losses. Specifically, for each asset type (e.g., housing, business assets, bonds and deposits, equity, debt), we employ the equation

$$A_{t+1} = A_t(1 + q_{t+1}) + S_{t+1,A}. \tag{1}$$

Here, A_{t+1} and A_t denote the real values at times $t + 1$ and t of a given asset recorded in the national accounts, while $S_{t+1,A}$ represents the net-of-depreciation saving flow in the asset in year $t + 1$. Lastly, q_{t+1} reflects the real capital gain or loss from asset type A between time t and

$t+1$. All components of the equation are derived from national accounts data, specifically the Flow of Funds.[16] In line with Piketty et al. (2018), we adjust the housing and equity saving rates in the national accounts to align housing capital gains with the Case-Shiller house-price index while ensuring consistency between the sum of all saving flows and total private saving. In the robustness checks (subsection 6.2.3), we show that using the unadjusted saving rates does not significantly alter the trends highlighted in this paper. Overall, the capital gains we derive closely align with existing asset-price indexes (such as Case-Shiller house-price index or SP-500 index), as displayed in Appendix Figure E35.

In the second step, we extend this framework to analyze wealth accumulation across different birth cohorts, in line with previous work from Wolff (1999) or Feiveson and Sabelhaus (2019). The main difference when looking at cohorts is that we include intergenerational wealth transfers (i.e., inheritances and gifts), to account for the fact that some cohorts are net givers and other cohorts net receivers of wealth transfers at a given point in time.

For a given asset type A (e.g., housing, business assets, etc.), and a specific generation g, we decompose wealth accumulation using the accumulation equation

$$A^g_{t+1} = A^g_t(1 + q_{t+1,A}) + S^g_{t+1} + I^g_{t+1}. \tag{2}$$

Here, A^g_t refers to the real holdings of asset A of generation g at time t and $q_{t+1,A}$ is the real capital gain or loss of asset type A between time t and $t+1$. Finally, I^g_{t+1} reflects the net inheritances and gifts received by generation g in time $t+1$, that is, the inflows of gifts and inheritances received by a generation less the outflows of gifts and inheritances given by a generation.

In terms of measurement, we observe A^g_t directly in the SCF+ on a triannual basis and then interpolate to construct values in between.[17] The capital gains $q_{t+1,A}$ on the other hand, are

[16] In practice, capital gains consist of two items in national accounts: valuation gains and other volume changes. The latter is not strictly a capital gains, and hence one might want to exclude it, but in practice its size is minimal, so it does not affect our results.

[17] Concretely, we linearly interpolate the share $x^g_{t,A}$ of an asset A that is owned by cohort g between survey waves. We then multiply the interpolated shares with the aggregates to obtain asset ownership between survey waves. This ensures that we are consistent with macroeconomic aggregates also between survey waves.

the ones constructed from macroeconomic accounts in equation 1 and hence correspond to the average of the economy. In other words, we assume that all cohorts experience the same capital gain on a given asset class at a point in time.[18] We discuss this assumption in the robustness checks (subsection 6.2.3) and show that capital gains on specific assets are generally similar across birth cohorts. Then, saving of a given cohort in a specific asset $S^g_{t+1,A}$ is obtained as the residual from all other components in the equation. As a result, this framework distributes aggregate private saving and aggregate capital gains, obtained in (1), across different generations over time.[19]

This accounting framework is particularly well-suited for analyzing birth cohorts using repeated cross-sections of survey microdata. This is because birth cohorts consist of the same households over time, except in case of death, for which we account through our inheritance estimation. In section 5.2, we also examine the saving behavior of within-cohorts wealth groups, such as the top-10% within a cohort. To do this, we compare the same group across two-time points, assuming that households do not change groups in between. This assumption aligns with prior literature that analyzes wealth growth across the wealth distribution using cross-sectional data (e.g., Saez and Zucman (2016); Garbinti et al. (2020); Kuhn et al. (2020); Martínez-Toledano (2020); Mian et al. (2021b)). We further discuss and provide evidence on this assumption in the robustness checks (section 6.2.4).

2.4 Estimation of inheritances and gifts

We estimate inheritances using the mortality multiplier approach (Alvaredo et al. 2017; Feiveson and Sabelhaus 2019). In this section, we outline the estimation and provide additional details in Appendix A.4, where we also show that our estimates compare well to existing results in the literature. In the next sections, we document that inheritances make up a small fraction of wealth accumulation when looking at cohorts as a whole (the object of this paper), which needs not be

[18]With different portfolios, however, different cohorts still experience differing capital gains on their wealth.

[19]Using this methodology allows us to accurately capture the rise in corporate saving (Bauluz et al. 2022; Chen et al. 2017), which account for a large fraction of aggregate saving in recent years. Corporate saving is treated as saving in equity assets, hence, our methodology assigns saving done by corporations to equity owners (see also Mian et al. (2021b)).

the case when looking at individuals within cohorts. This result is consistent with evidence from detailed microdata for Norway (Black et al., 2022). Hence, even though the measurement of inheritances and gifts is imperfect, it is unlikely to affect our results in a significant manner.

The method consists of two steps. First, it predicts the amount of post-tax bequest left by different population groups. Second, it assigns the bequests to different population groups.

In the first step, we forecast the bequests left by different households in a given year using mortality rates. We use mortality rates from the Social Security Administration (SSA) and adjust for differential mortality by wealth following Saez and Zucman (2016).[20] We further adjust those bequests for deductions. Using estate tax data, we first subtract charitable giving and funeral costs from the inheritance flow, as this does not pass to the next generation.[21] Second, we calculate the amount of estate taxes paid on the remaining inheritances and subtract them. To do so, we collect estate tax schedules and apply them to the estates. The total flow of inheritances compares well to available estimates from Feiveson and Sabelhaus (2019) and Alvaredo et al. (2017) as we show in Appendix Figure A9.

We distribute inheritances following the observed density of inheritances in the SCF. The SCF records inheritances in a separate module, which is available since 1989. The inheritances reported include only those received from outside of the households, in particular, they exclude inheritances from a deceased spouse. This means we need to take a stance on the share of inheritances going to the spouse and the share going to subsequent generations. Following evidence in Fahle (2023), we distribute 18% of bequests by deceased with a surviving spouse to the offspring.[22]

Finally, inter-vivos gifts also transfer wealth between generations. We account for these in a similar way. We compute the total amount of inter-vivos recorded in the SCF post 1989 and distribute them according to the distribution of recipients.[23] Before 1989, gifts are not reported, so

[20]Saez and Zucman (2016) compute differential mortality for different age groups and time periods directly from the Statistics of Income individual annual files.

[21]The deductions follow observed amounts in U.S. estate tax data. Estate Tax Data is available at https://www.irs.gov/businesses/small-businesses-self-employed/estate-tax

[22]We show that our results are robust to using a different distribution of inheritances in Section 6.

[23]Total gifts reported by givers are larger in the SCF than total gifts reported by recipients. We use the total flow of gifts given, but distribute it following the distribution of gift recipients.

we assume that gifts are 20% of the bequest flow before 1989, the same assumption as in Alvaredo et al. (2017).[24] We again distribute the gift flow following the observed density of gifts received in the SCF. Before 1989, we use the post-1989 distribution of gifts and inheritances to assign these to recipients, but shift it downward following the change in life expectancy, reflecting that these cohorts received their inheritances earlier in life.

3 New stylized facts

This section presents stylized facts for long-run trends in life-cycle wealth accumulation of birth cohorts in the U.S. spanning six decades. We analyze cohorts born in each decade from 1900 to 1979, which are observed throughout most of their working lives.

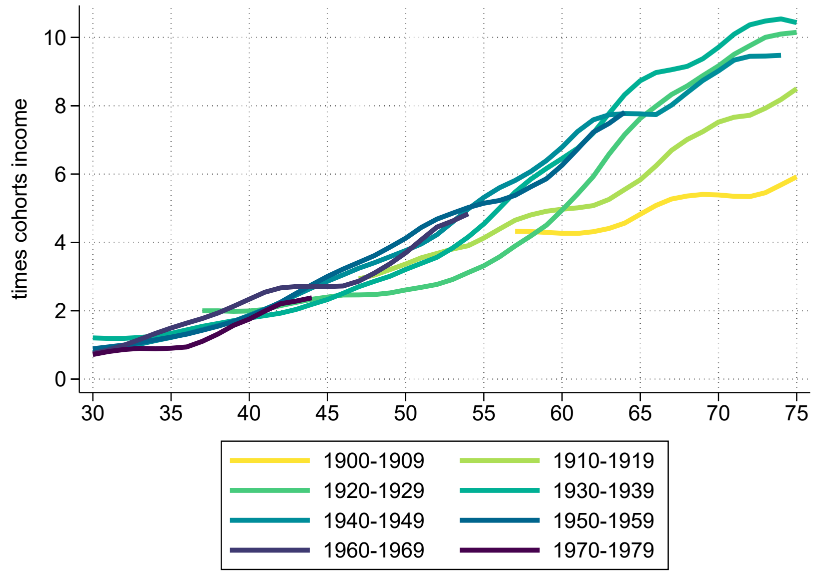
We begin by documenting the life-cycle wealth trajectories for these successive cohorts, including their portfolio composition. We go on to document how life-cycle wealth varies within each cohort, distinguishing between the top-10%, middle-40%, and bottom-50% groups. This, in turn, allows us to look at wealth inequality over the life-cycle for each of these cohorts. For an international perspective and a comparison with trends in life-cycle wealth accumulation in France, please refer to Appendix B.3. These results for birth cohorts map directly results for age groups; in Appendix B.4, we describe the distribution of wealth across age groups.

3.1 Life-cycle wealth trends

Figure 2 plots the life-cycle wealth for the eight generations examined in this paper. It measures cohorts' average wealth from age 30 to 75, normalized by their respective average income at each age. Throughout, age refers to the age at the midpoint of the the cohort. Expressing wealth relative to each group's income enables meaningful comparisons of life-cycle wealth trajectories. Without this normalization, differences in wealth levels could simply reflect variations in income, obscuring any distinctions in wealth behavior over the life cycle.

[24]The observed ratio of gifts to the bequest flow in the SCF in the available years is very close at 21%.

Figure 2: **Life-cycle wealth accumulation**



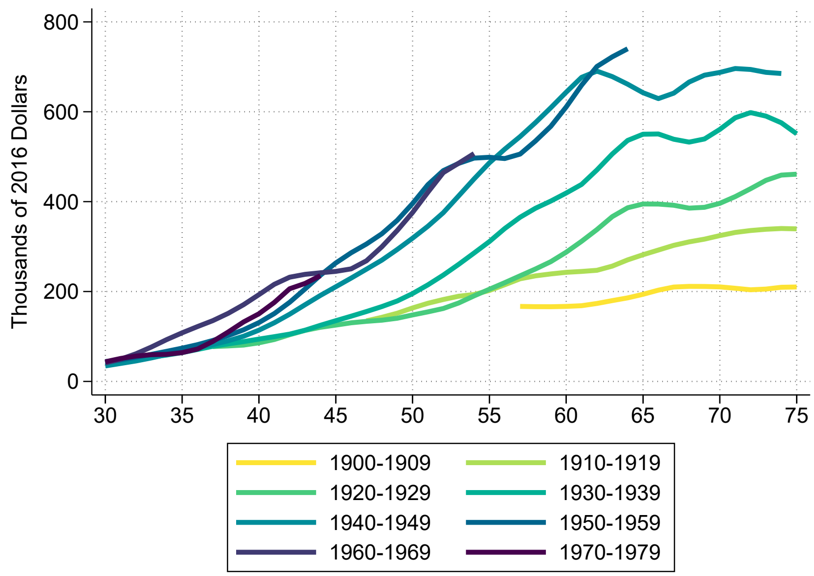
This figure plots the average wealth of eight cohorts during their life cycles, expressed as a share of the cohorts' own average income. Series are 7-year averages.

This chart serves as a key finding. We identify a much steeper life-cycle wealth accumulation profile among more recent cohorts, reflecting a change in the accumulation pattern experienced across different generations. Although all cohorts start with roughly similar levels of wealth (equivalent to 1 time their income at age 30), the more recent cohorts, born in the period spanning the 1920s to 1950s, attain significantly higher levels of wealth by retirement age. Wealth-income ratios rise by around 50%, from 5-6 to around 8-9 for recent cohorts. Furthermore, we find a steady increase in all cohorts' wealth-income ratios throughout their life cycles, contradicting the anticipated decline predicted by the standard life-cycle model in older ages. As a result, the observation that older adults have become wealthier in recent years, while younger ones have not seen a comparable increase, involves that age-wealth inequality (measured as the ratio of wealth of the old over the young) has reached, in recent years, its peak in the post-World War II era (see Appendix B.4).

As shown in the robustness section 6, this finding holds firm alternative data specifications, including the raw SCF+ series, excluding defined benefit pensions or using households instead of individual adults as the unit of observation. Additionally, the equivalent French series displayed in the Appendix (see Figure B13) shows a similar pattern. Together, these results suggest that shifts in household size or the US-specific institutional setting (such as the pension system) are not the primary drivers explaining this trend.

To gain deeper insights into the dynamics of life-cycle wealth, we present Figure 3 displaying the evolution of wealth only, with values expressed in constant 2016 dollars. This figure provides another key finding of this section: the stability of post-retirement wealth over time.

Figure 3: **Life-cycle wealth in constant prices**



This figure plots the average wealth and during cohorts' life cycles in constant thousands of 2016 dollars. Series are 7-year averages. For example, the average wealth at age 65 of the cohort born in 1920-29 is around 400,000 dollars at constant prices of 2016.

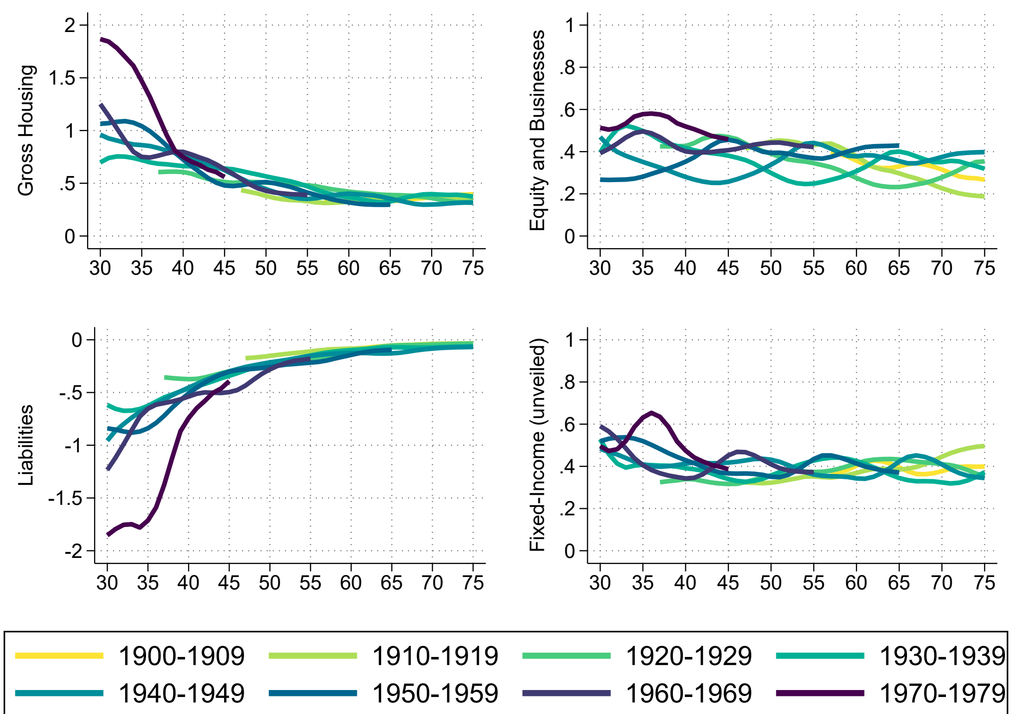
For all cohorts, we observe a consistent pattern where wealth increases until reaching retirement age and remains relatively stable thereafter.[25] Extensive research has shown the minimal decrease in individuals' wealth holdings after retirement in recent decades (French et al. 2023). Our findings show that this phenomenon is not a recent development; instead, it has persisted over time, irrespective of variations in the level of wealth achieved and the economic environment ex-

[25]Equivalently, Appendix Figure B10 displays cohorts' life-cycle income in constant dollars. Throughout all cohorts, income consistently rises until reaching the retirement age, after which it diminishes.

perienced by different cohorts. This result will be important when decomposing cohort wealth accumulation post-retirement in section 4, as those living after the 1980s experienced substantial positive valuation gains, while those before did not.

Next, we delve into the evolution of portfolio composition as individuals progress through different life stages. In Figure 4, we break down the cohort portfolios into four main categories: housing, fixed-income assets, and equity and business assets, and debt. These asset categories are expressed as percentages of net wealth at various ages. Unveiling of indirectly held assets through investment and pension funds, as discussed in section 2, enables us to simplify the representation of asset composition into three basic types, portfolios before unveiling are in appendix figure B12.

Figure 4: **Portfolio shares over the life-cycle across birth cohorts**



Notes: This figure shows the share of three assets (housing, fixed-income assets, and equity (including businesses)) and liabilities in the wealth of various cohorts at different points of their life-cycles. Holdings of assets are shown as a percentage of net wealth of the cohort at that age. Series are 7-year averages.

The unveiled portfolios reveal meaningful shifts that have occurred across generations. In particular, newer cohorts display substantially larger leveraging, with housing and debt taking up a larger share of their wealth in the early stages of their life cycles, particularly before ages 40 to 45 (see Bartscher et al. 2020 for further discussion). Consistent with prior research, we also observe a recurring pattern where the proportion of equity and housing gradually decreases as individuals progress through their life cycles, while fixed-income assets experience a slight rise after age 50 (e.g., Ameriks and Zeldes 2004; Cocco et al. 2005; Fagereng et al. 2017).[26] In section 4, we will provide additional insights into cohorts' life-cycle portfolios.

3.2 Life-cycle wealth: within-cohort inequality

Examining life-cycle wealth profiles *within* cohorts is important as income and wealth inequality widened in the U.S. in recent decades (e.g., Wolff 2002; Heathcote et al. 2010; Piketty et al. 2018; Smith et al. 2023). We look at this trend from a cohort perspective.

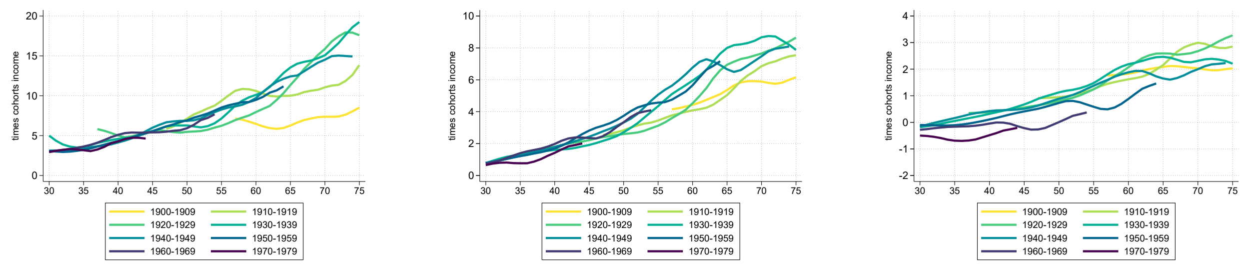
Figure 5 illustrates the life-cycle wealth profiles of three distinct wealth groups within birth cohorts: the top-10%, the middle-40% and the bottom-50%. The figure uncovers that the steeper wealth accumulation seen in more recent generations is primarily concentrated within the upper half of the within-cohort distribution. Both the top-10% and the middle-40% from the newer cohorts experience increased life-cycle wealth compared to older cohorts. In contrast, the bottom-50% of each new cohort lags behind their predecessors.[27]

The disparities in wealth *levels* attained throughout individuals' lifetimes are quite substantial, particularly around retirement. For example, the top-10% within birth cohorts accumulate wealth equivalent to 10 to 15 times their income by age 70, whereas the bottom-50% accumulates only two to three times their income. This underscores that a significant portion of the U.S. population holds relatively modest wealth not only in cross-sectional comparisons (Aguiar et al. 2020)

[26]However, a more detailed look at the data shows that more recent cohorts have increased their equity shares in the years before retirement at the expense of fixed-income assets, a behavior distinct from what the older generations did. This finding aligns with Catherine (2022), who studies the behavior of recent cohorts using modern SCF data.

[27]This finding aligns with studies by Gale et al. (2020) and Jaeger and Schacht (2022), who note that the most recent birth cohorts, those born in the 1960s or 1970s, tend to underperform prior generations in terms of median wealth. It also resonates with results from Bauluz et al. (2022), illustrating that the global wealth boom since the 1980s has primarily favored the top-10% and middle-40% of households in the cross-section, leaving the lower half of the population behind.

Figure 5: **Life-cycle wealth accumulation of the top-10%, middle-40% and bottom-50%**



(a) Wealth of the top-10% (b) Wealth of the middle-40% (c) Wealth of the bottom 50%

This figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of their own group's average income. Series are 7-year averages. For example, the average wealth of the top-10% at age 70 of the cohort born in 1910-19 is slightly above 10 times their own average income.

but also within cohorts over their life cycles, even around retirement.

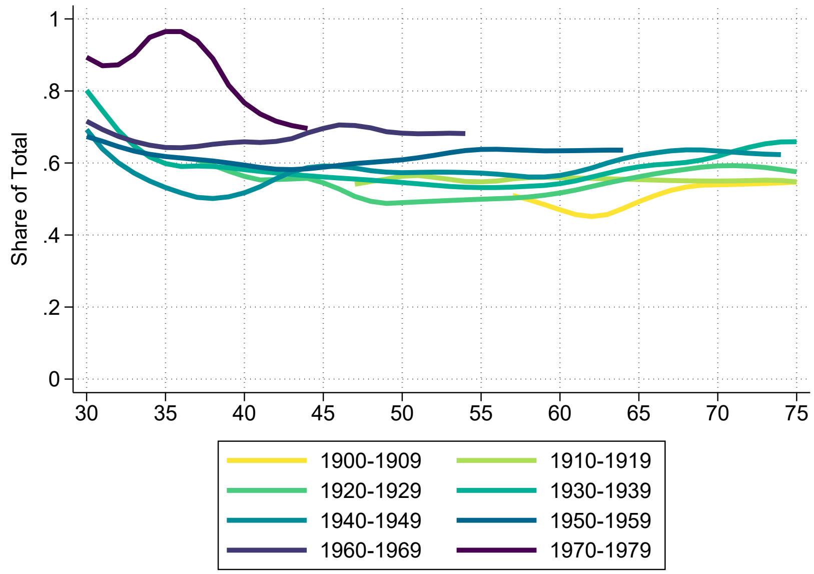
To conclude this section, we shift our perspective and focus on within-cohort wealth inequality across the life cycles, as illustrated in Figure 6. Specifically, we plot the share of wealth owned by the top 10% of each age group within each cohort.[28] Our examination across all cohorts reveals that wealth inequality tends to be somewhat higher during the early stages of their working age, gradually decreasing thereafter. This pattern of higher inequality at younger ages aligns with previous findings in the literature (e.g., Garbinti et al. 2020; Martínez-Toledano 2020). In line with the outcomes depicted in Figure 5, our analysis uncovers that within-cohort inequality was lower for older cohorts and has surged for more recent cohorts.

Notably, we focus on the comparison of wealth concentration around the age of 50, which encompasses the majority of cohorts (with the exception of those born in 1900-1909 and 1970-1979, for which data is unavailable at that age). Examining this age group, we find that the top 10% of the cohorts born in 1910-1919 and 1920-1929 collectively own approximately 50-55% of the group's wealth, while for the most recent cohorts, this figure approaches 70%.

Overall, the results from this section conclude that the rise in wealth inequality in the U.S. in recent decades is a broad phenomenon, reflecting both an increase across as well as within cohorts.

[28] Figure Appendix B11 shows the same results for the middle-40% and bottom-50%.

Figure 6: **Within-cohort top-10% wealth share over the life-cycle**



Notes: This figure displays the share of a cohort's wealth owned by the top-10% at a given age. For example, the share of the wealth of the cohort born in 1940-59 at age 50 owned by the richest top-10% of that age is approximately 60%.

4 Deconstructing life-cycle wealth growth

This section aims to uncover the drivers behind cohorts' life-cycle wealth growth, focusing on two main outcomes from the prior section: (i) the stepper life-cycle wealth profile of recent cohorts and (ii) stable post-retirement wealth. We undertake three steps: first, providing the macroeconomic context for wealth accumulation over recent decades; second, decomposing cohorts' life-cycle wealth growth into saving, capital gains, and inheritances/gifts; and finally, discussing our findings through the lenses of a life-cycle model.

4.1 Macroeconomic context: wealth growth and its sources

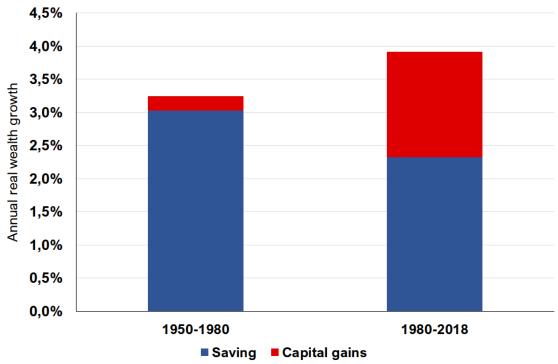
Two important macroeconomic trends across rich countries since 1980 are the strong increase in household wealth-to-income ratios (shown in Figure 1a) and a consistent rise in risky asset prices (e.g., Knoll et al. 2017; Kuvshinov and Zimmermann 2021). This subsection outlines the scale of these trends in the U.S., providing the macroeconomic context for the wealth accumulation of subsequent generations.

Figure 7a shows annual household real wealth growth decomposed into saving and capital gains for the broader periods 1950-1980 and 1980-2019. This decomposition is based on the accounting framework for aggregate wealth explained in section 2.3.[29] Two notable observations emerge: real wealth growth rates increased over the periods from about 3.2% to nearly 4%. Additionally, a shift in wealth dynamics occurred: asset prices became central in the second period, contributing nearly half of the increase since the 1980s, contrasting with the earlier minor role of capital gains.

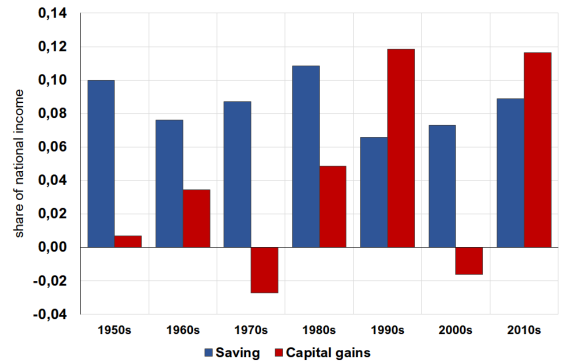
To assess the changing significance of saving and capital gains, we plot in Figure 7b the decennial average of annual saving and capital gains relative to national income. Capital gains have gained prominence in recent years, even surpassing saving during the 1990s and 2010s. Saving was around 9-10% of national income in the early period, then declined in the 1990s and 2000s averaging 7-8% and started to recover thereafter. This decline in the private saving rate has been subject to extensive scrutiny, yet no consensus exists regarding its fundamental drivers (e.g., Auerbach and Kotlikoff 1990; Bosworth et al. 1991; Mian et al. 2021b). Rising capital gains largely reflect an increase in both housing and equity prices, as shown in Figure 7c, which displays a sustained rise since 1980 compared to the more moderate increase preceding this era. Additionally, Appendix Figure C19 also shows capital gains on fixed-income assets. As the valuation of these assets is largely influenced by changes in consumer inflation, the moderation of inflation since the mid-1980s has resulted in less negative valuation losses. With this macroeconomic backdrop, the next subsection investigates the sources of life-cycle wealth growth for cohorts spanning these periods.

[29] Analogous decomposition for eight advanced economies, including the U.S., is detailed by Piketty and Zucman (2014). Saving is private saving, combining corporate and personal saving as is standard in the literature (e.g., Saez and Zucman 2016; Mian et al. 2021b; Bauluz et al. 2022). Saving is net of depreciation.

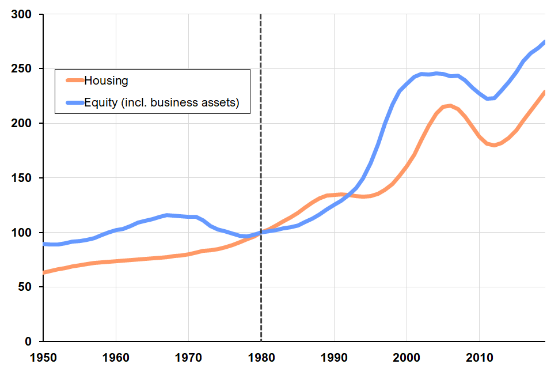
Figure 7: **Macroeconomic trends in wealth accumulation, 1950-2019**



(a) Annual household wealth growth: two periods



(b) Annual saving and capital gains (as a share of national income): decennial averages



(c) Capital gains index, 1980=100

Notes: Figure 7a decomposes the household sector's real average annual wealth growth into the contribution from saving and capital gains. Results are computed over the sub-periods 1950-1980 and 1980-2019. Figure 7b shows decennial averages for saving and capital gains expressed as a share of national income. Figure 7c shows the evolution of housing and capital gains over time, expressed as an index taking the value of 100 in 1980. Results in all cases use the asset-specific accumulation equations (see section 2).

4.2 Life-cycle wealth growth decomposition

The next step in our analysis is to investigate cohorts' life-cycle wealth growth, distinguishing the role of saving, capital gains and inheritances and gifts.[30] We use the accounting framework introduced in section 2.3. Importantly, this exercise is not intended for discerning the share of lifetime wealth that is inherited relative to self-made, as in the Kotlikoff–Summers–Modigliani controversy (Kotlikoff and Summers 1981; Kotlikoff 1988; Modigliani 1986; Modigliani 1988).

[30]While the flow of inheritances and gifts cancels out in the aggregate, at the cohort level, there are net givers and receivers. In the aggregate, in advanced economies the inheritance and gifts flow has increased along with wealth-income ratios. See Alvaredo et al. (2017) for a comparison of trends in the U.S., France, Germany and the U.K.

For that purpose, one would need to distinguish capital gains on inherited and self-made assets, which is beyond the scope of our paper. Rather, our focus lies in separating the wealth growth attributed to new saving, inheritances, or capital gains (on both inherited and self-made wealth).

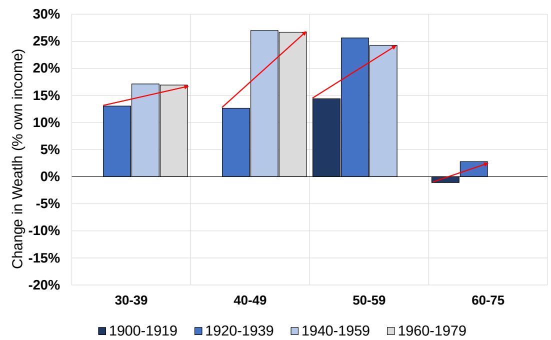
Figure 8 displays the outcome of this exercise. To simplify the presentation of results, we categorize birth cohorts into four larger groups: 1900-1919, 1920-1939, 1940-1959, and 1960-1979. The Figure shows annual real wealth growth (Figure 8a) and its three sub-components: saving (Figure 8b), capital gains (Figure 8c) and net inheritances and gifts (outflows minus inflows; Figure 8d). Annual flows are shown as a percentage of the income earned by the cohort at a given age to allow for a cross-cohort comparison. Note that, at a given age, annual real wealth growth is the sum of the three components. This decomposition is a central part of our analysis.[31]

We note a number of new insights comparing the life-cycle behavior of different cohorts. First, all cohorts display a hump-shaped pattern of real wealth growth, aligning with the core predictions of the life-cycle model. Peak growth occurs during middle ages (40-59), averaging an annual increase equivalent to 15-25% of income. Notably, as cohorts age beyond 60, wealth barely changes. As a result, the main difference in the wealth growth profile across cohorts is that recent ones exhibit higher growth during middle ages, consistent with the steeper life-cycle wealth profiles detailed in section 3 (Figure 2).

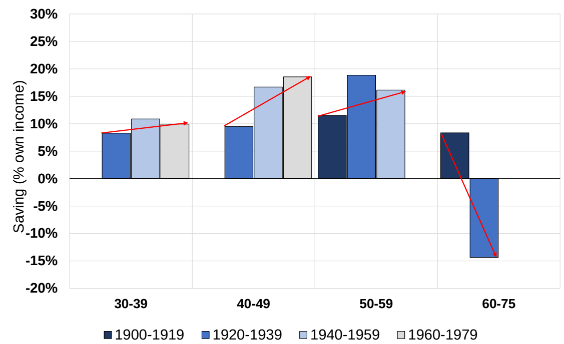
Second, saving emerges as the principal driver of wealth accumulation, following an inverted U-shaped trajectory across the life-cycle. Nevertheless, saving behavior has notably transformed over time. Recent cohorts (born since the 1920s) exhibit increased saving during middle age, marked by a noteworthy increase of around 5 to 10 percentage points in saving rates (rising from approximately 10% to 15-20%). Simultaneously, these newer cohorts exhibit a notable decrease in saving as they grow older, with saving rates declining from around 5% to -15%. We term this trend towards higher middle-age saving and larger old-age dissaving as a “life-cycle saving re-shuffling”. While the trend of increased dissaving among the elderly might seem unexpected given

[31] Feiveson and Sabelhaus (2019) conduct a similar decomposition using modern SCF data from 1989 onwards, pooling various cohorts into a single profile. We extend their analysis to distinguish the profiles of subsequent cohorts observed since 1960.

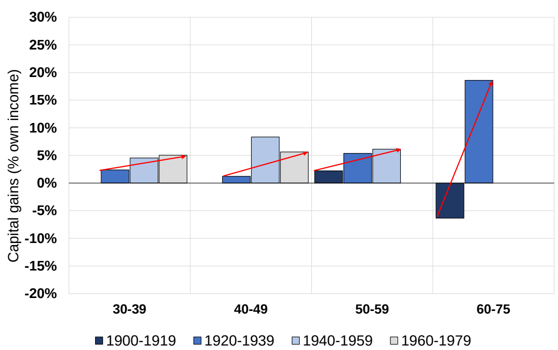
Figure 8: **Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances)**



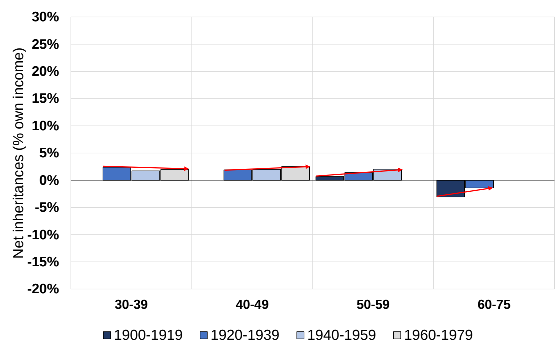
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



(c) Capital gains over the life-cycle



(d) Net inheritances and gifts over the life-cycle

This figure displays annual changes in real wealth (Figure 8a) decomposed into the contribution of net saving flows (Figure 8b), capital gains (Figure 8c) and inheritances and gifts (Figure 8d) along the life-cycle of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 30 to age 75. The flows are shown as a percentage of the average annual income of the cohort and are computed using the methodology outlined in section 2.

the apparent stability in wealth growth, it is consistent with the analysis of pension withdrawals in Poterba et al. (2011) (see a comparison in section 6). This result emphasizes the need to distinguish active saving relative to wealth changes, as both trends might differ, particularly for the elderly.

Third, capital gains played a limited role for the oldest cohorts (those born in 1900-19) and were, in fact, negative around their retirement. These cohorts were, on average, 65 years old in the 1970s, a period characterized by declining equity prices and high inflation, which negatively impacted nominal assets like bonds and deposits. Conversely, cohorts born from the 1920s onward experienced considerable capital gains throughout their working and initial retirement years, paralleling the secular rise in asset prices (Figure 7a). Most notably, the 1920-39 cohort experienced substantial annual valuation gains when old, equivalent to 10-15% of their income, concurrent with a decline in their saving rates. We link this saving behavior and capital gains in section 4.3.

Net inheritances and inter-vivos gifts, encompassing outflows minus inflows, represent a steady source of wealth accumulation. However, compared to saving and capital gains, annual inheritance flows remain relatively modest, consistent with prior research (e.g., Black et al. 2020; Ozkan et al. 2023).[32]

In sum, the previous decomposition documents two important shifts in life-cycle wealth growth across cohorts, notably between those born in the early 20th century and those after the 1920s. Firstly, newer cohorts experience much larger valuation gains on their assets throughout their lifetime, mirroring the secular rise in asset prices post-1980s. Secondly, these cohorts display higher saving in middle ages, followed by much stronger dissaving in later years—a phenomenon we term as a "life-cycle saving reshuffling".

Complementing the previous two results, Appendix C.1 offers a comprehensive breakdown concerning within-cohort wealth groups and asset classes. Looking at the "life-cycle saving reshuffling", we find a reduction in saving among both the elderly rich and non-rich, while the increased saving among the middle-aged primarily reflects the top-10% within that age group. Dissaving among the elderly primarily entails pension withdrawal (in equity and fixed-income assets) and housing, while larger middle-aged top-10% saving took the form of equity acquisitions.[33] In terms of capital gains, both the elderly rich and non-rich experienced substantial gains. Consistent with macro-financial trends, most of the increase stemmed from higher housing and equity prices and also lower negative gains in fixed-income assets.

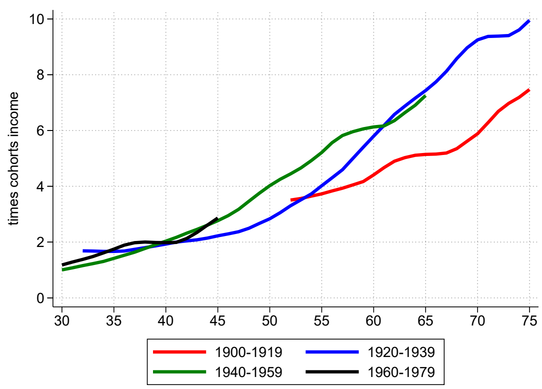
Given the paramount importance of capital gains since the 1980s, we conduct an additional

[32]For example, our findings indicate that the net inflow amounts to approximately 2% of cohorts' income around age 40. Yet, it is important to note that, on average, only a few individuals receive an inheritance in a given year. Consequently, this annual flow reflects substantial value for the recipients within the cohort. Second, as explained above, capital gains encompass gains on both inherited and self-made assets. Hence, a joint measure of inheritances and their valuation gains would involve a larger role. Inheritances are also much larger in absolute terms for rich heirs than for poorer ones, and the likelihood of receiving an inheritance increases with wealth (Elinder et al. 2018; Boserup et al. 2016; Nekoei and Seim 2022).

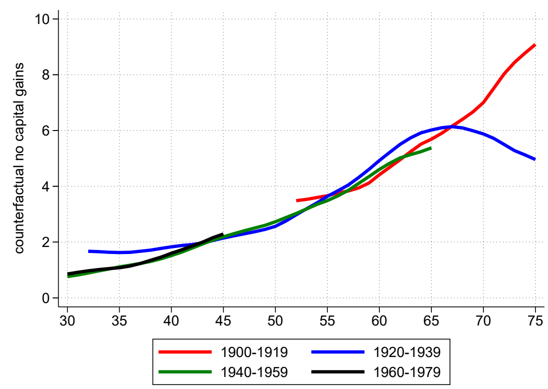
[33]About a third of the increased top-10% saving in equity is associated with corporate retained earnings, in line with results in Bauluz et al. (2022), who show that a large share of the rise in top-10% saving since the 1980s globally reflects corporate saving.

exercise to assess their influence on life-cycle wealth patterns. We conduct a counterfactual exercise that eliminates capital gains from cohort wealth accumulation, to describe their impact on cohorts' wealth-income ratios.[34] This is depicted in Figure 9. The left panel shows the observed wealth-income ratios while the right panel displays the counterfactual results absent capital gains.

Figure 9: **Cohort life-cycle wealth accumulation before and after excluding capital gains**



(a) Observed series



(b) Counterfactual without capital gains

Notes: This figure shows the average wealth-to-average income ratio of four generations over their life-cycle as observed (left panel) and in a counterfactual without capital gains since 1960 (right panel). See section 2 for details on the methodology. See Appendix Figure C23 for the same chart for within-cohort wealth groups.

Excluding capital gains from wealth accumulation significantly alters the wealth-to-income ratios for post-1920s generations. These ratios tend to converge across all cohorts when capital gains are removed, particularly until age 65. After retirement, the counterfactual wealth-income ratio notably declines for newer cohorts, reflecting substantial dissaving. In contrast, the older cohorts' ratios align more closely with the observed trend, revealing a pronounced disparity in saving behavior and asset-price impact between newer and older cohorts during retirement.

Counterfactuals for within-cohort wealth groups indicate that capital gains and saving shifted with different intensities for upper and bottom groups, with capital gains explaining a relatively greater share of the wealth accumulation for the bottom-90% in recent years, as shown in Appendix Figure C23.[35]

[34]To conduct this simulation, we rely on the accounting decomposition in equation 2. For each cohort, we simulate their wealth based only on the flow of saving and inheritances and gifts. Needless to say, this analysis does not consider general equilibrium effects. Still, given the sizeable rise in asset prices, it can be suggestive of their effect.

[35]This finding is explained by the larger relative exposure of bottom groups to house prices, which have increased

To summarize, this subsection's analysis clarifies the two main trends documented in section 3. The steeper life-cycle wealth profile among recent cohorts reflects large valuation gains since the 1980s, together with higher saving during midlife, collectively leading to higher wealth at the time of retirement. The persistent wealth stability post-retirement (the "retirement-saving puzzle"; French et al. 2023) hides strikingly different accumulation behaviors between newer and older cohorts. Consistent with basic predictions of the life-cycle model, recent cohorts engage in substantial dissaving (i.e., consuming their assets) but still hold their wealth constant amid positive valuation gains. This is in contrast to the slightly positive saving experienced by the older cohorts post-retirement.

4.3 A joint interpretation of life-cycle and macro-finance trends

We now sketch an interpretation of our findings in the context of the macroeconomic trends referenced at the beginning of the paper, that is, the rise in aggregate wealth-to-income ratios driven by increasing asset prices. The details of the model are given in appendix C.2, and we summarize the main insights here.

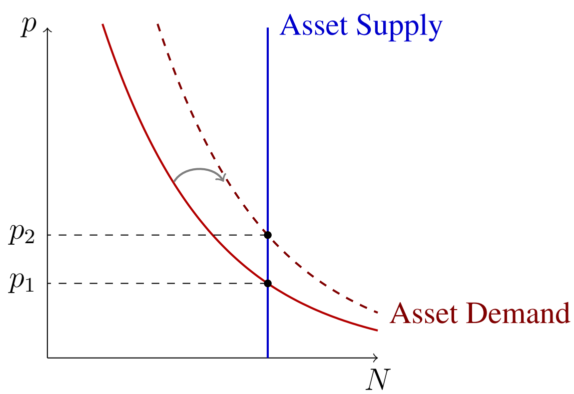
We build an overlapping generations model with each cohort living for two periods. In youth, cohorts save for retirement, which is when they decumulate their savings. Cohorts save for retirement in an asset in inelastic supply. Therefore, in equilibrium, the young are buyers of the asset, while the old sell to the young to finance their consumption. Within the model, we show how to link macroeconomic trends (rising asset prices and aggregate wealth-income ratios) with the life-cycle behavior documented in this paper. Concretely, we focus on the steepening of the life-cycle wealth-income profile and the "life-cycle saving reshuffling" highlighted in this section.

We consider two shifts in fundamentals within our model, corresponding to well-documented empirical trends in the last decades. First, we study an increase in the share of life spent in retirement, a well-established fact as the rise in life expectancy started to accelerate since the mid-1970's

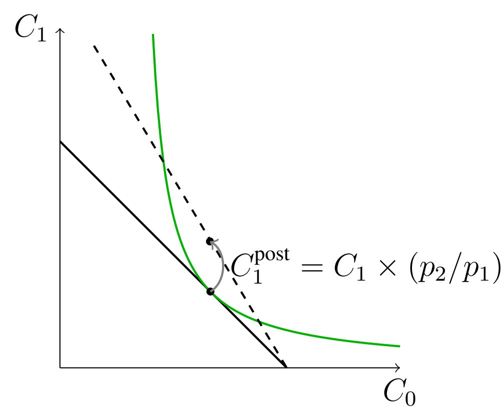
importantly in recent decades. This result is consistent with Kuhn et al. (2020) and Bauluz et al. (2022), who look at the cross-section of U.S. households instead of birth cohorts.

(e.g., Blundell et al. 2016; Carvalho et al. 2016). This leads young cohorts to increase their asset demand. However, as the asset supply is inelastic, any increase in asset demand is fully absorbed by increases in the equilibrium asset price, as illustrated in figure 10, panel (a). Since income is unchanged, the result is an increase in wealth-income ratios due to elevated asset prices, which is reflected in the steeper life-cycle wealth-income profiles of the younger cohorts. Concurrently, the old sell the asset to the young to fund their consumption. With the assets trading at higher prices, they dissave further. Figure 10, panel (b) illustrates this mechanism at play in our model graphically. As asset prices increase, this allows the old to increase consumption as their budget set expands ex-post. As a result, the rise in longevity prompts (i) an increase in asset prices and (ii) a "life-cycle saving reshuffling", with increased saving among the young and dissaving among the old.

Figure 10: **Illustration of the model's mechanism**



(a) Increasing Asset Demand of the Young



(b) Effect on the Old

Notes: This figure illustrates the mechanism at the heart of our model. Panel (a) illustrates an increase in asset demand, which is generated by either rising longevity or rising inequality among the younger generations. This raises the equilibrium asset price faced by the old when they sell their assets. Panel (b) illustrates the effect this has on the initially old. As they sell their assets at a higher price, this allows them to increase their consumption proportionally to the price increases. Therefore, their budget constraint shifts ex-post (when they are old).

Second, we consider a rise in within-cohort income inequality (Guvenen et al. 2022). Here, we extend the model to include non-homothetic preferences as in Straub (2019) or Mian et al. (2021a). The implication is that as the rich earn a larger share of the total income, they will also increase their saving rate. This increases total asset demand, as the desired saving of the non-rich does not fall commensurately. The result is the same as with an increase in longevity: asset prices rise, the young purchase assets at a higher price and the old dissave more. In both cases, the increase in asset prices constitutes a windfall gain for the initially old generation, who are able to sell their assets at a premium and finance increased consumption (Fagereng et al. 2022).

In summary, we show that a standard overlapping generations model can rationalize the shifts we document through an increase in longevity or income inequality. These generate an increase in asset prices and the patterns we document empirically: the steeper life-cycle wealth-income ratios as well as a "life-cycle saving reshuffling."

5 Aggregate wealth and saving

In this section, we provide a micro-level study of aggregate wealth and aggregate private saving in the U.S. since the 1960s. The development of both indicators has been linked to shifts in the evolution of relevant economic variables, such as the structural decline in natural interest rates or changes in the labor shares (e.g., Mian et al. 2021b; Auclert et al. 2021; Piketty and Zucman 2014).[36] However, the empirical investigation of the main drivers encounters a substantial limitation in most studies due to the absence of disaggregated dat on saving and wealth holdings across population groups over an extended period. Our analysis informs debates on the micro-level origins of shifts in aggregate wealth and saving as well as quantitative models (Kopecky and Taylor 2022; Sturrock 2023).

[36] A key debate in macroeconomics revolves around the factors driving the decline in natural interest rates in recent decades (Holston et al. 2017; Rachel and Smith 2015). Two prominent explanations put forward are the rise in income inequality leading to an excess in saving from the rich (Mian et al. 2021a; Mian et al. 2021c; Klein and Pettis 2020) and demographic changes pushing up aggregate wealth-income ratios (Auclert et al. 2021; Kopecky and Taylor 2022) and private saving (Gagnon et al. 2021; Carvalho et al. 2016).

5.1 Aggregate wealth-income ratios

A substantial body of research has investigated the rise in aggregate wealth-income ratios in recent years.[37] Relative to previous work, our microdata allow us to decompose the rise in aggregate wealth-income ratios across three components: (i) life-cycle wealth-income profiles, (ii) income inequality and (iii) the population's age structure, using a shift-share methodology. The work by Auclert et al. (2021) is closest to our study by analyzing the role of the population's age structure in the evolution of wealth-income ratios. We add to their paper by contrasting the age composition with the two other components.

To construct the shift shares, note that at each time τ, the ratio of aggregate household wealth (W_τ) to aggregate household income (Y_τ) can be defined as the sum of the wealth owned by various population group's i ($W_{i\tau}$) divided by aggregate household income: $\frac{W_\tau}{Y_\tau} = \sum_i \frac{W_{i\tau}}{Y_\tau}$. This expression can be further expanded and broken down into three components

$$\frac{W_\tau}{Y_\tau} = \sum_i \frac{\bar{w}_{i\tau}}{\bar{y}_{i\tau}} \cdot \frac{\bar{y}_{i\tau}}{\bar{y}_\tau} \cdot \frac{N_{i\tau}}{N_\tau}, \tag{3}$$

where $\frac{\bar{w}_{i\tau}}{\bar{y}_{i\tau}}$ is group's i average wealth-to-average income ratio (*life-cycle wealth-income profiles*), $\frac{\bar{y}_{i\tau}}{\bar{y}_\tau}$ is the ratio of group's i average income to the average income of all adults (*income inequality*) and $\frac{N_{i\tau}}{N_\tau}$ is group's share in the adult population (*demographic structure*).

The shift-share decomposition examines the contribution of each component in Equation 3 on the increase in the aggregate wealth-income ratio. More precisely, it decomposes changes in aggregate wealth-income ratios across two time periods, into shifts in the three components, along with a residual term γ (capturing simultaneous changes across all three sub-components):

[37] Previous studies typically decompose aggregate wealth growth into saving and capital gains (Piketty and Zucman 2014; Waldenström 2017; Artola-Blanco et al. 2020) or use quantitative models (Grossmann et al. 2021; Brun and González 2017; Kopecky and Taylor 2022; Eggertsson et al. 2021).

$$\frac{W_\tau}{Y_\tau} - \frac{W_0}{Y_0} = \sum_i \underbrace{\left[\frac{\bar{w}_{i\tau}}{\bar{y}_{i\tau}} - \frac{\bar{w}_{i0}}{\bar{y}_{i0}}\right]}_{\text{W-Y profiles}} \cdot \frac{\bar{y}_{i0}}{\bar{y}_0} \cdot \frac{N_{i0}}{N_0} + \sum_i \frac{\bar{w}_{i0}}{\bar{y}_{i0}} \cdot \underbrace{\left[\frac{\bar{y}_{i\tau}}{\bar{y}_\tau} - \frac{\bar{y}_{i0}}{\bar{y}_0}\right]}_{\text{income inequality}} \cdot \frac{N_{i0}}{N_0}$$
$$+ \sum_i \frac{\bar{w}_{i0}}{\bar{y}_{i0}} \cdot \frac{\bar{y}_{i0}}{\bar{y}_0} \cdot \underbrace{\left[\frac{N_{i\tau}}{N_\tau} - \frac{N_{i0}}{N_0}\right]}_{\text{demographics}} + \gamma \tag{4}$$

Each component represents a partial-equilibrium change in the outcome in which only this component is changing. As such, while this is not a general equilibrium exercise, it clarifies the mechanisms present in the data and serves to focus on potentially important explanations for shifts in aggregate wealth and saving.

The shift-share approach can be applied to different divisions within the total population. Based on the results from section 3, age and wealth emerge as significant partitions. Consequently, our baseline results comprise nine groups: three age categories (the "young", ages 20-39; the "middle-aged", ages 40-59; the "elderly", age 60+), each further divided into three wealth groups within every age category (top-10%, middle-40% and bottom-90%). We use 1960-1979 as the pre-period and 2000-2019 as the post-period.[38] We explore alternative population partitions and time periods in Appendix D.

Figure 11 summarizes the results of this exercise. In the left panel (Figure 11a), we illustrate the observed household wealth-income ratios over the periods 1960-1979 and 2000-2019. Initially standing at 388%, the household wealth-to-income ratio climbed to 583% by the later period, an increase of 195 percentage points.[39]

The right panel details the results of the shift-share decomposition, distributing the 195 percentage points rise among the subcomponents outlined in Equation 4.[40] Life-cycle wealth-income

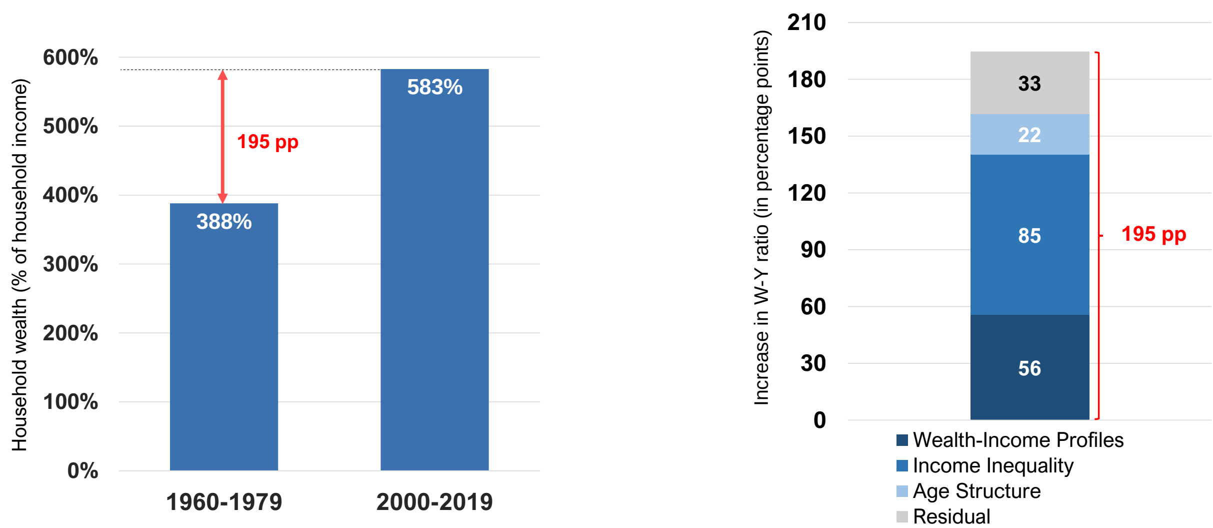
[38]As shown in Figure 1a, wealth-income ratios were relatively low and stable during 1960-1979 and relatively high and growing in 2000-2019, both in the U.S. and other rich countries.

[39]A note on the comparison of Figures 1a and 11. Both display aggregate household wealth over time in the U.S. However, Figure 1a employs national income as the denominator, while Figure 11 uses household income, which is somewhat smaller (see a discussion in section 2). As a result, the ratio in Figure 11 is slightly higher, but the trends are similar (see Appendix Figure D28).

[40]Appendix Figures B17, D32 and D33 show the evolution of each of the three components in equation 3 (wealth-

profiles and income inequality appear as the main drivers, accounting for 56 and 85 percentage points, respectively. By contrast, the age structure captures 22 percentage points. A closer look at the results for each of the nine population groups (Appendix Table D2) indicates that most of the positive impact from rising income inequality comes from the middle-aged top-10% group (59 percentage points out of 85), while life-cycle wealth changes reflect higher wealth by both the elderly top-10% and middle-40%. Alternative data specifications provide similar results (Appendix D).

Figure 11: **Shift-share decomposition of the rise in aggregate wealth-income ratios: wealth-income profiles vs. income inequality vs. demographics**



(a) Wealth-income ratio in two periods

(b) Decomposing the increase in the wealth-income ratio

Notes: The left panel of this figure plots the aggregate household wealth-income ratio averaged across two periods: 1960-1979 and 2000-2019. During this timeframe, the aggregate household wealth-income ratio increased by 195 percentage points, rising from 388% to 585%. In the right panel, the figure decomposes the 195 percentage points rise in the wealth-income ratio into four subcomponents, using a shift-share approach based on Equation 4.

Table 1 sheds further light on (i) within-period trends as well as (ii) projections going forward based on aging trends. Columns 2 and 3 decompose the overall increase between 1960-1979 and 2000-2019 into two sub-periods: 1980-1999 and 2000-2019. Income inequality and life-cycle wealth profiles both had a positive impact across the two sub-periods, with the role played by each mechanism not varying much over time.

An interesting result emerges regarding the age structure of the population: while it had a

income profiles, relative income and population shares) since 1960.

Table 1: Shift-share decomposition 1960-1979 vs. 2000-2019 (including subperiods)

	(1)	(2)	(3)	(4)
	1960-1979 vs 2000-2019			2000-19 vs 2040-60
	Total Increase	*Of which: 1980-89*	*Of which: 2000-19*	Increase
W-Y Profiles	56	*26*	*29*	.
Income Inequality	85	*41*	*43*	.
Age Structure	22	*–8*	*30*	77
Residual	33	*–6*	*39*	.
Total	195	*53*	*142*	77

Notes:: This table presents the components of the shift-share decomposition of the wealth-to-income ratio using 1960-1979 and 2000-2019 as base years and 9 within-age wealth groups: three age categories (the ”young”, ages 20-39; the ”middle-aged”, ages 40-59; the ”elderly”, age 60+), each further divided into three wealth groups within every age category (top-10%, middle-40% and bottom-90%). Column 1 decomposes the 195 percentage point increase over the period across the 3 components (life-cycle wealth-income profiles, income inequality and the age structure of the population) and a residual term. Columns 2 and 3 decompose the overall increase between 1960-1979 and 2000-2019 into two sub-periods: 1980-1999 and 2000-2019. Column 4 presents shift-share results derived from demographic projections by the U.S. Census Bureau, available until 2060, using the 2000-2019 period as the starting point and 2040-2060 as the endpoint. Appendix D.2 explores alternative population partitions and time periods.

negative impact during the 1980-1999 period—marked by the transition of the baby boom generation into the young and middle-aged groups (which exhibit lower wealth-income ratuis)—its role became notably positive in 2000-2019, with the baby boomers transitioning into their middle-age and early retirement years. Furthermore, column 4 presents shift-share results derived from demographic projections by the U.S. Census Bureau, available until 2060. This analysis uses the 2000-2019 period as the starting point and 2040-2060 as the endpoint. The outcome of this projection suggests a considerable mechanical increase in the aggregate wealth-income ratio, the equivalent of around three-quarters of household income. Our results for the population’s age structure are similar and consistent with the analysis in Auclert et al. (2021).[41]

In essence, our findings point to increasing income inequality and the steepening of life-cycle

[41] Auclert et al. (2021) central estimates are displayed in Table 2 of their paper. The shape of the age-composition effect in their retrospective analysis for the U.S. (looking at the decades before 2016) follows the same evolution as in our results (initial decrease, subsequent rise), although their overall effect appears slightly larger. This difference can be explained to a large extent by Auclert et al. (2021) shifting the age composition of the population (both forward and backward) while fixing the inequality and life-cycle wealth parameters in equation 4 based on data from 2016, a period of historically high-income inequality and steep life-cycle wealth profiles. Auclert et al. (2021) show in their Appendix Table A.3 that the effect reduces by around half when fixing parameters in the 1960-1970 period, as we have done. The projections for 2060 are nearly identical since both studies fix the parameters in recent periods (2016 in their case and 2000-2019 in ours).

wealth profiles as the primary driving forces behind the upsurge in aggregate wealth-income ratios across the longer 1960-2019 period. In section 4, we have argued that the rise in life-cycle wealth profiles is closely linked to the boom in asset prices since the 1980s. Although the influence of aging has been relatively smaller, its importance has notably risen in recent years and is expected to intensify in the decades ahead.

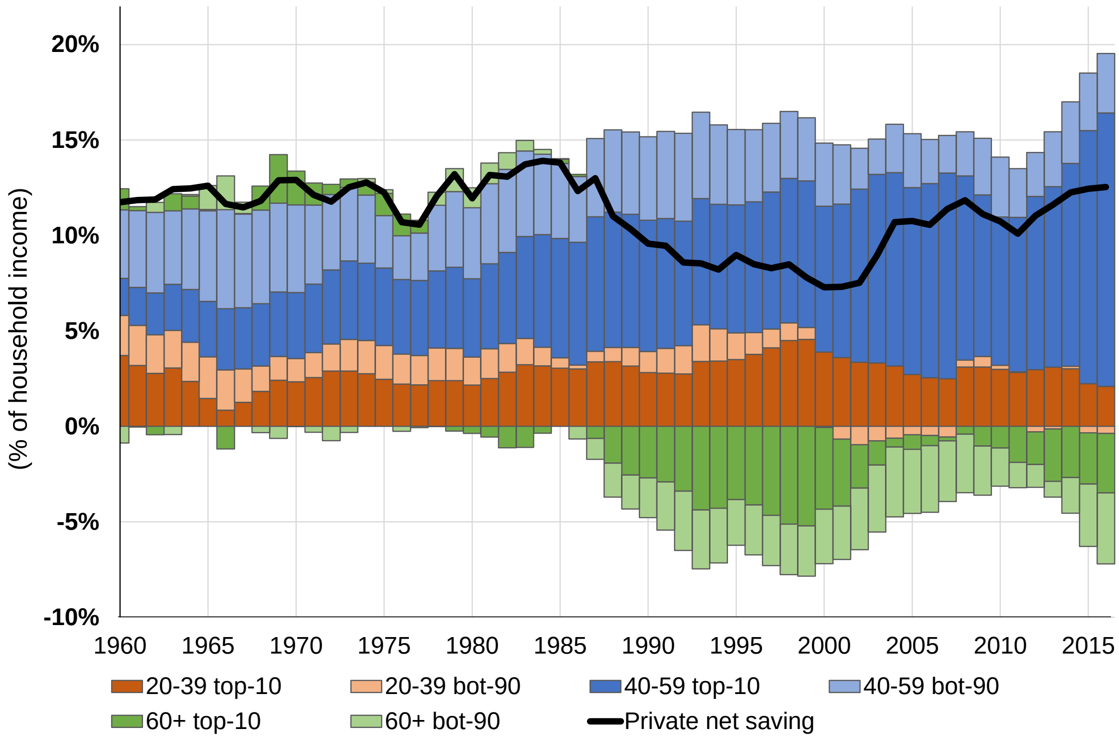
5.2 Aggregate private saving

We next examine the evolution of the U.S. private saving rate. Despite being the object of great scrutiny and debate in the last decades (e.g., Summers and Carroll 1987; Bosworth et al. 1991; Auerbach and Kotlikoff 1990; Mian et al. 2021b, etc.), it is still unclear which population groups and mechanisms drive trends in aggregate saving (Rachel and Smith 2015). We shed new light on these two questions: who saves more and less over time, and what are the drivers?

Who saves more and less over time? We explore this question in Figure 12 and Table 2. Figure 12 decomposes the aggregate private saving rate across age-wealth groups since 1960. To simplify the visualization of results, we use two within-age wealth groups (top-10% and bottom-90%). In addition, Table 2 presents the average saving at the beginning (1960-1979) and end (2000-2019) periods, breaking down the bottom-90% into two smaller groups (middle-40% and bottom-50%). As is well-known, the aggregate private saving rate was high in the 1960s and 1970s, declined in the 1980s, 1990s and early 2000s, and partially recovered in recent years.

This decomposition uncovers an important trend in the evolution of private saving since the 1980s: the emergence of a marked saving polarization. Two population groups clearly stand out. Saving from the middle-aged rich increased substantially since the 1980s, and this was mirrored by an equally important dissaving from the elderly (both the elderly rich and non-rich). Specifically, our results indicate that the middle-aged top-10% used to save approximately 3.3% of household income in 1960-1979 and 10.6% of national income in 2000-2018, an increase of 7.4 percentage points of household income over time. In contrast, saving among the elderly declined by the equivalent of 6.1 percentage points of household income across these two periods, from 1.1% to

Figure 12: **Private saving by age-wealth groups, 1960-2016**



Notes: This figure shows annual net saving of within-age wealth groups expressed as a percentage of total household income. Results are obtained using the budget constraint of each age-wealth group across two survey waves (equation 2), as explained in section 2.3. Given the harmonizonization of SCF+ microdata with macroeconomic aggregates, the sum of each group's saving in a given year adds up to aggregate private saving. Series are 7-year moving averages.

-5%.[42] Results are similar under alternative data specifications (Appendix D).

To synthesize our results, we find that (i) the "saving glut of the rich" since the 1980s (previously documented by Mian et al. (2021b), Saez and Zucman (2016) and Bauluz et al. (2022)) is more accurately described as the "saving glut of the middle-aged rich" and (ii) the dissaving by the old is the most important force putting downward pressure on aggregate saving in recent decades.[43]

[42]The bottom-90% from the young and middle-aged groups reduced their saving by approximately 2.5 percentage points of household income over these periods, while the top-10% from the young increased it by 0.3 percentage points. Although the dynamics of these groups are also important for aggregate saving, they experienced lesser variation than those that occurred for the middle-age rich and elderly groups.

[43]The latter result is consistent with findings from Bosworth et al. (1991) and Gokhale et al. (1996), who looked at

Table 2: Saving as a percentage of total household income: 2000-2019 vs. 1960-1979

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	20-39 top-10	20-39 mid-40	20-39 bot-50	40-59 top-10	40-59 mid-40	40-59 bot-50	60+ top-10	60+ mid-40	60+ bot-50	Total
1960–1979	2.5	1.7	–0.2	3.3	2.6	1.0	1.4	0.1	–0.4	11.9
2000–2019	2.8	0.8	–1.1	10.6	3.2	–0.4	–1.8	–2.3	–0.9	11.0
Difference	0.3	–0.9	–0.9	7.4	0.6	–1.3	–3.2	–2.4	–0.5	–1.0

Notes:: This table shows the average annual saving of 9 within-age wealth groups as a percentage of total household income in two periods (1960-1979 and 2000-2019), and the difference between these two periods (2000-2019 minus 1960-1979). The 9 groups are categorized into three age brackets: "young" (ages 20-39), "middle-aged" (ages 40-59), and "elderly" (age 60+). Within each age category, there are three wealth groups: top-10%, middle-40% and bottom-50%. For instance, the top-10% within the age group 40-59 saved the equivalent of 3.3% of household income in the 1960-1979 period, which increased to 10.6% in 2000-2019.

Drivers. The second part of our analysis investigates the drivers of the previous trends. We follow a similar shift-share approach as in subsection 5.1 which allows us to evaluate the role of three factors: (i) life-cycle saving rates, (ii) income inequality and (iii) the population's age structure. Concretely, we define the aggregate private saving rate as:

$$\frac{S_\tau}{Y_\tau} = \sum_i \frac{\bar{s}_{i\tau}}{\bar{y}_{i\tau}} \cdot \frac{\bar{y}_{i\tau}}{\bar{y}_\tau} \cdot \frac{N_{i\tau}}{N_\tau} \tag{5}$$

where $\frac{\bar{s}_{i\tau}}{\bar{y}_{i\tau}}$ is group's i average saving-to-average income ratio (*life-cycle saving rates*), $\frac{\bar{y}_{i\tau}}{\bar{y}_\tau}$ is the ratio of group's i average income to the average income of all adults (*income inequality*) and $\frac{N_{i\tau}}{N_\tau}$ is group's share in the adult population (*demographic structure*). The evolution of each of the three components of equation 5 is shown in Figures D30, D32, and D33.

To evaluate the role of each sub-component of Equation 5 in driving changes in saving across age-wealth groups, we again fix two sub-components in the first period (1960-1979) and let only one change according to its value in the second period (1999-2018). This is the same shift-share approach followed for aggregate wealth and described in equation 4, to which we refer. We present alternative results based on different time frames and population groups in Appendix D.

Our analysis is closest to Bosworth et al. (1991) and Mian et al. (2021c), who study the

a shorter period (from the early 1960s to late 1980s) and found the elderly to be the main group behind the decline in private saving in the 1980s.

evolution of the U.S. private saving rate. They follow a similar approach to ours to measure group-specific saving, and use a shift-share methodology to investigate potential mechanisms. We innovate in one specific dimension that turns out very important. Namely, we look separately at the top and bottom groups of different ages instead of comparing age groups, on the one hand, with top/bottom groups of all ages together on the other. This differentiation proves important, as we find opposing trends in the behavior of the same wealth group (e.g., the top-10%) before and after retirement, as illustrated in Figure 12 and Table 2.[44]

Table 3 shows the results from this analysis. It displays the shift-share results for each age-wealth group individually in order to grasp what drove the opposing saving trend followed by savers and dissavers. Two main insights emerge. Regarding the rise in the middle-aged rich's saving, we find that the combined rise in saving rates (3.1 percentage points) and income inequality (2.3 percentage points) accounts for most of its saving boom (7.4 percentage points). The large role of income inequality would be consistent with the mechanism posited by Mian et al. (2021a), according to whom the substantial increase in top-income shares since 1980 caused a saving glut among the rich. However, we circumscribe it to the middle-aged rich and show that this group simultaneously increased its saving rates, in line with results in section 4.

By contrast, the decline in the old's saving reflects almost exclusively a reduction in saving rates as both the relative income and demographic components barely account for meaningful shifts. Among the reasons that could explain the fall in saving rates (e.g., higher out-of-pocket medical expenses, larger variety of leisure activities, better elderly health, fewer descendants etc.), our argument in section 4 suggests that the asset-price surge post-1980s likely played an important role. In Appendix D, we replicate the shift-share analysis using alternative periods and population partitions, with the overall trends and orders of magnitudes being similar across specifications.[45]

[44] Another, albeit less significant, distinction is that Mian et al. (2021c) differentiate two components in equation 5, as opposed to our three. They look at saving rates ($\frac{\bar{s}_{i\tau}}{\bar{y}_{i\tau}}$) but combine the components of income inequality ($\frac{\bar{y}_{i\tau}}{\bar{y}_{\tau}}$) and the population shares ($\frac{N_{i\tau}}{N_{\tau}}$), hence not distinguishing the relative role of income differences and population shares. However, as we show in our analysis, population shares do not play a relevant role in shifts in aggregate saving, so their single component essentially reflects shifts in income inequality.

[45] Specifically, our results indicate that looking separately at rich individuals in middle age and older ages is important, as the two groups followed different trends. Additionally, our results suggest that while saving rates and income inequality appear to play comparable roles in explaining the increase in middle-aged top-10 saving, saving rates are

Table 3: Shift-share decomposition: 1960-1979 vs. 2000-2018 (9 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	20-39 top-10	20-39 mid-40	20-39 bot-50	40-59 top-10	40-59 mid-40	40-59 bot-50	60+ top-10	60+ mid-40	60+ bot-50	Total
Saving rate	0.1	–0.6	–1.4	3.1	0.6	–1.4	–2.6	–1.9	–0.5	–4.5
Income inequality	0.4	–0.3	0.0	2.3	0.0	–0.2	0.6	–0.1	0.0	2.6
Age structure	–0.1	–0.1	0.0	0.1	0.0	0.0	0.2	–0.1	–0.1	–0.1
Residual	–0.1	0.2	0.4	1.8	0.0	0.3	–1.4	–0.3	0.1	1.0
Total	0.3	–0.9	–0.9	7.4	0.6	–1.3	–3.2	–2.4	–0.5	–1.0

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1979 and 2000-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 9 within-age wealth groups, represented in columns 1 to 9. Column 10 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -1 percentage point of household income, with saving rates contributing to a decline of -4.5 percentage points and income inequality contributing to an increase of 2.6 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -3.2 percentage points in household income, with -2.6 percentage points attributed to the life-cycle saving rate component. Appendix D.2 explores alternative population partitions and time periods.

In summary, this subsection uncovers a significant new trend: a saving polarization emerging since the 1980s. This trend is marked by a considerable increase in saving among the middle-aged rich, paralleled by a simultaneous decline among the elderly. Our analysis indicates that the rise in income inequality and shifts in life-cycle saving rates (potentially associated with the booming asset prices in recent decades) stand out as two important drivers contributing to this trend.[46]

6 Robustness checks

Wealth measurement inherently entails some uncertainty. Hence, we test how our results change under various data treatments. We specifically investigate two key aspects: first, the alignment of the SCF+ dataset with macroeconomic aggregates, and second, the decomposition of cohorts' wealth growth into saving, capital gains, and inheritances. Additionally, we compare our saving

the main driver of dissaving among the elderly.

[46] It is also possible that the boom in asset prices has its root in the rise of income inequality, which would raise asset prices, a mechanism that we explore in section 4's theoretical model and is also present in Mian et al. 2021a.

estimates against direct measurements.

6.1 Mapping national accounts

We harmonize the SCF+ microdata with national accounts following three main steps: (i) aligning assets, debt, and income categories in the survey with their national account counterparts, (ii) imputing funded Defined Benefit (DB) pensions, and (iii) using equally-split married couples as the unit of observation. To illustrate the impact of these adjustments, we replicate Figure 2 of the paper under three alternative data treatments: using the raw SCF+ data (Figure 13a), employing the harmonized survey while excluding DB-funded pensions (Figure 13b), and using households as the unit of observation in the harmonized survey (Figure 13c). In addition, Appendix Figure E34 replicates cohorts' life-cycle wealth profiles in constant dollars (e.g., Figure 3) based on the raw SCF+ microdata. The overall finding indicates that none of these steps significantly alters the main trends we have documented.[47]

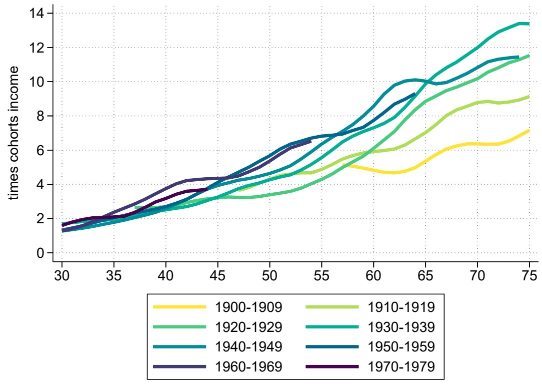
6.2 Wealth accumulation decomposition

In this paper, we decompose cohorts' life-cycle wealth growth into saving, capital gains, and inheritances based on their intertemporal budget constraints, as reflected in Equation 2, which is specific to each cohort's asset or debt type. In the empirical application, we derive saving flows residually by subtracting capital gains and inheritances from the changes in the stock of a specific asset type or debt. As a result, this measurement exercise involves three sources of uncertainty: (i) the asset and debt stocks, (ii) the flows of inheritances and gifts, and (iii) the capital gains. Furthermore, when applying this method to within-cohort wealth groups (e.g., the top-10% wealth group) instead of entire cohorts, an additional assumption is made: that the same individuals persist within a given group across two periods.

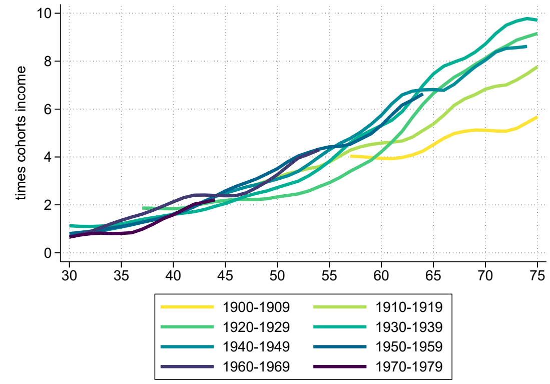
In what follows, we examine these assumptions and replicate the life-cycle saving profiles

[47]The raw SCF+ data further accentuates the steepening of the life-cycle wealth-income profile. This is mostly because income (the denominator) is captured less well in the survey than wealth relative to national accounts.

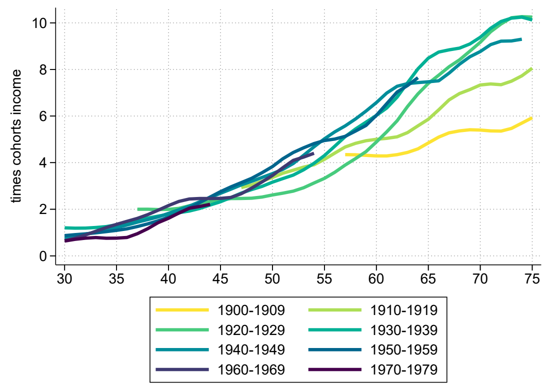
Figure 13: **Life-cycle wealth accumulation: alternative versions**



(a) Raw SCF+



(b) Excluding DB funded pensions



(c) Household as unit of observation

This figure presents the life-cycle wealth-income profiles of eight birth cohorts, as depicted in Figure 2, under three alternative data treatments: raw (unadjusted) SCF+ microdata (Figure 13a), harmonized survey data to macroeconomic aggregates while excluding DB-funded pensions (Figure 13b), and employing households as the unit of observation in the harmonized survey (Figure 13c). The y-axis represents cohorts' average wealth over average income, while the x-axis denotes ages from 30 to 75. For a detailed explanation of the harmonization process of the survey data to aggregates, please refer to section 2.

of cohorts (e.g., Figure 8b) under alternative data sources and methods. We present comparable results for cohorts' life-cycle capital gains and inheritances in Appendix E.2.

6.2.1 Cohorts' assets and debts

Our first analysis is on the evolution of cohorts' assets and debts. To assess the role that harmonizing the SCF+ to macroeconomic aggregates has, in Figure 14a we present life-cycle saving profiles derived from the raw survey microdata.[48] The overall pattern of life-cycle wealth accumulation is qualitatively similar between the raw and harmonized microdata. In both cases, there's a consistent trend towards increased saving during middle ages and more pronounced dissaving at older ages.

6.2.2 Inheritances and the surviving spouse

In section 2 and Appendix A.4, we have documented that our aggregate flow of inheritances and gifts is consistent with existing estimates. While we then use the observed density of inheritances from the SCF to allocate these, in an intermediate step we need to distribute inheritances to the surviving spouse and the offspring. In our baseline estimates, we allocate 18% of the inheritance left by couples with a surviving spouse to flow to the next generation, following evidence in Fahle (2023). We vary this assumption in figure 14d, which presents results on saving when allocating 50% of these estates to the next generation. This leads to lower saving at middle ages (a larger share of changes in wealth is attributed to transfers) and more saving for the old. However, the main trends we document are unchanged, as inheritances are generally small from year to year.

6.2.3 Capital gains and returns heterogeneity

Capital gains in national accounts. To achieve consistency between the distributional analysis of saving, wealth, and macroeconomic aggregates, we obtain capital gains data for each asset type from the national accounts (see section 2).[49] Additionally, we implement a correction to housing and equity capital gains in the national accounts, to make them consistent with the Case-Shiller price index, as implemented in Piketty et al. (2018).

We display in Appendix Figure E35 the evolution of three versions of capital gains: (i) the adjusted national accounts (this paper), (ii) the raw (unadjusted) national accounts and (iii) the Jordà-Schularick-Taylor Macrohistory Database (Jordà et al. 2019). The main finding is that all

[48] Results for life-cycle capital gains and inheritances and gifts are shown in Appendix Figures E36a and E37.

[49] This approach mirrors that of previous studies harmonizing the distribution of saving in microdata with national accounts, including Saez and Zucman (2016) for the US, Garbinti et al. (2020) for France, Martínez-Toledano (2020) for Spain or Bauluz et al. (2022) for a handful of rich countries and China.

capital gains exhibit a notable level of consistency, with national accounts displaying a strong correlation with well-established asset price indexes.[50]

To further understand the influence of capital gains, we replicate the analysis of life-cycle wealth growth decomposition under the two series for capital gains: unadjusted national accounts and the Jordà-Schularick-Taylor Macrohistory Database. The saving profiles are displayed in Figure 14 (panels b and c), while those for capital gains are in Appendix Figure E36. In essence, we find that the life cycle saving profile follows a similar trend when computed from the three distinct versions of capital gains.

Heterogeneous capital gains on individual asset classes. The method also assumes that different age groups experience the same capital gain for individual assets (e.g., housing, equity, etc.).[51] At first, this assumption might look strong, given the well-known result that returns (i.e., the sum of the income flow and the capital gain) for individual assets differ across wealth groups (Fagereng et al. 2020, Bach et al. 2020, Xavier 2021). However, available evidence for the U.S., Spain and Norway suggests rather small within-asset class heterogeneity of capital gains rates (Mian et al. 2021b; Martínez-Toledano 2020; Fagereng et al. 2020), with most variation in returns stemming from variation in income yields.[52]

We analyze variations in housing values in Figure 15. Arguably, this is the single asset for which differences across groups might affect our estimates most.[53] Importantly, our results

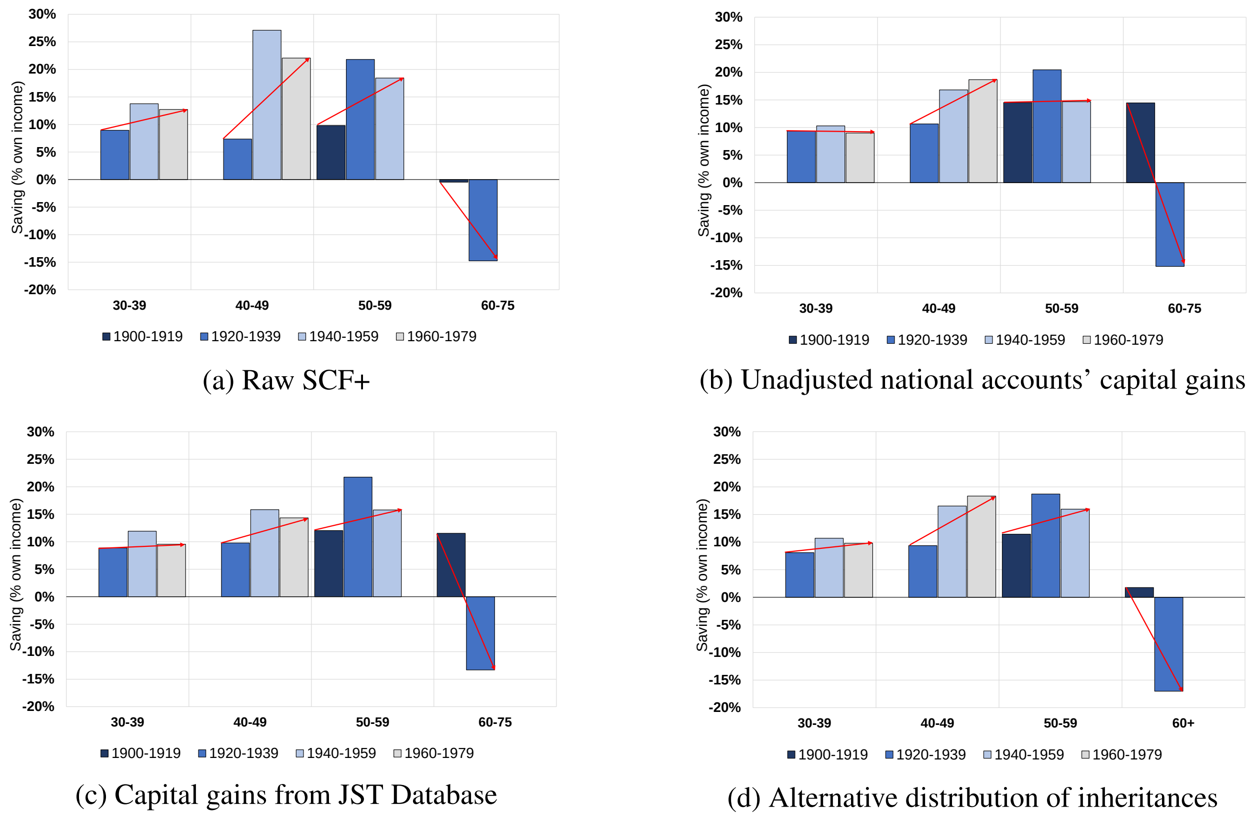
[50]One reason for the difference in equity capital gains is that national accounts include both listed and unlisted shares, while equity price indexes focus only on listed stocks. Another reason is that the national accounts measure is net of changes due to retained earnings, while common stock market-price indices are not.

[51]As a result, variation in capital gains across wealth groups reflects portfolio heterogeneity. Figure 4 documents large portfolio differences across age groups.

[52]Fagereng et al. (2020) document that returns across Norwegian wealth groups vary at the asset class level. Since returns are the sum of capital gains and income flows, we asked the authors if the capital gain component drives the observed variation in returns. In an email exchange, the authors suggested that differences in returns mostly stemmed from income flows since asset-specific capital gains across wealth groups are fairly small, at least for housing and public equity (the two assets they could check). We are grateful to the authors for sharing this information. Moreover, Xavier (2021) analyses returns along the wealth distribution in the U.S., finding large variations across wealth groups within asset classes. Her measure of return assumes (as we do) that capital gains in individual asset classes are the same across household groups.

[53]Deviations from the national average in this asset could significantly affect our estimates for two key reasons. Firstly, housing represents a central asset in households' portfolios, making up a substantial portion of their total assets. Secondly, it is widely shared between the top 10% and the middle 40% of the distribution. In contrast, equity and business assets are highly concentrated at the top of the distribution. This means that the aggregate capital gains in these assets are more reflective of the evolution of the top group and less pertinent to the dynamics of the bottom

Figure 14: **Life-cycle saving across cohorts: alternative estimates**



(a) Raw SCF+

(b) Unadjusted national accounts' capital gains

(c) Capital gains from JST Database

(d) Alternative distribution of inheritances

This figure illustrates the annual saving flows of four birth cohorts (born in 1900-19, 1920-39, 1940-59, and 1960-79) from ages 30 to 75, obtained under four different specifications. Figure 14a uses the raw SCF+ microdata on debt, assets and income. Figure 14b uses the unadjusted capital gains from the national accounts. Figure 14c uses capital gains on housing and equity from the Jordà-Schularick-Taylor Macrohistory Database. Figure 14d obtains saving flows assuming that 50% of inheritances of couples with a surviving spouse pass to the next generation, deviating from the benchmark estimate of 18% in Fahle (2023). The saving flows depicted in these figures are presented as a percentage of the cohort's average annual income and calculated using the methodology outlined in section 2.

indicate that movements in house values have been largely consistent across age groups over the past decades, with minimal differences across them.[54]

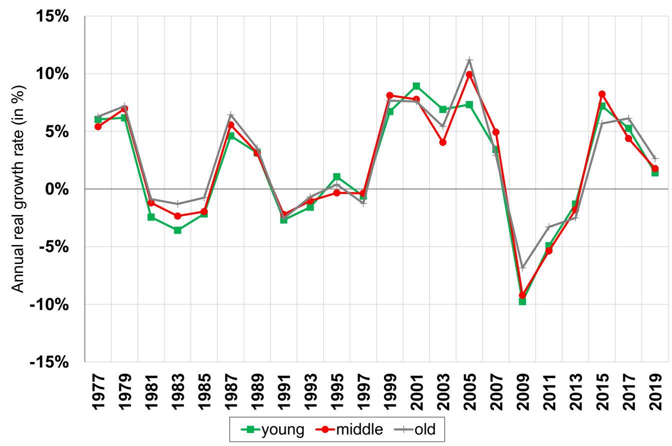
6.2.4 Intergroup mobility

The main focus of the paper when decomposing life-cycle wealth growth into saving, asset prices and inheritances is on birth cohorts as a whole. However, in section 5.2, we also distinguish saving

groups, which hold minimal wealth in these asset categories.

[54]This finding aligns with the analysis conducted by Mian et al. (2021b) for the U.S., where they performed a robustness check of the synthetic saving method using variation in house prices across wealth groups and found no substantial differences compared to their benchmark saving rates, which use uniform capital gains for individual assets.

Figure 15: **Annual real growth of house values per room across age groups, 1977-2019**

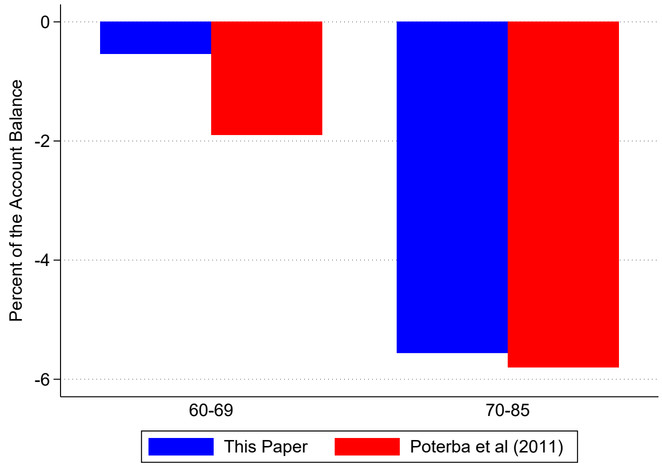


Notes: This figure computes annualized real growth rates of house values per room for three age categories: young (ages 20-39), middle-aged (ages 40-59), and elderly (age 60+), employing data from the American Housing Survey. In Appendix Figure E38, we present analogous results for house values per square meter (rather than per room), available for a shorter timeframe.

across within-age wealth groups, following "synthetic" groups over time, under the assumption that the same individuals remain in a given group across two survey waves (Saez and Zucman (2016), Garbinti et al. (2020) or Mian et al. (2021b)). In practice, however, there is some mobility so that individuals will move between groups. That is why we focus on large groups, such as the top-10% or the bottom-50%, for which mobility is relatively limited over shorter periods (Kuhn et al. 2020). In Appendix E.3, we test this assumption by computing persistence within birth cohorts in the Panel Study of Income Dynamics (PSID) as in Kuhn et al. (2020), who compute this persistence across the population as a whole (see Table C.2 in their paper). Overall, we find that the level of persistence is similar in both cases.

The finding for which within-cohort saving rates are most important is the result that the rise in saving at middle ages predominantly reflects the top decile. In contrast, we find that the dissaving of the elderly is not specific to any part of the wealth distribution. While mobility may induce some upward bias to these figures, we think its impact to be limited. The main mechanism for this potential upward bias would be an increase in entrants to the top decile due to transitory income shocks. However, the available evidence suggests that the rise in U.S. income inequality in recent decades is predominantly driven by permanent differences (Guvenen et al. 2022). In

Figure 16: **Annual dissaving in pensions: comparison to Poterba et al. (2011)**



Notes: This figure compares the annual dissaving in pension accounts obtained using our methodology with Poterba et al. (2011) across two age periods: 60-69 and 70-85. Pension withdrawals as a percentage of the value of the retirement account are taken from the description of Poterba et al. (2011), Figure 4-1. The estimates in this paper pertain to the cohort 1920-1939, ensuring consistency in the cohorts and time period covered in the two studies.

addition, our within-cohort analysis ranks households by wealth and not income. Wealth rankings are more stable and less sensitive to transitory income shocks.

6.3 Comparison to direct estimates of saving

Our methodology infers saving through households' intertemporal budget constraint. Data directly on saving in the U.S. is notably scarce (Mian et al. 2021b), but there are estimates of saving in certain asset classes that we can use to benchmark our results. Specifically, Poterba et al. (2011) study withdrawals from personal retirement accounts during the period 1997-2010. They observe that balances in these accounts remain relatively constant due to withdrawals being offset by positive capital gains earned by households on these accounts. We compare the dissaving in pension assets implied by our methodology with these estimates in Figure 16. Note that our methodology considers pension withdrawals as dissaving, consistent with the treatment in the U.S. financial accounts. Our figures closely align, with the implied dissaving in pension assets obtained by Poterba et al. (2011) being slightly larger than in our figures.

7 Conclusion

The main contribution of our paper is to examine the life-cycle wealth accumulation across cohorts in the U.S. since 1960, revealing some striking facts. Wealth is rapidly aging. This is strongly linked to a steepening of the age-wealth profile, itself reflecting the asset-price boom since the 1980s. We further find a "life-cycle saving reshuffling" in recent decades, with more saving occurring in middle ages and less in old age.

Standard life-cycle models reconcile these facts with two shifts over the last decades: the rise in life expectancy and the polarization of income. Both trends are predicted to raise asset prices, steepen the wealth-age profile, and polarize saving across asset buyers and sellers. This mechanism involves a transfer of resources from young buyers to old sellers (Fagereng et al. 2022).

We note several implications of the change in life-cycle behavior on macroeconomic outcomes. While it increases aggregate wealth, its effects on aggregate saving are less clear, as two forces are at play. Our decomposition reveals that private saving is increasingly the saving of rich households in middle ages. Old households, both rich and poor, are increasingly dissaving, pushing down aggregate saving.

A key question for future work is a full quantification of the key drivers behind changes in the life-cycle of U.S. households. The rise in capital gains since the 1980s appears to be at the core of the change in life-cycle profiles. Is the changing age-wealth profile a result of one-off capital gains, or is it here to stay?

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A Appendix to Section 2

A.1 Matching SCF to Macro Categories

Wealth. We harmonize wealth with macroeconomic aggregates to analyze aggregate behavior through the lens of distributional data. Table A1 gives details on the mapping of SCF+ to aggregate data.

Table A1: **Matching SCF to Macro Categories**

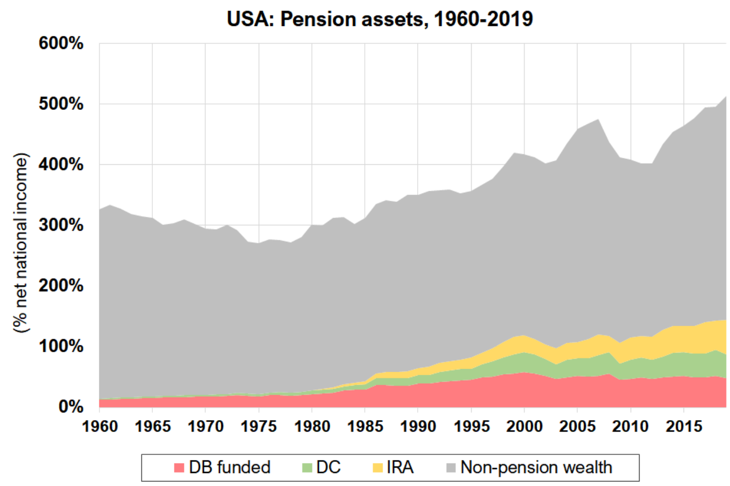
	SCF+ Asset Category	**Macroeconomic data category** [a]
Assets	Primary residence + Residential property excl. primary residence	Housing
	Businesses	Business assets
	All types of transaction account (Liq), Certificates of deposit, Savings Bonds, Directly held bonds	Fixed-income assets
	Directly held stocks	Equities (excluding held through funds)
	Directly held pooled investment funds	Investment funds
	Cash Value of Life insurance, quasi-liquid retirement accounts	Pensions & Life insurance
Liabilities	Debt secured by primary residence, Debt secured by other residential property	Mortgages, tenant and owner-occupied
	Other lines of credit, credit card balances after last payment, installment loans, other debt	Non-mortgage debt

[a] Based on Saez and Zucman (2020), Table TB1

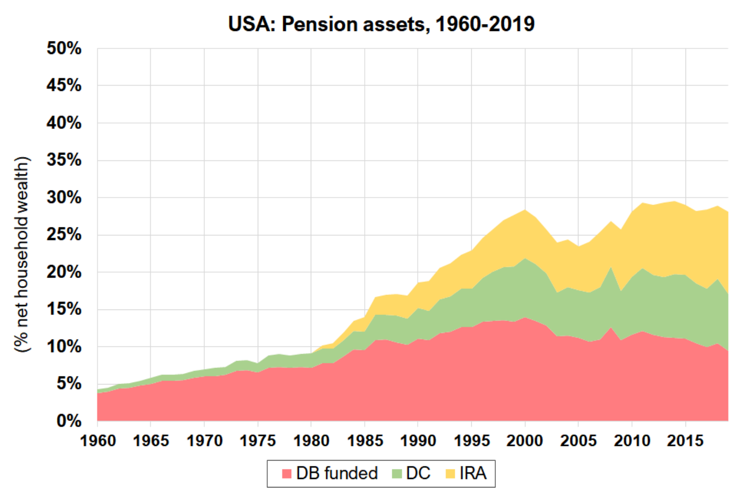
Regarding funded pension assets, the SCF+ lacks information on defined benefit pensions for the entire survey and defined contribution pensions in the historical waves. As explained in section A, we impute these two types of pensions in the missing periods. Figure Appendix A1 displays the value of funded pensions in the U.S. While funded pensions constitute nearly 30% of household wealth today, they accounted for less than 10% in the early period.

Income. Our goal is to measure flows of saving, capital gains and interfamily transfers as percent of gross income. National income in NIPA and income surveyed in the SCF differ from each other in some respects. We follow Dettling et al. (2015) and Kuhn et al. (2020) in constructing

Figure A1: Pension assets



(a) Household wealth: pension assets and non-pension wealth (% nat. income)



(b) Pension assets (% household wealth)

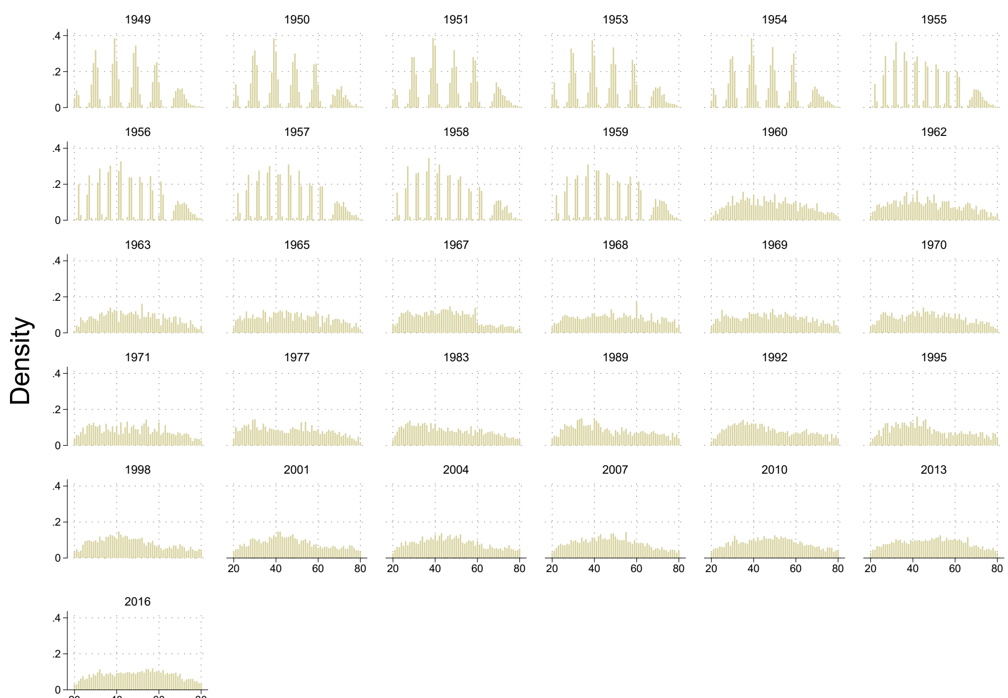
Notes: This figure shows funded pension assets decomposed into three types: Define Benefits (DB funded), Defined Contribution (DC) and Individual Retirement Arrangement (IRA). Pension assets are expressed as a percentage of national income (Figure A1a) and as a percentage of aggregate household wealth (Figure A1b).

a counterpart to the SCF+ income concept. Not all parts of NIPA income are covered in the SCF, with the most important omissions being supplements to wages and salaries (NIPA line 2.1.6), imputed interests received (NIPA line 7.11.63) as well as imputed rents (NIPA line 7.9.9). Capital gains are not included in our income measure and income is pre-tax but post-transfers. We then rescale income to the survey consistent concept, with SCF and NIPA incomes then aligning quite well in trends and size (Kuhn et al., 2020).

A.2 The Age Structure in the SCF+

In general, the age structure in the SCF+ is close to the general population. One important exception is the 1950s when the age in the SCF+ is only reported in discrete bins. We show this in figure A2, where it can be seen that in this decade, the age of respondents spikes around certain peaks. Therefore we do not consider the 1950's waves for our analysis. After 1960, the age structure from the SCF is aligned with the general population. We show this explicitly in figure A3, which compares the population shares in the SCF+ and the U.S. census by decade.[55] The SCF+ tracks the population composition in the census closely.

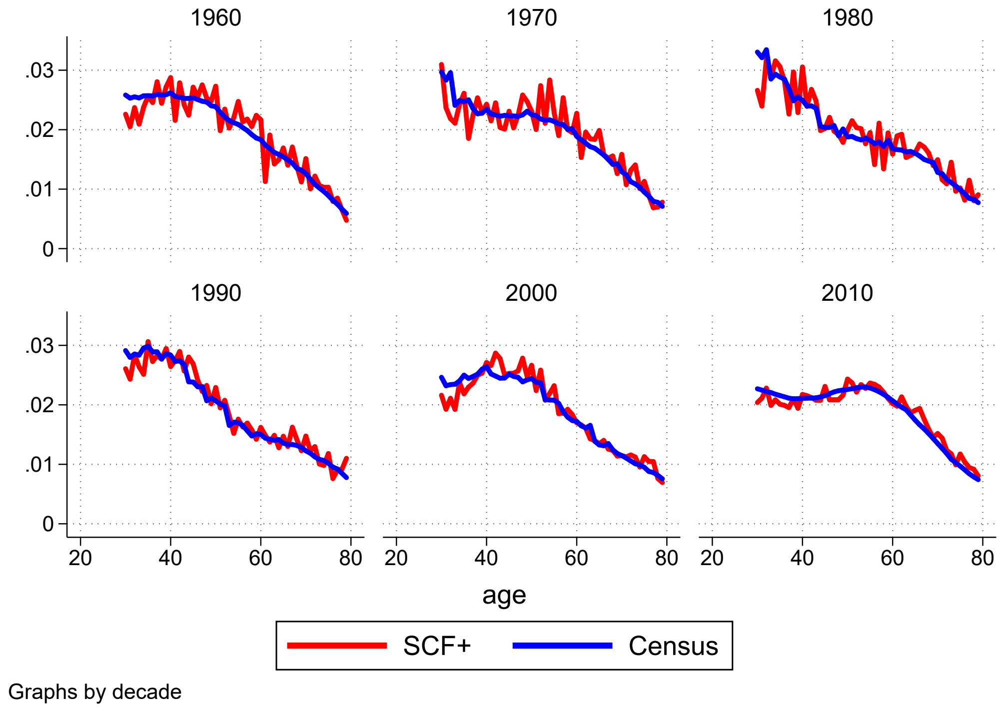
Figure A2: **Age density in the SCF+**



Notes: This figure presents the density of ages in the SCF+ for all survey waves.

[55]The U.S. census is conducted once per decade. We linearly interpolate the age structure in between census years.

Figure A3: **Age density in the SCF+**

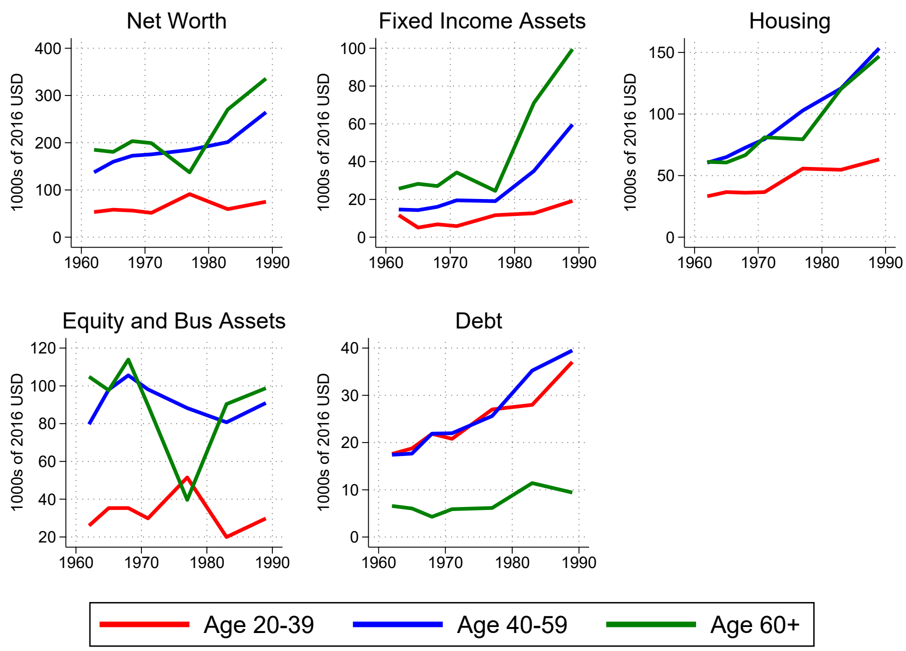


Notes: This figure compares the population composition in the SCF and the census.

A.3 Undercoverage in the 1977 Wave

In our baseline analysis, we exclude the 1977 wave due to an implausible drop in elderly wealth, as also noted in Auclert et al. (2021). In the 1977 survey, we find a large drop in holdings of equity and business assets by the elderly, with the value of total holdings of these assets dropping by over 60%. Figure A4 shows the mean dollar holdings of different assets (in constant prices) for age groups in the raw SCF+ data. Although this period sees a large fall in equity prices, the drop in holdings is observed only for the elderly generations. Moreover, although equity prices remained low into the early 1980's, holdings do not remain low but recover immediately. We, therefore, regard the fall in equity holdings as implausible. For our methodology, the sharp fall in equity holdings would appear as a large dissaving in equity assets with a large increase in saving in these assets thereafter as holdings recover. For young cohorts, the picture is reversed: the young increased their equity holdings by almost 50% in 1977, only to then see them drop sharply. However, the main trends we

Figure A4: Average real holdings of assets by age groups



Notes: This figure illustrates the coverage of different asset classes by age group for the 1977 wave.

document in the paper hold if including the 1977 wave, as we show in Figures A5 and A6.

A.4 Construction of Inheritances and Transfers

In this section, we explain the construction of inheritances and gifts in detail. First, we describe more closely the mortality multiplier method used to construct inheritances.

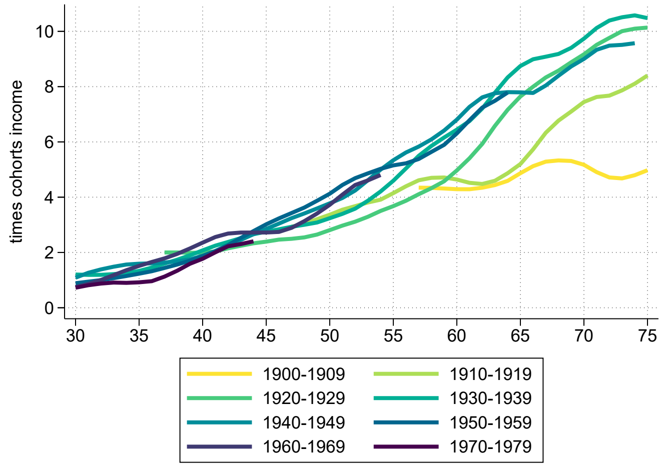
We use death rates from the Social Security Administration by age, sex and gender since 1900[56]. Then the bequests B_t in a given year t can be estimated via

$$B_t = \sum_{i \in I} w_{i,t} d(s_i, a_i, t),$$

where I is the set of adults, $w_{i,t}$ is their wealth in t and s_i, a_i refer to the sex and age of individual i. Following US tax law, estates with negative net wealth are dropped, as debts can't be inherited.

[56]These are available at https://www.ssa.gov/OACT/HistEst/Death/2020/DeathProbabilities2020.html

Figure A5: Life-cycle wealth accumulation: including the 1977 wave



Notes: This figure reproduces the chart on life-cycle wealth-income profiles (e.g., Figure 2 of the main text) in a sample including the 1977 wave.

For those estates with positive net wealth we consider net wealth instead of gross wealth as tax regulation requires an estate to settle its debts, so debts of the deceased are deducted from the amount transferred to the inheritors.

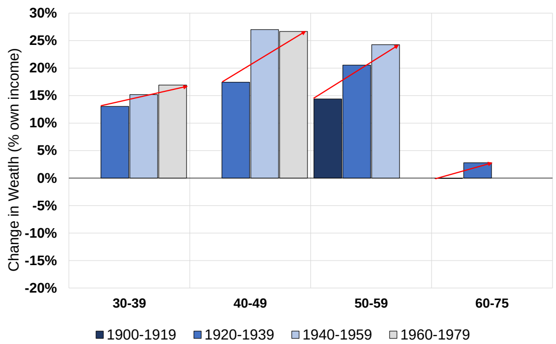
Next, we refine this method by correcting for differential mortality, estate taxes and other deductions from the estate and adding gifts.

Applying uniform mortality rates overstates the mortality rates of the rich, who tend to live longer lives (Chetty et al., 2016). Therefore we adjust mortality rates $d(s_i, a_i, t)$ by multiplying with a mortality multiplier $\alpha(x_{i,t})$ where $x_{i,t}$ is a vector describing other characteristics of the household (such as income, wealth etc.). We use the mortality multipliers of Saez and Zucman (2016) to correct for differential mortality of top wealth holders.[57]

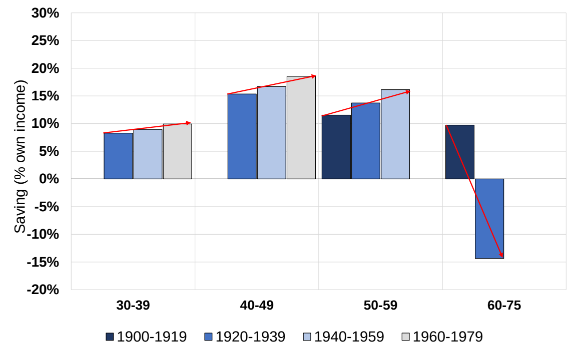
We next apply estate taxes and deductions to the estate. Costs that pertain to the death (such as funeral and attorney costs) and charitable contributions are deducted from the estate before applying the estate tax. We deduct these in a procedure following Feiveson and Sabelhaus (2019), that is based on the publicly available tax files of the IRS and the deductions recorded in them.

[57]Using other multipliers, such as the ones of the Congressional Budget Office yields very similar results, which can be seen from the fact that our numbers are close to (Feiveson and Sabelhaus, 2019). We choose the multipliers of Saez and Zucman (2016) as they also go back in time, reflecting changes in differential mortality.

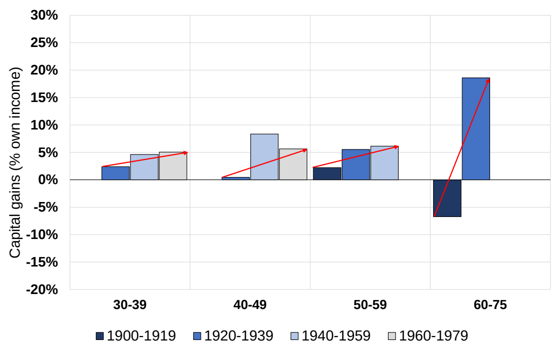
Figure A6: Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances): including the 1977 wave



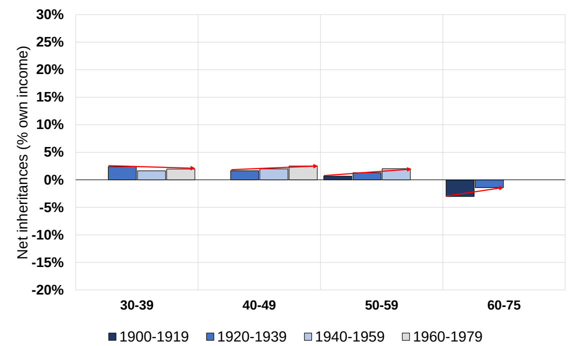
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



(c) Capital gains over the life-cycle



(d) Net inheritances and gifts over the life-cycle

This figure displays annual changes in real wealth (Figure A6a) decomposed into the contribution of net saving flows (Figure A6b), capital gains (Figure A6c) and inheritances and gifts (Figure A6d) along the life-cycle of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 30 to age 75. It uses the 1977 wave of the SCF+, while the corresponding Figure 8 of the main text does not. The flows are shown as a percentage of the average annual income of the cohort and are computed using the methodology outlined in section 2.

Finally, we apply the estate tax after making the deductions outlined above (charitable bequests and funeral costs). U.S. estate taxes have undergone many changes in the past years. For the past 50 years tax rates have been generally lowered and the exemption increased. This is especially true for the top marginal tax rate, which has declined from 77% (in the period of 1940 to 1977) to 40% today. But not only the extremely wealthy have seen a lowering of their estate taxes. Thresholds have been lowered, such that fewer estates are taxed in total. We collect precise estate tax schedules since 1946 and apply the tax to all inheritances not passed to the spouse, as these are tax free. Adding all deductions and taxes reduces the flow of inheritances by on average 20%, with yearly values ranging from 15-25%.

As we first estimate a total flow and then distribute according to the observed distribution of bequests received we must decide which parts of the inheritance go to the spouse and which parts go to subsequent generations. This is because the SCF survey module only records inheritance received from outside of the households, so that bequests received from the spouse will not be recorded. Fahle (2023) finds that in the U.S., a share sh_{next} = 18% of bequests of partners with a surviving spouse do not go to that surviving spouse but directly to the next generation. Hence, we distribute 18% of the bequest not to the surviving spouse but to the next generation. If both spouses die, then the inheritances flows to the next generation. Hence intergenerational bequests B_t^{intergen} (those passing to the next generation) are defined as

$$B_t^{\text{intergen}} = \sum_{i \in I_{\text{single}}} w_{i,t} d(s_i, a_i, t) + \sum_{i \in I_{\text{married}}} w_{i,t} d(s_{i_1}, a_{i_1}, t) d(s_{i_2}, a_{i_2}, t) + \sum_{i \in I_{\text{married}}} sh_{\text{next}} w_{i,t} d(s_{i_1}, a_{i_1}, t)(1 - d(s_{i_2}, a_{i_2}, t)). \tag{6}$$

and are comprised of bequests from single households, married households in which both partners die and bequests passing to the next generations from married households in which only one partner dies. $w_{i,t}$ represents the bequested wealth (after taxes and deductions). For those bequests that flow to the spouse it is clear from the microdata how they redistribute wealth across generations as we have the age of the spouse to which the inheritance flows.

Wealth can also be passed between households by inter-vivos transfers. These are harder to estimate than bequests, since they don't ocurr at a fixed point in time. Instead we make use of the gift module in the SCF to study the size of the inter-vivos gift flow. In this module both transfers received and transfers given by the household are recorded.[58] In the aggregate, households in the SCF report that they gave more transfers than they received. This indicates that gifts received are underreported in the survey and the gifts given are the more reliable estimate. In turn, we use the aggregate gifts given in the SCF for the size of our gift flow. Before 1989 we cannot rely on the

[58]The precise question is: During the past year, did you (or anyone in your family living here) provide any (other) financial support for relatives or friends who do not live here? The interviewer is asks respondents to also include any substantial gifts given in the answer to this question.

SCF for the aggregate of gifts. Following Alvaredo et al. (2017) we assume the flow of inter-vivos gifts to be 20% of all bequests. This approximation is validated by the gift flow since 1989, which is on average 21% of the total bequest flow.

Distribution of Bequests and Gifts. We distribute gifts and inheritances following observed densities from the SCF. Recall that we only distribute those bequests that flow to the next generation from equation 6 using these densities, the rest of the bequests goes to the spouse. Inheritances are only reported sparsely, with only 25% of households in the SCF reporting ever receiving an inheritance. Given this, we pool the survey waves since 1989 to produce more robust distributions of bequests.[59] The SCF asks respondents about all inheritances they ever received. As our goal is to capture only the distribution in a given year, we only include inheritances received in the past 3 years.[60] We show the distribution of inheritances received in figure A7. As the population ages, the distribution of inheritance recipients has moved upwards. Many inheritances are now reported by people over the age of 60. While this may seem surprising, many respondents in the survey also report receiving inheritances from siblings.

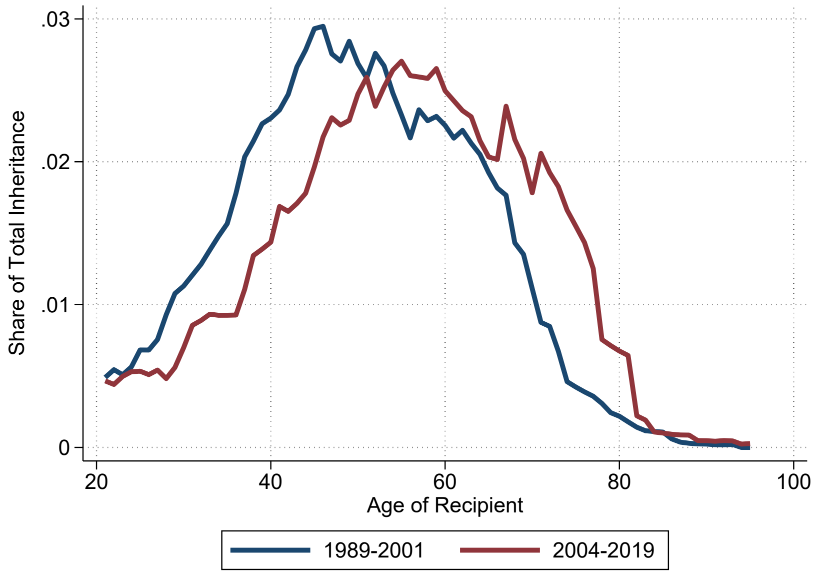
For gifts we follow a similar procedure. The biggest difference is that, unlike for inheritances, we do not have a 'predicted outflow' of gifts by age group. We could use the SCF question on gifts given to assign a gift outflow to each age group. However, as gifts are even rarer than inheritances, we choose to pool the survey waves since 1989 to compute the distribution of gift outflows. We then apply this distribution to the total flow of gifts. We compute the distribution of gift inflows similarly. Both are shown in figure A8. Gifts appear to be primary way of distributing wealth from parents to grown up children. Many gifts are given by around 60-year olds and received by those under the age of 40.

We further use the SCF to distribute gifts and inheritances to wealth deciles within these age groups. To do so, we pool all survey waves to get the distribution of gifts and inheritances. There is no trend in the distribution of inheritances or gifts received across wealth deciles. Given the small

[59] Specifically, we distinguish 2 time periods: 1989-2001 and 2004-2019.

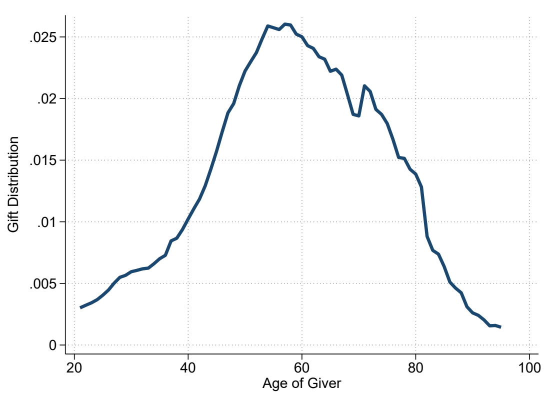
[60] In practice, in the public use files of the SCF, the exact year is often not given for confidentiality reasons, but the year reported as a 5-year interval. We then use the closest interval.

Figure A7: **Distribution of inheritances received**

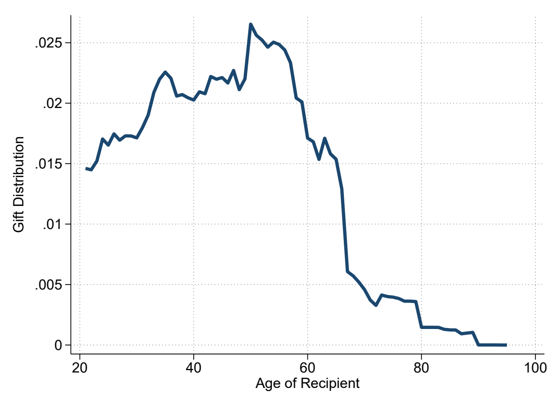


Notes: This figure shows the distribution of the inheritances in the SCF received by age of recipient over the two periods considered.

Figure A8: Distribution of Gifts in the SCF



(a) Age Distribution of Gift Givers



(b) Distribution of Gift Recipients

Notes: This figure shows the age distribution of gift givers and recipients in the SCF, pooling the survey since 1989.

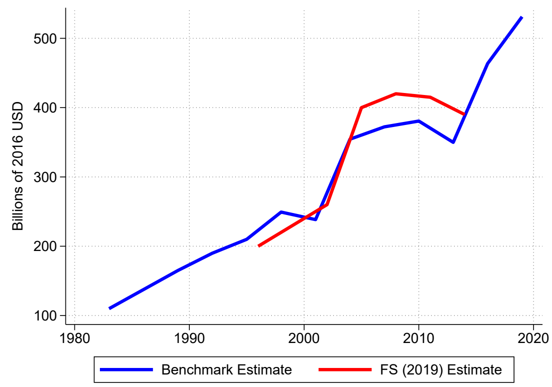
amount of inheritance and gifts we pool all survey waves. In general, the distribution of gifts and inheritances is slightly more equal than the distribution of wealth in general. This fact underlies our result that inheritances have an equalizing effect on within-cohort wealth shares. Although inheritances are very unequally distributed, as long as their distribution is more equal than wealth in general they will have an equalizing impact.

Unfortunately, the historical part of the SCF (before 1989) does not include data on inheritances or gifts. Therefore, we assume that the distribution of inheritances and gifts along age groups is shifted downward following changing life expectancy.[61]

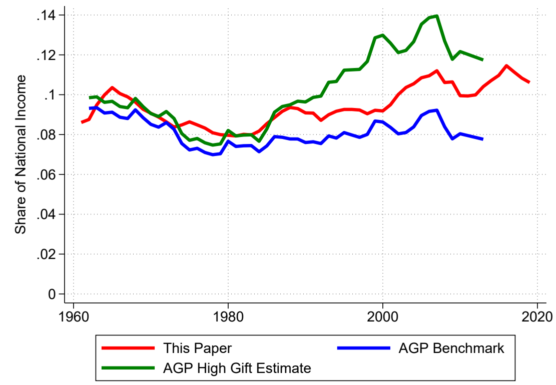
Discussion. There is very little evidence on the size of the aggregate inheritance flow in the US. This is due to the fact that the estate tax is only levied on very few estates (though the estate tax on these estates can be substantial, up to 40 % in recent years). To ensure the validity of our approach we compare our estimates to existing numbers from Feiveson and Sabelhaus (2019) and Alvaredo et al. (2017) in figure A9. The paper by Feiveson and Sabelhaus (2019) is closest to our methodology. They report the aggregate inheritance flow only for a few select years. We show our inheritance flow in 2016 dollars in figure A9a, in addition to their estimate; the flow we obtain is very close to theirs. We also compute the flow of bequests and gifts as calculated by Alvaredo et al. (2017), who exclude taxes and deductions. It also does not distinguish between bequests going to the spouse or going to the next generation. Our comparison that follows these same definitions is shown in figure A9b. Our estimates are close in the early years and between the AGP benchmark and the high-gift estimate for the later years. The difference between the benchmark and the high gift estimate in their paper is that in the high-gift estimate, the flow of gifts is growing over time and up to 80% of all inheritances in recent years, based on French data.

[61] We take life expectancy data from FRED: https://fred.stlouisfed.org/series/SPDYNLE00INUSA

Figure A9: Inheritance and Gift Flow



(a) Comparison with Feiveson and Sabelhaus (2019)



(b) Comparison with Alvaredo et al. (2017)

Notes: Figure A9a shows the flow of inheritances flowing to the next generation in billions of 2016$ in our paper and in Feiveson and Sabelhaus (2019). Numbers from their paper are estimated from the figure 'Estimated Bequests vs Reported Inheritances' in their paper. Figure A9b shows the total inheritance and gift flow as a fraction of national income. It compares our estimate to that of Alvaredo et al. (2017).

B Appendix to Section 3

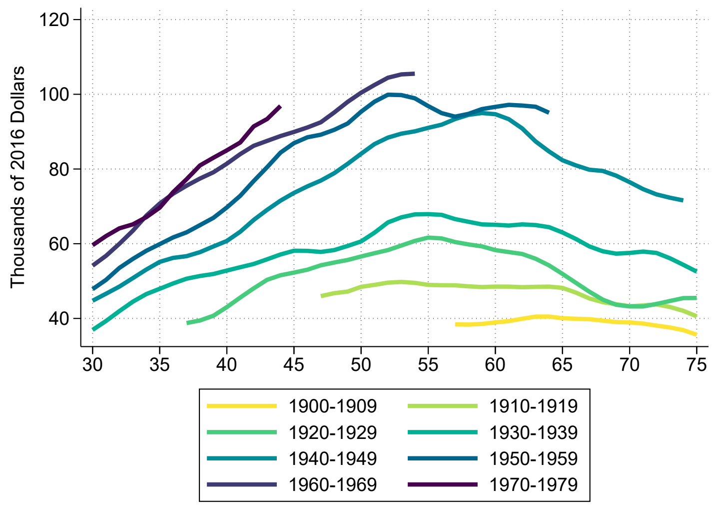
B.1 Additional figures

We provide additional descriptive results on the life-cycle profile of cohorts. Figure B10 shows the life-cycle income profile of eight cohorts in constant prices. It complements Figure 3 from the main text, which displays the life-cycle wealth in constant prices instead of income. Figure B11 illustrates the distribution of wealth within cohorts over their life cycles. Specifically, it displays the share of a cohort's wealth owned by the bottom-50% and middle-40% groups within the cohort at different ages. It complements Figure 6 in the main text, which shows the equivalent results for the top-10% within-cohort wealth group.

B.2 The impact of unveiling on cohort portfolios

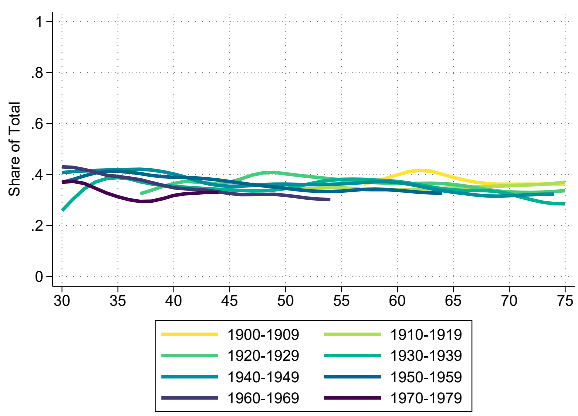
Our methodology unveils the financial portfolio of households into equity and fixed-income assets. In particular, we unveil assets held indirectly through investment or pension funds. Figure B12 shows the portfolios for the birth cohorts we cover before and after unveiling.

Figure B10: **Life-cycle income in constant prices**

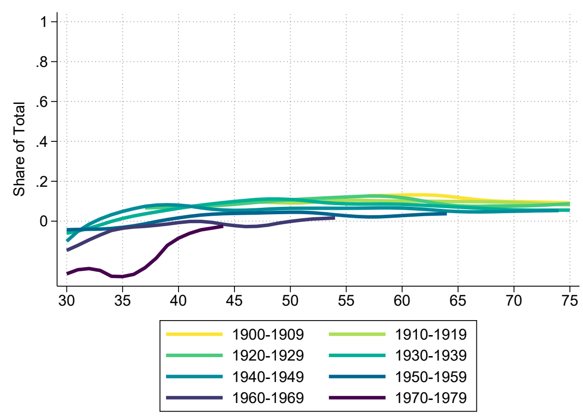


This figure plots the average income and during cohorts' life cycles in constant thousands of 2016 dollars. Series are 7-year averages. For example, the average wealth at age 65 of the cohort born in 1930-39 is around 65,000 dollars at constant prices of 2016.

Figure B11: Within-cohort middle-40% and bottom-50% wealth shares over the life-cycle



(a) Middle-40%



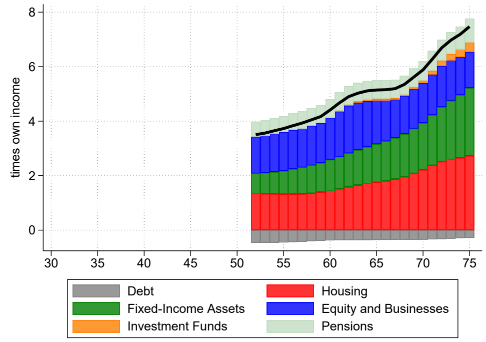
(b) Bottom-50%

Notes: This figure displays the share of a cohort's wealth owned by the middle-40% (Figure B11a) and bottom-50% (Figure B11b) at a given age. For example, the share of the wealth of the cohort born in 1920-39 at age 50 owned by the bottom-50% of that age is approximately 10%.

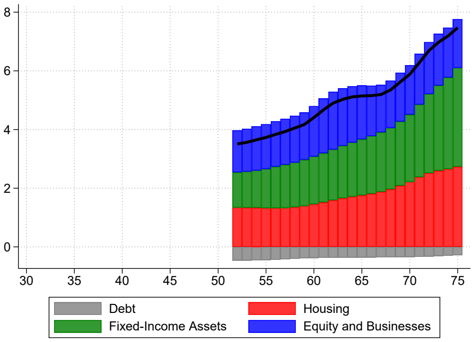
B.3 Comparison with other countries

Our key stylized facts hold not only in the U.S. but also in other countries. In this appendix, we present results for France using Distributional National Accounts produced by Garbinti et al.

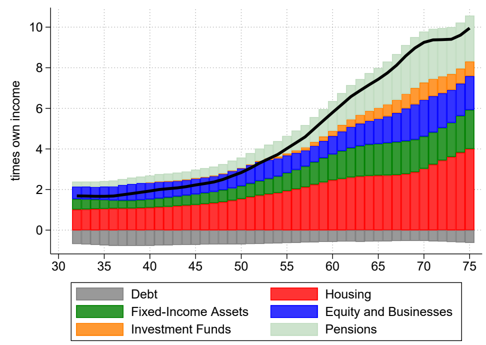
Figure B12: Cohort life-cycle portfolios before and after unveiling



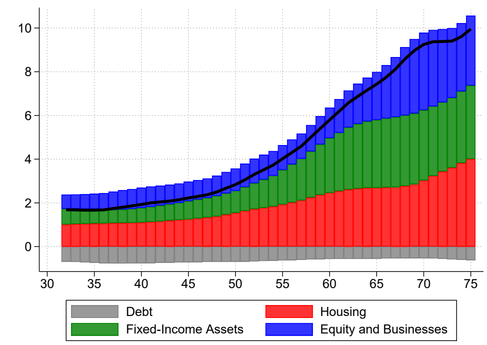
(a) 1900-1919 cohort before unveiling



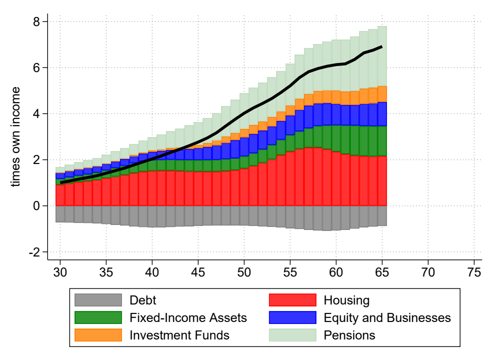
(b) 1900-1919 cohort after unveiling



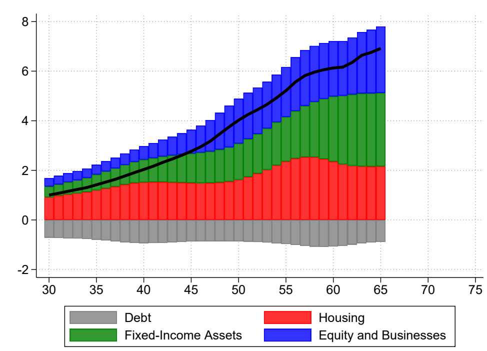
(c) 1920-1929 cohort before unveiling



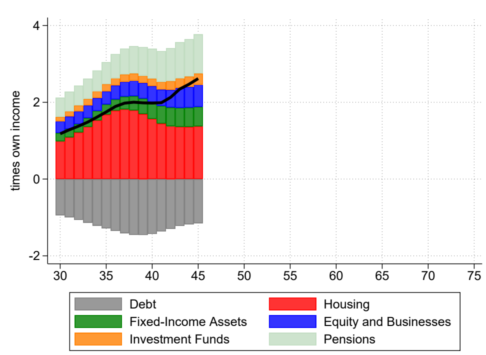
(d) 1920-1929 cohort after unveiling



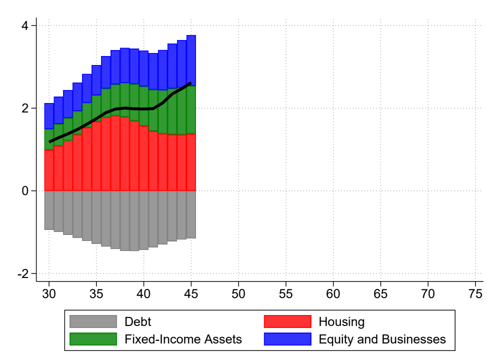
(e) 1940-1959 cohort before unveiling



(f) 1940-1959 cohort after unveiling



(g) 1960-1979 cohort before unveiling

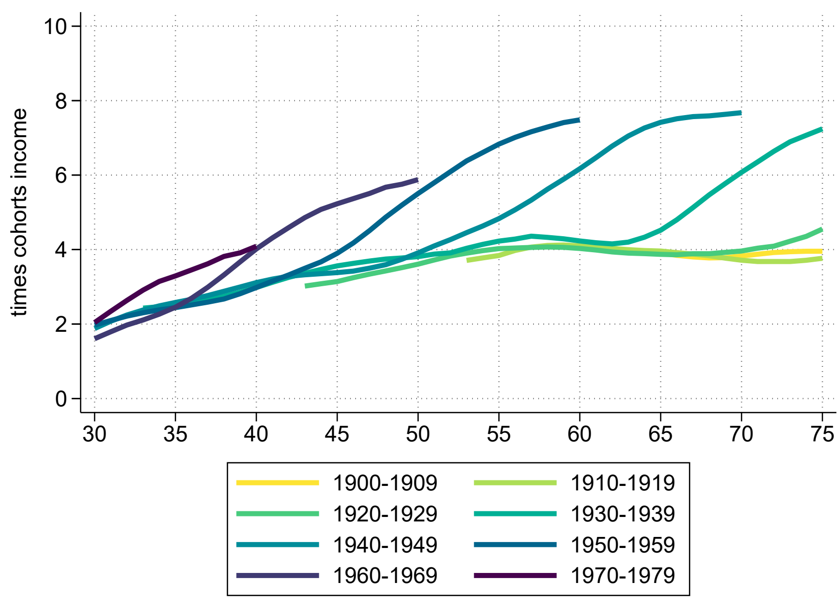


(h) 1960-1979 cohort after unveiling

Notes: This figure illustrates the effect of unveiling as described in section 2. Series are 7-year moving averages.

(2020). The data starts in 1970, so early cohorts are captured only at the end of their lives. In other work subsequent to the first version of our paper, Sturrock (2023) and Bartels and Morelli (2021) document similar trends for the U.K. and Italy and Germany, respectively, although for a shorter period (generally starting in the mid-1990s). In Figure B13, we present life-cycle wealth profiles for French cohorts. We observe a similar steepening of wealth profiles in France. In Figure B14, we study life-cycle wealth profiles across the within-cohort distribution. The trend towards steeper life-cycle wealth profiles holds across the groups in the wealth distribution, in contrast to the US, where this steepening is only observed for the top half. Nevertheless, the steepening of life-cycle wealth profiles is more pronounced at the top of the distribution, as in the U.S..

Figure B13: Life-cycle wealth accumulation in France

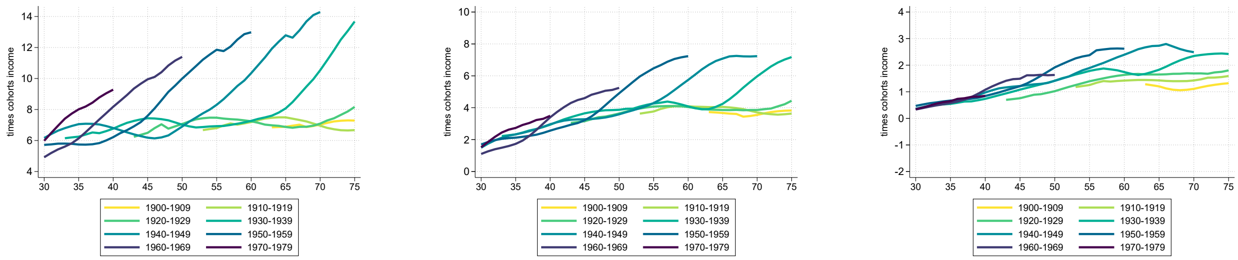


Notes: This figure plots the average wealth of birth cohorts in France during their life cycles, expressed as a share of the cohorts' own average income using data from Garbinti et al. (2020). Series are 7-year averages.

B.4 Wealth inequality across age groups

In section 3, we found that more recent cohorts reach higher wealth levels when old than their predecessors despite starting their working lives from similar levels. This, in turn, impacts the

Figure B14: Life-cycle wealth accumulation of the top-10%, middle-40% and bottom-50% in France



(a) Wealth of the top-10% (b) Wealth of the middle-40% (c) Wealth of the bottom 50%

Notes: This figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of their own group's average income. Series are 7-year averages.

distribution of wealth across age groups over time. We describe the age-wealth distribution in this section.

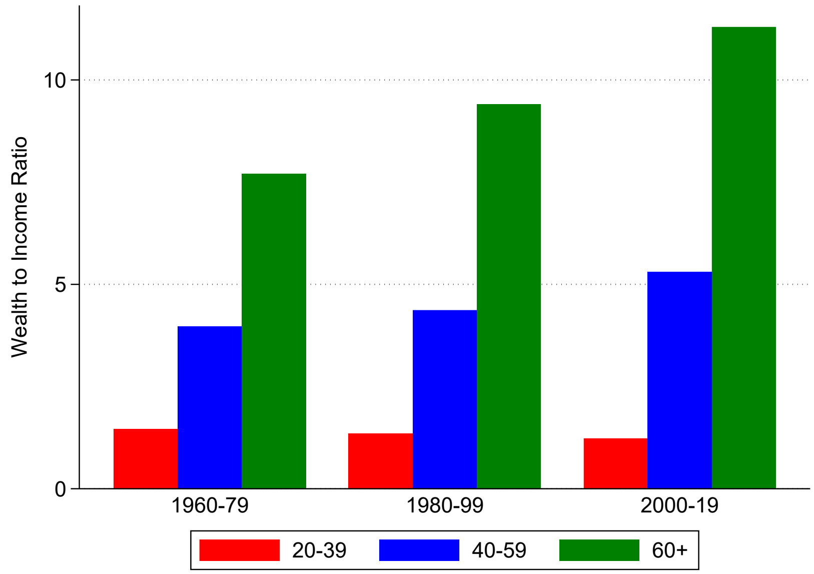
Figure B15 shows a divergent pattern across age groups. The Figure shows the average wealth-to-average income ratio for three age groups: 20-39, 40-59 and 60+. Before the 1980s, the older groups (e.g., those after age 60) had cumulated the equivalent of 7-to-8 their own income, the middle-aged groups attained levels of 4 times, while the young (i.e., at age 20 to 40) had, on average, wealth holdings around 1.5 times the average annual income.

The wealth gap across age groups substantially increased over the years. Old and middle-aged adults increased their wealth-income ratios substantially, reaching levels as high as 11 and 5.5, respectively. By contrast, young adults barely experienced any increase.[62] These results indicate a substantial widening of the age-wealth gap since the 1980s. Figure B16 illustrates the age-wealth gap by plotting the ratio of the average wealth of the elderly to the average wealth of young adults. This ratio more than doubled between the early period and the last decade.

We now turn to analyze wealth holdings of within-age wealth groups over time. Consistent with Figure 5 in the main text (which, instead, looked at birth cohorts), Figure B17 shows that the upper half of the within-age wealth distribution (in particular, the top-10%) drives the previous

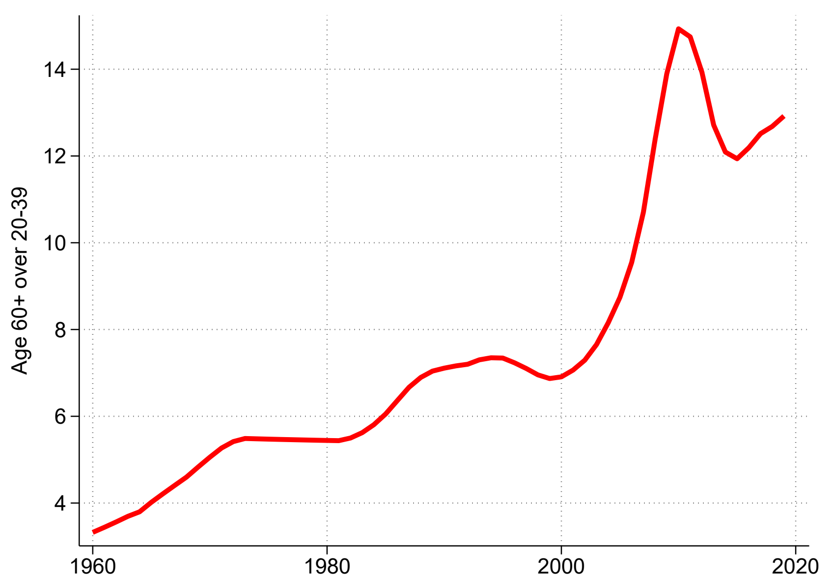
[62]This stability hides higher leverage from young adults in recent years, for which acquiring a house involves a much higher debt burden than decades ago (see Figure 4).

Figure B15: **Wealth-income ratios for age groups**



Notes: This figure shows the ratio of average wealth-to-average income age groups over time. Time frames are chosen to match those in the shift-share analysis (section 5).

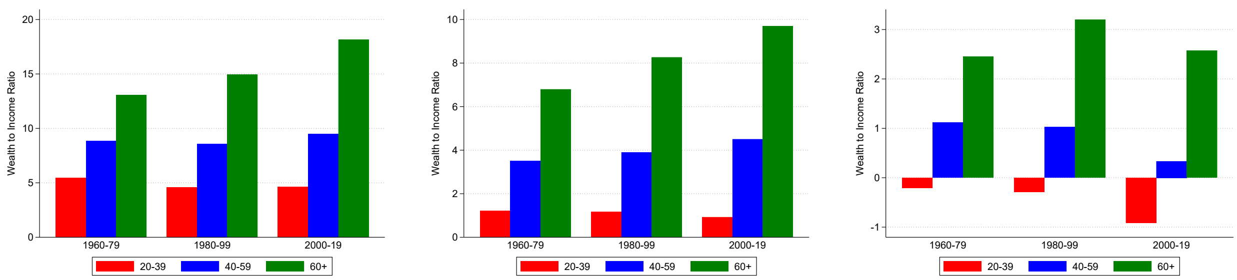
Figure B16: **Ratio: wealth of the old over the young**



Notes: This figure plots the ratio of the average wealth of the elderly (age 60+) over the average wealth of the young (age 20-39).

results for age groups as a whole. Namely, the top-10 and middle-40% attain much higher levels when old today than in the 1960s-1970s period. This is not true for the poorest half of the population, which has not improved its wealth-income ratio over time (and, indeed, does worse in the 2000-2019 period than in the two decades before).

Figure B17: Wealth-income ratios for age-wealth groups



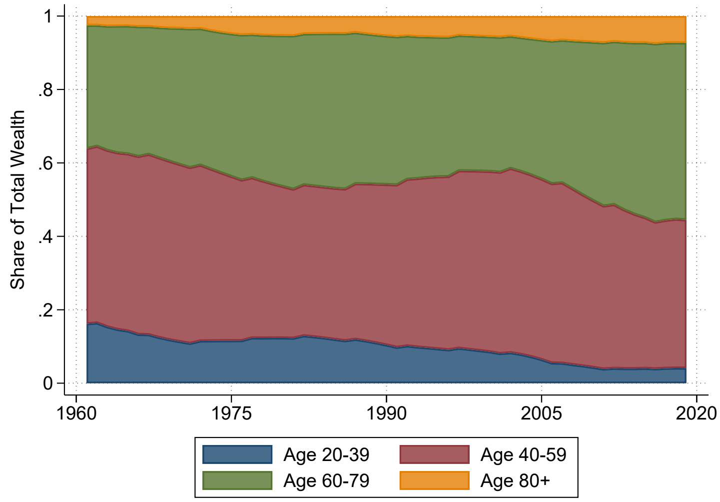
(a) Wealth of the top-10% (b) Wealth of the middle-40% (c) Wealth of the bottom 50%

Notes: This figure shows the ratio of average wealth-to-average income of within-age wealth groups over time. Time frames are chosen to match those in the shift-share analysis (section 5).

To better understand the extent of the growing age-wealth gap, Figure B18 shows the share of total household wealth owned by different age groups since 1960. Consistent with the analysis above, we observe a drastic increase in the percentage of total wealth owned by old adults. While adults 60+ held around one-third of total wealth in the 1960s, their share has increased to more than half of total wealth.

Overall, this subsection documents a strong aging of wealth in recent decades, with the most pronounced changes occurring in the upper half of the within-age wealth distribution (specifically, among the old top-10% and the old middle-40%).

Figure B18: **The distribution of household wealth across age groups**



Notes: This figure plots the share of total household wealth owned by four age groups (20-39, 40-59, 60-79 and 80+) over time. Series are 7-year averages.

C Appendix to Section 4

C.1 Life-cycle wealth growth decomposition

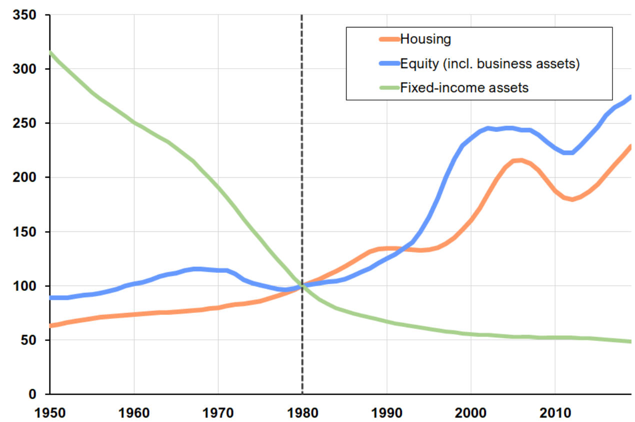
We present supplementary results regarding the life-cycle wealth growth decomposition across cohorts in the U.S. To begin, Figure C19 illustrates the macroeconomic trends for capital gains in three assets: housing, equity (including business assets), and fixed-income assets. This figure serves as a complement to Figure 7c in the main text, which does not include fixed-income assets.

Figures C20, C21 and C22 show the life-cycle wealth growth decomposition (into saving, capital gains and inheritances and gifts), for three distinct wealth groups within cohorts: the top-10%, middle-40%, and bottom-50%. These figures correspond to four birth cohorts: 1900-1919, 1920-1939, 1940-1959, and 1960-1979. They complement Figure 8 in the main text, which presents a similar decomposition but for entire cohorts without distinguishing between various wealth groups within each cohort.

Figures C24, C25, C26 further investigate some of the key trends we have identified. First, we have observed an increase in saving during middle age, primarily concentrated within the top decile. Figure C24 shows the asset classes in which this is concentrated. Second, we have identified increased dissaving among the elderly amidst large capital gains. Figures C25 and C26 illustrate the asset classes in which dissaving and capital gains have occurred for the elderly.

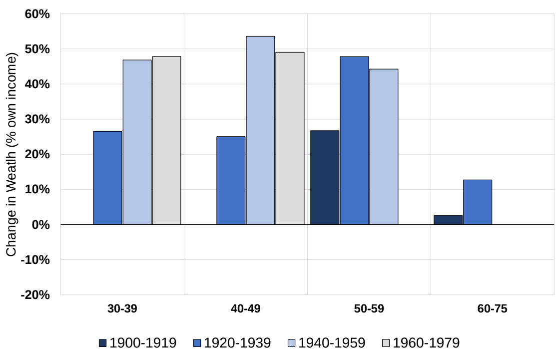
Finally, Figure C23 provides counterfactual life-cycle wealth profiles excluding capital gains for within-cohort wealth groups, complementing Figure 9 in the main text for entire cohorts.

Figure C19: **Capital gains index: 1950-2018**

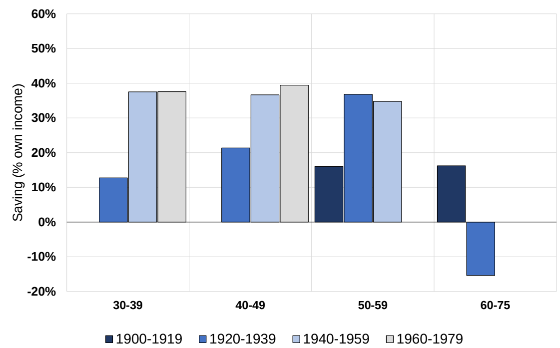


Notes: This figure shows the evolution of capital gains in the U.S. for the following asset classes: housing, equity (including business assets), and fixed-income assets. Results are expressed as an index, taking a value of 100 in 1980 and are obtained using the asset-specific accumulation equations (see section 2).

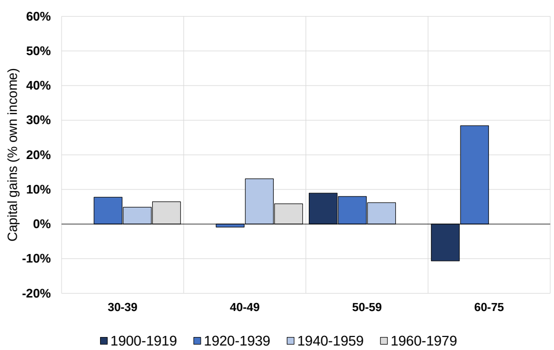
Figure C20: Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances): top-10% within-cohort wealth group



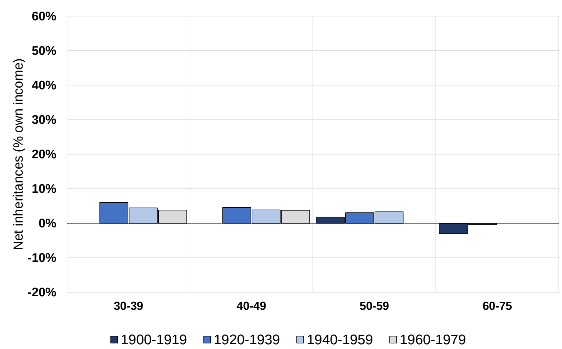
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



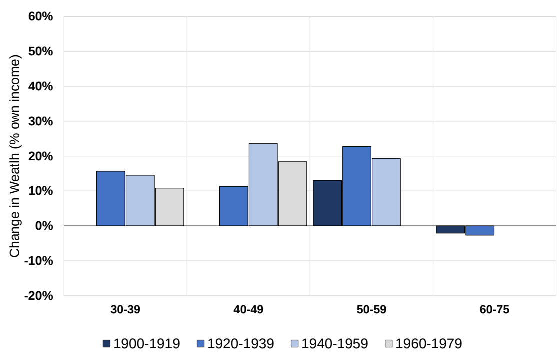
(c) Capital gains over the life-cycle



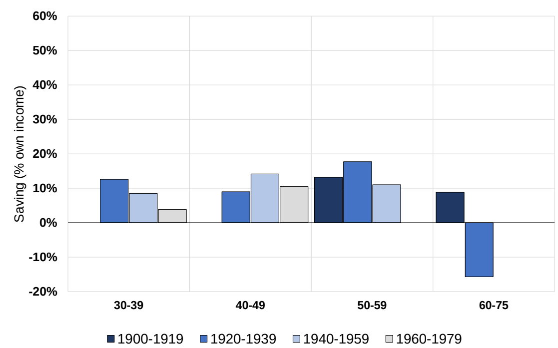
(d) Net inheritances and gifts over the life-cycle

This figure displays annual changes in real wealth (Figure C20a) decomposed into the contribution of net saving flows (Figure C20b), capital gains (Figure C20c) and inheritances and gifts (Figure C20d) along the life-cycle of the top-10% within-cohort wealth group of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 30 to age 75. The flows are shown as a percentage of the average annual income of the within-cohort wealth group and are computed using the methodology outlined in section 2.

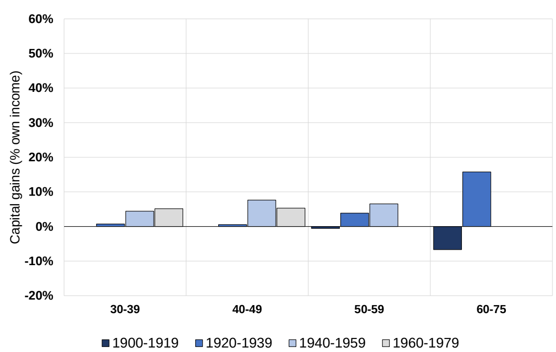
Figure C21: Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances): middle-40% within-cohort wealth group



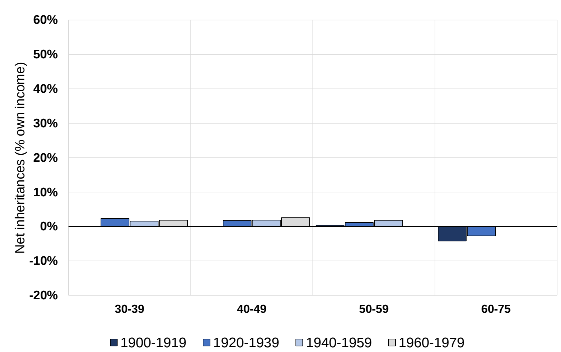
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



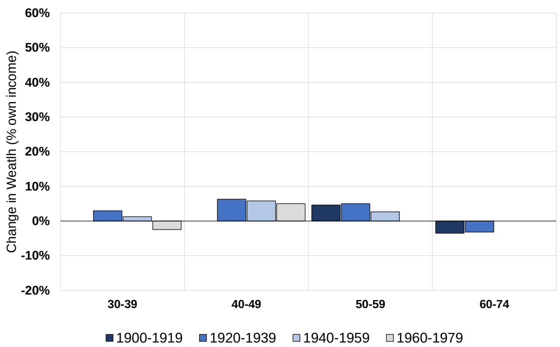
(c) Capital gains over the life-cycle



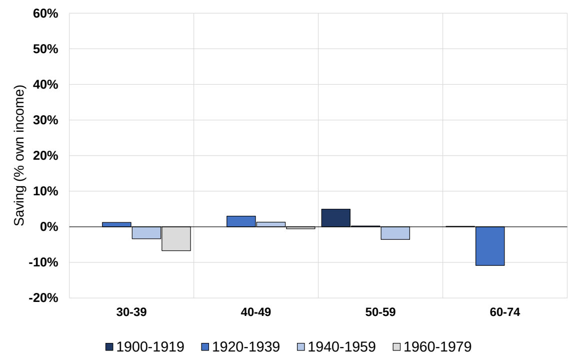
(d) Net inheritances and gifts over the life-cycle

This figure displays annual changes in real wealth (Figure C21a) decomposed into the contribution of net saving flows (Figure C21b), capital gains (Figure C21c) and inheritances and gifts (Figure C21d) along the life-cycle of the middle-40% within-cohort wealth group of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 30 to age 75. The flows are shown as a percentage of the average annual income of the within-cohort wealth group and are computed using the methodology outlined in section 2.

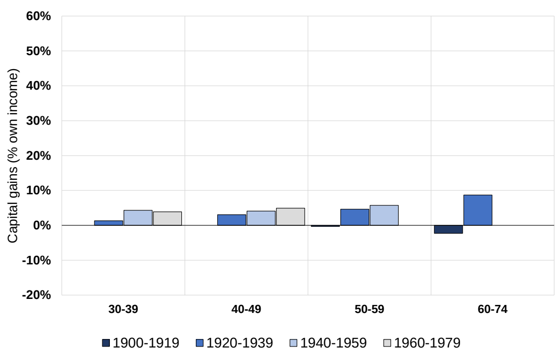
Figure C22: Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances): bottom-50% within-cohort wealth group



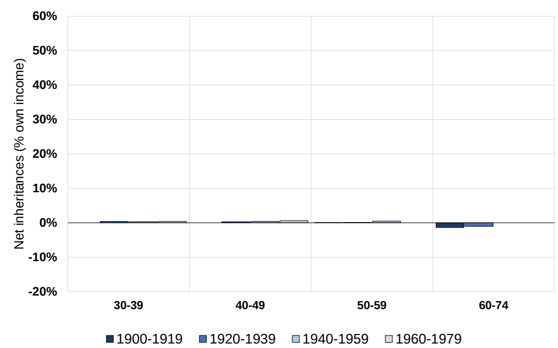
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



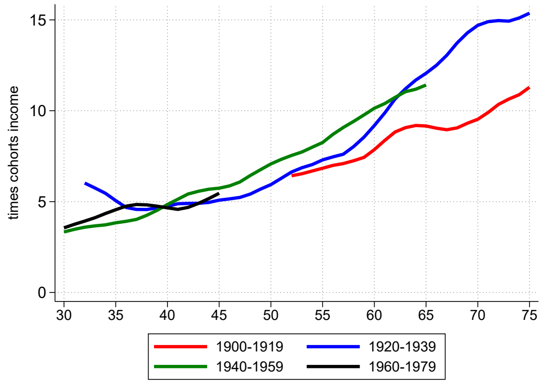
(c) Capital gains over the life-cycle



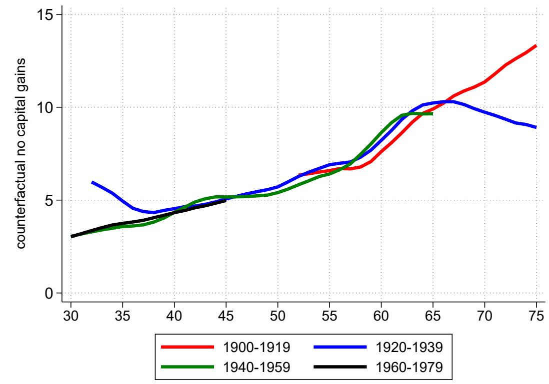
(d) Net inheritances and gifts over the life-cycle

This figure displays annual changes in real wealth (Figure C22a) decomposed into the contribution of net saving flows (Figure C22b), capital gains (Figure C22c) and inheritances and gifts (Figure C22d) along the life-cycle of the bottom-50% within-cohort wealth group of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 30 to age 75. The flows are shown as a percentage of the average annual income of the within-cohort wealth group and are computed using the methodology outlined in section 2.

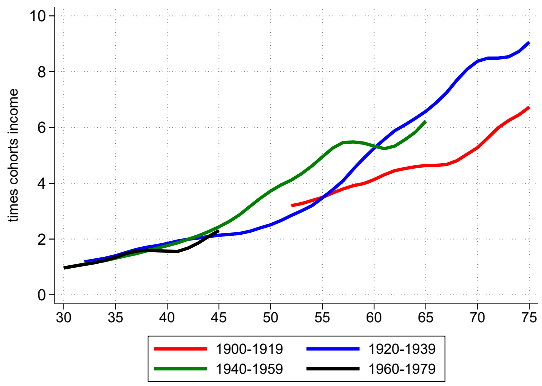
Figure C23: Life-cycle wealth accumulation of selected birth cohorts before and after excluding capital gains (within-cohort)



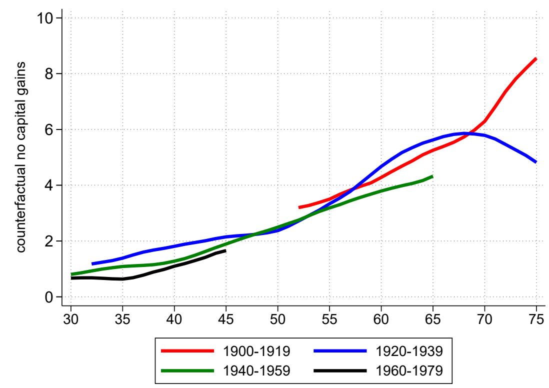
(a) Top-10%: observed series



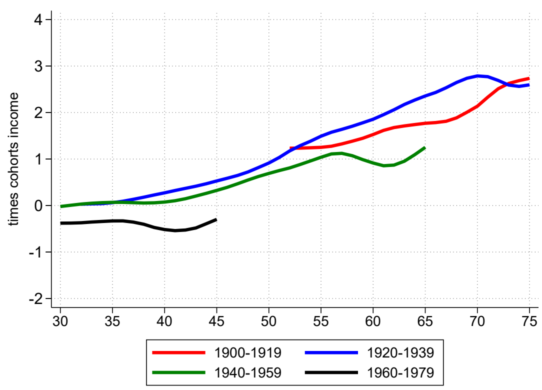
(b) Top-10%: counterfactual without capital gains



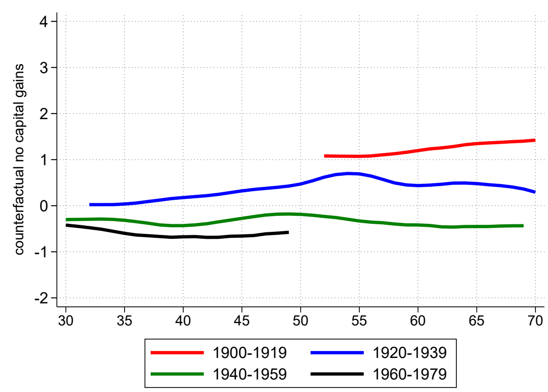
(c) Middle-40%: observed series



(d) Middle-40%: counterfactual without capital gains



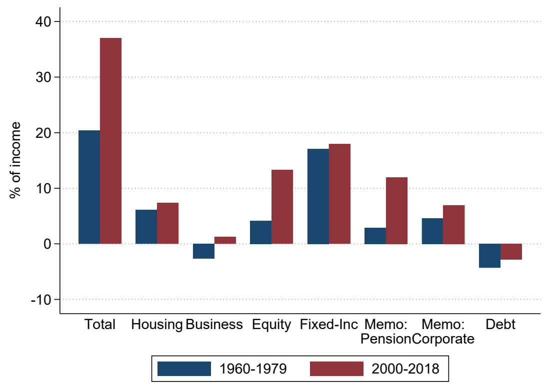
(e) Bottom-50%: observed series



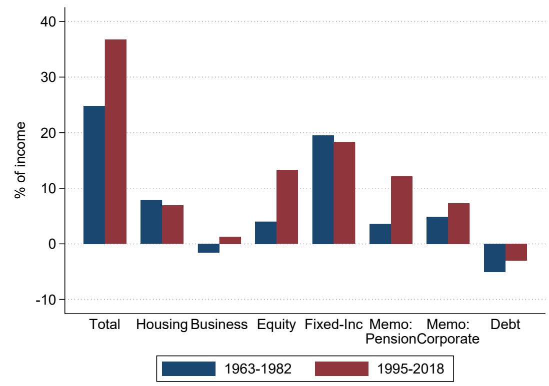
(f) Bottom-50%: counterfactual without capital gains

Notes: This figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of their own group's average income as observed (left panel) and in a counterfactual without capital gains since 1960 (right panel). See section 2 for details on the methodology.

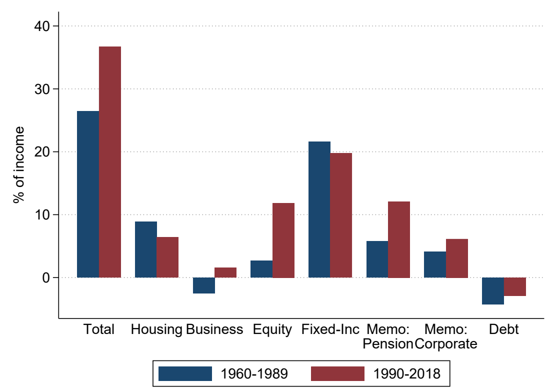
Figure C24: Saving by asset class: top-10% at middle age (40-59)



(a) 1960-79 vs 2000-18



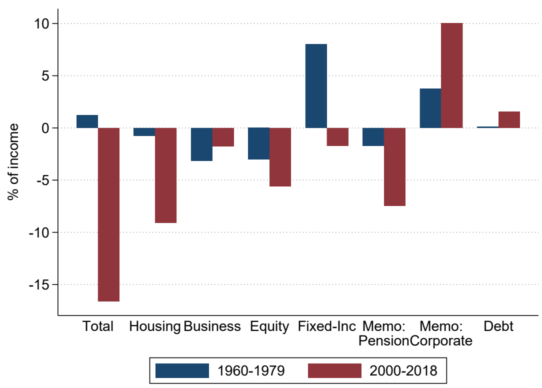
(b) 1962-83 vs 1995-2018



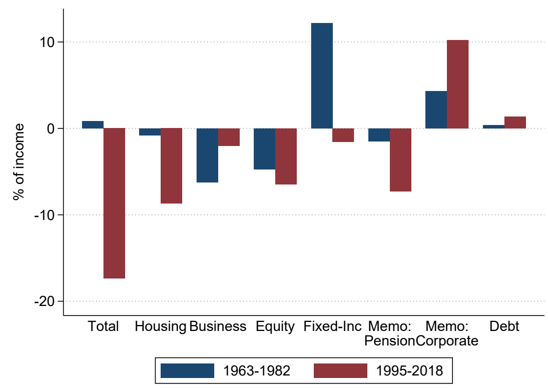
(c) 1960-89 vs 1990-2018

Notes: This figure decomposes the average annual saving of the top decile at middle ages into different asset classes across two periods of time. Two memo items detail corporate saving (part of saving in equity) as well as saving in pension assets. Saving is expressed as a share of the group's average income. See section 2 for details on the methodology.

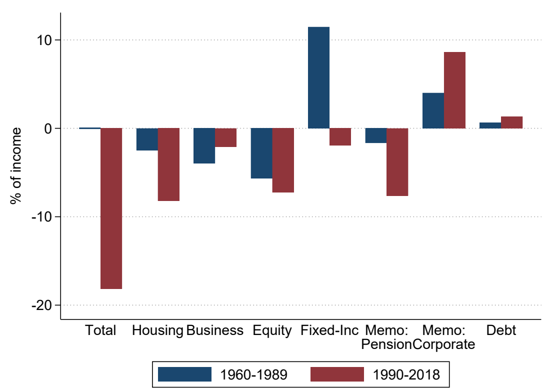
Figure C25: Saving by asset class: Elderly (Age 60-75)



(a) 1960-79 vs 2000-18



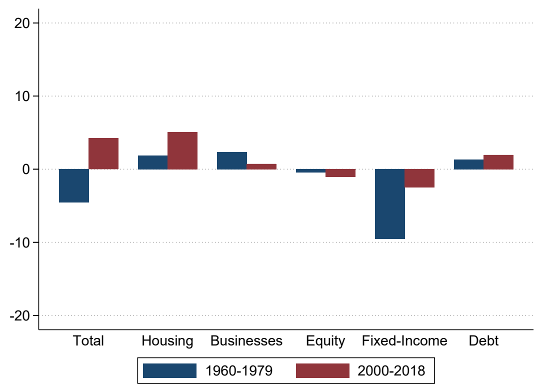
(b) 1962-83 vs 1995-2018



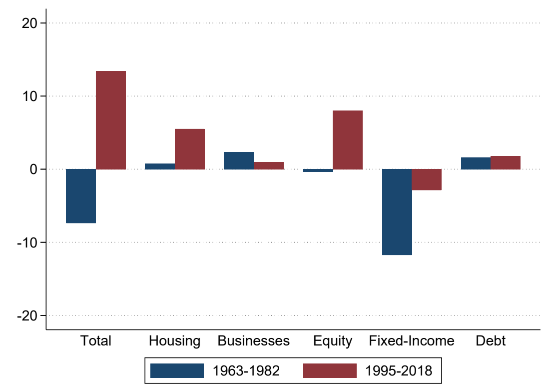
(c) 1960-89 vs 1990-2018

Notes: This figure decomposes the average annual (dis-)saving of the elderly into different asset classes across two periods of time. Two memo items detail corporate saving (part of saving in equity) as well as saving in pension assets. Saving is expressed as a share of the group's average income. See section 2 for details on the methodology.

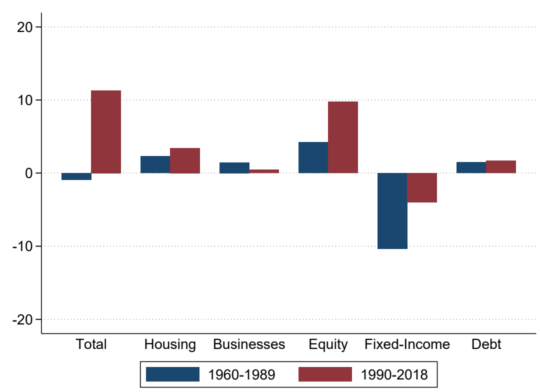
Figure C26: Capital gains by asset class: Elderly (Age 60-75)



(a) 1960-79 vs 2000-18



(b) 1962-83 vs 1995-2018



(c) 1960-89 vs 1990-2018

Notes: This figure decomposes the average annual capital gains of elderly into different asset classes across two periods of time. Capital gains are expressed as a share of the group's average income. See section 2 for details on the methodology.

C.2 Theoretical Framework

We build a simple overlapping generations (OLG) model to interpret our empirical results. This model serves to describe the channels we describe more formally, without a full quantification. In the main text, we identified two key trends in life-cycle wealth profiles: (i) a steepening of the life-cycle wealth profile and (ii) a life-cycle saving reshuffling amid high capital gains.

Consider an OLG model in which households live for two periods and there is only one long-lived asset. At each year $t \geq -1$, a new cohort is born. Every cohort lives for two periods and only earns income Y in the first period. The utility function of the initially young is given by

$$U(c_t, c_{t+1}) = (1 - \beta) \log c_t + \beta \log c_{t+1},$$

where c_{t+1} denotes consumption when old. The only vehicle for saving is the long-lived asset, of which there are N units available and which trades at the endogenous price P_t. Therefore, the full problem for the initially young becomes

$$\begin{aligned}
&\max(1 - \beta) \log c_t + \beta \log c_{t+1} \qquad \text{s.t.} \\
&c_t + P_t N = Y_t \\
&c_{t+1} = P_{t+1} N.
\end{aligned}$$

The young will find it optimal to consume a fraction $(1 - \beta)$ of their income.

The old find it optimal to dissave all assets in the last period. Hence, market clearing in the asset market requires that

$$\underbrace{N_t P_t}_{\text{Sales of the old}} = \underbrace{\beta Y_t}_{\text{Desired saving}},$$

so that the equilibrium price is equal to $P_t = \frac{\beta Y_t}{N}$. Hence we get that the savings rate of the young (out of income) is equal to β. Increasing longevity β leads to an increase in asset prices and to an increasing saving rate of the young. For the initially old this manifests as a windfall gain, which leads them to decumulate more wealth and decrease their saving rate. The young are born without any initial wealth, so the steepness of their life-cycle wealth profile is given by $N_t P_t / Y = \beta$. The life-cycle wealth profile also gets steeper, driven by increases in asset prices, not because the young are purchasing more assets, as these are held in fixed supply.

Non-homothetic preferences. We now consider a rise in permanent inequality among incoming cohorts. We now show how this effect works in our simple model augmented with non-homothetic preferences (Mian et al., 2021a; Straub, 2019).[63] We show in this setting that an increase in permanent income inequality can trigger the changes in life-cycle profiles we document.

Consider now that all households have utility ν when old. Later, these preferences will generate non-homothetic saving behavior, such that households with higher permanent incomes will tend to save more, a prediction true in the data. Further now assume that there are types of households in each cohort: A rich one, who makes up a share μ of all households earning a share $\gamma \geq \mu$ of total income and a poor household earning the rest.[64] The optimization problem of the rich household then becomes (with the poor household having the symmetric problem)

$$\max_{N_t}(1-\beta)\log\left(\frac{\gamma Y - N_t P_t}{\mu}\right) + \beta\nu\left(\frac{N_t P_t}{\mu}\right)$$

We define $\eta(a) := a \cdot \nu'(a)$, the deviation of the marginal utility from log. Note that when ν is equal to log, then η is constant and equal to 1. The first order condition of the rich household is

$$\frac{(1-\beta)P_t}{P_t N_t - \gamma Y} = -\frac{\beta}{N_t}\eta(P_t N_t/\mu).$$

Therefore, the saving demand of the rich household solves the equation

$$N_t(1 + (\eta(P_t N_t/\mu) - 1)\beta) = \frac{\beta\gamma Y}{P_t}.$$

[63]These preferences capture the fact that savings rate increase in permanent income, for evidence on this see Straub (2019) and the references therein.

[64]Both households have the same preferences.

Note that for $\eta \equiv 1$, we are back to the baseline case laid out in the last section. In total, given an asset supply of N that is owned by the elderly, the equilibrium holdings of the rich, poor, and the equilibrium asset price are pinned down by the following equations

$$N_t^{\text{rich}}(1 + (\eta(P_t N_t^{\text{rich}}/\mu) - 1)\beta) = \frac{\beta\gamma Y}{P_t},$$
$$N_t^{\text{poor}}(1 + (\eta(P_t N_t^{\text{poor}}/(1-\mu)) - 1)\beta) = \frac{\beta(1-\gamma)Y}{P_t},$$
$$N_t^{\text{rich}} + N_t^{\text{poor}} = N.$$

We now investigate how the saving of the rich, poor and the elderly will change with an increase in inequality γ. For this, we specify $\nu(a) = \frac{(a)^{1-\sigma}-1}{1-\sigma}$. We choose $\sigma > 1$, so that the saving rate of the rich is increasing in their income.[65]

To generate the illustrative plots below, we set the share of the rich to $\mu = 0.1$, total income Y and asset supply N to 1, the non-homotheticity $\sigma = 1.3$ and the share of life spent when β to 0.3. Figure C27 presents the impact of increasing inequality, that is varying the top ten income share γ. In panel (a) we show how the saving rate of the rich increases with income, in a partial equilibrium exercise in which the asset price is fixed. The non-homotheticity leads to a saving rate that increases in income, consistent with the empirical evidence. In panels (b) and (c) we solve for the equilibrium for different levels of income inequality γ. Panel (b) presents the wealth to income ratio. With an increase in income inequality, the saving supply of affluent households rises, leading to an increase in the equilibrium asset price. This pushes up the wealth-to-income ratio through rising asset prices (the asset supply is held fixed). As young cohorts accumulate this wealth, their saving rate rises, while the older cohorts, who sell the assets, experience dissaving. Panel (c) illustrates the effect on wealth inequality. With non-homothetic preferences, wealth inequality is larger than income inequality.

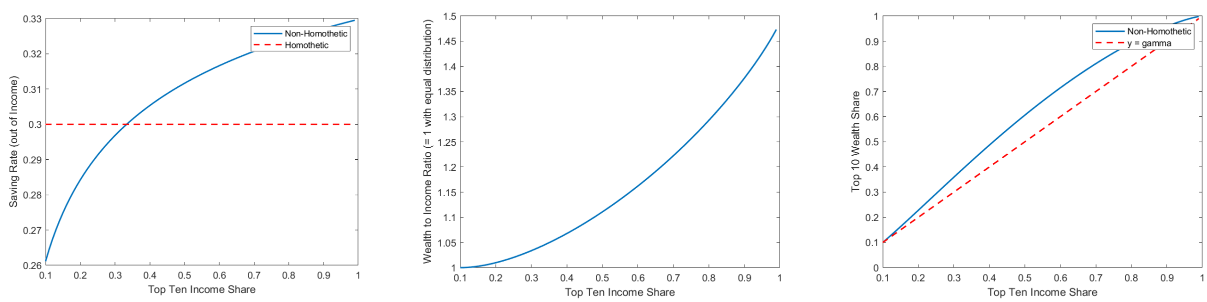
Again, for the elderly there is a windfall gain when their assets are revalued. As they sell to

[65]This is a deviation from Straub (2019), in which there is a distinction between the short and long-run savings supply schedule. In our model, there is no such distinction, as each household is assumed to live for two periods only. The savings supply of the young should be interpreted as the savings rate out of their lifetime income.

consume their assets, this allows them to sustain higher consumption levels, as is also illustrated in figure 10 in the main text.

The mechanism we explain is related to the one stressed in Fagereng et al. (2022), who clarify that asset price increases loosen the budget constraint of sellers. We show that in an overlapping generations framework, this benefits the initially old, while it increases the saving rates (as well as wealth-income ratios) of the younger generations purchasing the assets. Moreover, we point out potential sources of these asset price increases through our model: when the asset supply is inelastic, then both an aging population or an increase in inequality matches the life-cycle trends we document.

Figure C27: Economy with non-homothetic preferences



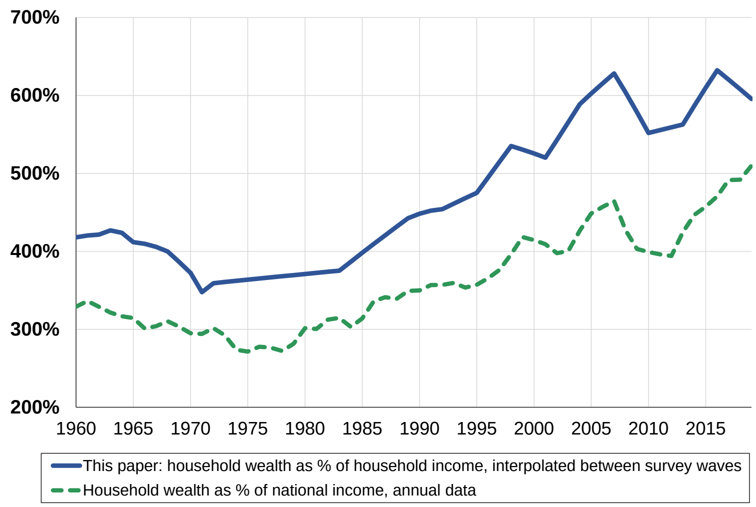
(a) Saving Supply (b) Wealth to Income Ratio (c) Wealth Inequality

D Appendix to Section 5

D.1 Trends

We start clarifying that the income concept we use throughout the paper harmonizes household income from the SCF to national accounts, as explained in section 2. This income concept is slightly lower than national income, a commonly used concept for displaying the evolution of aggregate household wealth-income ratio (as displayed in Figure 1) or the private saving rate. This constitutes a level shift, but the trends are the same. This is shown in Figure D28, comparing the aggregate household wealth-to-household income ratio (this paper) with the aggregate household wealth-to-national income ratio. Note that the shift-share analysis is only interested in the trends, not the levels.

Figure D28: **Household wealth-income ratio: alternative denominator**

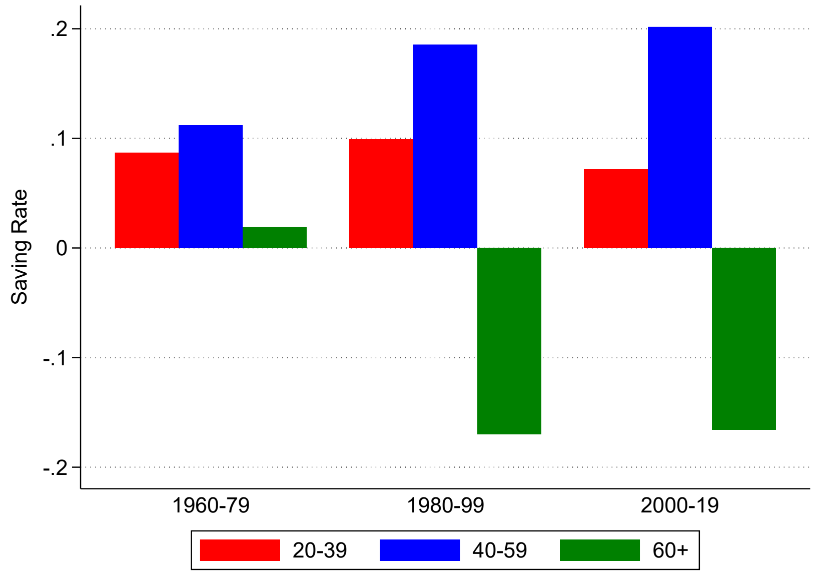


This figure plots (i) aggregate household wealth divided by household income and interpolated across survey waves (what we use in this paper) and (ii) aggregate household wealth divided by net national income using annual data (what is displayed in the international comparison of Figure D28).

The shift-share analysis investigates the role of three components in the evolution of aggregate household wealth-to-income ratio and aggregate private saving-income ratio. The three components are: (i) life-cycle wealth-income (or saving-income) profiles, (ii) income inequality and (iii) the population age structure. For details, see equations 3 and 5 and the corresponding explanation in section 5. In what follows, we provide the main trends for these three components.

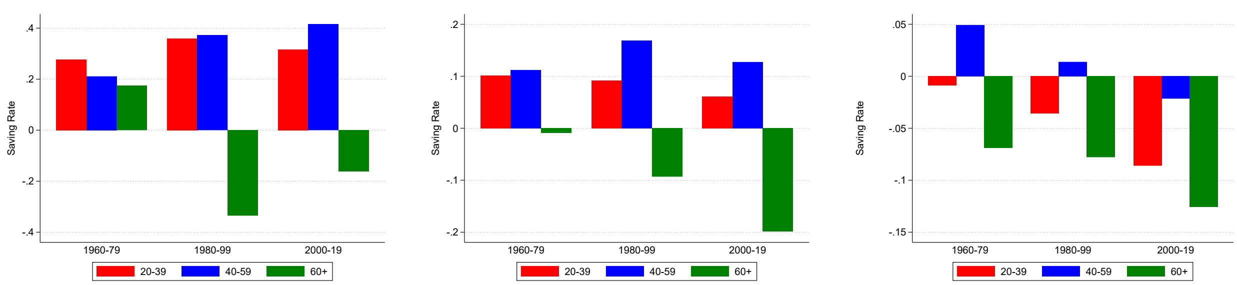
The evolution of life-cycle wealth-income profiles is displayed in Figures B15 and B17 for age groups and within-age wealth groups, respectively (and the trends are described in Appendix section B.4). Similarly, the evolution of life-cycle saving rates is shown in Figures D29 and D30, while that of income inequality is shown in Figures D31 and D32. Finally, Figure D33 shows the evolution of the age structure of the adult population.

Figure D29: **Saving rates for age groups**



Notes: This figure shows saving rates (the ratio of average saving-to-average income) of age groups over time. Time frames are chosen to match those in the shift-share analysis.

Figure D30: Saving rates for age-wealth groups



(a) Saving of the top-10%

(b) Saving of the middle-40%

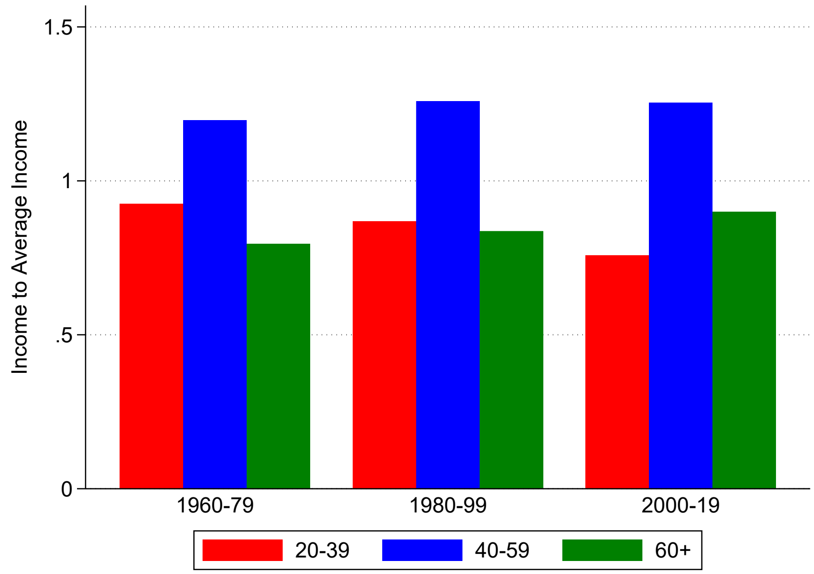
(c) Saving of the bottom 50%

Notes: This figure shows saving rates (the ratio of average saving-to-average income) of age-wealth groups over time. Time frames are chosen to match those in the shift-share analysis.

D.2 Shift-share decomposition

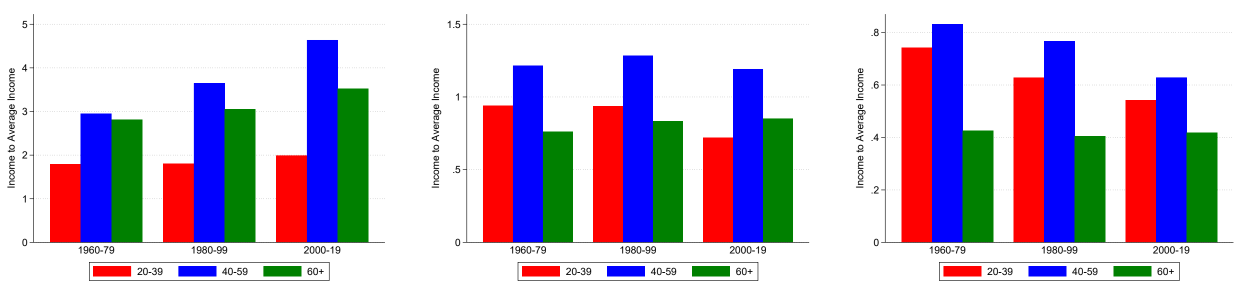
We explore the robustness of the shift-share analysis (Tables 1 and 3 of the main text) to multiple time periods and population groups, both for aggregate wealth and aggregate saving. Our benchmark results compare the initial period 1960-1979 with the end period 2000-2019 and use 9 within-age wealth groups: 3 age categories (young, ages 20-39; middle-aged, ages 40-59; and old,

Figure D31: **Relative income of age groups**



Notes: This figure shows the ratio of age groups' average income to the average income in the economy over time. Time frames are chosen to match those in the shift-share analysis.

Figure D32: Relative income of age-wealth groups



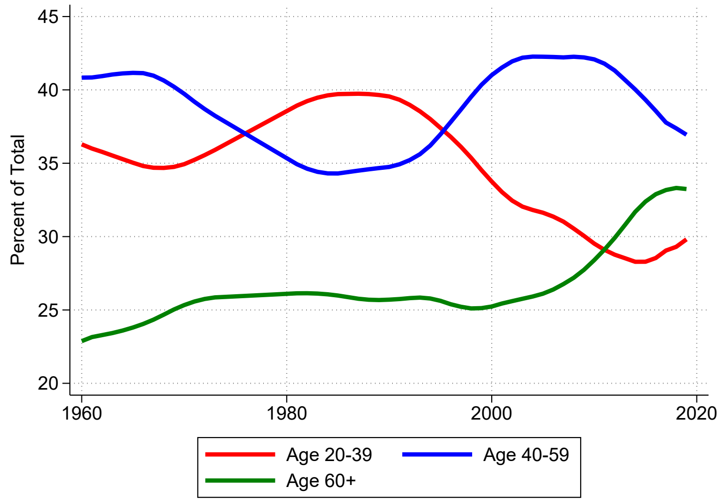
(a) Income of the top-10% (b) Income of the middle-40% (c) Income of the bottom 50%

Notes: This figure shows the ratio of age-wealth groups' average income to the average income in the economy. Groups refer to within-age wealth groups (e.g., top-10% at age 20-39). Time frames are chosen to match those in the shift-share analysis.

ages 60+) and 3 within-age wealth groups (top-10%, middle-40% and bottom-50%).

In this robustness, we compare the results using two alternative time frames: (i) 1960-1989 vs. 1990-2019 (which splits the 60-year sample into two equal parts) and (ii) 1963-1982 vs. 1995-2019, corresponding with the periodization used in Mian et al. (2021c). In terms of population groups, we use two alternative partitions: (i) 6 within-age wealth groups, corresponding with 3

Figure D33: **Age Composition of Adult Population, 1960-2019**



Notes: This figure shows age composition of the U.S. adult population in the SCF+ since 1960, using equal split households. Series are 7-year averages.

age categories (young, ages 20-39; middle-aged, ages 40-59; and old, ages 60+) and 2 within-age wealth groups (top-10%, middle-40% and bottom-50%), and (ii) 3 age groups only (young, ages 20-39; middle-aged, ages 40-59; and old, ages 60+). Moreover, we also present results for saving by looking at two wealth groups. Following Mian et al. (2021c), these wealth groups are obtained by combining, at a given point in time, the top-10% and bottom-90% from each age group (e.g., the top-10% from the young, the top-10% from the middle age, and the top-10% from the elderly). The idea is ”to compare high and low [wealth] households within the same birth cohort, thereby eliminating life cycle factors that are common to households based on the age of the household head” (Mian et al. 2021c).[66]

Results remain similar across all the options, except when using age groups only or wealth groups only.[67] When looking at age groups, the influence of income inequality diminishes while the significance of life-cycle wealth (or life-cycle saving) profiles increases: see Tables D4, D5, D7, D11 and D15. This result is not surprising, given the increase in within-age income inequality

[66]Mian et al. (2021c) look at income groups within age, while we prefer to sort individuals by wealth instead, given that the synthetic saving method is more robust to the latter sorting of groups (see section 6.2).

[67]Due to rounding, there are some minor discrepancies in the numbers reported across tables looking at the same period.

Table D2: Shift-share decomposition: 1960-1979 vs. 2000-2019 (9 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	20-39 top-10	20-39 mid-40	20-39 bot-50	40-59 top-10	40-59 mid-40	40-59 bot-50	60+ top-10	60+ mid-40	60+ bot-50	Total
W-Y profiles	–5	–4	–10	8	19	–13	38	22	1	56
Income inequality	4	–4	1	59	–1	–4	25	6	–0	85
Age structure	–4	–2	0	3	2	1	14	6	2	22
Residual	–1	2	3	6	1	3	14	6	–0	33
Total	–6	–8	–5	75	20	–14	90	40	2	195

Notes:: This table shows the components of the shift-share decomposition for the household wealth-to-household income ratio, using 1960-1979 and 2000-2019 as base years. We apply the shift-share (equation 4) to 9 within-age wealth groups, represented in columns 1 to 9. Column 10 sums up each component across age-wealth groups. For instance, out of the 195 percentage points increase in the aggregate wealth-income ratio, 56 percentage points are attributed to the life-cycle wealth-income profile component. Additionally, the last row in the table breaks down each age-wealth group's contribution to the changes in aggregate wealth-income ratio across components. For example, the top-10% within the elderly (age 60+) contributed 90 percentage points to the overall increase, with 37 percentage points stemming from the life-cycle wealth-income profile component.

(Appendix Figure D31), with top groups within-cohorts following a different path than bottom groups within-cohorts over time (see, for example, Figure 5). The opposite is true when looking at wealth groups only: see Tables D8, D12 and D16. In that case, the life-cycle dimension is muted since the same wealth group at different ages followed opposing trends, particularly for saving (see, for example, the opposite trajectory followed by the top-10% at middle ages and when old in Figure 12 or Table 2). Once we look at within-age wealth groups, results are quite similar across the various data specifications: see Tables D2, D3, D5, D6, D9, D10, D13 and D14. Overall, we highlight the importance of distinguishing within-age wealth groups separately when carrying out the shift-share analysis.

Table D3: Shift-share decomposition: 1960-1979 vs. 2000-2019 (6 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	20-39 top-10	20-39 bot-90	40-59 top-10	40-59 bot-90	60+ top-10	60+ bot-90	Total
W-Y profiles	–5	–13	8	16	38	25	68
Income inequality	4	–4	59	–11	25	4	78
Age structure	–4	–2	3	2	14	8	21
Residual	–1	5	6	–1	14	5	27
Total	–6	–13	75	7	90	42	194

Notes:: This table shows the components of the shift-share decomposition for the household wealth-to-household income ratio, using 1960-1979 and 2000-2019 as base years. We apply the shift-share (equation 4) to 6 within-age wealth groups, represented in columns 1 to 6. Column 7 sums up each component across age-wealth groups. For instance, out of the 194 percentage points increase in the aggregate wealth-income ratio, 68 percentage points are attributed to the life-cycle wealth-income profile component. Additionally, the last row in the table breaks down each age-wealth group's contribution to the changes in aggregate wealth-income ratio across components. For example, the top-10% within the elderly (age 60+) contributed 90 percentage points to the overall increase, with 37 percentage points stemming from the life-cycle wealth-income profile component.

Table D4: Shift-share decomposition: 1960-1979 vs. 2000-2019 (3 age groups)

	(1)	(2)	(3)	(4)
	20-39	40-59	60+	Total
W-Y profiles	–8	63	72	127
Income inequality	–9	9	21	21
Age structure	–5	5	19	18
Residual	4	6	21	30
Total	–18	82	132	195

Notes:: This table shows the components of the shift-share decomposition for the household wealth-to-household income ratio, using 1960-1979 and 2000-2019 as base years. We apply the shift-share (equation 4) to 3 age groups, represented in columns 1 to 3. Column 4 sums up each component across age-wealth groups. For instance, out of the 195 percentage points increase in the aggregate wealth-income ratio, 127 percentage points are attributed to the life-cycle wealth-income profile component. Additionally, the last row in the table breaks down each age group's contribution to the changes in aggregate wealth-income ratio across components. For example, the elderly (age 60+) contributed 132 percentage points to the overall increase, with 72 percentage points stemming from the life-cycle wealth-income profile component.

Table D5: Shift-share decomposition: contribution of different components under alternative sub-periods and population groups

	(1)	(2)	(3)	(4)
	Component	3 age x 3 within-age wealth groups	3 age x 2 within-age wealth groups	3 age groups
1960–1979 vs 2000-2019	W-Y Profiles	28.6%	35.2%	64.9%
	Income Inequality	43.5%	40.0%	10.5%
	Age Structure	11.1%	10.9%	9.3%
	Residual	16.9%	13.9%	15.3%
1963–1982 vs. 1995-2019	W-Y Profiles	39.9%	46.2%	72.9%
	Income Inequality	36.6%	33.3%	7.7%
	Age Structure	8.5%	8.2%	7.6%
	Residual	15.0%	12.3%	11.9%
1960–1989 vs. 1990-2019	W-Y Profiles	41.5%	47.2%	72.4%
	Income Inequality	34.9%	31.7%	7.4%
	Age Structure	10.7%	10.6%	8.6%
	Residual	12.9%	10.5%	11.7%

Notes:: This table shows the contributions of each component in the shift-share decomposition for the household wealth-to-income ratio (equation 4). We analyze three alternative periods and three partitions of the population. The age groups considered are young (ages 20-39), middle-aged (ages 40-59), and old (age 60+). The three within-age wealth groups comprise the top-10%, the middle-40% and the bottom-50%. The two within-age wealth groups correspond to the top-10% and the bottom-90%. The numbers in the table represent the proportion of each component's influence on the total increase in the aggregate wealth-income ratio for the specified period and population group partition. For example, when examining 9 within-age wealth groups (column 2) across the periods 1960-1989 and 1990-2019, 41.5% of the overall increase corresponds to to life-cycle wealth-income profile component.

Table D6: Shift-share decomposition: 1960-1979 vs. 2000-2018 (6 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	20-39 top-10	20-39 bot-90	40-59 top-10	40-59 bot-90	60+ top-10	60+ bot-90	Total
Saving rate	0.1	–1.9	3.1	–0.4	–2.6	–2.5	–4.2
Income inequality	0.4	–0.3	2.3	–0.4	0.6	–0.2	2.4
Age structure	–0.1	–0.1	0.1	0.0	0.2	–0.2	0.0
Residual	–0.1	0.6	1.8	0.0	–1.4	0.0	0.9
Total	0.3	–1.8	7.4	–0.8	–3.2	–2.9	–1.0

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1979 and 2000-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 6 within-age wealth groups, represented in columns 1 to 6. Column 7 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -1 percentage point of household income, with saving rates contributing to a decline of -4.2 percentage points and income inequality contributing to an increase of 2.4 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -3.2 percentage points in household income, with -2.6 percentage points attributed to the life-cycle saving rate component.

Table D7: Shift-share decomposition: 1960-1979 vs. 2000-2018 (3 age groups)

	(1)	(2)	(3)	(4)
	20-39	40-59	60+	Total
Saving rate	–0.8	5.7	–5.2	–0.4
Income inequality	–0.6	0.6	0.0	0.1
Age structure	–0.3	0.1	0.0	–0.2
Residual	0.3	0.3	–0.9	–0.3
Total	–1.4	6.7	–6.1	–0.8

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1979 and 2000-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 3 age groups, represented in columns 1 to 3. Column 4 provides the sum of each component across age groups. For example, the private saving rate declined by -0.8 percentage points of household income, with saving rates contributing to a decline of -0.4 percentage points and income inequality contributing to an increase of 0.1 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the elderly (age 60+) contributed to a decline of -6.1 percentage points in household income, with -5.2 percentage points attributed to the life-cycle saving rate component.

Table D8: Shift-share decomposition: 1960-1979 vs. 2000-2018 (2 wealth groups)

	(1)	(2)	(3)
	Top-10	Bottom-90	Total
Saving rate	0.9	–5.6	–4.6
Income inequality	3.3	–0.6	2.7
Age structure	0.1	0.0	0.1
Residual	0.3	0.7	1.0
Total	4.6	–5.5	–0.9

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1979 and 2000-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 2 wealth groups (top-10% and bottom-90% of all within-age groups), represented in columns 1 to 2. Column 3 provides the sum of each component across income groups. For example, the private saving rate declined by -0.9 percentage points of household income, with saving rates contributing to a decline of -4.6 percentage points and income inequality contributing to an increase of 2.7 percentage points. Additionally, the last row in the table breaks down each wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the bottom-90% contributed to a decline of -5.5 percentage points in household income, with -5.5 percentage points attributed to the life-cycle saving rate component.

Table D9: Shift-share decomposition: 1960-1989 vs. 1990-2018 (6 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	20-39 top-10	20-39 bot-90	40-59 top-10	40-59 bot-90	60+ top-10	60+ bot-90	Total
Saving rate	0.1	–1.1	2.0	–0.3	–3.3	–2.8	–5.4
Income inequality	0.3	–0.2	2.1	–0.2	0.3	–0.2	2.2
Age structure	0.0	0.0	0.1	0.1	0.2	–0.2	0.2
Residual	0.0	0.4	0.9	–0.1	–0.8	0.2	0.7
Total	0.5	–1.0	5.1	–0.5	–3.5	–2.9	–2.3

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1989 and 1990-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 6 within-age wealth groups, represented in columns 1 to 6. Column 7 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -2.3 percentage points of household income, with saving rates contributing to a decline of -5.4 percentage points and income inequality contributing to an increase of 2.2 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -3.5 percentage points in household income, with -3.3 percentage points attributed to the life-cycle saving rate component.

Table D10: Shift-share decomposition: 1960-1989 vs. 1990-2018 (9 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	20-39 top-10	20-39 mid-40	20-39 bot-50	40-59 top-10	40-59 mid-40	40-59 bot-50	60+ top-10	60+ mid-40	60+ bot-50	Total
Saving rate	0.1	–0.2	–0.9	2.0	0.2	–0.8	–3.3	–2.4	–0.2	–5.5
Income inequality	0.3	–0.2	0.1	2.1	0.1	–0.2	0.3	–0.1	0.0	2.4
Age structure	0.0	0.0	0.0	0.1	0.1	–0.1	0.2	–0.1	–0.1	0.1
Residual	0.0	0.1	0.3	0.9	–0.1	0.2	–0.8	–0.1	0.1	0.7
Total	0.5	–0.4	–0.6	5.1	0.3	–0.8	–3.5	–2.7	–0.2	–2.3

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1989 and 1990-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 9 within-age wealth groups, represented in columns 1 to 9. Column 10 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -2.3 percentage points of household income, with saving rates contributing to a decline of 5.5 percentage points and income inequality contributing to an increase of 2.4 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -3.5 percentage points in household income, with -3.3 percentage points attributed to the life-cycle saving rate component.

Table D11: Shift-share decomposition: 1960-1989 vs. 1990-2018 (3 age groups)

	(1)	(2)	(3)	(4)
	20-39	40-59	60+	Total
Saving rate	–0.2	3.6	–6.2	–2.7
Income inequality	–0.5	0.9	0.0	0.4
Age structure	–0.1	0.2	0.0	0.1
Residual	0.2	–0.1	–0.1	0.0
Total	–0.5	4.6	–6.4	–2.3

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1989 and 1990-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 3 age groups, represented in columns 1 to 3. Column 4 provides the sum of each component across age groups. For example, the private saving rate declined by -2.3 percentage points of household income, with saving rates contributing to a decline of -2.7 percentage points and income inequality contributing to an increase of 0.4 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the elderly (age 60+) contributed to a decline of -6.4 percentage points in household income, with -6.2 percentage points attributed to the life-cycle saving rate component.

Table D12: Shift-share decomposition: 1960-1989 vs. 1990-2018 (2 wealth groups)

	(1)	(2)	(3)
	Top-10	Bottom-90	Total
Saving rate	–0.3	–4.4	–4.8
Income inequality	2.4	–0.4	1.9
Age structure	0.1	0.0	0.1
Residual	0.0	0.5	0.5
Total	2.2	–4.4	–2.3

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1960-1989 and 1990-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 2 wealth groups (top-10% and bottom-90% of all within-age groups), represented in columns 1 to 2. Column 3 provides the sum of each component across income groups. For example, the private saving rate declined by -2.3 percentage points of household income, with saving rates contributing to a decline of -4.8 percentage points and income inequality contributing to an increase of 1.9 percentage points. Additionally, the last row in the table breaks down each wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the bottom-90% contributed to a decline of -4.4 percentage points in household income, with -4.4 percentage points attributed to the life-cycle saving rate component.

Table D13: Shift-share decomposition: 1963-1982 vs. 1995-2018 (6 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	20-39 top-10	20-39 bot-90	40-59 top-10	40-59 bot-90	60+ top-10	60+ bot-90	Total
Saving rate	0.8	–1.9	2.1	–1.1	–2.0	–3.7	–5.8
Income inequality	0.4	–0.4	2.5	–0.4	–0.2	0.0	1.9
Age structure	0.0	0.0	0.0	0.0	–0.1	–0.1	–0.2
Residual	0.0	0.5	1.3	0.1	0.0	0.0	1.8
Total	1.2	–1.8	6.0	–1.4	–2.3	–3.9	–2.2

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1963-1982 and 1995-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 6 within-age wealth groups, represented in columns 1 to 6. Column 7 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -2.2 percentage points of household income, with saving rates contributing to a decline of -5.8 percentage points and income inequality contributing to an increase of 1.9 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -2.3 percentage points in household income, with -2 percentage points attributed to the life-cycle saving rate component.

Table D14: Shift-share decomposition: 1963-1982 vs. 1995-2018 (9 age-wealth groups)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	20-39 top-10	20-39 mid-40	20-39 bot-50	40-59 top-10	40-59 mid-40	40-59 bot-50	60+ top-10	60+ mid-40	60+ bot-50	Total
Saving rate	0.8	–0.7	–1.3	2.1	–0.1	–1.5	–2.0	–2.8	–0.7	–6.0
Income inequality	0.4	–0.4	0.0	2.5	0.0	–0.2	–0.2	0.0	0.0	2.1
Age structure	0.0	0.0	0.0	0.0	0.0	0.0	–0.1	–0.1	0.0	–0.2
Residual	0.0	0.2	0.4	1.3	0.0	0.3	0.0	–0.3	0.1	1.9
Total	1.2	–0.9	–0.8	6.0	0.0	–1.4	–2.3	–3.2	–0.7	–2.2

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1963-1982 and 1995-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 9 within-age wealth groups, represented in columns 1 to 9. Column 10 provides the sum of each component across age-wealth groups. For example, the private saving rate declined by -2.2 percentage points of household income, with saving rates contributing to a decline of 6 percentage points and income inequality contributing to an increase of 2.1 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the top-10% within the elderly (age 60+) contributed to a decline of -2.3 percentage points in household income, with -2 percentage points attributed to the life-cycle saving rate component.

Table D15: Shift-share decomposition: 1963-1982 vs. 1995-2018 (3 age groups)

	(1)	(2)	(3)	(4)
	20-39	40-59	60+	Total
Saving rate	–0.2	3.6	–5.8	–2.4
Income inequality	–0.6	0.8	–0.1	0.1
Age structure	–0.1	0.0	–0.2	–0.2
Residual	0.2	0.2	–0.1	0.3
Total	–0.6	4.7	–6.2	–2.1

Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1963-1982 and 1995-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 3 age groups, represented in columns 1 to 3. Column 4 provides the sum of each component across age groups. For example, the private saving rate declined by -2.1 percentage points of household income, with saving rates contributing to a decline of -2.4 percentage points and income inequality contributing to an increase of 0.1 percentage points. Additionally, the last row in the table breaks down each age-wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the elderly (age 60+) contributed to a decline of -6.2 percentage points in household income, with -5.8 percentage points attributed to the life-cycle saving rate component.

Table D16: Shift-share decomposition: 1963-1982 vs. 1995-2018 (2 wealth groups)

	(1)	(2)	(3)
	Top-10	Bottom-90	Total
Saving rate	1.8	–7.2	–5.3
Income inequality	2.3	–0.8	1.6
Age structure	0.1	0.0	0.1
Residual	0.6	0.8	1.5
Total	4.9	–7.1	–2.2

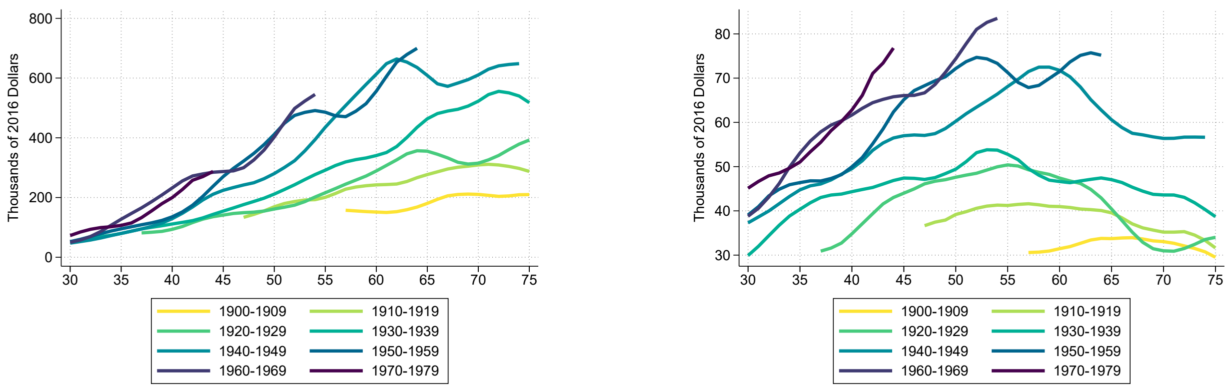
Notes:: This table presents the components of the shift-share decomposition for the private saving-to-household income ratio, using 1963-1982 and 1995-2018 as base years. We apply the shift-share method (see equations 4 and 5) to 2 wealth groups (top-10% and bottom-90% of all within-age groups), represented in columns 1 to 2. Column 3 provides the sum of each component across income groups. For example, the private saving rate declined by -2.2 percentage points of household income, with saving rates contributing to a decline of -5.3 percentage points and income inequality contributing to an increase of 1.6 percentage points. Additionally, the last row in the table breaks down each wealth group's contribution to changes in the aggregate private saving rate across components. For instance, the bottom-90% contributed to a decline of -7.1 percentage points in household income, with -7.2 percentage points attributed to the life-cycle saving rate component.

E Appendix to Section 6

E.1 Mapping national accounts

Figure E34 shows the evolution of cohorts's life-cycle wealth (panel a) and life-cycle income (panel b) in constant prices based on the raw SCF+ microdata.

Figure E34: Life-cycle wealth and life-cycle income in constant prices: raw SCF+



(a) Cohorts' average wealth

(b) Cohorts' average income

This figure plots the average wealth and the average income during cohorts' life cycles in constant thousands of 2016 dollars using the raw SCF+ microdata. Series are 7-year averages.

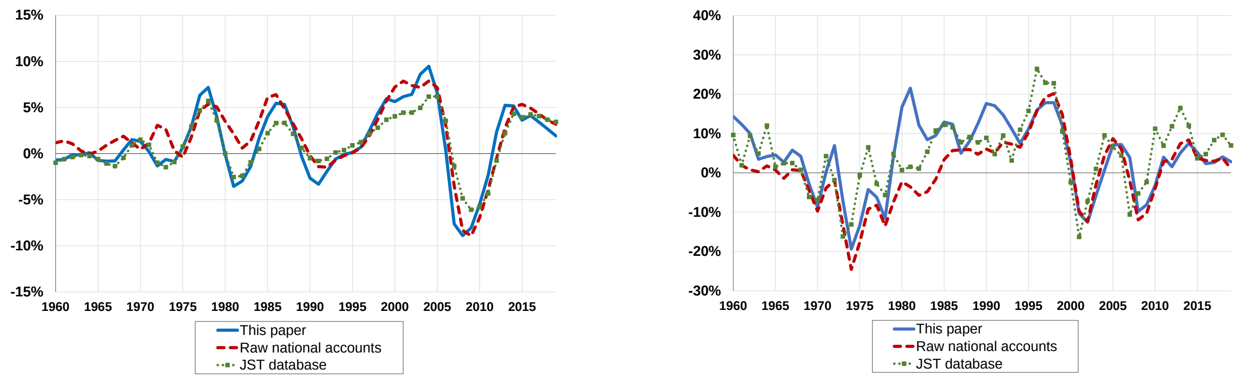
E.2 Wealth accumulation decomposition

In section 6.2, we analyze how the decomposition of cohorts' life-cycle wealth growth into saving, capital gains, and inheritances varies depending on the specific data treatment. Here, we provide additional insights.

In Figure E35, we compare the evolution of housing and equity capital gains according to three different types of data sources: (i) the adjusted national accounts (this paper), (i) the unadjusted national accounts and (iii) the Jordà-Schularick-Taylor Macrohistory Database (JST Macrohistory Database). The main result is that all capital gains exhibit a notable level of consistency.

In addition, Figure E36 displays cohorts' life-cycle capital gains under alternative data treatments. Figure E36a uses raw SCF+ microdata on debt, assets, and income, combined with adjusted

Figure E35: Housing and equity capital gains: alternative estimates



(a) Housing capital gains (b) Equity capital gains

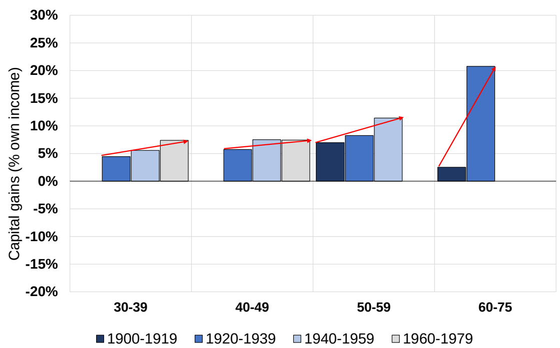
Notes: This figure compares the annual real capital gains in housing and equity in this paper with those from (i) the raw (unadjusted) national accounts and (ii) the Jordà-Schularick-Taylor Macrohistory Database (JST Macrohistory Database). Note that equity capital gains from JST refer to listed firms and include valuation changes due to corporate retained earnings. By contrast, equity capital gains in the national accounts are net of valuation changes driven by corporate saving and cover both listed and unlisted firms. Housing capital gains in JST splice the following series: Case-Shiller (1960-1974), Federal Housing Finance Agency (1975-2012) and OECD housing prices database (2013-2019). Equity prices in JST correspond with those in Shiller (2000) (up-to-date data from http://www.econ.yale.edu/~shiller/data.htm), which is based on the Standard and Poor Composite Stock Price Index. Series are 3-year moving averages.

capital gains in the national accounts. Figure E36b utilizes harmonized SCF+ to national accounts data for debt, assets, and income, but with raw (unadjusted) capital gains in the national accounts. Finally, Figure E36c relies on harmonized SCF+ to national accounts data for debt, assets, and income, along with capital gains from the Jordà-Schularick-Taylor Macrohistory Database.

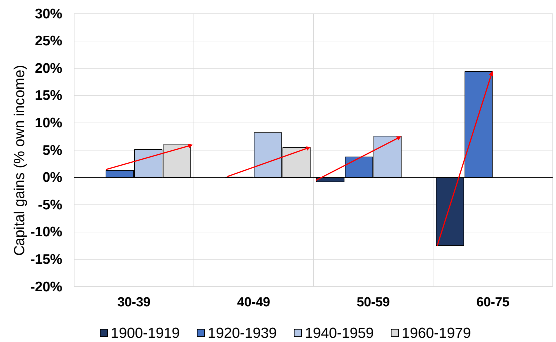
In Figure E37, we present cohorts' life-cycle inheritances and gifts obtained from raw SCF+ microdata on debt, assets, and income, without harmonizing it to national accounts.

Finally, in Figure E38, we present the real growth rate of house values per square foot across age groups over the period 1987-2019. It complements Figure 15, which presents similar results on house values per number of rooms available for the longer period 1977-2019.

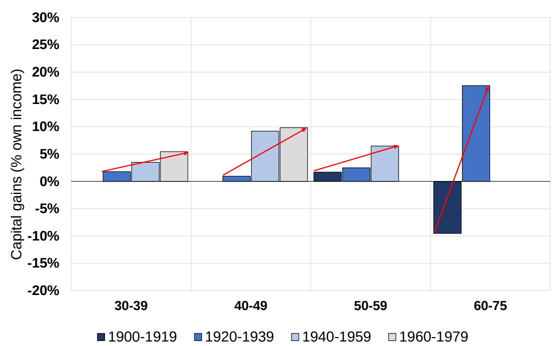
Figure E36: Life-cycle capital gains across cohorts: alternative estimates



(a) Raw SCF+



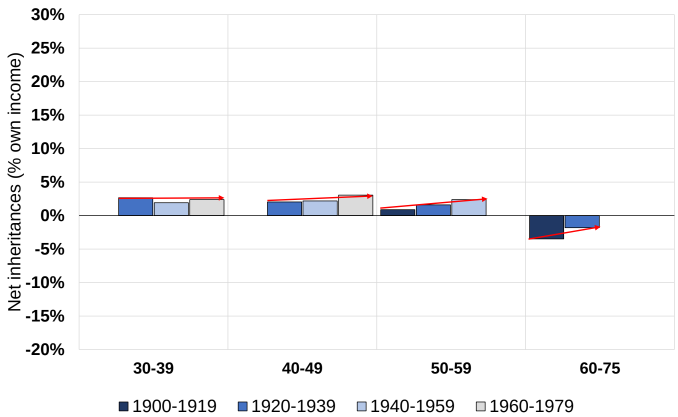
(b) Unadjusted national accounts' capital gains



(c) Capital gains from JST Database

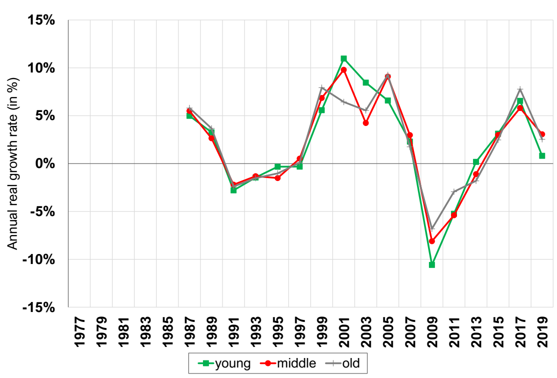
This figure illustrates the annual capital gains of four birth cohorts (born in 1900-19, 1920-39, 1940-59, and 1960-79) from ages 30 to 75, obtained under four different specifications. Figure E36a uses the raw SCF+ microdata on debt, assets and income. Figure E36b uses the unadjusted capital gains from the national accounts. Figure E36c uses capital gains on housing and equity from the Jordà-Schularick-Taylor Macrohistory Database. The capital gains depicted in these figures are presented as a percentage of the cohort's average annual income and calculated using the methodology outlined in section 2.

Figure E37: Life-cycle inheritances across cohorts: alternative estimate

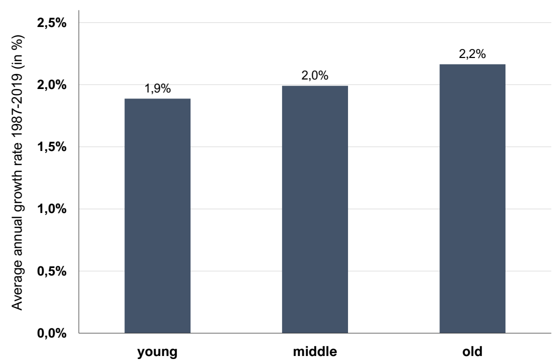


This figure illustrates the annual inheritances and gifts of four birth cohorts (born in 1900-19, 1920-39, 1940-59, and 1960-79) from ages 30 to 75, obtained with the raw SCF+ microdata on debt, assets and income. The inheritances and gifts are presented as a percentage of the cohort's average annual income and calculated using the methodology outlined in section 2.

Figure E38: Annual real growth of house values per square foot across age groups, 1987-2019



(a) Housing capital gains



(b) Housing capital gains (averaged)

Notes: This figure computes real growth rates of house values per square foot for three age categories: young (ages 20-39), middle-aged (ages 40-59), and elderly (age 60+), using data from the American Housing Survey spanning from 1987 to 2019. The left panel displays annualized values over the years, while the right panel shows the average annual growth rate for the entire period.

Table E17: Wealth persistence in the PSID

Birth cohort	bottom 50	middle 40	top 10
1920-39	87%	77%	67%
1940-59	85%	76%	68%
1960-79	80%	72%	68%

This table shows the wealth persistence for the different within cohort wealth groups we consider. Wealth persistence in the PSID is computed as the fraction of households in a wealth group in $t+1$ that were in the same wealth group in t. The numbers shown are averages over PSID survey waves. Following Kuhn et al. (2020), we restrict ourselves to the SRC sample.

E.3 Intergroup Mobility

When we apply the synthetic savings method to wealth groups within birth cohorts, we make the implicit assumption that there is little mobility between wealth groups within birth cohorts at short horizons. We test this assumption by computing persistence in the PSID as in Kuhn et al. (2020), who compute this persistence not within birth cohorts but across populations. Table E17 shows for the three wealth groups we consider within birth cohorts the probability that a household belongs to a wealth group, conditional on belonging to the same within cohort wealth group in the last survey wave. Persistence is relatively high, especially for the bottom 50 percent and the middle 40 percent, with our numbers comparable to those found by Kuhn et al. (2020). Persistence for the bottom half of the within-cohort wealth distribution is generally above 80%. For the middle 40 it is around 75% and for the top decile around 68%. On closer inspection of the data we find that there are some respondents located at the "fringes" of the wealth groups that we define. These switch a lot between wealth groups and account for a large part of the transitions.

This is reassuring, especially given the features of wealth coverage in the PSID: Many wealth variables are imputed, which induces sampling error into our persistence computation. The top of the wealth distribution is also not covered well, which likely accounts for part of the lower persistence in the top decile. Finally, the PSID only covers wealth every five years at the beginning of our sample and only later covers it biannually.