

A Closer Look at 401(k) Plan Target Date Fund Investors' Account Balance Asset Allocations Over Time

By Sarah Holden, ICI; Emily Williams, ICI; Steven Bass, ICI; and Craig Copeland, EBRI

Key Findings:

Drawing from the EBRI/ICI 401(k) database, this paper follows a group of consistent 401(k) plan participants over a six-year period. A few key insights emerge from looking at the 0.7 million consistent 401(k) plan participants who were fully invested in target date funds (TDFs) as of year-end 2016:

- **Most consistent 401(k) participants who were fully invested in TDFs remained fully invested.** Among participants who were 100 percent invested in TDFs at year-end 2016, 85 percent remained fully invested in TDFs through year-end 2022.
- **When moving away from TDFs, participants in their 60s were the most likely to completely exit TDFs.** In contrast, when moving away from TDFs, younger participants were more likely to reduce their TDF holdings rather than exit completely.
- **When moving away from TDFs, older 401(k) participants typically made larger adjustments to their equity allocations than younger participants.** For example, among 401(k) participants in their 60s who moved away from TDFs, 47 percent increased their equity allocation by 20 percent or more and 32 percent decreased their equity allocation by 20 percent or more.

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Because the annual cross-sections cover individuals with a wide range of participation experiences in 401(k) plans, meaningful analysis of the evolution of TDF investments for individual 401(k) participants must examine their 401(k) plan accounts over multiple years. Drawing from the 2.1 million consistent 401(k) plan participants in the EBRI/ICI 401(k) database with account balances from year-end 2016 through year-end 2022, this paper focuses on the 0.7 million consistent 401(k) plan participants who had a 100 percent allocation to TDFs at year-end 2016 and tracks their asset allocation to TDFs and other assets from 2016 to 2022.

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Introduction

Target date funds (TDFs) play a central role in the U.S. retirement system as a widespread investment option in 401(k) plan lineups and the most common default investment option in 401(k) plans. They offer a professionally managed, diversified portfolio that rebalances to become less focused on growth and more focused on income as the fund approaches and passes its target date. Most 401(k) plans offer a suite of TDFs as options that are suitable for typical retirement savers, while preserving flexibility for 401(k) participants who want to make their own active allocation decisions.

The question then arises, how do 401(k) plan participants actually engage with TDF investments? More specifically, do TDF investors tend to remain invested in their TDFs, or do they take advantage of the flexibility offered and trade out of their TDFs to customize their asset allocation?

Annual snapshots from the EBRI/ICI 401(k) database reveal that a majority of 401(k) plan participants hold TDFs, whether by active choice or accepting them as a default. Investors in TDFs appear to value the hands-off diversification and rebalancing that occur within the TDF. At the same time, some have questioned whether such glide paths constrain investors—particularly those nearing retirement—who would otherwise prefer to personalize their asset allocation.

This paper follows a group of consistent 401(k) plan participants over a six-year period to explore the persistence or flexibility of their TDF use. By focusing on observed investment behavior over an extended period, this analysis provides new insight into how TDFs are used in practice. At year-end 2016, 36 percent of 401(k) plan participants in the consistent sample had 100 percent of their accounts invested in TDFs (full-TDF investors). Most (85 percent) of these full-TDF investors continued to be full-TDF investors through year-end 2022, the end of the study period, and 15 percent made reallocations. This study additionally documents whether the 401(k) participants who moved away from full-TDF investment changed their equity exposure.

Most of the 401(k) participants who were fully invested in TDFs at year-end 2016 remained fully invested in TDFs for many years. Nevertheless, a subset made substantial allocation changes—particularly as participants approached retirement—perhaps reflecting a more individualized or personalized asset allocation approach. Taken together, the results offer a more nuanced view of TDF use, one that highlights both the durability of TDFs and the presence of meaningful variation in participant behavior over time.

Background: Rising Use of TDFs

TDFs follow a glide path designed to manage a diversified asset allocation, gradually shifting away from a focus on growth toward income over time as the fund approaches and passes its target date.¹ They have gained significant traction in 401(k) plans, both as default investment options and through 401(k) participant choice. The growth in TDF use reflects a combination of regulatory developments, 401(k) plan design innovations, and 401(k) plan participant behavior.

In terms of regulatory developments,² the Pension Protection Act of 2006 (PPA), along with subsequent Department of Labor (DOL) regulations, provided legal clarity and fiduciary support for innovations in 401(k) plan design—particularly around default investment options and automatic enrollment.³ More specifically, the PPA directed the DOL to develop guidelines for diversified default investments (the investment option into which a participant's contributions would be placed, in the absence of other investment instructions from the participant) that would receive some protection under ERISA's fiduciary standards. As a result, in 2007, the DOL issued guidance that indicated balanced funds, TDFs, and professionally managed accounts could be used as qualified default investment alternatives (QDIAs).⁴ Although TDFs

had been available since 1994, they quickly became the most popular QDIA, likely because of their intuitive, age-based investment approach.

401(k) plan design has also evolved significantly over the past few decades with the goal of helping more workers save and invest for retirement. Employers (or plan sponsors) have increasingly adopted auto-enrollment⁵ to boost participation rates in 401(k) plans⁶ and have commonly designated TDFs as the default investment for automatically enrolled participants.⁷ In addition to serving as defaults, TDFs have also become a standard option within many plan investment lineups.⁸ Indeed, by year-end 2022, 85 percent of 401(k) plans in the EBRI/ICI 401(k) database offered TDFs in their investment lineup.⁹

Finally, 401(k) plan participants have increasingly embraced TDF investing. As of year-end 2022, 68 percent of 401(k) plan participants held TDFs, and 38 percent of 401(k) plan assets were invested in TDFs.¹⁰ Prior EBRI/ICI research also shows that participants tend to use TDFs as intended: among those holding TDFs at year-end 2018, 88 percent had allocated their entire account balance to a single age-appropriate TDF.¹¹

Despite the well-documented popularity of TDFs¹² and the tendency of 401(k) participants to remain in default investments at least over the first few years in the 401(k),¹³ it is still unclear how long individual participants stay invested in TDFs over the course of their careers. Several factors may influence whether a 401(k) participant remains in the same TDF:

- **Changes made by plan sponsors:** Employers may switch recordkeepers, update their investment lineups, or select new default investments. When this happens, participants can be automatically mapped to a different TDF, or even to a non-TDF option, without making an active choice.
- **Job changes or retirement:** The U.S. work force is highly mobile.¹⁴ When workers change jobs or retire, they often roll over their 401(k) balances into individual retirement accounts (IRAs) or a new employer's plan.¹⁵ These rollovers frequently result in changes to the participant's investment allocations, including potential changes in TDF allocations.¹⁶
- **Participant-driven reallocation:** 401(k) participants, whether they were originally defaulted into TDFs or actively chose TDFs, may later decide to adjust their asset allocation. These decisions—reflecting changing financial goals or a desire for more control over or personalization of their asset allocations—can result in a move away from TDF investments.

This paper focuses on the third factor by examining the evolving role of TDFs among the 0.7 million consistent 401(k) plan participants who had a full-TDF allocation (whether by active choice or default) at year-end 2016.¹⁷ Tracking the asset allocations of these full-TDF investors provides some insight into the persistence of TDF investments among ongoing 401(k) plan participants over time (specifically, from year-end 2016 through year-end 2022).

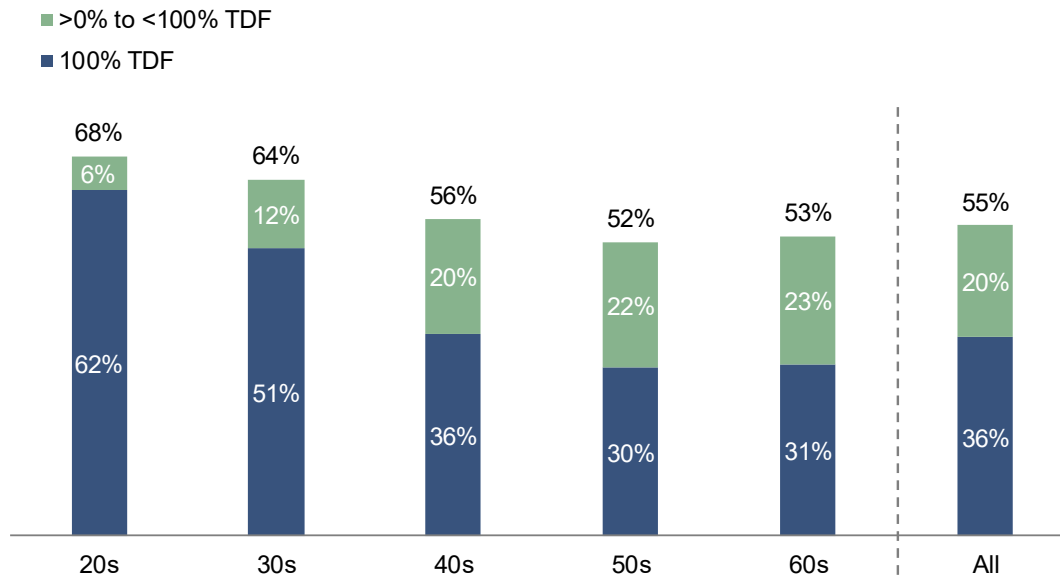
Consistent 401(k) Plan Participants' Use of TDFs

The EBRI/ICI 401(k) database, built from administrative records of 401(k) plans, offers a broad snapshot of plan participants at the end of each year. It includes a wide range of workers—from recent hires, whether younger or older, to longer-tenured employees—and allows for detailed cross-sectional analysis.¹⁸ However, these annual snapshots have limitations when it comes to studying how individual participants manage their investments over time, such as long-term decisions involving TDFs. This is because the composition of the database changes every year: the selection of data providers and sample of plans using a given provider vary and 401(k) participants join or leave plans.¹⁹ As a result, changes observed in the full database do not necessarily reflect the behavior of individual participants over time.

To address the limitations inherent in snapshots, the analysis in this paper uses a longitudinal panel of consistent participants—those who maintained accounts continuously from year-end 2016 through year-end 2022. Among the 2.1 million consistent 401(k) plan participants in the EBRI/ICI 401(k) database who maintained 401(k) accounts from year-

end 2016 to year-end 2022,²⁰ 55 percent held some TDFs and 36 percent (0.7 million) were full-TDF investors at year-end 2016 (Figure 1).

Figure 1
Majority of Consistent Participants Hold Target Date Funds
 Percentage of consistent participants holding target date funds by age, year-end 2016



Note: The sample is 2.1 million consistent 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age groups are based on participant age at year-end 2016.

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

This study focuses on the asset allocation choices of the 0.7 million consistent 401(k) participants who were full-TDF investors at year-end 2016.²¹ These individuals remained in the database each year through year-end 2022, allowing for a longitudinal assessment of investment behavior while removing the effects of 401(k) participants and plans entering or exiting the database. By focusing on this group, this paper can shed light on TDF investments over time, and the broader implications for retirement investment strategies. As plan sponsors, financial services firms, policymakers, and individual retirement savers consider the role of TDFs in 401(k) plan participants’ retirement investment strategies, it is important to understand whether 401(k) plan participants are persistent TDF investors or choose to step off the TDF glide path and personalize their asset allocations at some point in time.

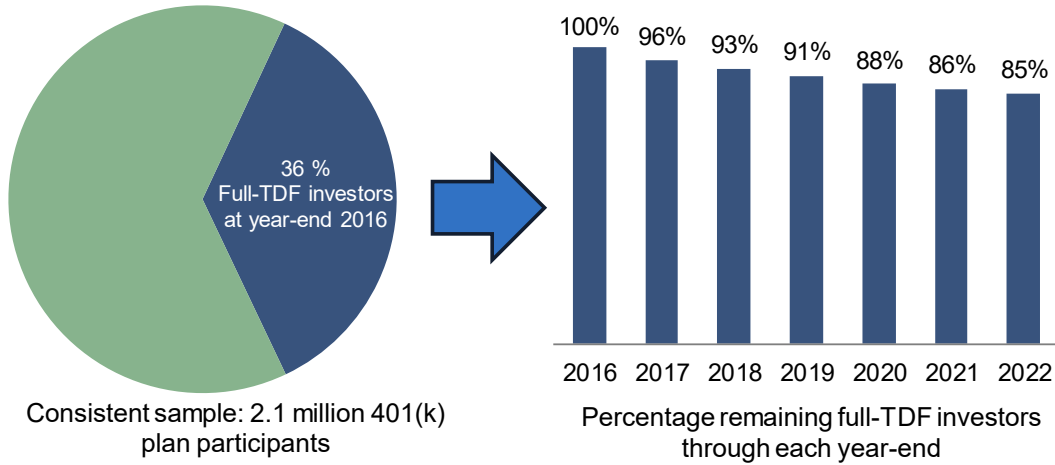
Ongoing 401(k) Participants Tend to Remain Invested in TDFs

A large majority of consistent 401(k) participants who were full-TDF investors at year-end 2016 continued to be full-TDF investors at each year-end from 2017 through 2022. Among the consistent 401(k) plan participants who were full-TDF investors at year-end 2016, 96 percent were still full-TDF investors at year-end 2017, and 85 percent remained full-TDF investors through year-end 2022 (Figure 2).²² Two caveats apply, both of which may lead to an overstatement of persistence in holding a specific TDF. First, 401(k) participants who invested in and exited TDFs prior to year-end 2016 are excluded from the sample and are hence not counted as lacking persistence. Second, reallocations within a given year or between different TDFs within a 100 percent TDF allocation are not captured in the EBRI/ICI 401(k) database, so such changes appear as continuous TDF use.

Figure 2

401(k) Participants Tend to Remain in Target Date Funds

Share of consistent 401(k) participants with a full-TDF allocation, year-end



Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The consistent sample is 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022; 0.7 million of these consistent 401(k) plan participants had a full-TDF allocation at year-end 2016.

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

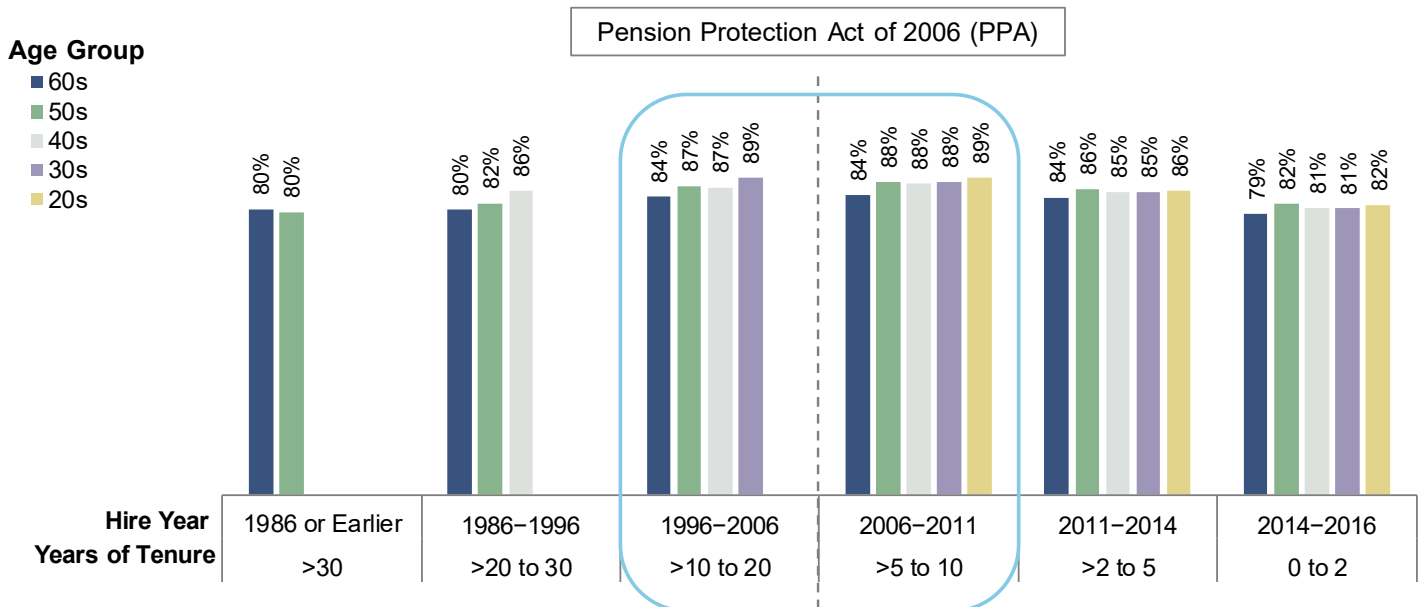
Mid-Tenured 401(k) Participants Are Most Likely to Remain Fully Invested in TDFs

Among consistent 401(k) plan participants who were full-TDF investors at year-end 2016, those with mid-level job tenure are the most likely to remain fully invested in TDFs through year-end 2022. For example, among full-TDF investors in their 50s at year-end 2016, 88 percent of those with five to 10 years of tenure remained fully invested in TDFs through year-end 2022 (Figure 3). This compares with 82 percent of those with two years or less of tenure and 80 percent of those with more than 30 years of tenure.

Figure 3

Mid-Tenured Participants Are Most Likely to Remain Fully Invested in Target Date Funds

Share of consistent 401(k) participants who had a full-TDF allocation at every year end among those who had a full-TDF allocation at year-end 2016 by age and hire year/years of tenure



Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The sample is 0.7 million consistent 401(k) participants who were fully invested in target date funds at year-end 2016, drawn from the 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

This pattern of TDF retention among 401(k) participants may reflect a combination of factors, including when investment decisions were typically made, how they evolved over time, and the age of the 401(k) plan participant.

For instance, differences in the timing of these initial decisions may help explain variation in TDF persistence across tenure groups. Longer-tenured 401(k) participants at year-end 2016 (those with more than 10 years of job tenure) began their employment before the passage of the PPA, a period when TDFs were not as widely offered in 401(k) plans—either as default investments²³ or as options in the investment lineup.²⁴ As a result, longer-tenured participants who were fully invested in TDFs at the beginning of the observation period are more likely to have actively selected that allocation, rather than passively through plan design. Additionally, if the bulk of investment allocations occur at the point of new employment, then longer-tenured 401(k) participants are more likely to be further in time from their original investment choice than shorter-tenured 401(k) participants. As a result, longer-tenured participants are more likely to have had the opportunity to revisit and affirm their investment choices. Hence, the full-TDF allocation at the time of entering the sample is more likely to have been a deliberate choice.

As a result of these two factors, full-TDF 401(k) participants with longer tenure were more likely to have either actively chosen the allocation initially and/or deliberately decided to remain in it. Consequently, they may be more inclined to continue to hold that intentional allocation over time.

While these timing-related factors may contribute to higher TDF retention among longer-tenured participants, there is also a competing effect within the longest tenure group. Participants with the longest tenure are also more likely to be older²⁵ and approaching retirement—a time when individuals often reassess their portfolios to better align with their anticipated income needs.²⁶ This life-stage-driven adjustment may reduce TDF retention rates among the longest-tenured group.

When Moving Away From Full-TDF Investment, Older 401(k) Participants Are Most Likely to Completely Exit TDFs

Of the consistent 401(k) plan participants who were full-TDF investors at year-end 2016, the oldest participants were the most likely to move away from a full-TDF allocation (Figure 4, upper panel).²⁷ This trend is driven by participants in their 60s completely exiting TDFs when moving away from the full allocation (Figure 4, middle panel).

This pattern is consistent across tenure groups, suggesting that regardless of how long an individual has been with their employer, age itself is a consistent predictor of TDF investment exits. For example, among full-TDF investors at year-end 2016, 11 percent of those in their 60s at year-end 2016 moved to a 0 percent TDF allocation by year-end 2022, whereas only about 5 percent of all other age groups moved to a 0 percent allocation during this period.²⁸ These findings suggest that the decision to completely exit TDFs is likely age-driven. Put differently, while mid-tenured 401(k) participants exhibited higher retention rates possibly as a result of an active investment choice by year-end 2016, older participants' likelihood of exiting TDFs appears unrelated to when they initially entered the plan. Instead, it is likely that the desire for greater portfolio flexibility and customization or personalization as retirement approaches may be the primary driver of the tendency to move away from a full-TDF allocation.

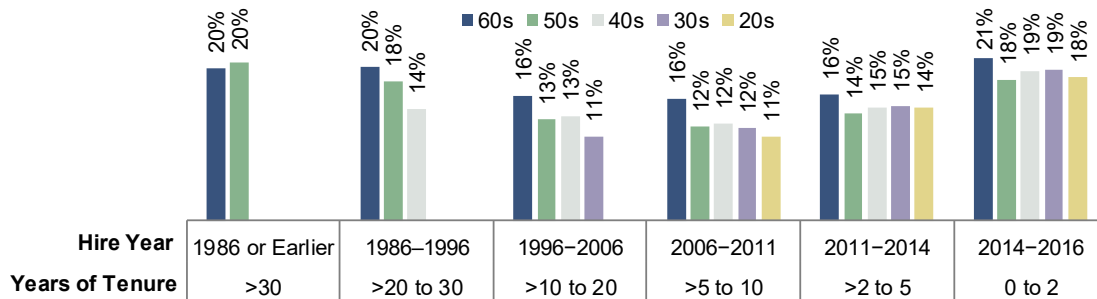
Focusing on the oldest participants further highlights this trend. Across all tenure groups, when older 401(k) participants adjusted their TDF allocations, they were more likely to eliminate TDFs from their portfolios entirely, rather than shift to a partial allocation (Figure 5). These findings align with established research on investment behavior as individuals age and approach retirement. At this point in the life cycle, financial needs in retirement become more imminent and salient, prompting individuals to actively adjust their portfolios to better align with their specific income needs, risk tolerance, and time horizons.²⁹ Hence, older 401(k) participants often seek greater control over their asset allocation, which could lead them to move away from TDFs, which do not allow for customization beyond their predetermined glide path.

Figure 4

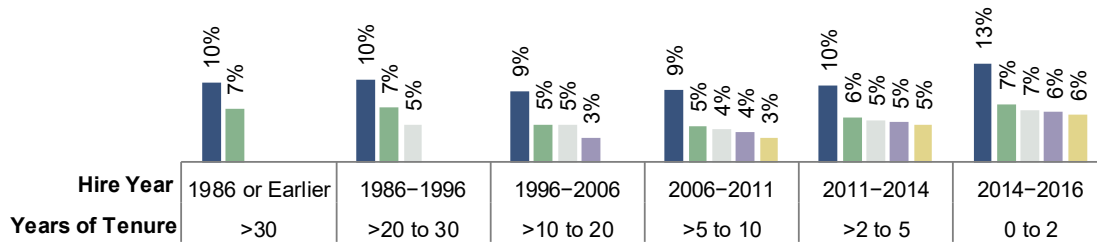
Older Participants Are Most Likely to Completely Exit Target Date Funds

Share of consistent 401(k) participants who had a full-TDF allocation at year-end 2016 by participant age and hire year/years of tenure

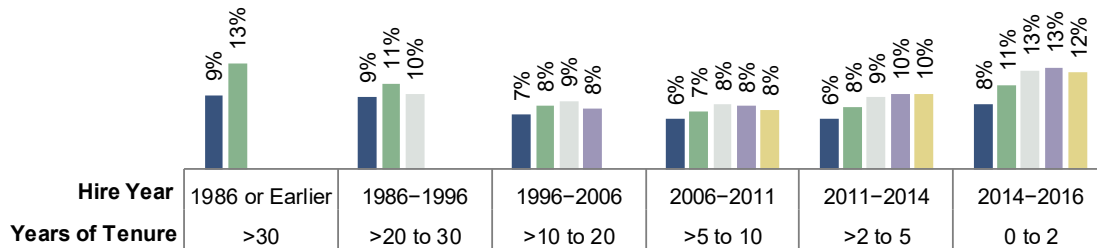
Left a Full-TDF Allocation (Total)



Moved to a 0 Percent TDF Allocation



Moved to a 1-99 Percent TDF Allocation



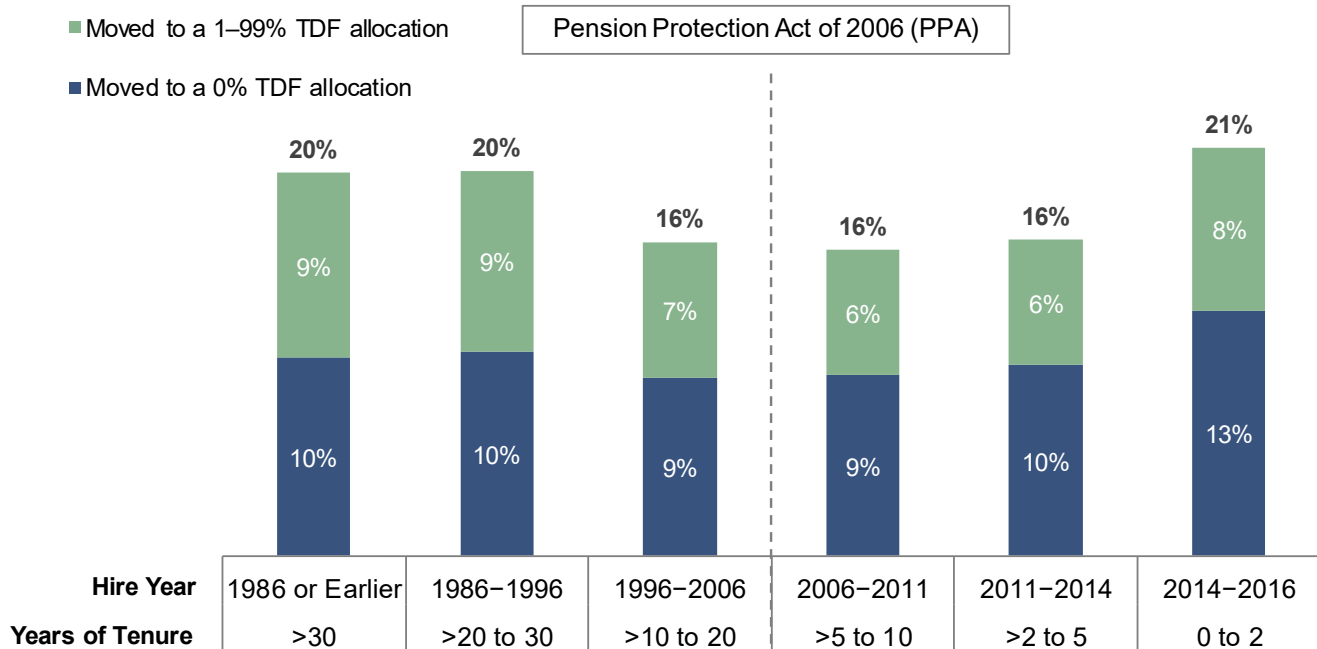
Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The sample is 0.7 million consistent 401(k) participants who were fully invested in target date funds at year-end 2016, drawn from the 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

Figure 5

Across All Tenure Groups, Older Participants Are Most Likely to Completely Exit Target Date Funds

Share of consistent 401(k) participants in their 60s at year-end 2016 who had a full-TDF allocation at year-end 2016 by hire year/years of tenure



Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The sample is consistent 401(k) participants in their 60s who were fully invested in target date funds at year-end 2016, drawn from the 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

401(k) Participants Who Move Away From a Full-TDF Position Tend to Adjust Their Equities Allocations

TDFs follow a structured glide path that gradually reduces equity exposure as the fund approaches and passes its target date, aligning with investors’ expected transitions into retirement. When 401(k) participants move away from a full-TDF allocation, they step outside this preset path—leading to more varied equity allocations that likely reflect diverse individual preferences, financial goals, and risk tolerances. Older 401(k) plan participants display a wider array of allocations to equities both before and after moving away from TDFs, which suggests that older participants appreciate the flexibility of being able to personalize or customize their asset allocations.

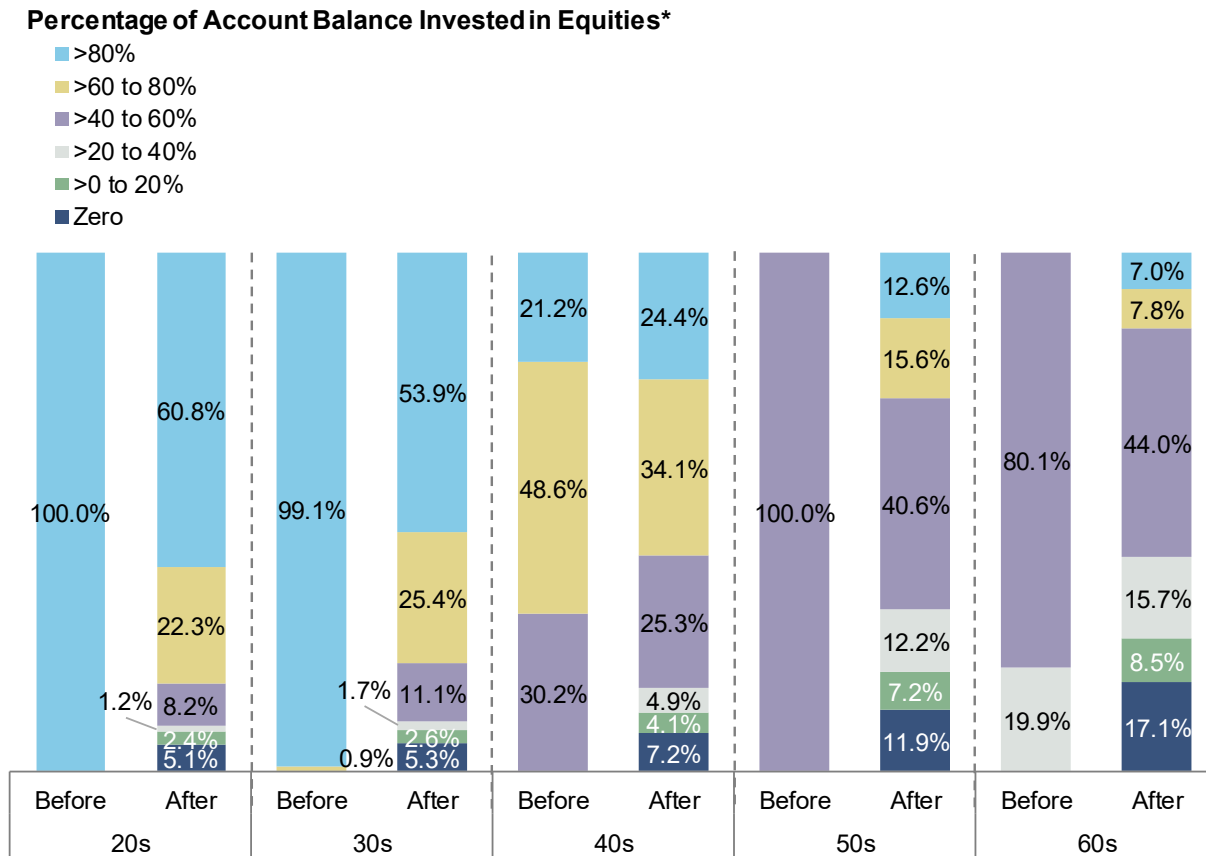
Determining a 401(k) Participant’s Allocation to Equities

Each 401(k) participant’s allocation to equities is calculated as the sum of:

- **Company stock.** The percentage of their 401(k) account balance invested in the stock of their employer.
- **Equity funds.** The percentage of their 401(k) account balance invested in equity funds.
- **Equity portion of TDFs.** The percentage of their 401(k) account balance estimated to be invested in equities through TDFs is based on the industry average asset allocation for the TDF appropriate to their age.³⁰
- **Equity portion of non–target date balanced funds.** The percentage of their 401(k) account balance estimated to be invested in equities (based on industry average asset allocation) through these balanced funds.

Figure 6 illustrates this resulting dispersion in asset allocation across age groups by documenting how estimated allocations to equity (equity funds, company stock, and the estimated equity portion of TDFs and non-target date balanced funds) shifted for participants who were full-TDF as of year-end 2016, versus as of the year they first exited a full-TDF position.

Figure 6
Participants Who Exit Target Date Funds Tend to Adjust Their Allocation to Equities
 Share of consistent participants who had a full-TDF allocation at year-end 2016 and moved away from that allocation by year-end 2022



*Equities include equity funds, company stock, and the equity portion of balanced funds. For additional detail, see the box on page 14.

Note: The sample is 0.1 million consistent 401(k) participants who had a full-TDF allocation at year-end 2016 and moved away from that allocation prior to year-end 2022. "Before" indicates the allocation to equities at the final year-end at which the participant had a full-TDF allocation. "After" indicates the allocation to equities at the first year-end at which the participant moved away from a full-TDF allocation. Age groups are based on participant age at year-end 2016.

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

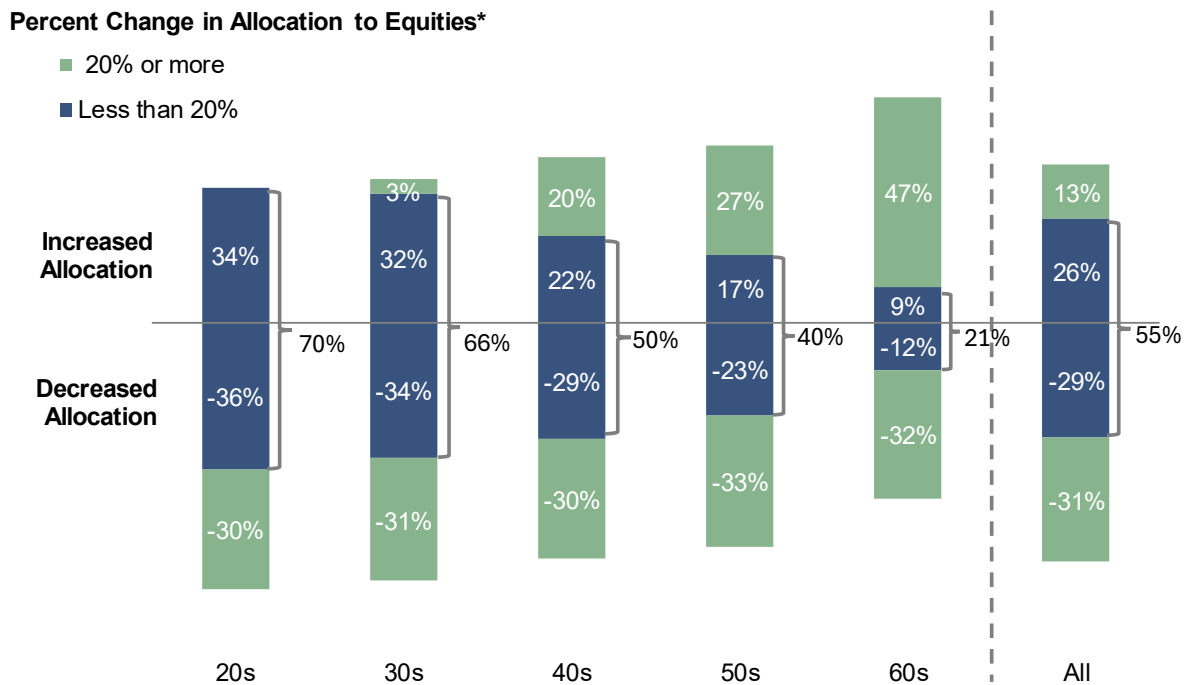
Among full-TDF consistent participants in their 20s, an estimated 100 percent had more than 80 percent of their 401(k) accounts invested in equities at the end of their last year before moving away from a full-TDF allocation ("before").³¹ Among those who moved away from a full TDF allocation, 61 percent maintained more than 80 percent of their account in equities at the year-end in which they moved away ("after") (Figure 6). Another 22 percent held between 60 percent and 80 percent in equities, while the remaining 17 percent held 60 percent or less, including 5 percent who held no equities at all.

Among older 401(k) participants, there is clear evidence of diverse reallocations. Participants in their 40s, who as a group held the widest range of pre-TDF-exit equity allocations,³² also made varied adjustments to their equity exposure

(Figure 6). Similarly, participants in their 50s initially had a much narrower distribution: 100 percent were estimated to have between 40 percent and 60 percent of their 401(k) accounts invested in equities while fully invested in TDFs. After moving away from a full-TDF allocation, 41 percent remained in that range, while 28 percent increased their equity exposure to more than 60 percent. The remaining 31 percent reduced their equity holdings to 40 percent or less, including 12 percent who held no equities at all. 401(k) participants in their 60s were distributed across a wide range of allocations to equities both when fully invested in TDFs and after.

For a majority of participants, the adjustments to their allocations to equities after leaving a full-TDF allocation were not large.³³ Overall, 55 percent of individuals had an allocation to equities after moving away from a full-TDF allocation that was within 20 percent of their allocation to equities in the year before they moved away (Figure 7). Younger participants were the most likely to make relatively modest changes: 70 percent of those in their 20s were within 20 percent of their full-TDF allocation to equities after moving away compared with 21 percent of participants in their 60s. For younger participants, some of this result is by design—the high average allocation to equities in their TDFs limits their ability to increase their equity allocation by more than 20 percent when moving away. Participants in their 60s made the largest adjustments to their allocations to equities, with 47 percent increasing their equities allocation by 20 percent or more in the year they moved, and 32 percent decreasing their equities allocation by 20 percent or more.³⁴

Figure 7
Younger Participants Who Left a Full-TDF Allocation Were More Likely to Maintain Similar Allocation to Equities
 Percentage of participants who left a full-TDF allocation by age



*Equities include equity funds, company stock, and the equity portion of balanced funds. For additional detail, see the box on page 14.

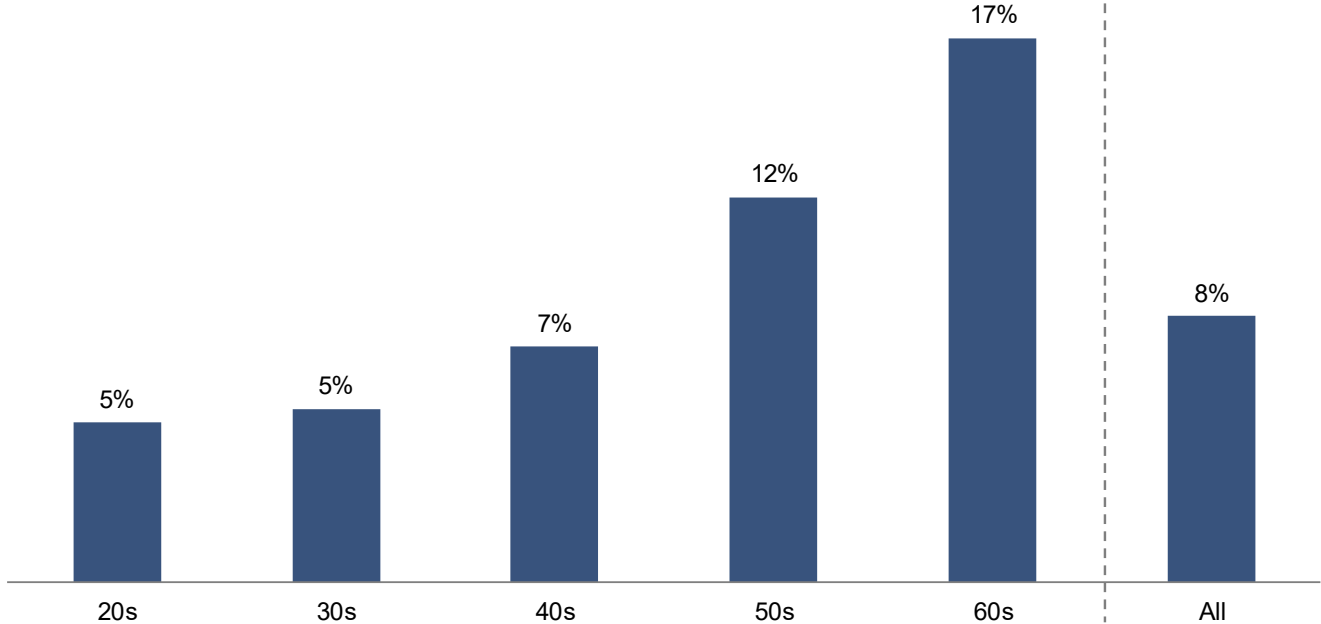
Note: The sample is 0.1 million consistent 401(k) participants who had a full-TDF allocation at year-end 2016 and moved away from that allocation prior to year-end 2022. The change in allocation to equities is calculated as the percent difference between the percentage of the participant's account balance invested in equities at the final year-end before the participant exited a full-TDF allocation compared with the following year-end. Age groups are based on participant age at year-end 2016.

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

Older participants were the most likely to exit equities entirely after moving away from a full-TDF allocation. Overall, 8 percent of full-TDF participants exited equities entirely in the year in which they left a full-TDF allocation (Figure 8). However, that rose from 5 percent of full-TDF investors in their 20s to 17 percent of full-TDF investors in their 60s. To have zero investment in equities, the 401(k) participant would have allocated none of their 401(k) balance to equity funds, target date funds, non–target date balanced funds, or company stock.

Figure 8

Older Participants Who Left a Full-TDF Allocation Were More Likely to Exit Equities Completely
 Percentage of participants who held zero equities* in the year after they left a full-TDF allocation by age



*Equities include equity funds, company stock, and the equity portion of balanced funds. For additional detail, see the box on page 14.

Note: The sample is 0.1 million consistent 401(k) participants who had a full-TDF allocation at year-end 2016 and moved away from that allocation prior to year-end 2022. Participant allocation to equities is reported for the first year-end after the participant exited a full-TDF allocation. Age groups are based on participant age at year-end 2016.

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

These shifts underscore that moving away from a TDF does not reflect a single behavior. Rather, it highlights how participants diverge from the glide path to pursue strategies likely better aligned with their individual goals—whether that means seeking higher returns, de-risking ahead of retirement, or simply wanting more control over or personalization of their asset allocations. TDFs offer diversification and rebalancing over time. And they also offer flexibility for 401(k) plan participants wanting to step off their glide path to tailor their asset allocation to their own individual goals and needs.

Overall, this analysis finds that while most 401(k) full-TDF investors display persistence in using TDFs over the six years studied, a significant minority adjust their allocations. Older 401(k) plan participants were the most likely to move away from a full-TDF allocation and had the widest variation in their allocations to equities, which highlights the importance of preserving flexibility in retirement investment options.

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.³⁵ 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 2023, 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.³⁶ For each 401(k) plan 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.³⁷ 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.³⁸

- 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: TDFs and non-target date balanced funds.
 - A TDF 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.³⁹
- 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 GICs⁴⁰ and other stable value funds,⁴¹ 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.⁴²

Appendix

Figure A1
Full-TDF Participants More Likely to Have Low Tenure

Percentage of 401(k) Participants by Tenure, Year-End 2016

	Full EBRI/ICI 401(k) Database	Consistent Participants	Full-TDF Participants
0 to 2	22	18	34
>2 to 5	21	20	25
>5 to 10	20	22	23
>10 to 20	24	28	15
>20 to 30	9	10	3
>30	5	3	1
All	100	100	100

Percentage of 401(k) Participants by Age, Year-End 2016

	Full EBRI/ICI 401(k) Database	Consistent Participants	Full-TDF Participants
20s	14	10	15
30s	24	24	28
40s	25	30	26
50s	25	29	25
60s	11	7	6
All	100	100	100

Note: The upper-panel sample is 2.1 million consistent 401(k) plan participants with account balances from year-end 2016 to year-end 2022. The lower-panel sample is 0.7 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022, and who had a full-TDF allocation at year-end 2016. Age groups are based on participant age at year-end 2016.

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

Figure A2

Recent Hires Include a Range of Worker Ages

Percentage of Consistent 401(k) Participants by Hire Year/Years of Tenure and Age, Year-End 2016

Age	Hire Year / Years of Tenure						All
	<1986 >30	1986–1996 >20 to 30	1996–2006 >10 to 20	2006–2011 >5 to 10	2011–2014 >2 to 5	2014–2016 0 to 2	
20s				7	17	23	10
30s			23	31	29	27	24
40s		39	37	29	26	24	30
50s	67	50	32	26	23	21	29
60s	33	11	8	7	6	5	7
All	100	100	100	100	100	100	100

Percentage of Full-TDF 401(k) Participants by Hire Year/Years of Tenure and Age, Year-End 2016

Age	Hire Year / Years of Tenure						All
	<1986 >30	1986–1996 >20 to 30	1996–2006 >10 to 20	2006–2011 >5 to 10	2011–2014 >2 to 5	2014–2016 0 to 2	
20s				9	18	25	15
30s			27	32	29	28	28
40s		34	33	27	25	23	26
50s	64	52	32	26	22	19	25
60s	36	14	9	6	5	4	6
All	100	100	100	100	100	100	100

Note: The upper-panel sample is 2.1 million consistent 401(k) plan participants with account balances from year-end 2016 to year-end 2022. The lower-panel sample is 0.7 million consistent 401(k) participants who were fully invested in target date funds at year-end 2016, drawn from the 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

Figure A3

Younger or Lower-Tenured Participants More Likely to Have a Full-TDF Allocation

Share of consistent 401(k) participants who had a full-TDF allocation at year-end 2016 by hire year/years of tenure

Age	Hire Year	<1986	1986–1996	1996–2006	2006–2011	2011–2014	2014–2016	All
	Tenure	>30	>20 to 30	>10 to 20	>5 to 10	>2 to 5	0 to 2	
20s					48	50	62	56
30s				23	40	47	58	42
40s			10	18	36	44	55	31
50s	11	12	20	38	44	53	30	
60s	12	15	22	38	43	49	30	
All	10	11	20	38	46	56	36	

Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The sample is 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

Figure A4

Participants Who Left a Full-TDF Allocation

Share of consistent 401(k) participants who had a full-TDF allocation at year-end 2016 by hire year/years of tenure

Left a Full-TDF Allocation (Total)

	Hire Year	<1986	1986–1996	1996–2006	2006–2011	2011–2014	2014–2016	All
	Years of Tenure	>30	>20 to 30	>10 to 20	>5 to 10	>2 to 5	0 to 2	
Age	20s				11	14	18	16
	30s			11	12	15	19	15
	40s		14	13	12	15	19	15
	50s	20	18	13	12	14	18	15
	60s	20	20	16	16	16	21	18
	All	20	17	13	12	14	19	15

Moved to a 0 Percent TDF Allocation

	Hire Year	<1986	1986–1996	1996–2006	2006–2011	2011–2014	2014–2016	All
	Years of Tenure	>30	>20 to 30	>10 to 20	>5 to 10	>2 to 5	0 to 2	
Age	20s				3	5	6	5
	30s			3	4	5	6	5
	40s		5	5	4	5	7	5
	50s	7	7	5	5	6	7	6
	60s	10	10	9	9	10	13	11
	All	8	7	5	4	6	7	6

Moved to a 1–99 Percent TDF Allocation

	Hire Year	<1986	1986–1996	1996–2006	2006–2011	2011–2014	2014–2016	All
	Years of Tenure	>30	>20 to 30	>10 to 20	>5 to 10	>2 to 5	0 to 2	
Age	20s				8	10	12	11
	30s			8	8	10	13	10
	40s		10	9	8	9	13	10
	50s	13	11	8	7	8	11	9
	60s	9	9	7	6	6	8	7
	All	12	10	8	8	9	12	10

Note: Participants with a full-TDF allocation had 100 percent of their 401(k) plan balance invested in target date funds. The sample is 0.7 million consistent 401(k) participants who were fully invested in target date funds at year-end 2016, drawn from the 2.1 million 401(k) plan participants with account balances at the end of each year from 2016 through 2022. Age and tenure groups are based on participant age and tenure at year-end 2016. The tenure variable is generally years working at current employer and thus may overstate years of participation in the 401(k) plan.

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

Figure A5

Default Investment Option Used for Automatic Deferrals

Percentage of plans with automatic enrollment

	2002	2006	2007	2008	2016	2022	2023
Stable Value Fund	31.5	19.2	6.3	2.3	2.9	1.9	0.7
Money Market Fund	25.9	6.4	1.0	1.3	7.0	1.7	1.6
Balanced Fund	22.2	14.6	16.0	13.0	14.8	6.1	6.7
Lifestyle Fund	14.8	22.8	21.0	17.9	3.8	2.8	0.7
Professionally Managed Account	N/A	3.7	4.0	2.9	6.1	2.8	2.5
Target Retirement Date	N/A	30.6	48.7	59.7	63.7	84.7	86.0
Other	5.6	2.7	3.0	2.9	1.7	N/A	1.8

N/A = not available

Source: Plan Sponsor Council of America, Annual Survey of Profit Sharing and 401(k) Plans

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Notes

¹ For detail on TDF design, see Investment Company Institute 2025a. For more background on TDFs, see also Brien et al. 2010; Holden, VanDerhei, and Bass 2021; Holden, Bass, and Copeland 2024a; Investment Company Institute 2025b; and Holden, Bass, and Copeland 2025.

² For a comprehensive background on 401(k) plans and their complex legislative and regulatory history, see Holden, Brady, and Hadley 2006. For a discussion of the Pension Protection Act (PPA) of 2006, which called for the U.S. Department of Labor

to define qualified default investment alternatives (QDIAs), see Holden and Chism 2016. For information on the regulations around (QDIAs), see U.S. Department of Labor, Employee Benefits Security Administration 2007 and 2008. See also Butrica, Dworak-Fisher, and Perun 2015, for more details on how the PPA and ensuing Department of Labor regulations affected plan structures.

³ The PPA included provisions that helped reduce key barriers to broader retirement plan participation (and improved investment outcomes). For example, it clarified legal uncertainties around automatic enrollment, enabling employers to enroll workers into 401(k) plans by default, even in the absence of an affirmative employee election. This change was particularly important for lower-wage and younger workers who often failed to opt in, and it removed concerns that automatic enrollment might conflict with state wage withholding laws. See note 2 and, in particular, Holden and Chism 2016.

⁴ See U.S. Department of Labor, Employee Benefits Security Administration 2008.

⁵ See Plan Sponsor Council of America 2024, which reports that 63.8 percent of 401(k) plans in their survey had automatic enrollment in plan year 2023, compared with 52.4 percent in plan year 2014. See also, Clark 2025.

⁶ For example, see Madrian and Shea 2001, Choi et al. 2004, and Clark 2025, which document the effects of auto-enrollment on participation rates in 401(k) plans and resulting investment allocations.

⁷ The offering of TDFs in 401(k) plans has expanded in part because increasing numbers of 401(k) plans are using automatic enrollment (see note 5), and TDFs are often the chosen default in plans with automatic enrollment. Plan Sponsor Council of America reports 31 percent of plans in their sample with automatic enrollment used TDFs as the default investment in 2006, rising to 60 percent in 2008 and 86 percent in 2023 (see Figure A5). See Plan Sponsor Council of America 2003, 2007, 2008, 2009, 2017, 2023, and 2024; and additional discussion in Holden, Salinas, Seligman, and Bass 2024.

⁸ Between 2006 and 2022, large 401(k) plans that were in MarketPro Retirement powered by BrightScope in every year added an average of seven investment options, on net, to their plan lineups, going from 22 investment options on average in 2006 to 29 in 2022. TDFs accounted for much of the net increase in the number of investment options offered. If a TDF suite is counted as a single investment option, then the number of investment options offered in consistent plans only increased, on average, from 19 options in 2006 to 20 options in 2022. See Exhibit 2.3 in BrightScope and Investment Company Institute 2025. For a similar analysis of large ERISA 403(b) plans, see Investment Company Institute and ISS Market Intelligence 2025.

Furthermore, between 2006 and 2022, large 401(k) plans that were in MarketPro Retirement powered by BrightScope in every year added an average of seven TDFs, on net, to their plan lineups, going from 2.9 TDFs, on average, in 2006 to 10.0 in 2022. See Exhibit 2.7 in BrightScope and Investment Company Institute 2025.

For a similar analysis of large ERISA 403(b) plans, see Investment Company Institute and ISS Market Intelligence 2025. See also, Holden, Bass, and Copeland 2024a.

⁹ See Holden, Bass, and Copeland 2024a.

¹⁰ See Holden, Bass, and Copeland 2024a.

¹¹ See Holden, VanDerhei, and Bass 2021.

¹² For example, see Investment Company Institute and ISS Market Intelligence 2025; BrightScope and Investment Company Institute 2025; Holden, Bass, and Copeland 2025a; and Investment Company Institute 2025.

¹³ For example, Madrian and Shea 2001 shows that a substantial fraction of 401(k) participants hired under automatic enrollment exhibit default behavior, sticking to both the default contribution rate and the default fund allocation (over the 1997–1999 period analyzed) even though very few employees hired before automatic enrollment picked this particular outcome. Choi et al. 2004 documents, for 401(k) participants, the persistence of default savings behavior over the 1997–2000 period analyzed.

¹⁴ The median tenure among American workers aged 25 or older was 4.8 years in 2024 (see Copeland and Thephasit 2025). There is also evidence of recent job change among older 401(k) participants in the EBRI/ICI 401(k) database. For example, in the sample analyzed, 23 percent of full-TDF investors with two years or less of tenure at year-end 2016 were aged 50 or older, indicating job transitions even at later stages of participants' careers (see Figure A2).

¹⁵ In 2024, 59 percent of U.S. households owning traditional IRAs indicated that their traditional IRAs contained rollovers. When surveyed about the rollover decision, many indicated that they rolled over to consolidate assets and many indicated the desire to make investment changes was a motivating factor. See Holden and Schrass 2025.

¹⁶ Copeland 2019 explores how asset allocation changes when 401(k) plan balances are rolled over to IRAs.

¹⁷ The analysis will tend to overestimate persistence in TDF investing. First, the analysis does not observe changes between TDFs (whether active or passive remapping). Second, some full-TDF investors may have already exited a full-TDF allocation before year-end 2016 and would not be counted in the analysis. See also the discussion on page TK.

¹⁸ For the research drawn from this data collection, see <https://www.ici.org/Research/Defined-Contribution-Plans/401ks/EBRIICI401kInvestorDatabase> and [https://www.ebri.org/retirement/401\(k\)-database](https://www.ebri.org/retirement/401(k)-database).

¹⁹ Because of these changes in the cross sections, comparing asset allocations across different year-end cross-sectional snapshots can lead to false conclusions. For example, new hires could show higher rates of TDF ownership but move away from them as their tenure increases. If the proportion of new hires remained stable, then the cross-sectional allocation to TDFs could also remain stable, even though individual participants were consistently changing their allocations.

²⁰ Holden, Bass, and Copeland 2024b presents the analysis of the full consistent sample of 401(k) plan participants who had accounts from year-end 2016 through year-end 2022. Holden, Bass, and Copeland 2025 presents an analysis of another consistent sample of 401(k) plan participants—those who had accounts from year-end 2019 through year-end 2023.

²¹ At year-end 2016, the demographic characteristics of the 2.1 million consistent 401(k) participants were similar to the broader EBRI/ICI 401(k) database. However, the subset of 401(k) participants who were full-TDF investors at year-end 2016 was younger and tended to have shorter job tenure relative to the full consistent sample and to the full EBRI/ICI 401(k) database (see Figure A1). This results from younger and recently hired 401(k) participants being more likely to be fully invested in TDFs (see Figure A3).

²² This analysis considers the individual 401(k) participant's allocation to the TDF category and does not distinguish any variation in the specific underlying TDF(s) held in the account.

²³ See note 7.

²⁴ See Holden, Bass, and Copeland 2024a for the rising offering and use of TDFs in the EBRI/ICI 401(k) database. See also, BrightScope and Investment Company Institute 2025 for the rising offering and use of TDFs by large 401(k) plans in MarketPro Retirement powered by BrightScope (drawing data from the Department of Labor's Form 5500 filings). For a similar analysis of large ERISA 403(b) plans, see Investment Company Institute and ISS Market Intelligence 2025.

²⁵ In the sample of full-TDF 401(k) participants analyzed, 100 percent of full-TDF 401(k) participants with more than 30 years of tenure were 50 or older at year-end 2016 (see Figure A2, lower panel). Additionally, 100 percent of full-TDF 401(k) participants who had more than 20 years of tenure were 40 or older at year-end 2016. On the other hand, less than half (46 percent) of full-TDF 401(k) participants with two or fewer years of tenure were 40 or older at year-end 2016.

²⁶ For example, see Sabelhaus, Bogdan, and Schrass 2008. Bodie, Merton, and Samuelson 1992 explain that younger individuals can consider their future work/labor income as a bond-like investment and therefore have a higher allocation to equities in their investment portfolio. Traditional IRA-owning households tend to be older than Roth IRA-owning households and tend to report higher ownership rates in fixed-income investments (annuities; bank or savings accounts; individual bonds), which may reflect their anticipated or already occurring distributions. See Figure A16 in Holden and Schrass 2025. Furthermore, in 2024, 69 percent of traditional IRA-owning households indicated they have a strategy to manage income and assets in retirement. Focus on reviewing their asset allocation as part of their strategy varied with age: 53 percent of traditional IRA-owning households younger than 35 with a strategy indicated they reviewed their asset allocation, compared with 76 percent of those aged 50 to 64 (see Figure A33 in Holden and Schrass 2025).

²⁷ See Figure A4 for additional information.

²⁸ See Figure A4.

²⁹ See note 26.

³⁰ The allocation to equities in TDFs varies with the funds' target dates. For TDFs, investors were assumed to be in a fund whose target date was nearest to their 65th birthday. Allocation to equities in TDFs is assumed to vary with investor age. The equity portion for TDFs was estimated using the industry average equity percentage for the assigned TDF, which was calculated using the Morningstar Lifecycle Allocation Indexes (see Morningstar 2022).

Although this approach misses some variation in individual TDF choice, the error is unlikely to be significant. At year-end 2018, 88 percent of TDF-holding participants in the EBRI/ICI database held a single age-appropriate TDF (see Holden, VanDerhei, and Bass 2021).

³¹ Because the specific TDFs held by participants are not observed, equity allocations while in TDFs are estimated by assuming investors were in a fund with a target date closest to their 65th birthday. The equity portion of these assumed TDFs was imputed using the industry average for that target date, based on Morningstar's Lifetime Allocation Indexes (see Morningstar 2022).

³² Consistent participants in their 40s at year-end 2016 would have ranged between 40 and 55 years old during the 2016–2022 sample period. During this age range (10 to 25 years before the target date of the fund) TDF equity allocation tends to decrease the most (see Investment Company Institute 2025a).

³³ In addition to participant-directed changes to asset allocation, the percentage of the account balance in equities is also affected by changes in the relative prices of the different holdings in a participant's 401(k) portfolio.

³⁴ This diversity in new allocation to equity is consistent with older 401(k) plan participants seeking to personalize their asset allocations as they are approaching retirement. This result is consistent with Choukhmane and de Silva 2024; and Banerjee et al. 2025.

³⁵ For the complete update from the year-end 2022 EBRI/ICI 401(k) database, see Holden, Bass, and Copeland 2024a.

³⁶ 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.

³⁷ Account balances are net of unpaid loan balances. Thus, unpaid loan balances are not included in any of the eight asset categories described.

³⁸ 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 2023 indicates that in 2022, the average number of investment fund options available for participant contributions was 21 among the 687 plans surveyed. BrightScope and Investment Company Institute 2025 reports an average of 29 investment options in 2022, and an average of 20 investment options when a TDF suite is counted as a single investment option.

³⁹ 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.

⁴⁰ GICs are insurance company products that guarantee a specific rate of return on the invested capital over the life of the contract.

⁴¹ 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.

⁴² 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.