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Age, evolving allocation preferences, and the case for personalized solutions

In the Spotlight

Key Insights

- Inertia, inattention, and other cognitive challenges—not risk aversion—deter stock market participation. Absent these barriers, equity holdings align with traditional life-cycle models.
- Preferred asset allocations and financial circumstances become more diverse with age. Personalized retirement solutions could meet the needs of older participants.
- High fees and lack of engagement from participants could limit the benefits of personalization.

Older investors have more diverse asset allocation preferences and savings levels than younger participants, making them suitable candidates for personalized retirement solutions.

Target date solutions with their age-based glide paths offer tailored investment allocations to retirement investors. But several studies (Aboagye et al. 2024; Li and Webb 2012; Tang and Lin 2015; Janssen et al. 2013; Drew and West 2021; Duarte et al. 2022) have suggested that target date strategies can be improved through further personalization. For example, investors could be transitioned to a managed account at a certain age and offered more customized asset allocations. Retirement investors could also personalize their investments by working with financial professionals or by doing it themselves. The impact of such personalization on participant outcomes will depend on several factors, including investment expertise, underlying fees, and the willingness among participants to share their personal information among others.

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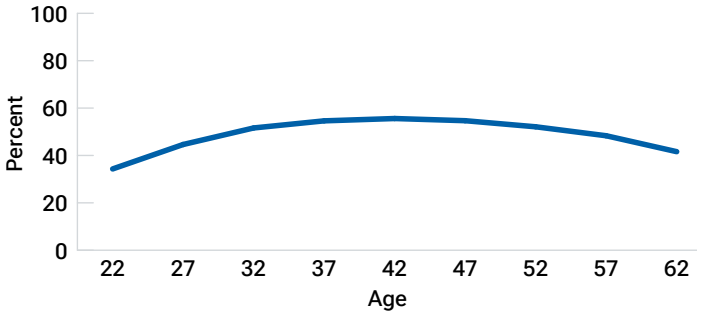
In this paper, we argue that the benefits of personalization increase with age. Younger investors are very similar in terms of their savings and risk preferences. Older investors, however, are a lot more diverse in their asset allocation preferences and investment goals. This is reflected in their investment behavior. Offering professional investment help to achieve their desired personalization could be beneficial.

Theory versus reality

Economic theory suggests that all investors should hold equities when there is a positive equity premium. Yet many investors avoid stocks entirely, while others maintain lower equity shares[1] than what economic models and typical target date glide paths recommend. For example, Figure 1 shows the average equity share among 401(k) participants on T. Rowe Price's recordkeeping platform in 2007, before target date strategies were commonplace.

Equity allocations were low before the prevalence of target date strategies

(Fig. 1) Average equity allocations in retirement plan accounts in 2007



Source: Analysis by Taha Choukhmane and Tim de Silva of data from T. Rowe Price's recordkeeping platform from December 2006 to December 2017. For full details, see Choukhmane and de Silva 2024.

Data show two important patterns. First, average equity allocations did not exceed 60% at any age. Second, the average equity share peaked in middle age, contrary to standard theories and target date allocations that favor higher equity shares for younger investors. These low equity holdings have often been interpreted as a sign that households are highly risk averse, i.e., they avoid investing in stocks because they see them as too risky. However, other reasons such as conservative investment defaults, investor inertia—such as sticking with defaults, or lack of investing knowledge could also lead to lower equity holdings. How can we determine investors' true preference for equities when observed behaviors are influenced by barriers or frictions rather than by genuine preferences?

Revealing true investor allocation preferences

An ideal experiment to uncover the preference for equities would give non-investors a portfolio of stocks and then analyze their reaction. Risk-averse individuals would be expected to sell quickly (perhaps due to the fear of losing money in the market) and move into safer options. Meanwhile, those hindered by inertia or inattention would likely keep the stocks.

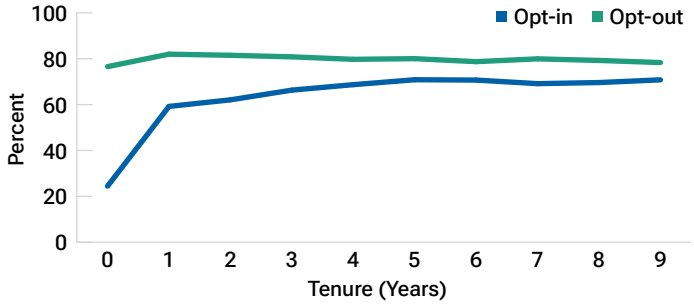
Using data from T. Rowe Price's recordkeeping platform, Choukhmane and de Silva (2024) studied a quasi-experiment that seeks to mimic this ideal experiment. The quasi-experiment compared the portfolio choices of employees hired within 12 months before employers changed the 401(k) default asset allocation to include stocks with those hired within 12 months after the change.

The sample included 191 firms that changed their 401(k) plan defaults between 2006 and 2017, from an opt-in regime (no stock exposure by default) to an opt-out regime with automatic enrollment (AE) and a target date strategy as the default investment (with positive stock exposure). The control group (opt-in) consisted of 40,337 employees hired within 12 months before the change, and the treatment group (opt-out) consisted of 52,400 employees hired in the 12 months following the change (see Choukhmane and de Silva 2024 for full details). For the rest of this paper, we refer to the employees as investors or participants interchangeably.

As shown in Figure 2, the equity allocation chosen by investors in the opt-out and opt-in groups evolved after the change in the default at their respective firms. Investors in the opt-out group, i.e., those defaulted into target date strategies, maintained

Equity allocations of opt-in participants caught up with opt-out participants over time

(Fig. 2) Percentage equity allocations for opt-in participants versus opt-out participants



Source: Analysis by Taha Choukhmane and Tim de Silva of data from T. Rowe Price's recordkeeping platform from December 2006 to December 2017. For full details, see Choukhmane and de Silva 2024.

[1] Equity shares are constructed by multiplying the portfolio weight on each fund investment (i.e., fund holdings divided by total 401(k) balance) by the target equity share of each fund. For example, money market and pure bond funds are assigned an equity target of 0%, while balanced funds and target date funds are assigned an equity share that matches their target equity allocation share.

a relatively high allocation to equities, approximately 80%. In contrast, investors in the opt-in group started with a much lower exposure to equities but slowly and continuously moved toward the equity allocation of the opt-out group.

Estimating allocation preferences over the life cycle

To estimate how asset allocation preferences change over the life cycle, we need to identify the preferences of three groups of investors. Consider an example (Table 1) in which there are two types of 401(k) designs—opt-in and opt-out (AE). In this environment, we can divide investors into three types based on whether they participate in the stock market under each default.

- Type 1 always follows the default
- Type 2 avoids stocks regardless of the default
- Type 3 invests in stocks regardless of the default

Types 2 and 3 are "consistent" investors because their choices are not dependent on the default. For these investors, it is reasonable to assume that their choices reveal their true allocation preferences. The challenge is identifying the preferences of Type 1 investors, who always follow the default.

We found that consistent investors, whether quick or slow to move out of the default, chose similar equity shares. This suggests that the preferences of more consistent investors (i.e. those who are quick to reveal their allocation preference) and less consistent investors (i.e. those who reveal their allocation preferences later) are similar. We use this observation to assume that preferences of consistent and inconsistent investors are similar. With some additional assumptions, we then estimate investors' preferences for stock market participation and their preferred equity shares over the life cycle.[2]

As outlined on the right panel of Figure 3, the preference for stock market participation is high, over 90% on average, and remains relatively flat over the life cycle. This differs meaningfully from investors' actual stock market participation rates observed in the data (left panel of Figure 3).

In Figure 4, the right panel shows that the preferred share of stocks in the retirement portfolio is high, varies between 60% and 85%, and declines with age. This is in line with the traditional models of portfolio choices but in sharp contrast with the observed share of stocks in our data as shown on the left panel of Figure 4.

[2] See Choukhmane and de Silva 2024 for full details.

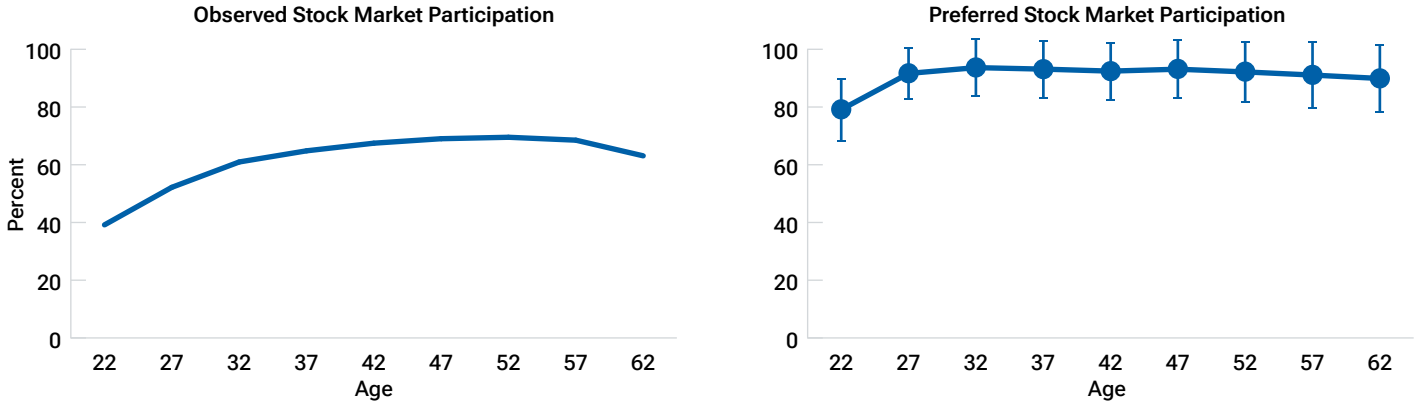
Investor classification based on stock market participation

(Table 1)

	Investor Participates in Stock Market?		
401(k) Design	Type 1	Type 2	Type 3
Opt-In	No	No	Yes
Opt-Out (AE)	Yes	No	Yes
Consistent	×	✓	✓
Prefer Stocks	?	×	✓

Estimated preferred stock market participation is high in absence of investment barriers

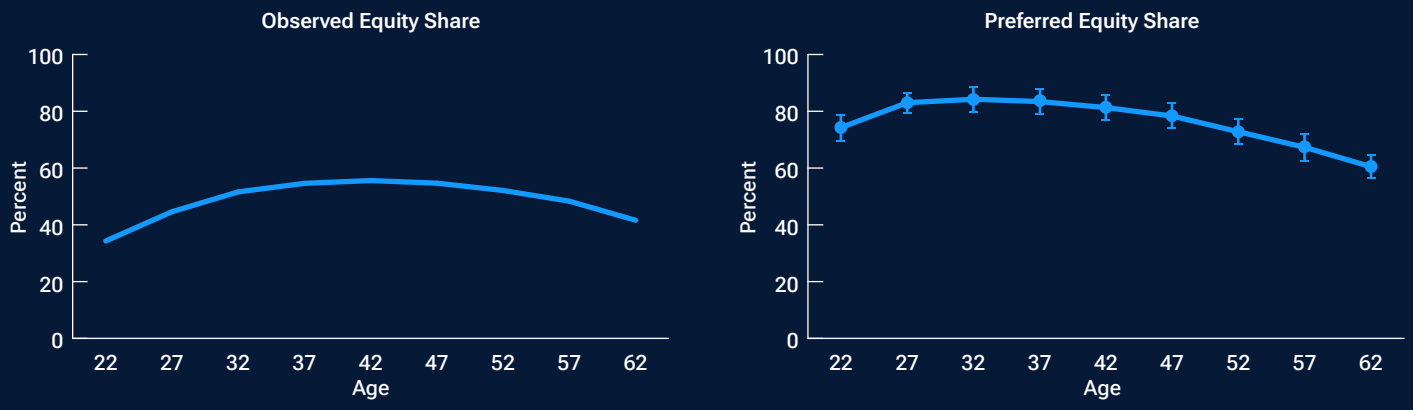
(Fig. 3) Observed and preferred stock market participation



Source: Analysis by Taha Choukhmane and Tim de Silva of data from T. Rowe Price's recordkeeping platform from December 2006 to December 2017. The analysis utilizes transition of retirement plans from opt-in defaults to opt-out with target date funds as defaults. The framework for estimating an investor's preferred stock market participation and preferred equity allocation assumes that: allocation preferences are independent of the default option, and employers select defaults without considering individual allocation preferences. Investors who participate in the stock market under default regimes genuinely prefer market participation, while no investors systematically oppose defaults. When investors actively deviate from defaults, they select their truly preferred allocations. The framework also assumes that at comparable age and tenure points, both consistent investors (who make same stock market participation decision under both defaults) and inconsistent investors (who always follow the defaults) share similar allocation preferences. For full details, see Choukhmane and de Silva 2024.

Preferred equity shares align with life-cycle models in absence of investment barriers

(Fig. 4) Observed and preferred share of stocks in retirement portfolio



Source: Analysis by Taha Choukhmane and Tim de Silva of data from T. Rowe Price's recordkeeping platform from December 2006 to December 2017. For full details, see Choukhmane and de Silva 2024.

These large differences between actual investor behavior and their estimated preferences highlight the importance of various frictions that may impede optimal stock market participation.

Changing circumstances, changing preferences

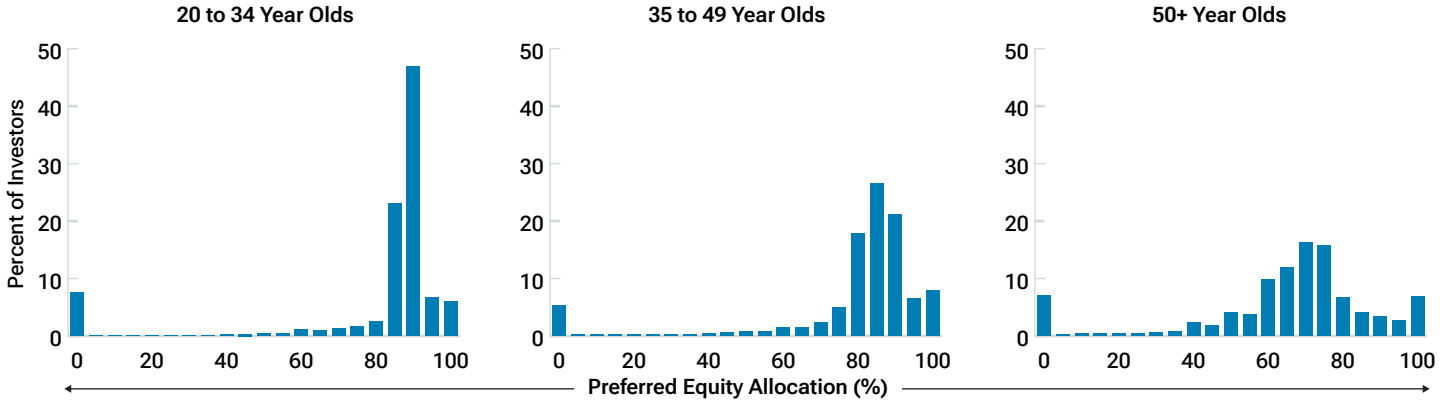
Next, we focus on the consistent investors—those whose choices are not dependent on defaults—and analyze how their estimated preference for equities varies with age. We divide the sample into three roughly equal age groups: 20–34, 35–49, and 50+.

As shown in Figure 5, heterogeneity in preferred equity allocations increases with age. Young investors (20–34) predominantly preferred a high share of equities (80%+). The middle age group (35–49) maintained high equity preferences but showed greater variation. The oldest age group (50+) displayed the most diverse preferences, with most favoring 60%–80% equities, but significant numbers at extremes—10% wanting no equities, 5% preferring all equities, and more in between. This provides a strong rationale to offer personalized asset allocations to the older group.

Investment preferences can become more heterogeneous with age due to varied experiences and life events. Differences in investment history and financial education can influence risk tolerance. Additionally, major life events such as marriage, divorce, birth of children, unemployment or job changes, health issues, etc., can have significant impacts (Goda and Streeter 2021).

Heterogeneity in allocation preferences increases with age

(Fig. 5) Estimated preferred share of equities



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While it is hard to measure exactly how and to what extent these factors impact the preference for equities, they cumulatively manifest in varying levels of accumulated assets.

We used data from the 2022 Survey of Consumer Finances (SCF) to show that the distribution of retirement assets becomes more dispersed with age. We focused on families with a reference person between ages 20 and 65, who has a defined contribution plan from their current job (reference person or spouse/partner), and positive retirement assets (capped at USD 5 million).

Our results are displayed in Figure 6, which shows the interquartile range—the difference between the 75th percentile and the 25th percentile—of retirement savings for the different age groups.

From Figure 6, it is apparent that the absolute range of savings expands with age. However, the range of savings expands in relative terms as well. The ratio of the upper to lower whisker increases from 23.83 for the youngest age group (20–34) to 31.53 for the oldest (50–65) age group.

This diversity in financial circumstances for older participants underscores the need for more personalized investment solutions. While some might want to focus on asset protection, others might aim for growth. The next section shows how this is reflected in investment behavior across different age groups.

Older investors are personalizing their allocations

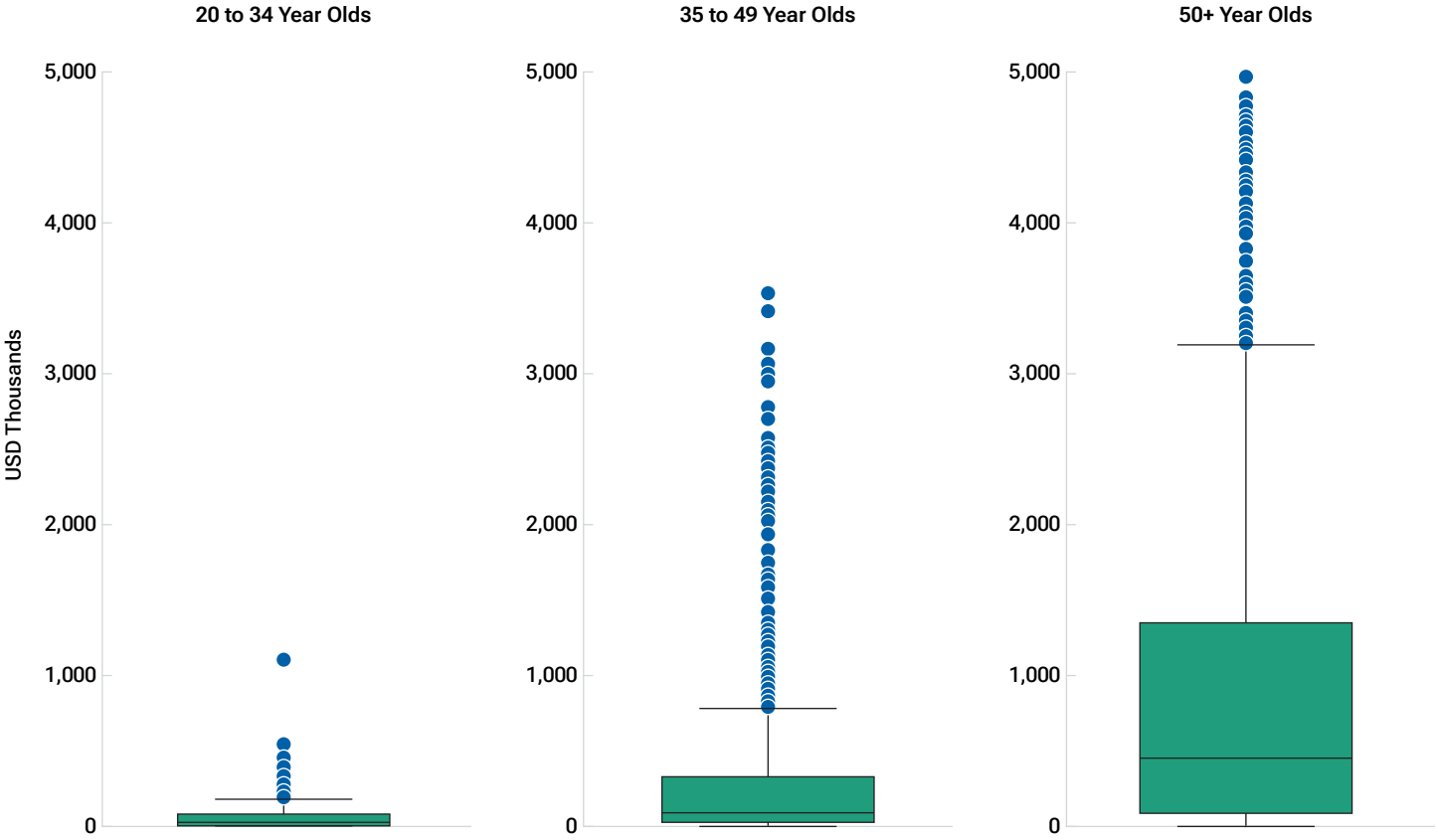
In the final section of the paper, we use data from T. Rowe Price's recordkeeping platform from 2019 to 2024 to show how investors of different ages changed their equity allocation.

We analyzed fixed panels of active retirement plan participants across the three age groups as of 2019: ages 20–34 (94,933 investors), 35–49 (133,974 investors), and 50+ (84,083 investors). We show how their equity allocation[3] shifted between 2019 and 2024. We kept the target date equity allocations fixed based on 2024 levels. This means that our analysis captured only participant-directed equity allocation changes, not those resulting from target date glide path adjustments.

[3] Equity allocation for an individual investor is constructed by first joining each of their specific holdings to equity share data from Morningstar by CUSIP/ticker, then aggregating across the holdings. Loans and settlement accounts are excluded from the calculation.

The range of retirement savings expands with age

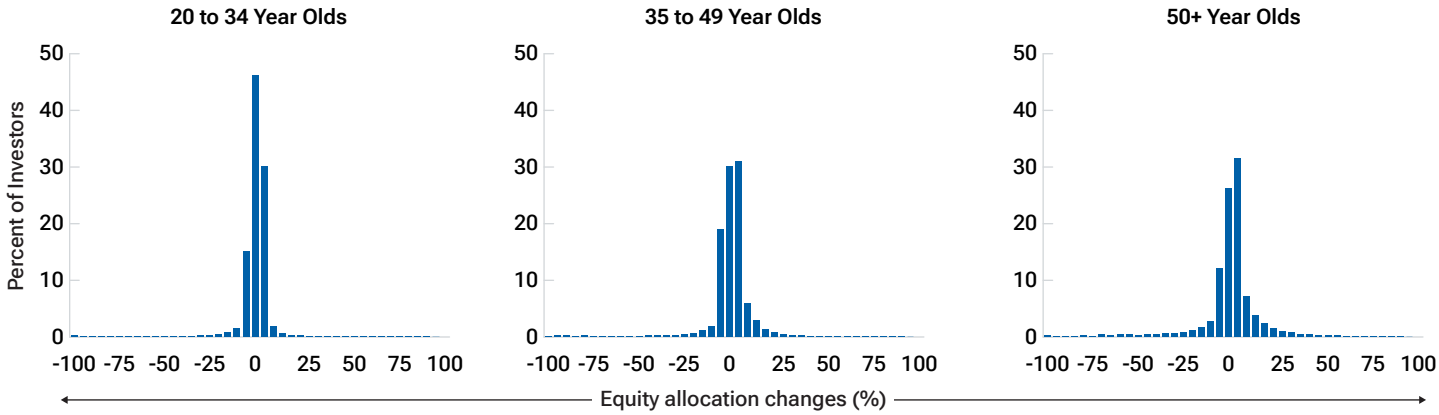
(Fig. 6) Distribution of retirement assets



Source: T. Rowe Price analysis of data from 2022 Survey of Consumer Finances. The green box represents the interquartile range between the first quartile (25th percentile) and the third quartile (75th percentile), containing the middle 50% of all savers. The horizontal line inside the box marks the median value, and the distance between the whiskers shows the full range of savings. The blue dots beyond the whiskers are considered outliers.

Older investors exhibit a wider range of equity adjustments

(Fig. 7) Equity allocation changes from 2019 to 2024



Source: T. Rowe Price retirement plan recordkeeping data as between January 2019 and December 2024.

From Figure 7, it is apparent that older investors exhibited a wider range of equity allocation changes, consistent with the notion that diverging preference for equities and financial circumstances prompt greater allocation adjustments. Table 2 offers additional interesting insights into these patterns.

Directional change in equity shares of different age groups

(Table 2)

Age	No Change (%)	Higher Equity Share (%)	Lower Equity Share (%)
20–34	46	34	20
35–49	30	44	26
50+	26	50	24

- Older investors actively adjusted their portfolios more than younger ones. 46% of investors age 20–34 kept their equity allocation unchanged, compared with only 26% of investors age 50+.
- Among those who changed their equity allocations during this period, investors across all age groups tended to increase rather than decrease their equity exposure as they aged.
- The share of investors who increased their equity allocations went up with age. 50% of investors age 50+ increased their equity share, compared with just 34% of investors aged age 20–34.

These observations suggest that older investors are trying to adjust their equity allocations more actively, often increasing their equity allocation. It is possible that many feel that they are lagging in savings and trying to catch up via a more aggressive allocation. Alternatively, some might develop a stronger preference for risk as they gain experience and become more comfortable with investing (Malmendier and Nagel 2011, 2016).

Fees and other considerations

Collectively, these findings indicate that offering professionally managed personalized investment solutions to aging retirement investors could better serve their needs and preferences. However, there are other factors, not explored in our research, that must be considered to assess the effectiveness of such investment offerings.

First, the success of these solutions hinges on participant engagement and willingness to share personal information, which may be hindered by privacy concerns. Second, personalized products might carry higher fees, raising questions about balancing cost versus benefit. Last, increased personalization might lead to excessive portfolio monitoring and trading, potentially harming returns, as documented by Barber and Odean (2001, 2008).

For a successful adoption of personalized investments—either through managed accounts offered as dynamic qualified default investment alternatives (QDIAs)[4] or working with financial professionals—fee structures must be carefully designed and be transparent. Clear communication to explain changes in default investments, their benefits, and associated costs is essential. If these challenges are properly addressed, personalized investment strategies could improve retirement outcomes for investors.

[4] A dynamic QDIA is an investment option where younger participants are initially defaulted into an age-appropriate target-date strategy, but are automatically (re)defaulted into a personalized portfolio with age (e.g. age 50) or balance triggering the transition as participants approach retirement.

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