WHY ARE 401(K)/IRA BALANCES SUBSTANTIALLY BELOW POTENTIAL?

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Abstract

For most workers, 401(k)/IRA assets represent the main source of retirement savings outside of Social Security. These accounts can generate significant wealth if workers contribute consistently from a young age, keep their money in their accounts, and minimize their investment fees. However, most workers have 401(k)/IRA balances at retirement that are substantially below their potential. For example, a 25-year-old median earner in 1981 who contributed regularly would have accumulated about $364,000 by age 60, but the typical 60-year-old in 2016 had less than $100,000. The discrepancy is somewhat less if those under 30 and those with defined benefit plans are excluded from the analysis, but still significant. This study uses the *Survey of Income and Program Participation*, linked with administrative tax records, to explore the reasons for this gap between potential and actual balances and their relative importance. The potential reasons include: the immaturity of the 401(k) system, lack of universal coverage, leakages, and fees.

The paper found that:

- The main reasons why 401(k)/IRA balances fall short of their potential are the immaturity of the 401(k) system and the lack of universal coverage, followed by leakages and fees.
- The same pattern holds if workers under 30 and those with defined benefit plans are excluded from the analysis.
- Even in a mature system, the lack of universal coverage means that balances are still expected to fall well below potential.

The policy implications of the findings are:

- Providing continuous access to a workplace-based saving vehicle for all workers could substantially increase retirement saving.
- Encouraging less leakage by modifying pre-retirement withdrawal rules could also increase 401(k)/IRA balances at retirement, albeit more modestly.

Introduction

For most workers, 401(k)/IRA assets represent the main source of retirement savings outside of Social Security. These accounts can generate significant wealth if workers contribute consistently from a young age, keep their money in their accounts, and minimize their investment fees. However, most workers have 401(k)/IRA balances at retirement that are substantially below their potential. For example, a 25-year-old median earner in 1981 who contributed regularly would have accumulated about $364,000 by age 60, but the typical 60-year-old in 2016 had less than $100,000. This paper explores the reasons for this gap between potential and actual balances. The source of the gap is important, because factors like the system's immaturity will dissipate, while inconsistent contributions are likely to continue.

The discussion proceeds as follows. The first section identifies four factors – immaturity of the 401(k) system, lack of universal coverage, leakages, and fees – that might explain why 401(k)/IRA balances fall below their potential. The second section describes the data and the methodology used to estimate the role of each factor. The third section discusses the results, which show that the immaturity of the system and inconsistent contributions are the main culprits, followed by leakages, and finally fees. The final section concludes that, without a significant effort to cover the uncovered, a large gap between potential and actual accumulations will persist.

Possible Sources of the Gap

For workers to accumulate substantial retirement saving, they must contribute regularly, keep their money in the account, and maximize after-fee returns. Four aspects of the U.S. retirement system make it difficult to achieve these goals. First, the immaturity of the 401(k) system means that many 60-year-olds did not have access to a 401(k) plan early on in their careers, so they would have accumulated less than workers covered throughout their worklives. Second, the lack of universal coverage means that workers are not always in jobs that offer retirement plans and therefore not always able to contribute. Third, participants' ability to tap their account before retirement means that accumulations leak out. Fourth, fees can significantly erode net returns on investments. One could question whether it is realistic or necessary for everyone to save in a 401(k). Specifically, many young workers do not start saving until their 30s; and workers with a defined benefit pension plan may have no need for additional saving.

Therefore, the analysis will include a sensitivity test that excludes these groups to determine the effect on the baseline results.

Immaturity of the 401(k) System

The emergence of 401(k) plans is a relatively recent event. 401(k) plans owe their origins to the Revenue Act of 1978, which went into effect in January 1980. In 1981 the Internal Revenue Service issued proposed regulations that sanctioned the use of employee salary reduction plans for retirement contributions. At the time, most workers covered by a retirement plan had a traditional defined benefit plan, which provides benefits in the form of a lifetime annuity.[1]

After their introduction, 401(k)s grew rapidly. Their initial growth resulted from the addition or substitution of 401(k) provisions to traditional thrift and profit sharing plans. This move was an obvious one because thrift plans, which generally served as supplements to defined benefit plans, required employees to make after-tax contributions. Since 401(k) plans allowed pre-tax contributions, introducing a 401(k) provision meant that employees could maintain their contribution level and see an increase in their take-home pay. In the case of profit sharing plans, the shift to voluntary participation allowed employers to reduce profits distributed to employees. The importance of conversion is evident in the fact that 30 percent of 401(k) participants in 1995 were in plans established before 1980, implying that these were not new 401(k)s but instead thrift or profit sharing plans that were converted to 401(k) status.[2]

In addition to reclassification, the 1980s saw a surge in new 401(k) plan formations as they were greeted enthusiastically by both employers and employees (see Figure 1). At the same time, the formation of new defined benefit plans came to a virtual halt, and industries with these plans, such as manufacturing, declined.[3] Finally, after the bursting of the dot.com bubble at the turn of the century drove down asset values, large companies began to freeze their defined benefit plans and expand their 401(k)s.

This shift from traditional pensions to the newer 401(k) plans means that many of today's 60-year-olds did not participate in a 401(k) plan when they were young workers. To the extent

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[1] Retirement benefits were typically based on years of service and final pay.
[2] Munnell and Sundén (2004).
[3] In the wake of the Tax Reform Act of 1986, which placed restrictions on small defined benefit plans that only benefit highly paid individuals, plan terminations also increased sharply.

that the immaturity of the system explains the gap between potential and actual balances, future cohorts of workers that have experienced a more mature 401(k) system should accumulate larger retirement balances over the course of their careers.

Lack of Universal Coverage

While 401(k) plans have expanded dramatically since the early 1980s, many workers today still do not participate in a 401(k). This outcome can occur for a number of reasons. The most important is that their employer does not offer a plan. But employees can also work for an employer that *offers* a plan for some of its employees, but not be eligible to participate. Or their employer can offer a plan and they can be eligible to participate but choose not to do so – though this group only accounts for a small minority of all workers who do not participate. Among workers who are eligible, only about 20 percent choose not to participate according to the Federal Reserve's *Survey of Consumer Finances*.

The percentage of workers participating in an employer-sponsored plan depends on the survey – that is, the *National Compensation Survey* (NCS), which gathers data from employers, shows a higher level of participation than the *Current Population Survey* (CPS), which gathers data from households. It also depends on the population under consideration – that is, all workers versus private sector or full-time versus part-time (see Table 1).

The CPS, which goes back to 1979, provides a broader historical trend than the NCS. According to the CPS, the percentage of private sector workers without coverage has changed very little since 1979 and, if anything, may have declined (see Figure 2). Regardless of how the uncovered are defined, the group without an employer-provided plan is large. This lack of universal coverage means that workers will move in and out of 401(k) plans and that their 401(k) accumulations will be much lower than projections based on the prospect of a steady lifetime of contributions.

For this study, the focus is on workers who do not make contributions regardless of the reason. Thus participation rather than coverage is the relevant measure. However, given that a lack of coverage is the main reason for not participating, the word "coverage" is used synonymously with participation throughout.

Leakages

  401(k) participants have a number of ways of accessing their account balances before retirement. These pathways include the ability to cash out when they change jobs, in-service withdrawals (hardship and tax-free withdrawals beginning at age 59 ½), and loans. Congress has tried to limit withdrawals by imposing a 10-percent penalty (in addition to federal and state income taxes), but a substantial portion of 401(k)/IRA balances leak out. (IRAs are included because most of the money held in IRAs is rolled over from 401(k) plans.)

  Cash-outs at Job Change. Roughly 20 million workers change jobs each year. Ten million of these job changers have a retirement plan and increasingly that plan is a 401(k).[4] While one of the advertised advantages of a defined contribution plan is the ability for workers to take their savings when they move from job to job, in practice it is often difficult to move assets between 401(k)s. Some employers do not accept rollovers, many fail to process them on a timely basis, and the process/forms vary from employer to employer. Given the difficulties with plan-to-plan rollovers, money often either stays with the old employer's plan, moves from the workplace system to an IRA, or gets cashed out.[5]

  It is always easier for participants to roll their balances over to an IRA than to move it to the new plan. As a result, while 401(k) plans serve as the main gateway for retirement saving, they often do not retain the money. As of 2016, more than half of 401(k) balances had been rolled over to IRAs, and these rollovers are responsible for the bulk of IRA assets.[6] Given this shift, IRAs are now the largest single repository of retirement plan savings (see Figure 3). The following analysis therefore considers 401(k) balances and rollover-IRA holdings together.

  Most of the money not rolled over to an IRA is cashed out. The penalty tax on early withdrawals appears not to be a significant deterrent. For low earners who pay little or no income taxes, the penalty may seem acceptable when financing a needed purchase or a financial emergency. In addition, a meaningful portion of the participant's account may represent free

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[4] Authors' calculations from U.S. Census Bureau, *Survey of Income and Program Participation* (2008 panel).
[5] For a detailed discussion on the challenges of plan-to-plan rollovers, see Munnell, Belbase, and Sanzenbacher. (2018).
[6] ICI (2016) estimates that $6.2 trillion of the total $7.3 trillion in IRA assets are held in traditional IRAs. Of traditional IRAs, 86 percent were opened with rollovers. For more information on the role of IRAs in retirement savings, see Holden and Schrass (2016) and Chen and Munnell (2017).

money from employer contributions, so the net cost of cashing out may seem minimal both in financial and psychological terms. An estimated one quarter of individuals withdraw money from their 401(k) plans when they separate from an employer.[7]

In-service Withdrawals. Another mechanism through which assets can leak out before retirement is in-service withdrawals, either for hardship reasons or at age 59½.[8]

Hardship Withdrawals. Hardship withdrawals allow individuals to withdraw funds to cover immediate and heavy financial needs. Under a safe harbor provision, a 401(k) participant is deemed to automatically have such a need if the distribution is to be used for one of the following six purposes: 1) medical care expenses; 2) funeral expenses; 3) prevent the eviction from, or mortgage foreclosure on, the principal residence; 4) repair damage to the principal residence; 5) costs directly related to the purchase of a principal residence (excluding mortgage payments); and 6) postsecondary education. IRAs offer three additional exemptions not available in 401(k)s: 1) withdrawals to cover expenditures for postsecondary education for any family member; 2) up to $10,000 toward first home purchase or repair; and 3) expenditures on health insurance for those unemployed for 12 or more weeks. In all cases, withdrawals are subject to the 10-percent penalty.[9]

Post 59 ½ Withdrawals. The other form of in-service withdrawal is the post 59½ withdrawal. These withdrawals are exempt from the 10-percent penalty, but are still considered a source of leakage because 59½ is too early for most to use their 401(k)/IRA holdings, given increased life expectancy and a contracting retirement income system. Fortunately, recent data show that most post 59½ distributions are rolled over.[10]

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[7] Engelhardt (2002), Hurd et al. (2006), Munnell and Webb (2015), and Munnell, Belbase, and Sanzenbacher (2018) provide estimates of cash-outs at job changes. The studies have found that cash-out rates tend to be higher for those who have smaller balances and for those who are younger, less educated, or lower earners.

[8] Profit-sharing plans may allow the distribution of employer profit sharing contributions prior to age 59 ½.

[9] Despite the penalty, hardship withdrawals are a major component of leakages. Butrica, Zedlewski, and Issa (2010) and Argento, Bryant, and Sabelhaus (2013) found that adverse events, such as job loss, poor health, accounted for one quarter of retirement account leakage or 0.3 percent of assets (U.S. Government Accountability Office, 2009 and Vanguard, 2014).

[10] Vanguard (2014) shows that while most post 59½ distributions are rolled over, roughly 30 percent leaks out.

Loans. Many 401(k) plans also allow participants to borrow from their accounts. The Internal Revenue Code limits the borrowing to 50 percent of the account balance, up to $50,000. While loans are typically repaid, some participants default, in which case the loan becomes a distribution subject to the 10-percent penalty.[11]

Estimates of Leakages. Researchers have tried to estimate annual leakage rates using household surveys and, more recently, tax data.[12] Unfortunately, most household surveys are not designed to answer these precise questions and have led many researchers to focus on loans. Loans are pervasive but are mostly repaid and therefore just a small piece of the leakage puzzle. Fortunately, Vanguard data present a comprehensive picture of the percentage of assets leaking out each year through the various channels (see Figure 4). These data show that cash-outs at job change are by far the largest source of leakage, accounting for 0.5 percent of assets. This source of leakage is followed by hardship withdrawals, which accounts for 0.3 percent of assets. Post-age 59 ½ withdrawals and loans each account for 0.2 percent of plan assets.[13]

While the Vanguard data provide a useful way to identify the various leakage paths, they likely understate leakage rates because Vanguard's clients tend to be large plans with higher-paid workers who have lower leakage rates. In fact, the annual leakage rates estimated from household surveys amount to 1.5 percent of aggregate balances,[14] modestly higher than those implied by Vanguard, and estimates using tax data are much higher, amounting to 2.9 percent of assets (see Figure 5).[15]

Fees

Fees can also erode 401(k) accumulations. Average fees are currently 0.48 percent of assets for bond mutual funds and 0.59 percent for equity mutual funds. These fees have declined noticeably from 0.84 percent and 1.04 percent respectively in 1997 (see Figure 6). This decline

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[11] Lu et al. (2015) estimate that loan defaults result in only about 0.2 percent of asses leaking out annually.

[12] For a full review of the literature, see Munnell and Webb (2015).

[13] The analysis assumes that 30 percent of post-age 59 ½ withdrawals and all defaulted loans are leakages. Form 5500 data estimates a 10-percent default rate. See Munnell and Webb (2015).

[14] Butrica, Zedlewski, and Issa (2010).

[15] See Bryant, Holden, and Sabelhaus (2011) and Argento, Bryant, and Sabelhaus (2013).

most likely reflects the rise in passive mutual funds, the Department of Labor's 2012 requirement that service providers disclose fees, and litigation over 401(k) fees.[16]

While fees have declined, they still vary significantly by size of plan. Most participants in large plans face fees that are typically less than 1 percent of assets – less than 0.5 percent in the case of very large plans.[17] However, fees in small plans can be considerably higher.[18] Furthermore, the challenges, discussed above, in moving assets from one 401(k) plan to another mean that workers during a job change often roll their accumulated assets into an IRA.[19] Financial services firms handling IRAs face no requirement to disclose fees, which may make it more likely that participants end up paying higher fees relative to workplace plans.[20]

Perhaps most importantly, while 401(k) plan fees have dropped substantially, the retirement plan balances of households nearing retirement today reflect the higher fee rates that were charged in past years as these households were building their savings.

The four factors described above – the immaturity of the 401(k) plan, the coverage gap, leakages, and fees – are all possible explanations for the discrepancy between potential and actual 401(k)/IRA account balances. The following analysis uses the *Survey of Income and Program Participation* (SIPP) linked with administrative tax records to sort out the relative importance of each component.[21]

Data and Methodology

The SIPP linked with administrative tax records is accessed through the Cornell Virtual Data Center, and results are validated by the U.S. Census Bureau.[22] These linked administrative

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[16] Aven Gladych (2015) and Mellman and Sanzenbacher (2018).

[17] Authors' estimates from U.S. Department of Labor, Form 5500 Private Pension Plan Bulletin (2013), and BrightScope (Alfred 2015), and Investment Company Institute (2014).

[18] Alfred (2015)

[19] Chen and Munnell (2017)

[20] The shift from 401(k)s to IRAs moves the employee's money to a less protective regulatory environment. 401(k) plans are covered by ERISA, which requires plan sponsors to operate as fiduciaries who act in the best interest of plan participants. In contrast, the standard of conduct for a broker selling IRAs has historically been "suitability," a lower hurdle. See Munnell, Belbase, and Sanzenbacher (2018).

[21] Poterba, Venti, and Wise (2001) project 401(k) balances forward and examine the role in final plan balances of leakages and the lack of employer plan coverage, but their data are from the early 1990s when 401(k)s were in their infancy. Munnell and Webb (2015) provide rough estimates of all four factors but focused their analysis mainly on leakages.

[22] The project relies on SIPP data made available through the U.S. Census Bureau's SIPP Synthetic Beta (SSB) project. In the SSB, a subset of essential SIPP variables, is linked, via Social Security number, to an SSA-produced extract from tax records, including an individual's total annual tax-deferred earnings for 1957-2014 and elective

tax records include earnings from all jobs in a given year from 1957-2014 and all deferred contributions from 1990-2014.[23] Aside from the tax data, the survey includes information on self-reported 401(k)/IRA wealth. Since the SIPP is designed to evaluate the eligibility of households for federal, state, and local government programs, the survey tends to oversample lower-income households. To ensure it is comparable to national aggregates, the SIPP sample is re-weighted.

The focus of the analysis is 401(k) contributions and 401(k)/IRA balances of workers from the 2008 SIPP panel who were ages 55-64 in 2014 and had an account. This group consists of about 13,500 individuals. Of those, only individuals who have worked at some point between ages 55-64 and have ever contributed over their working careers were included. This leaves a sample of 9,900 workers. To estimate the effect on balances from the immaturity of the 401(k) system, the analysis also compares 401(k)/IRA balances of individuals ages 55-64 to those of individuals 35-44 in 2014. This younger group consists of 7,300 workers who have ever contributed (see Table 2). All workers in these groups were successfully linked to a valid Social Security number.

The analysis proceeds in five steps. The first step is to estimate retirement account balances on the assumption that coverage were universal and workers saved consistently over their careers, earning average market returns. Specifically, workers are assumed to contribute 9 percent of their earnings (6-percent employee contribution with a 3-percent employer match) to their 401(k) plan every year from ages 25-64. These contribution rates are applied to earnings reported in Box 1 of forms W-2 or Schedule C from all jobs in a given year, including self-employment. Accumulated balances are allocated across assets based on the glide path of a typical target date fund (TDF), and the assets earn average gross returns based on Ibbotson (2017).[24] Under these assumptions, the median earner near retirement would accumulate about $364,000 in 401(k)/IRA holdings.

The second step is to look at actual balances since, in reality, workers do not consistently work at jobs that offer retirement plans, they face investment fees, and sometimes withdraw

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deferrals for 1990-2014. Code will be run on synthetic data by the authors and then run through a Census employee to be validated on the actual data.

[23] While reporting deferred wages on W-2 forms began in 1987, too few people deferred wages during this period so the values are restricted until 1990.

[24] See Table A1 for allocations by age and Table A2 for returns. Total returns series are used because earnings and dividends are assumed to be reinvested.

money before retirement. Comparing asset accumulations in the perfect system described above with actual accumulations defines the size of the gap between potential and actual 401(k)/IRA balances. This step requires turning to self-reported wealth from the 2014 SIPP. These data show that the median worker ages 55-64 in 2014 had about $92,000 in 401(k) and rollover IRA accounts.[25] For the median worker, therefore, the gap is the difference between accumulations under a perfect system ($364,000) and actual accumulations ($92,000).

The third step is to calculate actual lifetime contributions and accumulated balances for each individual in the SIPP sample, assuming no leakages or fees. Actual contributions are available from the administrative tax data (from Box 12 of forms W-2 or from Schedule C) from 1990 to 2014. The data encompass deferred earnings across all employers, including self-employment.[26]

Since actual contribution data are available only since 1990, contributions from 1981-1989 must be imputed. The imputations are based on the self-reported amounts from the publicly available SIPP, which asks questions about retirement contributions in 1985-1987.[27] The imputation is conducted by five-year age groups, educational attainment, race/ethnicity, and gender.[28] This approach allows for variation across socio-economic status. Once the imputation procedure is complete, each individual will now have a contributions profile for ages 25-64.[29] As in the first step, contributors are assumed to receive a 50-percent employer match and their accumulated balances are allocated across investments based on the glide path of a typical TDF and earn actual market returns for each asset class based on Ibbotson (2017). Using actual participation and contribution rates, the median worker ages 55-64 in 2014 is estimated to have

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[25] While prior studies suggest that previous panels of the SIPP tend to underreport wealth estimates relative to the SCF and administrative aggregates, Eggleston and Gideon (2017) found that wealth estimates in the re-designed 2014 SIPP panel were more comparable to the SCF and administrative aggregates.

[26] The records include deferrals from both FICA and non-FICA covered jobs.

[27] These questions were in wave 4 of the 1984 panel, wave 7 of the 1985 panel, and wage 4 of the 1986 panel.

[28] The education groups are high school or less, some college, and college or more. The race/ethnicity groups are White, Black, Hispanic, and Other.

[29] The methodology for imputation is as follows. The first step is to stratify the respondents in both the administrative-linked and the publicly available data by five-year age groups, educational attainment, race/ethnicity, and gender. Next, the percentage of workers contributing and the average deferral rates for those who contribute are calculated for each subgroup. Because not everyone contributes, workers in each subgroup are assigned a random number uniformly distributed between zero and one. Workers with a random number less than the percentage of workers contributing for their subgroup will be imputed the average contribution rate for their subgroup. For example, if 23 percent of black men ages 40-44 with a college degree reported deferring an average of 3.5 percent of their annual salary in the public data, then black men ages 40-44 with a college degree assigned a random number less than 0.23 from the administrative dataset are assumed to contribute 3.5 percent to their 401(k) plans between 1981-1989.

$136,200 in 401(k)/IRA assets. The gap between the hypothetical amount of $364,000 and the $136,200 is the entire amount lost because individuals did not contribute. This failure to contribute could be attributed to either the immaturity of the system or to inconsistent coverage/contributions.

The fourth step aims to divvy up responsibility for the lack of contributions between the immaturity of the system and the coverage gap. The approach focuses on the foregone contributions due to the immaturity of the system. The contribution patterns of workers ages 55-64 in 2014 may not provide a fair representation of how the 401(k) system could work for most workers, because this group would have been in their 30s when 401(k) plans began to take off. To estimate the effect of the immature system, the analysis compares the 401(k)/IRA balances of individuals 55-64 in 2014 with the accumulated balances of a younger cohort, those ages 35-44 in 2014 (projected forward 20 years).[30] The projected accumulations for the median worker in this younger cohort are $252,400 (see Figure 7). The difference between $252,400 from the younger cohort and $136,200 from the older cohort – that is, $116,200 – is attributed to an immature system. Thus, an immature system reduces balances from $364,000 to $247, 800 ($364,000 – $116,200) and the difference between $247,800 and $136,200 is attributable to the coverage gap or inconsistent contributions.

The final step is to sort out how the remaining difference between $136,200 and the actual balances reported by SIPP participants should be divided between fees and leakages. The approach taken is to estimate the effect of fees and attribute the residual to leakages. The Investment Company Institute reports average expense ratios for equity and bond mutual funds from 1996-2017. For years prior to 1996, fees are assumed to be the same as in 1996. Balances are then adjusted by asset-weighted expense ratios. The results show that fees reduce assets by 10 percent, reducing balances from $136,200 to $122,800. Finally, the difference between the fees-adjusted balance of $122,800 and the actual observed balance of $92,000 is attributed to leakages.

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[30] To scale up the younger cohort's contributions, it is assumed that the workers who are contributing in 2014 will continue to contribute for the next 20 years and those not contributing will not contribute in the future. Future returns on the balance are assumed to equal the geometric average returns from 1970-2016, by asset class (see Table A-2). 1970 is the earliest year that returns are available for every asset class.

Results

        The results of the multi-step process described above are summarized in Figure 8. The figure shows that immaturity of the system and inconsistent coverage/contributions account for the majority of the gap between potential and actual 401(k)/IRA balances, followed by leakages and fees.

        The fact that the immaturity of the system accounts for such a substantial portion of the difference between hypothetical and actual 401(k) balances means that once the system matures, worker balances should be higher than they are today. Nevertheless, actual balances will still end up being less than half of the potential (see Figure 9).[31]

        In a mature system, the main reason for the gap between potential and actual balances is inconsistent coverage/contributions. The conclusion that contributions fall so far short of potential may seem surprising. However, three pieces of evidence support this finding. First, the linked administrative tax records show that the typical worker ages 35-44 in 2014 has spent less than half of his working life contributing to a retirement account (see Table 3). Second, aggregate statistics from the IRS *Statistics of Income* confirm this pattern – only 37 percent of all workers deferred earnings into a retirement account in 2014.[32] Third, data on contributions by age show that the majority of even young workers are not contributing earlier in their career (see Figure 10). It is unclear from the tax data whether workers just do not have coverage earlier on in their careers or if other priorities hinder saving for retirement.

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[31] The sensitivity of the results are discussed more in Box.
[32] Available at: https://www.irs.gov/statistics/soi-tax-stats-individual-information-return-form-w2-statistics

Box. Sensitivity of Results

The analysis assumes that in a perfect system, coverage would be universal and workers would save consistently from ages 25-64. However, these assumptions may not be realistic since many workers do not start saving until their 30s and some workers are covered by defined benefit plans.

To test the sensitivity of our baseline results to these factors, the analysis re-estimates the sources of the gap assuming that coverage and contributions begin at age 30 and excludes the approximately 15 percent of workers between ages 55-64 who have a defined benefit plan with their current employers.

The results show that under a perfect system, if workers without a DB plan began contributing at age 30, they should expect to accumulate $270,100 in retirement assets by the time they retire, less than estimates that include all workers (see Figure below). As a result, their final holdings equal a third of the possible accumulations, compared to a quarter for all workers. However, the main culprits of the gap between the perfect system and actual accumulations remain the same, with the immaturity of the system and inconsistent coverage/contributions accounting for 39 percent and 25 percent of the gap, respectively.

Figure. *Impact of Immature System, Inconsistent Contributions, Fees, and Leakages on 401(k)/ IRA Balances for a Typical Worker Ages 55-64 in 2014*
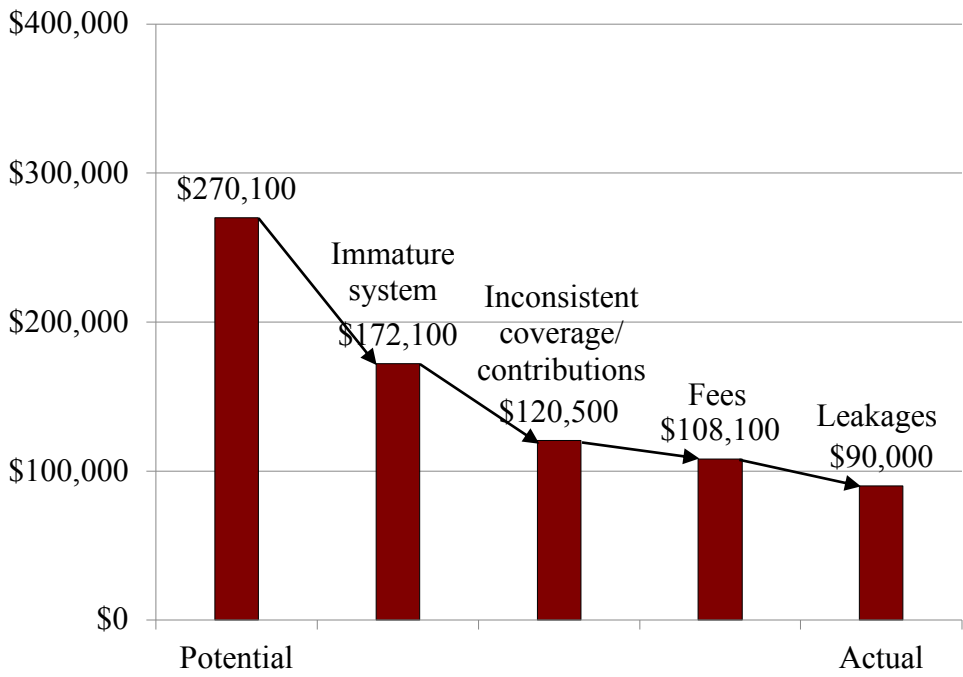
Note: Assumes contributions start at age 30 and excludes workers with DB plans between ages 55-64.
Source: Authors' calculations using SIPP 1984-1986 and SIPP-linked Administrative Tax Data (1990-2014).

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Large variations in contribution patterns are also evident when workers are broken down by lifetime income quintiles (see Figure 11).[33] While close to 75 percent of workers in the top quintile contribute to their 401(k) accounts by the time they reach their 40s, less than 20 percent of workers in the bottom quintile are contributing. This pattern likely reflects the fact that lower-earning participants receive relatively high replacement rates from Social Security and are less likely to be covered by employer-sponsored plans.

Fees account for the smallest portion of the savings gap. Although, given that fees still reduce assets by 10 percent, the dent to retirement savings is non-trivial. The fee estimates in this project also assume that fees prior to 1996 are held constant at 1997 levels. These estimates should be seen as a lower-bound for the effects of fees on asset accumulation, for the time period analyzed, since fees have been declining over time. The good news is that because fees have been declining, their effect on 401(k)/IRA balances should also decrease.

The residual factor in this analysis is leakages. The estimates show that, after accounting for all other factors, leakages explain the remaining 25-percent reduction in assets. Over a 35-year career, this amount is equivalent to an annual leakage rate of 1.5 percent of assets annually, the same level as indicated by household surveys.

Conclusion

401(k)/IRA plans have become the primary mechanism for private retirement saving. These accounts give households the potential to accumulate substantial retirement assets if they contribute regularly, keep the money in the account, and maximize after-fee returns. But, in reality, the typical worker has less than $100,000 in 401(k)/IRA assets, instead of the $364,000 he would have had under a system in which workers participated throughout their careers, paid zero fees on account balances, and did not withdraw money prematurely from their accounts. The discrepancy is somewhat less if those under 30 and those with defined benefit plans are excluded from the analysis, but still significant.

This paper shows that the immaturity of the system and inconsistent contributions are the main culprits, followed by leakages and fees. Today's near-retirees typically spent only about one third of their working careers participating in a retirement plan, and the majority do not participate when they are younger. Furthermore, the portion of workers without coverage has

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[33] Large variations can also be seen across race/ethnicity and educational attainment.

stagnated and remains large. The lack of universal coverage means that – even once the system matures – 401(k)/IRA plans will continue to fall below their potential.

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Table 1. *Pension Coverage and Participation in the CPS and NCS for Workers Ages 25-64, 2013*

Category	CPS	NCS
Employer offers plan, public and private, full-time workers	62%	78%
Employer offers plan, private, full-time workers	57	74
Employer offers plan, private, full-time and part-time workers	53	64
Employee participates in plan, private, full-time workers	49	59
Employee participates in plan, private, full-time and part-time workers	44	49

Sources: Authors' calculations from U.S. Census Bureau, *Current Population Survey* (2014); and U.S. Department of Labor, *National Compensation Survey* (2014).

Table 2. *Sample of Workers in SIPP, 2014*

Age in 2014	Year turned 25	Observations	Workers	Workers who have ever contributed
55-64	1975-1984	13,500	10,500	9,900
45-54	1985-1994	13,500	9,600	9,400
35-44	1995-2004	11,500	7,400	7,300

Sources: Authors' calculations SIPP-linked Administrative Tax Data (1990-2014).

Table 3. *Percent of Time Workers Spend Contributing to a Retirement Account, By Age Group*

Age groups	Percent of time contributing
35-44	44.0%
45-54	42.1
55-64	34.6

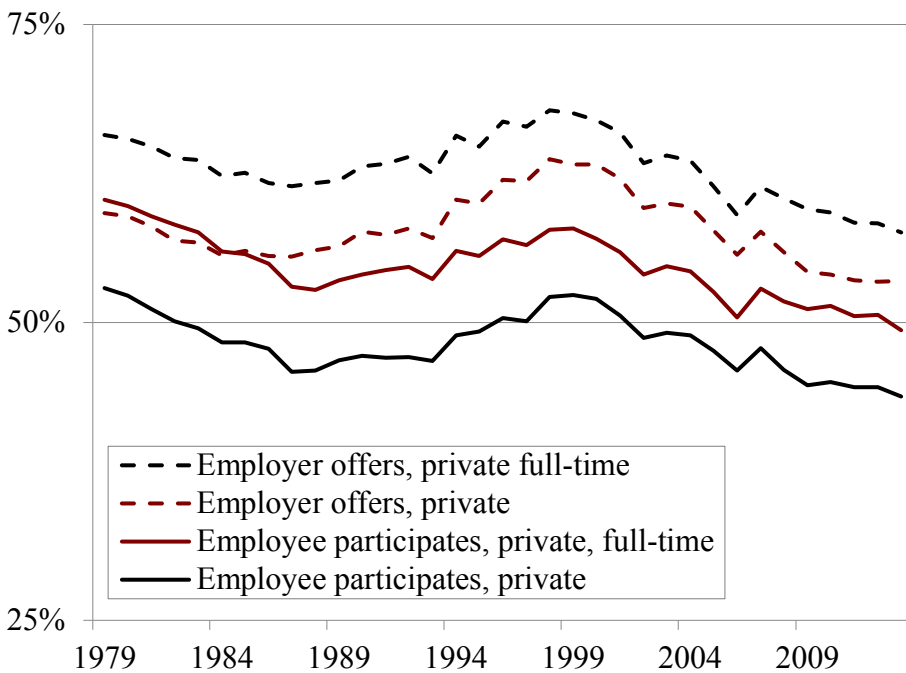Note: Only working and contributing years after age 25 are counted.
Sources: Authors' calculations using SIPP 1984-1986; and SIPP-linked Administrative Tax Data (1990-2013)

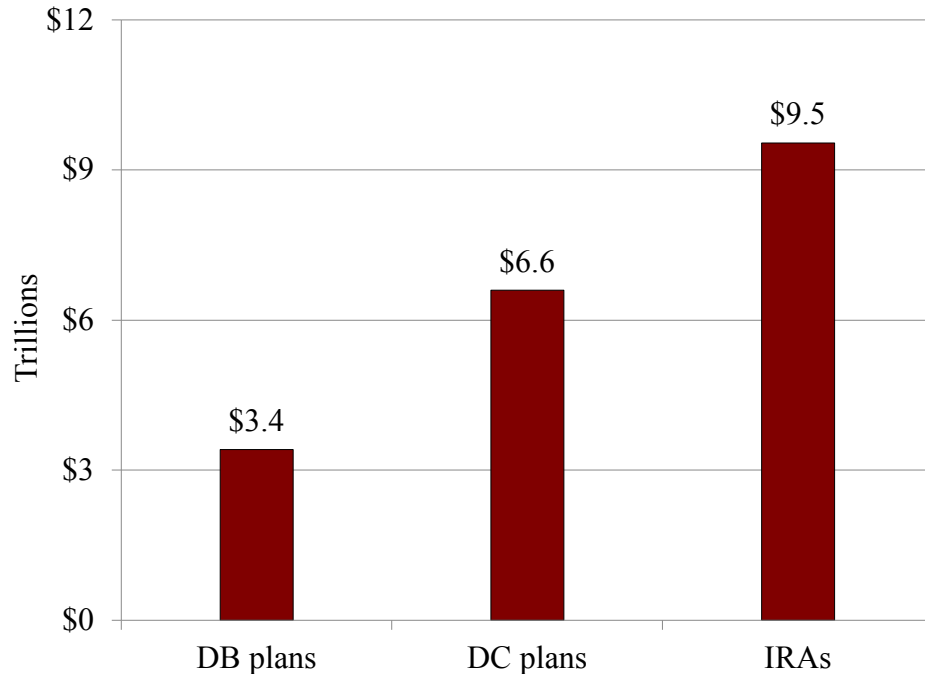Figure 1. *Workers with Pension Coverage by Type of Plan, 1983-2016*
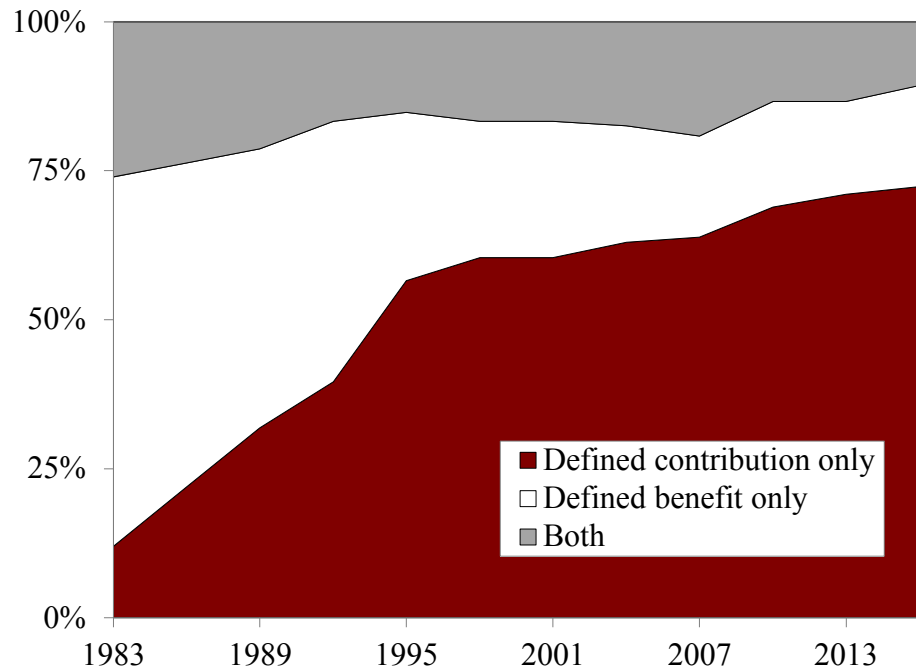
Figure 2. *Pension Sponsorship and Participation in the Private Sector, Ages 25-64, 1979-2013*

Figure 3. *Total U.S. Private Retirement Assets, by Type of Plan, 2018 Q3*
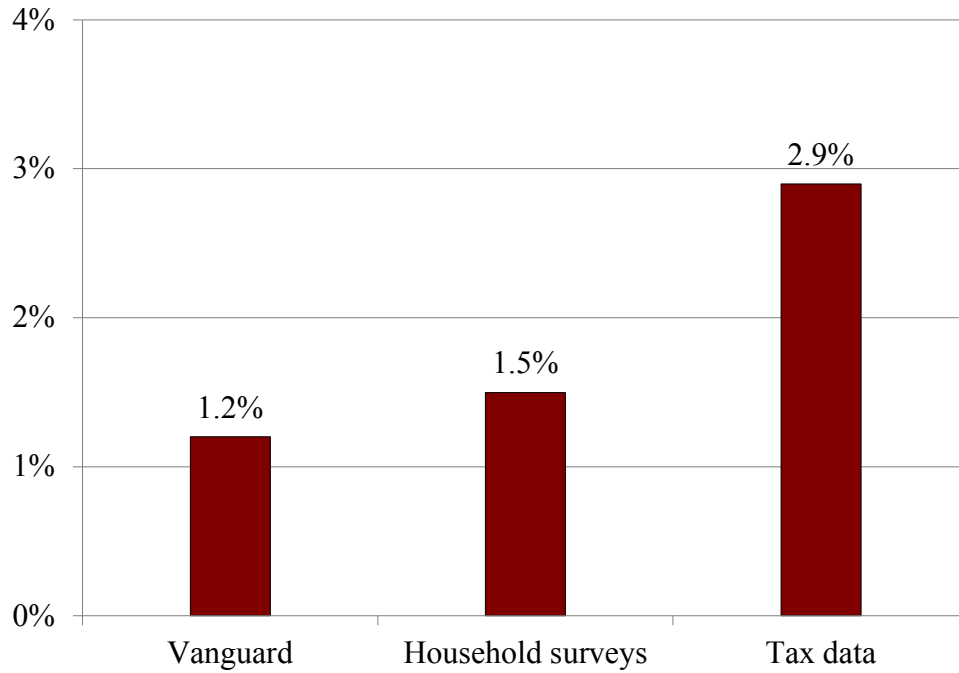

Source: U.S. Board of Governors of the Federal Reserve System, *Financial Accounts of the United States* (2018).

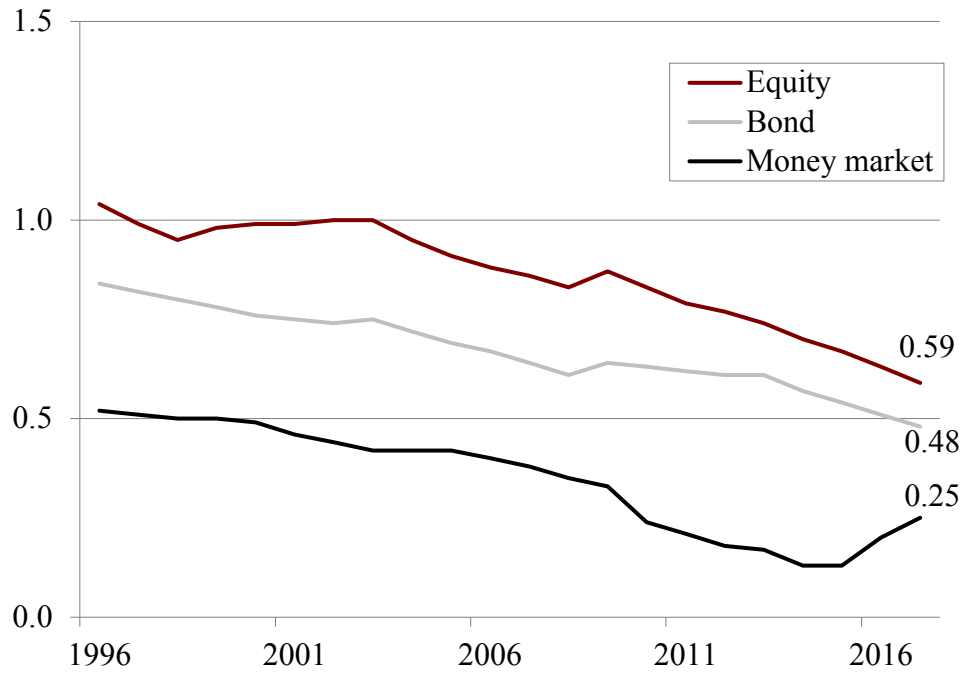Figure 4. *Annual Leakages Out of Vanguard Accounts as a Percentage of Assets, 2013*
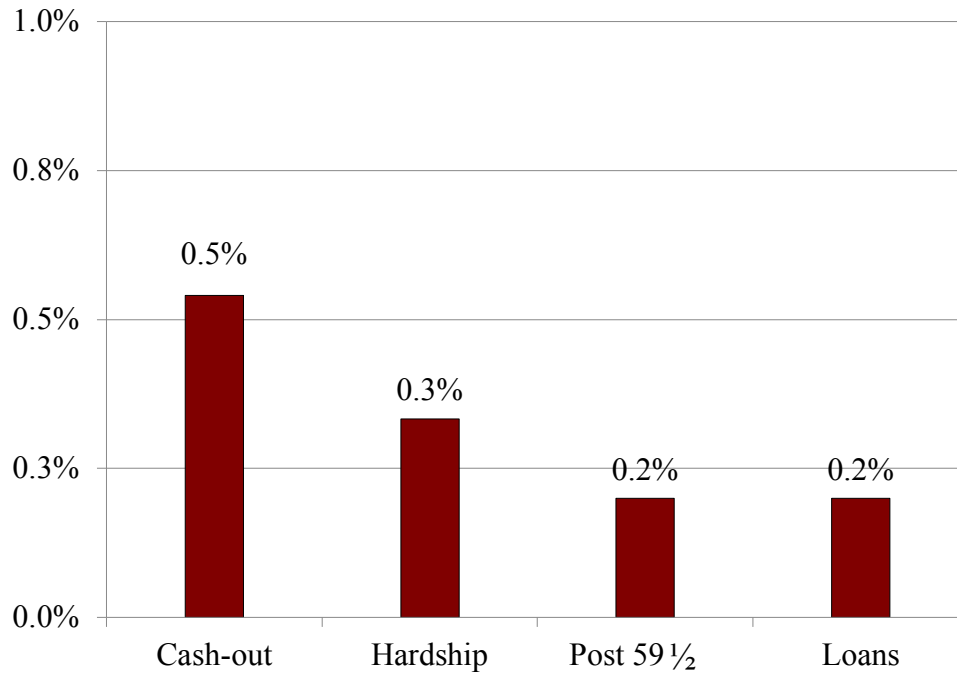
Source: Authors' estimates based on Vanguard (2014).

Figure 5. *Leakage Estimates from Various Sources*

	2.9%

Source: Munnell and Webb (2015).

Figure 6. *Average Expense Ratios for Long-Term Mutual Funds, By Asset Type, 1996-2017*


Source: Investment Company Institute (2018).

Figure 7. *Projected and Accumulated Balances for Workers at Ages 55-64, by Age Group in 2014*

Note: Individuals must have worked at some point between ages 55-64 and contributed at least $1 to a 401(k) plan over their working careers.
Sources: Authors' calculations using SIPP 1984-1986; and SIPP-linked Administrative Tax Data (1990-2014).

Figure 8. *Impact of Immature System, Inconsistent Contributions, Fees, and Leakages on 401(k)/ IRA Balances for a Typical Worker Ages 55-64 in 2014*
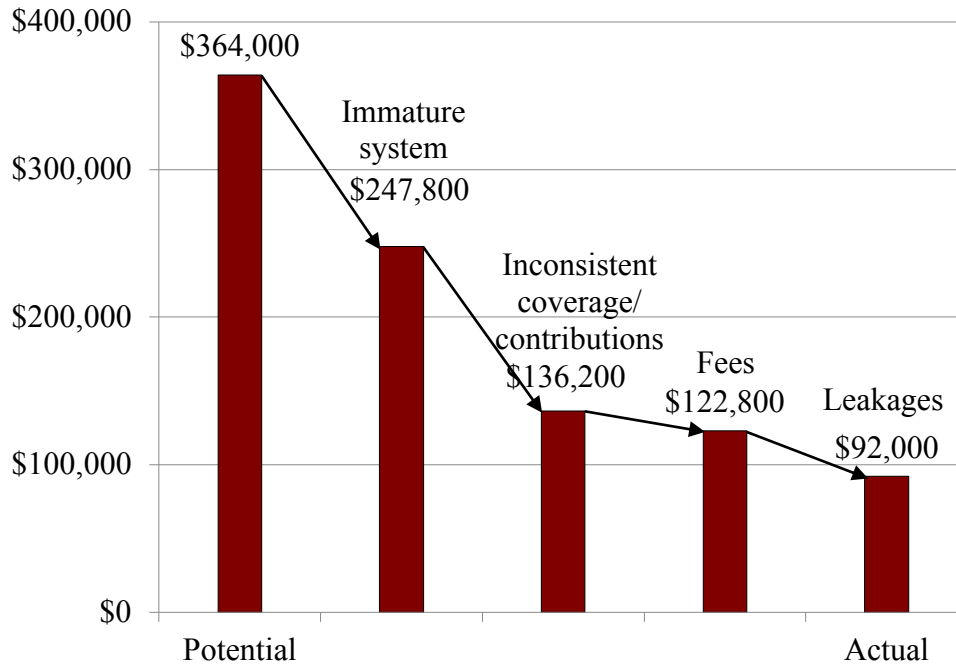
Note: Individuals must have worked at some point between ages 55-64 and contributed at least $1 to a 401(k) plan over their working careers.
Sources: Authors' calculations using SIPP 1984-1986; and SIPP-linked Administrative Tax Data (1990-2014).

Figure 9. *Estimated Impact of Inconsistent Contributions, Fees, and Leakages on 401(k)/ IRA Balances for a Typical Worker Ages 55-64 in a Mature System*
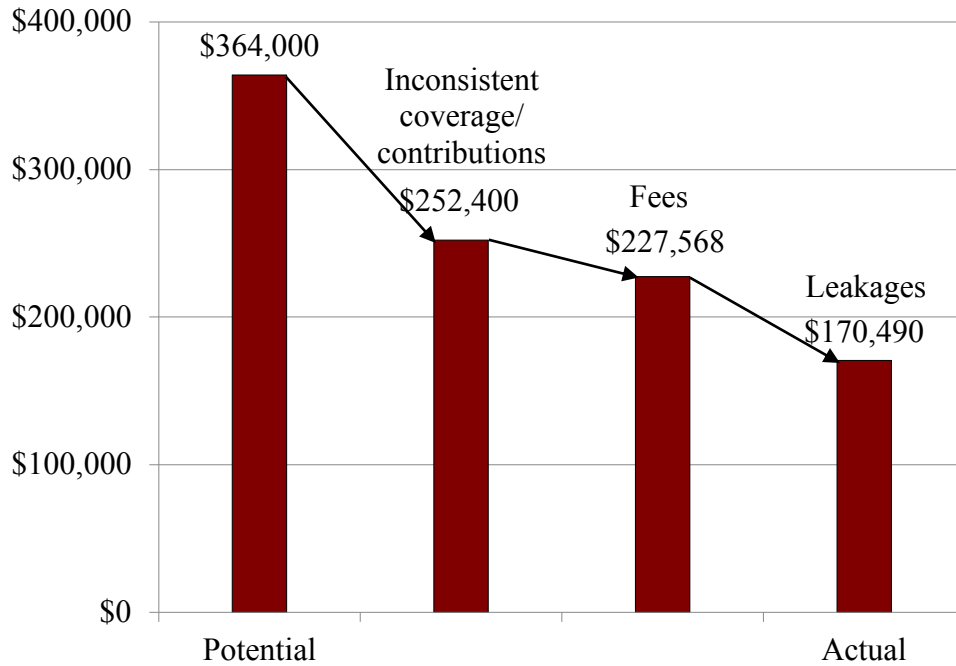
Note: Individuals must have worked at some point between ages 55-64 and contributed at least $1 to a 401(k) plan over their working careers.
Source: Authors' calculations using SIPP 1984-1986 and SIPP-linked Administrative Tax Data (1990-2014).
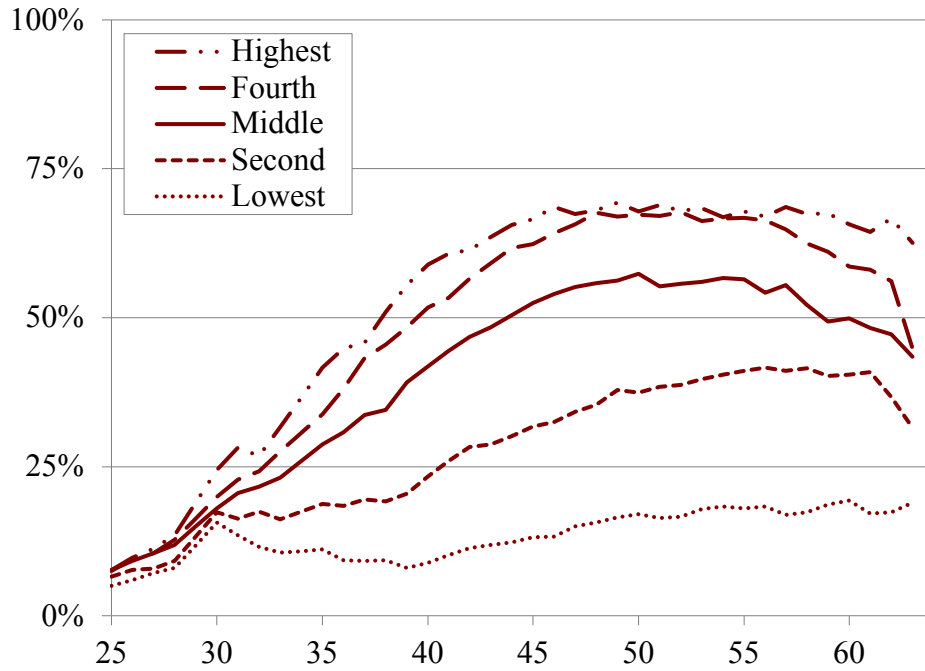
Figure 10. *Percentage of Workers Contributing Over Working Lives, By Age Group in 2014*
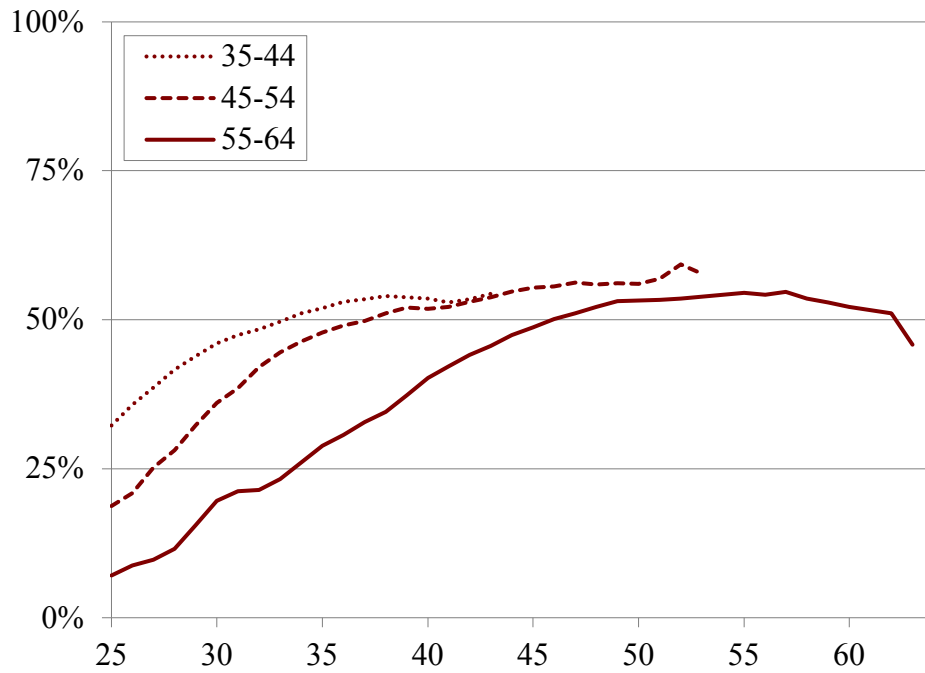
Note: Individuals must have worked at some point between ages 55-64 and contributed at least $1 to a 401(k) plan over their working careers.
Source: Authors' calculations using SIPP 1984-1986 and SIPP-linked Administrative Tax Data (1990-2014).

Figure 11. *Percentage of Workers Ages 55-64 Contributing, By Income Quintile, 2014*

Note: Individuals must have worked at some point between ages 55-64 and contributed at least $1 to a 401(k) plan over their working careers.
Source: Authors' calculations using SIPP 1984-1986 and SIPP-linked Administrative Tax Data (1990-2014).

Table A1. *Vanguard Target Date Fund Asset Allocation, by Age Group*

Age group	U.S. equities	International equities	U.S. corporate bonds	Long-term government bonds	U.S. inflation adjusted bonds
18-21	54%	36%	7%	3%	0%
21-25	54	36	7	3	0
26-30	54	36	7	3	0
31-35	54	36	7	3	0
36-40	54	36	7	3	0
41-45	51	34	11	4	0
46-50	47	31	16	7	0
51-55	42	28	21	9	0
56-60	38	26	25	11	0
61-65	32	29	21	12	5
66-70	33	24	16	14	12

Source: Vanguard (2018).

Table A2. *Average Historical Returns from 1970-2016, by Asset Class*

Asset class	Geometric returns
U.S equities	6.26%
International equities	8.99
U.S. corporate bonds	4.65
Long-term government bonds	4.44
U.S. inflation adjusted bonds	0.80

Source: Authors' calculations from Ibbotson (2017).

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