

What Does Consistent Participation in 401(k) Plans Generate? Changes in 401(k) Plan Account Balances, 2010–2018

By Sarah Holden, ICI; Jack VanDerhei, EBRI; and Steven Bass, ICI

AT A GLANCE

This paper provides an update of a longitudinal analysis of 401(k) plan participants drawn from the EBRI/ICI 401(k) database.

Because the annual cross sections cover participants with a wide range of participation experience in 401(k) plans, meaningful analysis of the potential for 401(k) participants to accumulate retirement assets must examine the 401(k) plan accounts of participants who maintained accounts over all of the years being studied (consistent participants). For example, because of changing samples of providers, plans, and participants, changes in account balances for the entire database are not a reliable measure of how individual participants have fared. A consistent sample is necessary to accurately gauge changes, such as growth in account balances, experienced by individual 401(k) plan participants over time.

A few key insights emerge from looking at the 1.9 million consistent participants in the EBRI/ICI 401(k) database over the eight-year period from year-end 2010 to year-end 2018.

- The average 401(k) plan account balance for consistent participants rose each year from 2010 through year-end 2017 before edging down in 2018. Overall, the average account balance increased at a compound annual average growth rate of 13.9 percent from 2010 to 2018, rising from \$63,756 to \$180,251 at year-end 2018.
- The median 401(k) plan account balance for consistent participants increased at a compound annual average growth rate of 17.3 percent over the period, to \$90,015 at year-end 2018.
- The growth in account balances for consistent participants generally exceeded the growth rate for all participants in the EBRI/ICI 401(k) database.

Younger 401(k) participants or those with smaller year-end 2010 balances experienced higher percent growth in account balances compared with older participants or those with larger year-end 2010 balances. Three primary factors affect account balances: contributions, investment returns, and withdrawal and loan activity. The percent change in average 401(k) plan account balance of participants in their twenties was heavily influenced by the relative size of their contributions to their account balances and increased at a compound average growth rate of 39.9 percent per year between year-end 2010 and year-end 2018.

401(k) participants tend to concentrate their accounts in equity securities. The asset allocation of the 1.9 million 401(k) plan participants in the consistent group was broadly similar to the asset allocation seen in the annual EBRI/ICI 401(k) database updates. On average at year-end 2018, about two-thirds of consistent 401(k) participants' assets were invested in equities — through equity funds, the equity portion of target-date funds, the equity portion of non-target-date balanced funds, or company stock. Younger 401(k) participants tend to have higher concentrations in equities than older 401(k) participants.

Sarah Holden is Senior Director of Retirement and Investor Research at the Investment Company Institute (ICI). Jack VanDerhei is Director of Research at the Employee Benefit Research Institute (EBRI). Steven Bass is an economist at ICI. This *Issue Brief* was written with assistance from the Institute’s research and editorial staffs. Any views expressed in this report are those of the authors, and should not be ascribed to the officers, trustees, or other sponsors of EBRI, EBRI-ERF, or their staffs. Neither EBRI nor EBRI-ERF lobbies or takes positions on specific policy proposals. EBRI invites comment on this research.

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Since 1996, the Employee Benefit Research Institute (EBRI) and the Investment Company Institute (ICI) have worked together on collecting and analyzing annual data on millions of 401(k) plan participants’ accounts. This report reflects data through year-end 2018 and EBRI’s and ICI’s ongoing research into 401(k) plan participants’ activity.

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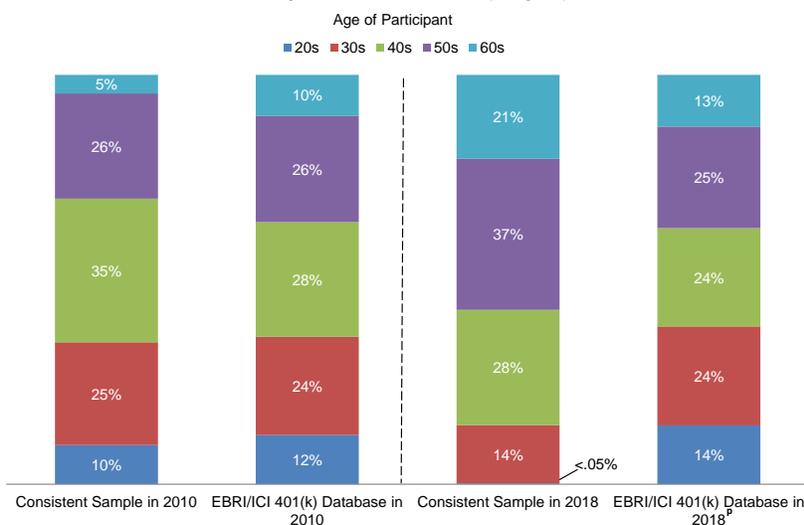
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Introduction

The EBRI/ICI 401(k) database, which is constructed from the administrative records of 401(k) plans, represents a large cross section, or snapshot, of 401(k) plans at the end of each year. It is a cross section of the entire population of 401(k) plan participants, and it represents a wide range of participants — including those who are young and individuals who are new to their jobs, as well as older participants and those who have been with their current employers for many years. For example, at year-end 2018, preliminary analysis indicates that 14 percent of 401(k) participants in the EBRI/ICI 401(k) database were in their twenties, while 13 percent were in their sixties (Figure 1); 20 percent of participants had two or fewer years of tenure at their current jobs, while 4 percent had more than 30 years of tenure (Figure 2). Participants in the consistent sample are both older and longer tenured than participants in the overall database at year-end 2018.

Figure 1
Consistent Sample Was Older Than Participants in the EBRI/ICI 401(k) Database at Year-End 2018
Percentage of participants by age, year-end



^PData are preliminary.
 Note: The consistent sample is 1.9 million 401(k) plan participants with account balances at the end of each year from 2010 through 2018. Participant age is age as of the year-end indicated.
 Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Although annual updates of the EBRI/ICI 401(k) database provide valuable perspectives of 401(k) plan account balances, asset allocation, and loan activity across wide cross sections of participants, cross-sectional analyses are not well suited to examining the impact of consistent participation in 401(k) plans. Cross sections change in composition from year to year because the selection of data providers and sample of plans using a given provider vary, and because 401(k) participants join or leave plans.¹ In addition, the analysis covers account balances held in 401(k) plans at participants' current employers. Retirement savings held in plans at previous employers or rolled over into individual retirement accounts (IRAs) are not included in the analysis.² To explore the full impact of ongoing participation in 401(k) plans, and to understand how 401(k) plan participants have fared over an extended period, it is important to analyze a consistent group of participants (a longitudinal sample) who have been part of the database for an extended period — in this case, 2010 through 2018.

Sample of Consistent 401(k) Participants, 2010–2018

Among the 401(k) participants with accounts at the end of 2010 in the EBRI/ICI 401(k) database, 1.9 million are in the consistent sample.³ These consistent participants had accounts at the end of each year from 2010 through 2018; they make up a longitudinal sample, which removes the effect of participants and plans entering and leaving the database. Initially, this group was demographically similar to the entire EBRI/ICI 401(k) database at year-end 2010. However, by year-end 2018, these participants had grown older, accrued longer job tenures, and accumulated larger account balances compared with participants in the year-end 2018 cross section.

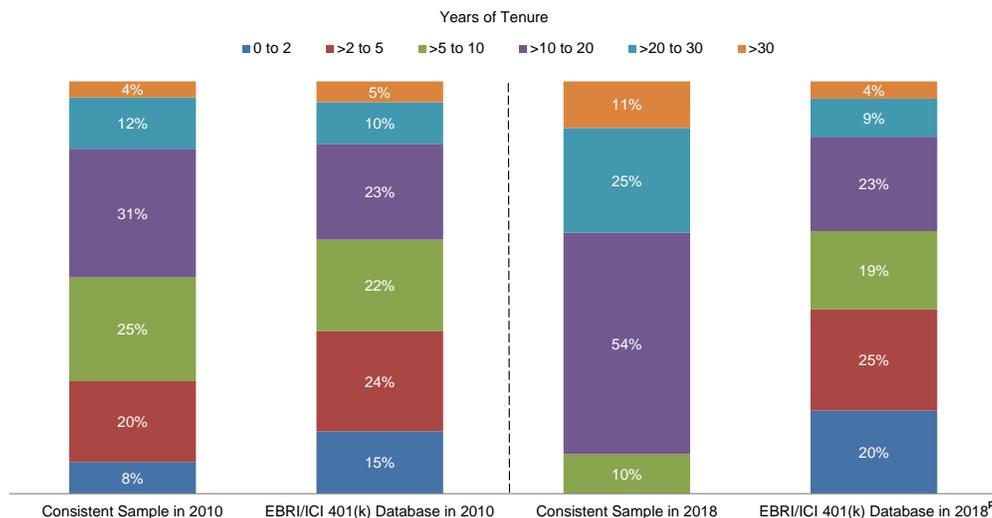
Age and Tenure of Consistent 401(k) Participants

At year-end 2010, the consistent group was similar in age to the participants in the entire EBRI/ICI database. For example, 35 percent of the participants in the consistent sample were in their twenties or thirties in 2010, similar to 36 percent of participants in the entire database (Figure 1).⁴ Thirty-five percent of the participants in the consistent sample were in their forties in 2010, while 28 percent of participants in the entire database were in their forties. Thirty-one percent of the participants in the consistent sample were in their fifties or sixties, compared with 36 percent of participants in the EBRI/ICI database overall.

The tenure composition of the consistent sample also was roughly similar to the tenure composition of 401(k) participants in the year-end 2010 EBRI/ICI 401(k) database.⁵ For example, 16 percent of the consistent sample had more than 20 years of tenure in 2010, similar to the 15 percent of the participants in the entire EBRI/ICI 401(k) database (Figure 2). Twenty-eight percent of the consistent sample had five or fewer years of tenure in 2010, compared with 39 percent of participants in the entire EBRI/ICI 401(k) database.

As expected, the consistent participants who were followed over the eight-year period tended to have longer tenures by year-end 2018, compared with the broader base of 401(k) participants in the EBRI/ICI 401(k) database. Participants in the consistent sample, by definition, had at least eight years of tenure in 2018 (the length of time for the longitudinal analysis), with none having five or fewer years of tenure, 10 percent having more than five to 10 years, 54 percent having more than 10 to 20 years, and 36 percent having more than 20 years (Figure 2). In contrast, preliminary analysis of the entire EBRI/ICI 401(k) database in 2018 finds 45 percent of participants had five or fewer years of tenure, 19 percent had more than five to 10 years, 23 percent had more than 10 to 20 years, and 13 percent had more than 20 years.

Figure 2
**Consistent Sample Had Longer Tenure Than Participants
 in the EBRI/ICI 401(k) Database at Year-End 2018**
Percentage of participants by years of tenure, year-end



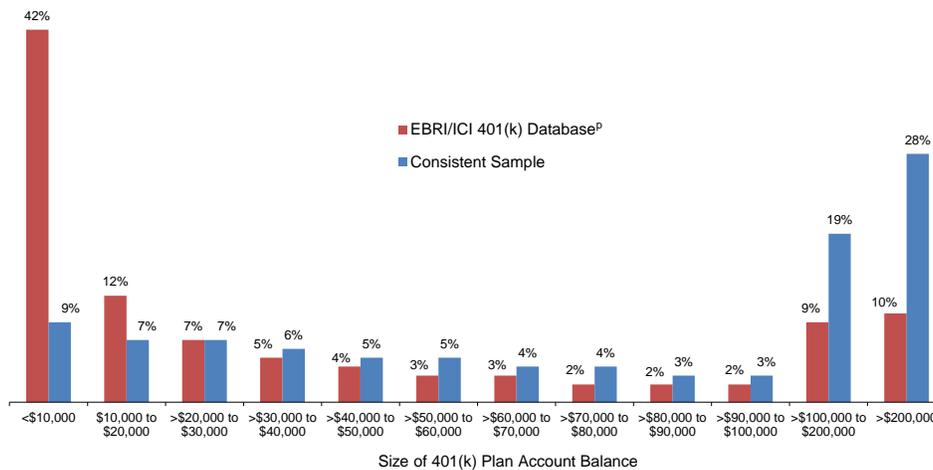
³Data are preliminary.
 Note: The consistent sample is 1.9 million 401(k) plan participants with account balances at the end of each year from 2010 through 2018. Participant tenure is tenure as of the year-end indicated.
 Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

By year-end 2018, the consistent sample of 401(k) participants also was older, on average, compared with participants in the entire EBRI/ICI 401(k) database. For example, fewer than 0.5 percent of the participants in the consistent group were in their twenties and 14 percent were in their thirties at year-end 2018 (Figure 1). In the entire EBRI/ICI 401(k) database at year-end 2018, preliminary analysis finds 14 percent of participants were in their twenties and 24 percent were in their thirties. Thirty-seven percent of the participants in the consistent sample were in their fifties and 21 percent were in their sixties, compared with 25 percent and 13 percent, respectively, in the entire database at year-end 2018.

Consistent Participants Have Accumulated Sizable 401(k) Plan Account Balances

Trends in the consistent group’s account balances highlight the accumulation effect of ongoing 401(k) participation. At year-end 2018, 28 percent of the consistent group had more than \$200,000 in their 401(k) plan accounts at their current employers, while another 19 percent had between \$100,000 and \$200,000 (Figure 3). In contrast, in the broader EBRI/ICI 401(k) database, preliminary data indicate that 10 percent had accounts with more than \$200,000, and 9 percent had between \$100,000 and \$200,000.

Figure 3
Distribution of 401(k) Account Balances by Size of Account Balance
Percentage of participants with account balances in specified ranges, year-end 2018



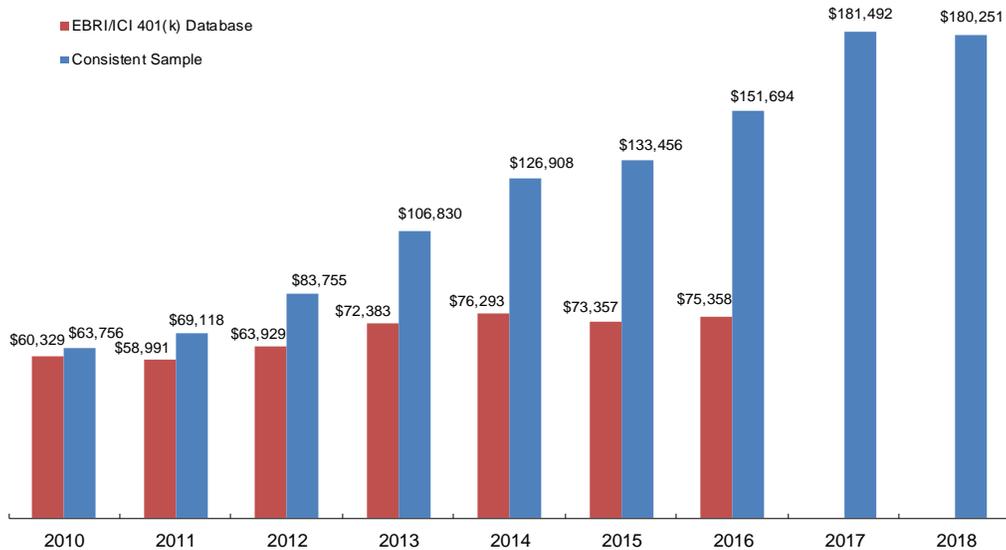
^PData are preliminary.
 Note: Account balances are participant account balances held in 401(k) plans at the participants’ current employers and are net of plan loans. Retirement savings held in plans at previous employers or rolled over into IRAs are not included.
 Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Reflecting their higher average age and tenure, the consistent group historically also have had average and median account balances that are much higher than the average and median account balances of the broader EBRI/ICI 401(k) database (Figure 4).

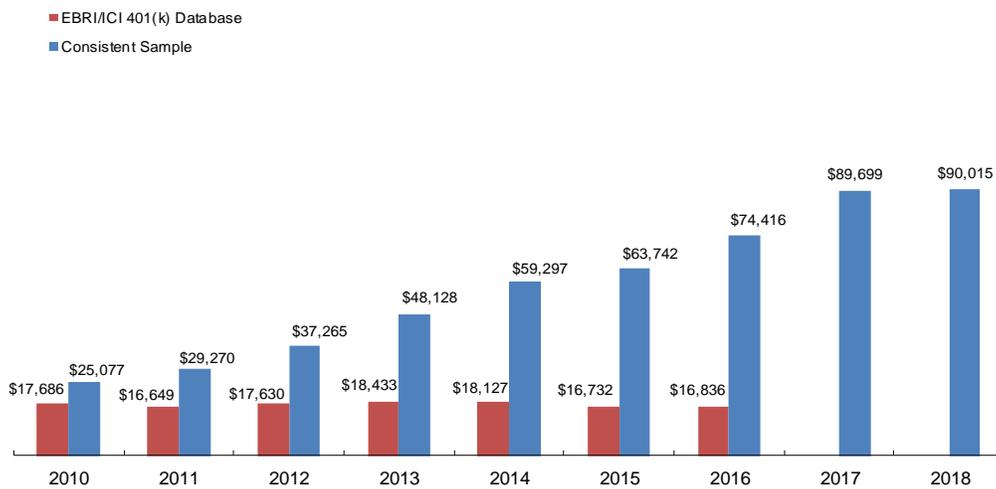
401(k) plan account balances tended to increase with both age and tenure among the consistent group of participants, as they do in the cross-sectional EBRI/ICI 401(k) database. Younger participants or those with shorter job tenures at their current employers tended to have smaller account balances, while those who were older or had longer job tenures tended to have higher account balances.⁶ For example, within the consistent group, among 401(k) participants with more than 10 to 20 years of tenure at year-end 2018, older participants tended to have higher balances than younger participants: Those in their thirties with more than 10 to 20 years of tenure had an average account balance of \$90,658, compared with an average of \$129,458 for participants in their sixties with more than 10 to 20 years of tenure (Figure 5). Among consistent participants in their sixties at year-end 2018, those with more than five to 10 years of tenure had a lower average 401(k) plan balance (\$114,948) than those with more than 30 years of tenure (\$363,394).

Figure 4
Consistent 401(k) Participants
Accumulate Significant Account Balances

Average



Median



Note: Account balances are participant account balances held in 401(k) plans at the participants' current employers and are net of plan loans. Retirement savings held in plans at previous employers or rolled over into IRAs are not included.
Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Changes in Consistent 401(k) Participants' Account Balances

In any given year, the change in a participant's account balance is a combination of three factors:

- New contributions by the participant (+), the employer (+), or both;
- Total investment return on account balances (\pm), which depends on the performance of financial markets and on the allocation of assets in an individual's account; and
- Withdrawals (-), borrowing (-), and loan repayments (+).

The change in any individual participant's 401(k) plan account balance is influenced by the magnitudes of these three factors relative to the starting account balance. For example, a contribution of a given dollar amount produces a larger growth rate when added to a smaller account than it would if added to a larger one. On the other hand, investment returns of a given percentage produce larger dollar increases (or decreases) when compounded on a larger asset base.

In other words, growth rates are a function of the relative size of the dollar adjustment to the size of the individual account.

Altogether, from year-end 2010 through year-end 2018, the average 401(k) plan account balance among the group of consistent participants more than doubled (increasing by 183 percent), rising from \$63,756 at year-end 2010 to \$181,492 at year-end 2018 (Figures 4, 5, and 6). This translates into a compound annual average growth rate of 13.9 percent over the eight-year period. The median account balance among this consistent group also grew, more than tripling from \$25,077 in 2010 to \$90,015 in 2018 (a compound annual average growth rate of 17.3 percent) (Figure 4).

Among the consistent group, individual 401(k) participants experienced a wide range of outcomes, often influenced by the relationship among contributions, investment returns, and withdrawal or loan activity. Participants who were younger or had fewer years of tenure experienced the largest percent increases in average account balance between year-end 2010 and year-end 2018. For example, the average account balance of 401(k) participants in their thirties rose 450.8 percent (a 23.8 percent compound annual average growth rate) between the end of 2010 and the end of 2018 (Figures 5 and 6). Because younger participants' account balances tended to be smaller (Figure 5), their contributions produced significant percent growth in their account balances. In contrast, the average account balance of older participants, or those with longer tenures — both of whom tended to have larger balances at the beginning of the study period than younger workers or those with shorter tenures — showed more modest percent growth in account size (Figure 6). For example, the average account balance of 401(k) participants in their sixties increased 122.9 percent (a 10.5 percent compound annual average growth rate) between year-end 2010 and year-end 2018. Investment returns, rather than annual contributions,⁷ generally account for most of the change in accounts with larger balances.

Figure 5
401(k) Plan Account Balances Among Consistent 401(k) Participants
Average 401(k) plan account balance for consistent 401(k) participants by age and tenure, year-end

Age Group	Tenure (years)	2010	2011	2012	2013	2014	2015	2016	2017	2018
20s	All	\$2,424	\$4,305	\$7,015	\$11,397	\$16,416	\$19,792	\$25,179	\$33,962	\$35,565
	>5 to 10	1,793	3,681	6,383	10,809	16,169	19,844	25,873	35,225	37,539
30s	All	15,754	19,716	27,184	37,648	48,484	54,194	66,404	84,628	86,776
	>5 to 10	6,549	11,084	18,296	28,606	38,925	45,717	58,770	78,710	81,972
	>10 to 20	18,342	22,323	30,019	40,556	52,312	57,919	70,522	88,619	90,658
40s	All	43,749	48,884	61,896	82,450	99,295	106,521	124,651	153,634	154,284
	>5 to 10	13,936	20,387	30,661	45,322	59,184	67,806	84,365	109,875	113,007
	>10 to 20	39,683	45,040	57,598	77,008	94,034	101,425	119,888	148,279	149,189
	>20 to 30	68,361	73,142	89,398	116,322	137,710	144,598	165,024	198,219	198,168
50s	All	78,670	84,676	102,323	131,177	155,374	163,612	186,174	224,287	224,143
	>5 to 10	21,028	27,981	39,505	55,994	71,364	80,421	97,803	124,481	128,656
	>10 to 20	46,789	52,529	65,889	86,276	105,316	113,360	132,271	161,724	163,545
	>20 to 30	105,990	112,033	133,771	169,782	200,582	209,056	235,929	282,308	281,025
	>30	146,014	153,374	178,864	224,491	262,643	271,223	300,921	353,134	350,586
60s	All	94,123	100,318	117,760	144,723	168,820	173,387	190,136	217,211	209,814
	>5 to 10	25,219	31,976	43,115	57,970	72,330	80,119	93,346	113,408	114,948
	>10 to 20	43,556	49,179	60,447	76,600	93,230	98,896	111,950	131,159	129,458
	>20 to 30	102,568	108,443	126,774	154,915	181,070	185,162	202,388	230,435	222,348
	>30	190,519	198,090	226,251	272,421	315,865	317,487	341,272	380,118	363,394
All	All	63,756	69,118	83,755	106,830	126,908	133,456	151,694	181,492	180,251

Note: Age and tenure groups are based on participant age and tenure at year-end 2018. The *all* category includes participants with missing tenure information. Account balances are participant account balances held in 401(k) plans at the participants' current employers and are net of plan loans. Retirement savings held in plans at previous employers or rolled over into IRAs are not included.

Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Investment returns, which vary with 401(k) plan account asset allocation, also influence the changes in participants' accounts. Although asset allocation varied with age, and many participants held a range of investments, stock market performance tends to have an impact on these balances because, in large part, 401(k) plan participants' balances tended to be weighted toward equities. Altogether, at year-end 2018, equities — equity funds, the equity portion of target-date funds, the equity portion of non-target-date balanced funds,⁸ and company stock — represented about two-thirds of consistent 401(k) plan participants' assets (Figure 7, lower panel).⁹

The asset allocation of participants in the consistent sample varied with participant age, a pattern that also is observed in the cross-sectional EBRI/ICI 401(k) database. Younger participants generally tended to favor equity funds and target date funds, while older participants were more likely to invest in fixed-income securities such as bond funds, money funds, or guaranteed investment contracts (GICs) and other stable-value funds.

Finally, loan or withdrawal activities can have an impact on 401(k) plan account balances. Although in general, very few active 401(k) plan participants take withdrawals,¹⁰ participants in their sixties tend to have a higher propensity to make withdrawals as they approach retirement.¹¹

Figure 6
Changes in 401(k) Plan Account Balances Among Consistent 401(k) Participants

Percent change in average 401(k) plan account balance among consistent 401(k) participants by age and tenure

Age Group	Tenure (years)										Compound Annual
		2010–2011	2011–2012	2012–2013	2013–2014	2014–2015	2015–2016	2016–2017	2017–2018	2010–2018	Average Growth Rate, 2010–2018
20s	All	77.6%	63.0%	62.5%	44.0%	20.6%	27.2%	34.9%	4.7%	1,367.2%	39.9%
	>5 to 10	105.3%	73.4%	69.3%	49.6%	22.7%	30.4%	36.1%	6.6%	1,993.6%	46.3%
30s	All	25.1%	37.9%	38.5%	28.8%	11.8%	22.5%	27.4%	2.5%	450.8%	23.8%
	>5 to 10	69.2%	65.1%	56.4%	36.1%	17.4%	28.6%	33.9%	4.1%	1,151.7%	37.1%
	>10 to 20	21.7%	34.5%	35.1%	29.0%	10.7%	21.8%	25.7%	2.3%	394.3%	22.1%
40s	All	11.7%	26.6%	33.2%	20.4%	7.3%	17.0%	23.3%	0.4%	252.7%	17.1%
	>5 to 10	46.3%	50.4%	47.8%	30.6%	14.6%	24.4%	30.2%	2.9%	710.9%	29.9%
	>10 to 20	13.5%	27.9%	33.7%	22.1%	7.9%	18.2%	23.7%	0.6%	276.0%	18.0%
	>20 to 30	7.0%	22.2%	30.1%	18.4%	5.0%	14.1%	20.1%	(*)	189.9%	14.2%
50s	All	7.6%	20.8%	28.2%	18.4%	5.3%	13.8%	20.5%	-0.1%	184.9%	14.0%
	>5 to 10	33.1%	41.2%	41.7%	27.4%	12.7%	21.6%	27.3%	3.4%	511.8%	25.4%
	>10 to 20	12.3%	25.4%	30.9%	22.1%	7.6%	16.7%	22.3%	1.1%	249.5%	16.9%
	>20 to 30	5.7%	19.4%	26.9%	18.1%	4.2%	12.9%	19.7%	-0.5%	165.1%	13.0%
	>30	5.0%	16.6%	25.5%	17.0%	3.3%	10.9%	17.4%	-0.7%	140.1%	11.6%
60s	All	6.6%	17.4%	22.9%	16.7%	2.7%	9.7%	14.2%	-3.4%	122.9%	10.5%
	>5 to 10	26.8%	34.8%	34.5%	24.8%	10.8%	16.5%	21.5%	1.4%	355.8%	20.9%
	>10 to 20	12.9%	22.9%	26.7%	21.7%	6.1%	13.2%	17.2%	-1.3%	197.2%	14.6%
	>20 to 30	5.7%	16.9%	22.2%	16.9%	2.3%	9.3%	13.9%	-3.5%	116.8%	10.2%
	>30	4.0%	14.2%	20.4%	15.9%	0.5%	7.5%	11.4%	-4.4%	90.7%	8.4%
All	All	8.4%	21.2%	27.6%	18.8%	5.2%	13.7%	19.6%	-0.7%	182.7%	13.9%

(*) = between -0.05 and 0.05 percent

Note: Age and tenure groups are based on participant age and tenure at year-end 2018. The *all* category includes participants with missing tenure information. Account balances are participant account balances held in 401(k) plans at the participants' current employers and are net of plan loans. Retirement savings held in plans at previous employers or rolled over into IRAs are not included.

Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Figure 7
Average Asset Allocation of 401(k) Plan Accounts by Participant Age
Percentage of 401(k) plan account balances among consistent participants

Year-End 2010

Balanced Funds

Age Group	Equity Funds	Target-Date Funds ^{1, 2}	Non-Target-Date Balanced Funds	Bond Funds	Money Funds	GICs ^{2, 3} and Other Stable-Value Funds	Company Stock ²	Other	Unknown	Memo: Equities ⁴
20s	24.4%	46.3%	3.4%	3.6%	5.2%	5.4%	9.1%	0.8%	1.8%	76.5%
30s	34.1%	34.7%	4.6%	4.9%	2.3%	5.7%	10.3%	1.4%	1.9%	77.4%
40s	44.7%	20.4%	5.0%	6.0%	2.9%	6.6%	10.6%	2.2%	1.5%	74.2%
50s	44.4%	15.2%	5.7%	7.0%	3.9%	9.1%	10.7%	2.7%	1.3%	67.3%
60s	38.9%	14.9%	5.9%	8.7%	6.4%	12.4%	9.1%	2.4%	1.2%	57.9%
All Consistent Sample	41.8%	16.6%	5.6%	7.3%	5.0%	9.9%	10.0%	2.4%	1.3%	65.1%

Year-End 2018

Balanced Funds

Age Group	Equity Funds	Target-Date Funds ^{1, 2}	Non-Target-Date Balanced Funds	Bond Funds	Money Funds	GICs ^{2, 3} and Other Stable-Value Funds	Company Stock ²	Other	Unknown	Memo: Equities ⁴
20s	19.9%	55.6%	3.0%	2.8%	1.4%	2.2%	6.2%	7.1%	1.8%	77.9%
30s	35.6%	37.8%	3.0%	4.1%	1.2%	3.1%	7.8%	5.7%	1.8%	78.7%
40s	43.6%	25.8%	3.8%	5.4%	1.6%	4.6%	7.9%	5.4%	1.9%	74.0%
50s	42.4%	21.7%	4.5%	7.1%	2.6%	7.4%	7.6%	4.8%	2.0%	65.3%
60s	36.4%	21.2%	4.7%	8.9%	3.2%	12.3%	6.3%	4.7%	2.3%	54.8%
All Consistent Sample	40.6%	23.5%	4.3%	7.0%	2.4%	7.8%	7.3%	4.9%	2.1%	65.4%

¹A target-date fund typically rebalances its portfolio to become less focused on growth and more focused on income as it approaches and passes the target date of the fund, which is usually included in the fund's name.

²Not all participants are offered this investment option.

³GICs are guaranteed investment contracts.

⁴Equities include equity funds, company stock, the equity portion of target-date funds, and the equity portion of non-target-date balanced funds.

Note: Funds include mutual funds, bank collective trusts, life insurance separate accounts, and any pooled investment product primarily invested in the security indicated. Age group is based on the participant's age at year-end 2018. Percentages are dollar-weighted averages.

Source: Tabulations from EBR/ICIP Participant-Directed Retirement Plan Data Collection Project.

Background Factors Influencing 401(k) Plan Assets

Aggregate data on 401(k) plans provide insight into the possible influence of each of the factors that cause changes in account balances: contributions, investment returns, and withdrawal or loan activity. Between year-end 2010 and year-end 2017 (the latest data available), contributions to 401(k) plans have averaged \$352 billion a year, and benefits paid (including rollovers) have averaged \$346 billion (Figure 8). Investment returns — interest, dividends, and realized and unrealized asset appreciation/depreciation — vary significantly from year to year. For example, on net they had nearly no impact on assets in 2011 and 2015, but provided a significant boost as the stock market rose sharply from 2012 through 2014, and in 2016 and 2017. In the same period, on average, investment returns have been approximately equal to contributions.

Contributions — which positively affect 401(k) plan account balances — include both employer and employee contributions, and most 401(k) participants are in plans where the employer contributes. In 2017, 9 in 10 participants were in 401(k) plans where the employer made contributions (Figure 9). Although this figure fell slightly in the wake of the financial market crisis, reaching a low of 85 percent in 2010, it had generally rebounded during the longitudinal study. Regarding individual participants' contribution activity, defined contribution (DC) plan participants tend to continue contributing in any given year to their plans.¹²

Between year-end 2010 and year-end 2018, the U.S. stock market generally rose (Figure 10), which tends to provide a boost to 401(k) plan accounts holding equities. On average, about two-thirds of the consistent sample of 401(k) participants' account balances were invested in equities (Figure 7). Subdued stock market performance in 2011 was followed by stronger growth in 2012 through 2014 (with particularly strong appreciation in 2013), moderated in 2015, and resumed growth in 2016 and 2017, before falling at the end of 2018 (Figure 10). Though contributions and loan repayments also play a role in the growth of the average 401(k) plan account balances observed, the pattern of account balance growth rates from year to year also reflects the stock market performance.

Withdrawals and borrowing reduce 401(k) plan account balances in the EBRI/ICI 401(k) database, while loan repayment has a positive impact. Withdrawal activity among active DC plan participants is relatively rare. Typically, fewer than 5 percent of active DC plan participants take any withdrawal in a given year, with fewer than 2 percent taking hardship withdrawals.¹³ Preliminary data from the EBRI/ICI 401(k) database indicate that 19 percent of 401(k) plan participants in plans offering loans had loans outstanding at year-end 2018, with the youngest (8 percent of participants in their twenties) and oldest (14 percent of participants in their sixties) less likely to have loans outstanding than those in their thirties, forties, or fifties (Figure 11). In

Figure 8
401(k) Plan Contributions, Benefits Disbursed, Investment Returns, and Assets
Annual flows reported on Form 5500 and year-end assets, billions of dollars, 2000–2019

	Total Contributions ¹	Total Benefits Disbursed ²	Interest, Dividends, Gains, and Other Items ³	Assets at Year-End ⁴
2000	\$169	\$172	-\$79	1,738
2001	174	147	-119	1,701
2002	182	147	-203	1,565
2003	186	141	300	1,932
2004	204	167	204	2,193
2005	223	189	146	2,393
2006	251	228	303	2,773
2007	273	261	215	2,975
2008	285	233	-770	2,203
2009	256	206	431	2,718
2010	265	243	337	3,119
2011	283	250	-1	3,112
2012	303	282	357	3,495
2013	325	326	645	4,148
2014	349	366	278	4,406
2015	378	386	-1	4,377
2016	399	391	335	4,741
2017	429	425	763	5,486
2018	N/A	N/A	N/A	5,330
2019	N/A	N/A	N/A	6,395

¹Total contributions include both employer and employee contributions.

²Total benefits disbursed include both benefits paid directly from trust funds and premium payments made by plans to insurance carriers. Amounts exclude benefits paid directly by insurance carriers.

³This category includes interest, dividends, rent, net gains or losses on sale of assets, unrealized appreciation or depreciation of assets, and other income and expenses. The bulk of this category is net investment gains or losses.

⁴Estimates through 2017 are based on the Department of Labor Form 5500 Research File.

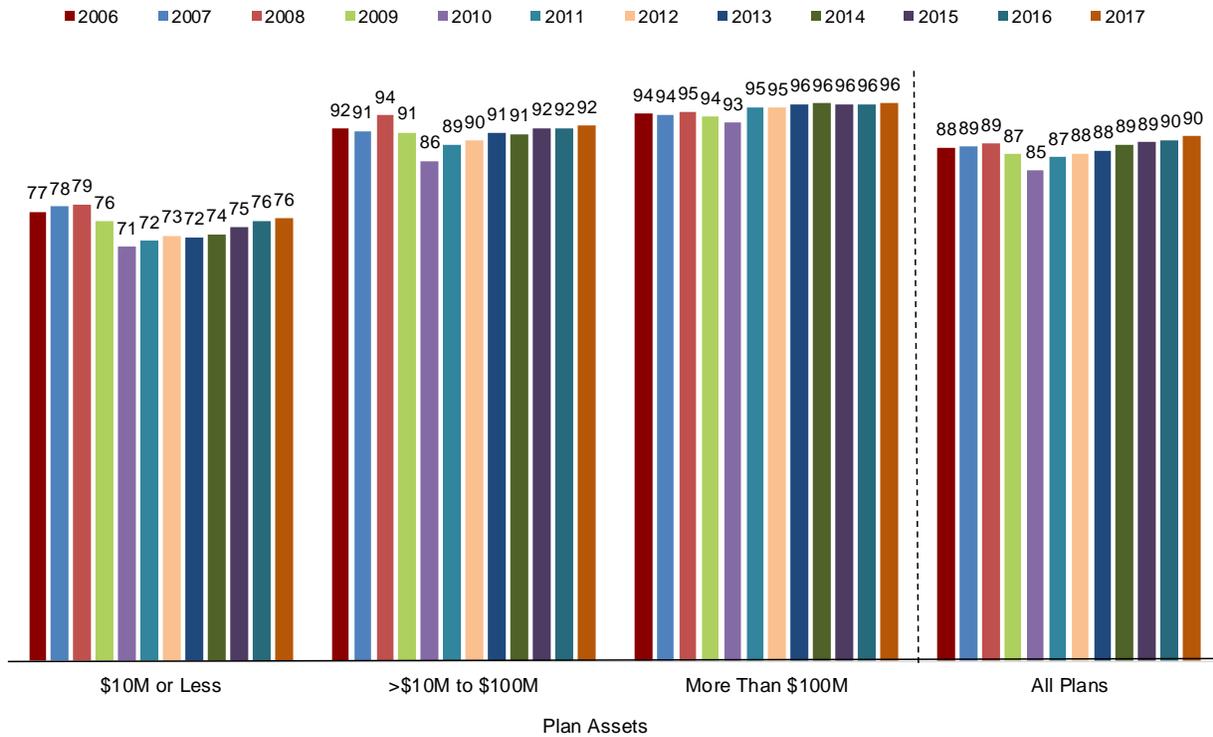
Note: Data exclude plans covering only one participant.

N/A = not available

Sources: Investment Company Institute and Department of Labor.

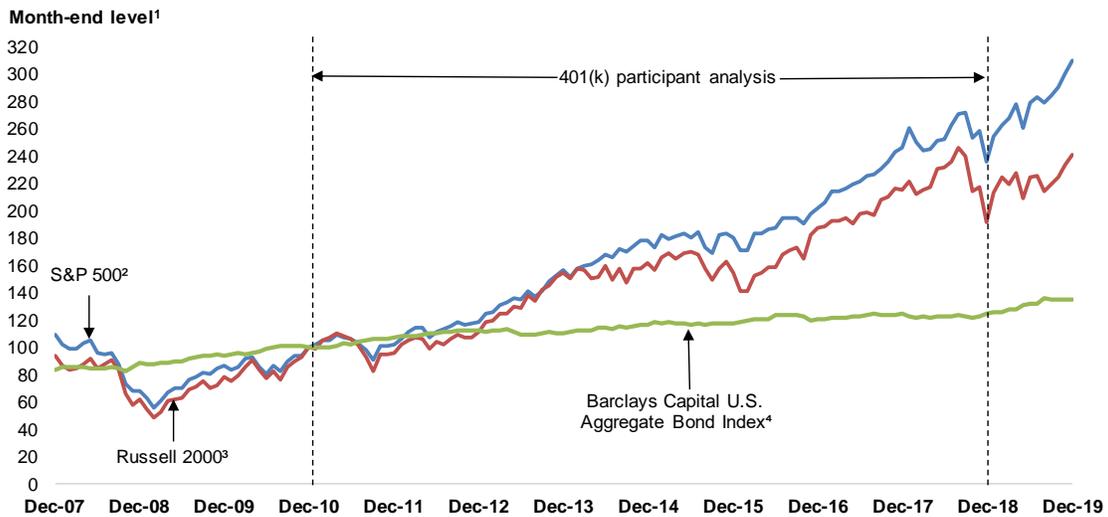
the database, a participant's account balance is reduced in the year that the loan is originated, but repayment of the loan in the ensuing years contributes to account growth.

Figure 9
Most 401(k) Plan Participants Are in Plans With Employer Contributions
Percentage of active 401(k) participants in plans with employer contributions by plan assets, plan year

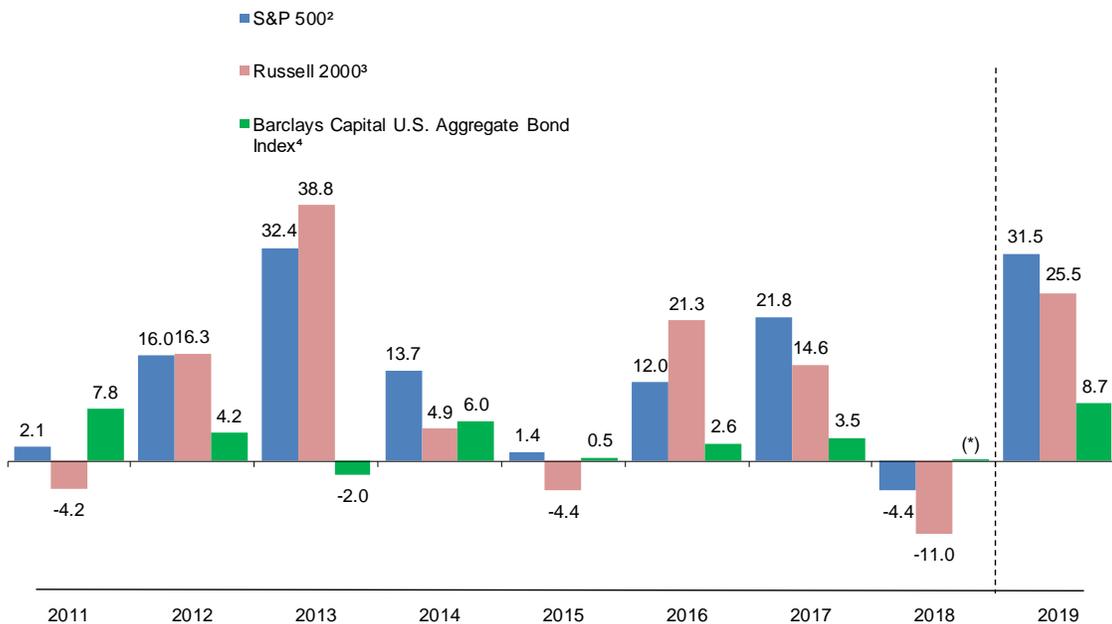


Source: ICI tabulations of U.S. Department of Labor Form 5500 Research File.

Figure 10
Domestic Stock and Bond Market Indexes



Annual percent change in total return index



(*) = between -0.05 and 0.05 percent

¹All indexes are set to 100 in December 2010.

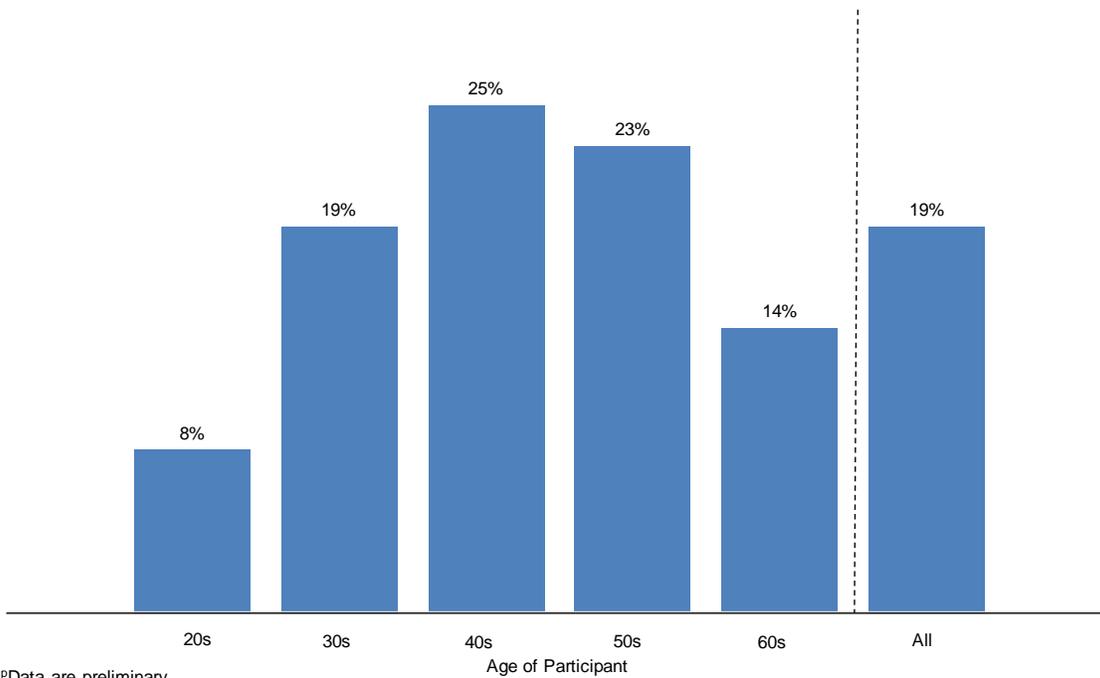
²The S&P 500 index measures the performance of 500 stocks chosen for market size, liquidity, and industry group representation.

³The Russell 2000 index measures the performance of the 2,000 smallest U.S. companies (based on total market capitalization) included

⁴Formerly the Lehman Brothers U.S. Aggregate Bond Index, the Barclays Capital U.S. Aggregate Bond Index is composed of securities covering government and corporate bonds, mortgage-backed securities, and asset-backed securities (rebalanced monthly by market capitalization). The index's total return consists of price appreciation/depreciation plus income as a percentage of the original investment.

Sources: Bloomberg, Barclays Global Investments, Frank Russell Company, and Standard & Poor's.

Figure 11
**Less Than One-Fifth of Eligible 401(k) Plan
 Participants Have Loans Outstanding**
Percentage of eligible 401(k) plan participants with loans outstanding, year-end 2018^p



^pData are preliminary.

Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project.

Note: Eligible 401(k) plan participants are those in 401(k) plans that offer loans.

About the EBRI/ICI 401(k) Database

The EBRI/ICI project is unique because of its inclusion of data provided by a wide variety of plan recordkeepers, permitting the analysis of the activity of participants in 401(k) plans of varying sizes — from very large corporations to small businesses — with a variety of investment options.

Sources and Types of Data

Several EBRI and ICI members provided records on active participants in 401(k) plans for which they kept records for year-end 2010 through year-end 2018.¹⁴ These plan recordkeepers include mutual fund companies, banks, insurance companies, and consulting firms. Although the EBRI/ICI 401(k) project has collected data from 1996 through 2018, the universe of data providers varies from year to year. In addition, the plans using a particular provider can change over time. Records were encrypted to conceal the identity of employers and employees, but were coded so that both could be tracked over multiple years.¹⁵ For each participant, data include date of birth, from which an age group is assigned; date of hire, from which a tenure range is assigned; outstanding loan balance; funds in the participant's investment portfolios; and asset values attributed to those funds. An account balance for each participant is the sum of the participant's assets in all funds.¹⁶ Plan balances are constructed as the sum of all participant balances in the plan.

Investment Options

In the EBRI/ICI 401(k) database, investment options are grouped into eight broad categories.¹⁷ Equity funds consist of pooled investments primarily invested in stocks, including equity mutual funds, bank collective trusts, life insurance separate accounts, and other pooled investments. Similarly, bond funds are any pooled account primarily invested in bonds. Balanced funds are pooled accounts invested in both stocks and bonds. They are classified into two subcategories: target-date funds and non-target-date balanced funds. A target-date fund typically rebalances its portfolio to become less focused on growth and more focused on income as it approaches and passes the target date of the fund, which is usually included in the fund's name. Non-target-date balanced funds include asset allocation or hybrid funds, in addition to lifestyle funds.¹⁸ Company stock is equity in the 401(k) plan's sponsor (the employer). Money funds consist of those funds designed to maintain a stable share price. Stable-value products, such as GICs¹⁹ and other stable-value funds,²⁰ are reported as one category. The *other* category is the residual for other investments, such as real estate funds. The final category, *unknown*, consists of funds that could not be identified.²¹

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Endnotes

¹ Because of these changes in the cross sections, comparing average account balances across different year-end cross-sectional snapshots can lead to false conclusions. For example, newly formed plans would tend to pull down the average account balance but would tell us nothing about consistently participating workers. Similarly, the aggregate average account balance would tend to be pulled down if a large number of participants retire and roll over their account balances.

² Account balances are net of unpaid loan balances.

³ This number is lower than it would have been if it merely reflected employee turnover and retirement. For example, if 401(k) plan sponsors change their service providers, all participants in those plans would be excluded from the consistent sample.

⁴ For the report on the year-end 2010 EBRI/ICI 401(k) database, see Holden et al. 2011.

⁵ Tenure refers to years at the current employer and is generally derived from date of hire reported for the participant. Tenure will not reflect the years of participation in the 401(k) plan if the 401(k) plan was added by the employer at a later date or if there are restrictions on participating in the 401(k) plan immediately upon hire.

⁶ The cross-sectional EBRI/ICI 401(k) database also shows that younger participants and those with shorter tenures tend to have lower 401(k) balances than those who are older or have longer tenures. See Holden et al. 2018a.

⁷ Contribution amounts and contribution rates tend to increase with age and earnings. See Figures A3 and A4 in Brady and Bass 2020 or data tables in Internal Revenue Service, Statistics of Income Division 2020.

⁸ At year-end 2018, 57 percent of non-target-date balanced fund assets were assumed to be invested in equities (see Investment Company Institute, Quarterly Supplementary Data). The allocation to equities in target-date funds

varies with the funds' target dates. For target-date funds, investors were assumed to be in a fund whose target date was nearest to their 65th birthday. Allocation to equities in target-date funds is assumed to vary with investor age. The equity portion was estimated using the industry average equity percentage for the assigned target-date fund, which was calculated using the Morningstar Lifecycle Allocation Indexes (see Morningstar 2019).

⁹ For a description of the investment options, see page 16.

¹⁰ See Holden and Schrass 2020.

¹¹ For statistics indicating the higher propensity of withdrawals among participants in their sixties, see Holden and VanDerhei 2002. In addition, nonhardship withdrawals, which are generally limited to employees who are aged 59½ or older, constitute a majority of all withdrawals (see Alling, Clark, and Stinnett 2020).

¹² Data from the ICI Survey of Defined Contribution Plan Recordkeepers find that DC plan participants generally stayed the course through the financial crisis and ensuing years. During each year from 2010 through 2019, fewer than 3 percent of DC plan participants stopped contributing to their 401(k) plan accounts. Some of these participants may have stopped contributing because they reached the contribution limit. See Holden and Schrass 2020 for DC plan participants' annual activities between 2008 and 2019. For an analysis of contribution activity during the bear market of 2000–2002 using the cross-sectional EBRI/ICI 401(k) databases, see Holden and VanDerhei 2004. The analysis finds that, overall, 401(k) participants' contribution rates were little changed in 2000, 2001, and 2002 when compared to 1999. On average, 401(k) participants' contribution behavior does not appear to have been materially affected by the bear market in equities from 2000 through 2002, whether measured in dollar amounts or percentage of salary they contributed.

¹³ See Holden and Schrass 2020.

¹⁴ For the complete update from the year-end 2016 EBRI/ICI 401(k) database, see Holden et al. 2018a. Data since year-end 2016 continue to be processed, and some preliminary results have been included in this paper.

¹⁵ The EBRI/ICI 401(k) database environment is certified to be fully compliant with the ISO-27002 Information Security Audit standard. Moreover, EBRI has obtained a legal opinion that the methodology used meets the privacy standards of the Gramm-Leach-Bliley Act. At no time has any nonpublic personal information that is personally identifiable, such as a Social Security number, been transferred to or shared with EBRI.

¹⁶ Account balances are net of unpaid loan balances. Thus, unpaid loan balances are not included in any of the eight asset categories described.

¹⁷ This system of classification does not consider the number of distinct investment options presented to a given participant, but rather, the types of options presented. Plan Sponsor Council of America 2019 indicates that in 2018, the average number of investment fund options available for participant contributions was 19 among the 608 plans surveyed. BrightScope and Investment Company Institute 2020 reports an average of 28 investment options in 2017, and an average of 21 investment options when a target-date fund suite is counted as a single investment option.

¹⁸ Lifestyle funds maintain a predetermined risk level and generally use words such as “conservative,” “moderate,” or “aggressive” in their name to indicate the fund’s risk level. Lifestyle funds generally are included in the non-target-date balanced fund category.

¹⁹ GICs are insurance company products that guarantee a specific rate of return on the invested capital over the life of the contract.

²⁰ Other stable-value funds include synthetic GICs, which consist of a portfolio of fixed-income securities “wrapped” with a guarantee (typically by an insurance company or a bank) to provide benefit payments according to the plan at book value.

²¹ Some recordkeepers supplying data were unable to provide complete asset allocation detail on certain pooled asset classes for one or more of their clients. The final EBRI/ICI 401(k) database includes only plans for which at least 90 percent of all plan assets could be identified.