RETIREMENT INSIGHTS

Ready! Fire! *Aim?* 2018

Updated findings from over a decade of research into real-world participant saving and withdrawal patterns

J.P.Morgan
Asset Management

ABOUT

READY! FIRE! *AIM?* SERIES

The ***Ready! Fire! Aim?*** research series is an ongoing study that analyzes how participants are engaging with defined contribution (DC) plans and how these saving and withdrawal behaviors can interact with target date fund design. Our original research, published in 2007, found participant behavior was much more varied and volatile than many target date fund providers had assumed in their asset allocation models, with significant ramifications around potential outcomes.

These trends continued to be confirmed in our subsequent research updates in 2009, 2012, 2015 and now 2018. Participants are saving too little, on average; many are taking loans, and most quickly withdraw assets after retiring. This elevated cash flow volatility has a potentially negative amplifying effect on portfolio volatility.

WHAT IS NEW FOR 2018?

Expanded data universe

This year, we evaluated an expanded participant universe that draws from MassMutual Financial Group and Empower Retirement, which together are record keepers for approximately 4,000 defined contribution plans serving more than two million participants. This more diverse and robust data set allows for a deeper analysis, with perspectives on how enrollment and salary can shape behaviors.

Higher retirement hurdle

Participants may have to accumulate even more to achieve safe retirement funding levels:

- **Replacement income targets are slightly up for the average participant.**
- **Long-term market expectations remain generally lower.**
- **The full-benefit age for Social Security continues to increase**.

Our ongoing study of how real-life participant saving patterns interact with target date design continues to show that suboptimal participant behaviors and the consequent increase in cash flow volatility remain much more prevalent than many plan sponsors might expect. In this series of articles, we discuss our findings and the steps plan sponsors can take to place participants on a path to a more secure retirement.

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RESEARCH METHODOLOGY

PARTICIPANT BEHAVIOR

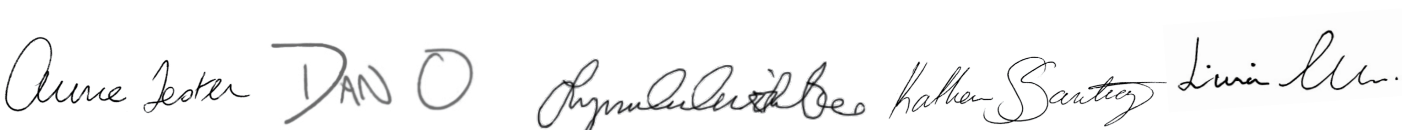
A rigorous quantitative examination of actual saving and spending patterns, drawn from approximately 4,000 DC plans with more than 2 million participants.

PROJECTED RETIREMENT OUTCOMES

Based on 10,000 portfolio simulations using the range of identified participant behavior applied a broad mix of market scenarios.

MEASURE OF SUCCESS

Number of participants who reach at least the minimum level of income replacement at retirement.



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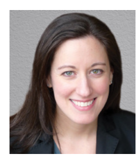

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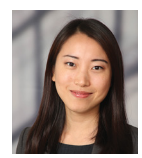

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PART ONE

The impact of automatic enrollment

THE GOOD NEWS: AUTOMATIC ENROLLMENT CONTINUES TO EXPAND ENGAGEMENT

This year's research continued to highlight that effective plan design can have a powerful impact on participant behaviors. Nowhere is this clearer than with automatic enrollment programs.

Past *Ready! Fire! Aim?* findings have consistently shown that contribution rates, on average, started too low for younger participants and increased much too slowly throughout their working careers to ensure adequate retirement funding—and these trends have gotten steadily worse over the years. With this current update, we were able to take a deeper dive into contribution patterns to evaluate how behaviors differed among three participant segments:

1. **Passive participants,** who were automatically enrolled in their plans and never made contribution changes beyond their initial default rates
2. **Subsequent shifters,** who were automatically enrolled but had a later rate change (either through automatic contribution escalation or by making a change on their own)
3. **Active engagers,** who both enrolled in their plans and set their contribution rates on their own

Approximately 62% of the plans in our study, which covered roughly 80% of the participants, utilized automatic enrollment as a way to increase participant engagement.[1] Given this broad adoption, it was unsurprising to see that more than 51% of 25-year-old participants investing in a plan were initially enrolled through an automatic enrollment default, potentially engaging participants who might not have invested in the plan otherwise. This percentage drifted lower to 36% for 45-year-old participants and to 27% for 65-year-old participants, since the bulk of many companies' new hires (i.e., the employees most likely to have been automatically enrolled) tend to be in their earlier working years.

This large percentage of younger defaulted participants suggests that plan sponsors can have an extremely positive influence by setting employees on a constructive retirement savings path while also getting them to start investing for retirement early in their careers. These participants are also typically automatically

[1] Statistics may vary depending on plan size, population base, calculation method, etc.

invested in qualified default investment alternatives (QDIAs), usually professionally managed target date funds, which research has shown often deliver stronger investment results for the average investor than if that investor had selected his or her own asset allocation.

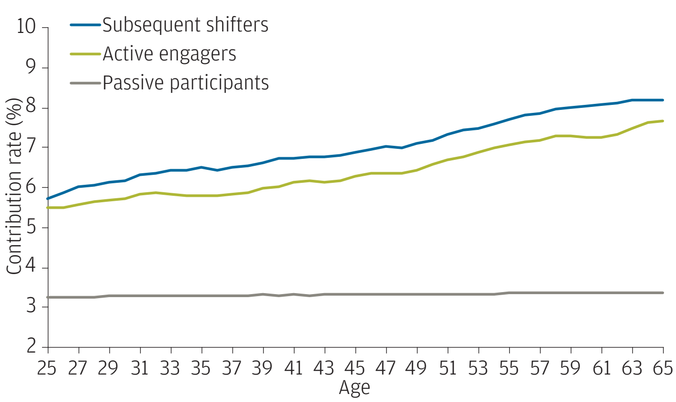
THE BAD NEWS: AUTOMATIC ENROLLMENT IS ALSO WEIGHING ON LOWER CONTRIBUTION RATE TRENDS

Unfortunately, the average contribution rate for passive participants fell significantly below those of subsequent shifters and active engagers. On average, contribution rates for:

- **Passive participants** started at a 3.3% average contribution rate at age 25 and stayed at that level across all working years
- **Subsequent shifters** started at a 5.7% average contribution rate at age 25 and increased slowly, reaching 6.9% at age 45 and 8.2% at age 65
- **Active engagers** started at a 5.5% average contribution rate and increased even more slowly, reaching 6.3% of salary at age 45 and 7.7% at age 65

Key finding: **Automatic enrollment weighing on contribution rates**

EXHIBIT 1: AVERAGE CONTRIBUTION RATES BY ENROLLMENT TYPE



Source: J.P. Morgan retirement research, 2015-17.

This means that a sizable segment of participants is starting average contributions at a minimal 3.3% rate and failing to take any action other than what the plan sponsor makes on their behalf in terms of subsequent increases. Moreover, these contributions are anchored at a level notably below the savings rate of at least 10% recommended by many industry experts.

On the plus side, **subsequent shifters** changed their contribution rates, on average, at the highest percentage amounts across all three groups, a trend that continued as the segment grew older. There also seemed to be a strong correlation between participant salary increases and positive contribution rate changes, particularly in the earlier career years.

Digging deeper into these averages reveals a wide range of contribution behaviors. Disappointedly, even at the higher end of the spectrum many participants are simply contributing far too little. This also illustrates how retirement planning averages alone may be misleading. The median numbers below show the midpoint in each segment where 50% of participants are contributing more and 50% are contributing less. There can be extremes on both sides. The strongest retirement plans need to be built to address this broad array of potential behaviors to help ensure as many participants as possible are best positioned for retirement funding success.

Key finding: **The least engaged participants contribute less**

EXHIBIT 2: CONTRIBUTION RATES BY PARTICIPANT SEGMENT

Contribution enrollment	Lower end	Median	Higher end
Passive participants	3.3%	3.3%	3.4%
Subsequent shifters	5.7%	6.9%	8.2%
Active engagers	5.5%	6.3%	7.7%

Note: All contribution rates are representative of contribution rates made by individuals age 25-65. The lower end represents the bottom 5% of contributions, while the higher end represents the top 5%.

Source: J.P. Morgan retirement research, 2015-17.

Loans

We again found that a large number of participants were taking sizable account loans. On average:

- 14% of **passive participants** borrowed 22% of their account balances
- 19% of **subsequent shifters** borrowed 18% of their account balances
- 21% of **active engagers** borrowed 18% of their account balances

It makes intuitive sense that the more engaged participants were more likely to tap into their plans for cash needs. However, across all three segments a sizable portion of assets were not invested in any given year. Our earlier papers presented how this cash flow volatility may negatively interact with market volatility.

Withdrawals

Pre- and post-retirement withdrawal trends were fairly consistent across all three segments. A range of 7% to 12% of participants over the age of 59½ withdrew, on average, 55% of assets. The majority of participants, regardless of how they enrolled in the plan, left the plan within three years of retirement. More insights into these withdrawal patterns can be found in Part three of this year's research, *Withdrawal trends*.

IMPLICATIONS FOR PLAN SPONSORS

The main takeaway from these numbers is that getting employees into the plan is a good first step. However, plans interested in positioning as many participants as possible for retirement funding success also need to lobby more aggressively for higher contribution rates, either passively through targeted communications or more explicitly by broadly implementing automatic contribution escalation programs at much higher rate increase levels than typically used today. Ultimately, the only way to be certain of safe retirement funding is to save enough. Our *2018 DC Plan Participant Survey Findings* showed that participants tend to appreciate these efforts as well, indicating high satisfaction rates with automatic enrollment and automatic contribution escalation programs, and that 80% of participants with both features expect their savings to last throughout their lifetime vs. 47% of those who were only automatically enrolled.[2]

Further, cash flow volatility remains higher and more prevalent than many general industry expectations. This can significantly shape the most suitable target date design in two critical ways. First, plan sponsors and their advisors/consultants should carefully weigh appropriate levels of overall market exposures across the glide path. Second, they should prudently assess potential drawdown risk at the times when participants are most apt to withdraw assets, typically when entering retirement or soon after.

[2] J.P. Morgan Plan Participant Research 2018.

| PART TWO

The salary effect

WHAT ARE THE MOST OPTIMAL BEHAVIORS?

Salary is an important behavioral input because income levels often influence contribution rates, as well as set the standard of living that needs to be replaced in retirement. As salaries move lower, Social Security tends to play a proportionately larger role in providing participants' post-retirement income, potentially reducing the overall account balance targets lower-earning participants need to accumulate for safe levels of funding. But these relationships among salary, Social Security and contribution rates are not linear, making it difficult to assess what may be the most optimal contribution rate.

With this year's expanded data universe, we were able to evaluate saving patterns at various salary ranges. We looked at 1) **higher-income earners,** with annual salaries above $85,000 ($120,000 average); 2) **middle-income earners,** with annual salaries between $40,000 and $85,000 ($60,000 average); and 3) **lower-income earners,** with annual salaries below $40,000 ($30,000 average).

Across the board, **higher-income earners** generally exhibited the most optimal saving patterns. For example, average contribution rates for:

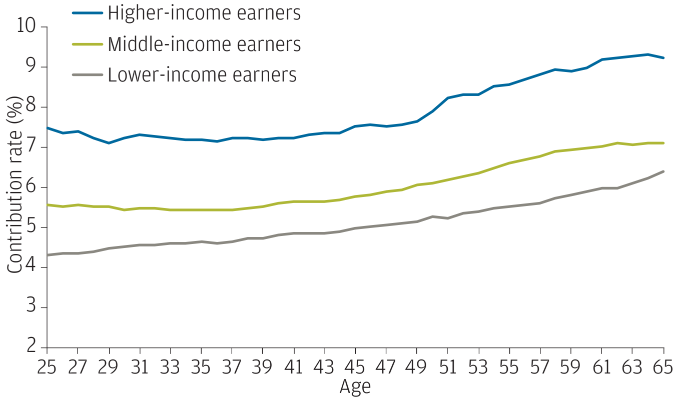
- **Higher-income earners** started at 7.5% at age 25, remained flat at age 45, then rose to 9.2% at age 65
- **Middle-income earners** started at 5.6% at age 25, stayed relatively the same at 5.7% at age 45, then climbed to 7.1% at age 65
- **Lower-income earners** started at 4.3%, slightly increased to 5.0% at age 45, then increased to 6.4% at age 65

Wealthier participants' higher average contribution rates make sense given their usually greater disposable income levels and a generally stronger likelihood of familiarity with investing and the importance of saving for retirement.

Examining the individual numbers behind these averages shows a wide array of contribution behaviors within each segment. Only wealthier participants at the higher end of the average contribution rate spectrum are even approaching the savings rate of at least 10% recommended by many industry experts.

Key finding: Higher-income earners tend to contribute the highest rates

EXHIBIT 3: AVERAGE CONTRIBUTION RATES BY SALARY LEVEL



Source: J.P. Morgan retirement research, 2015-17.

Additionally, the range of behaviors notably expands—unfortunately to the downside—moving lower on the salary scale. This reinforces our related research *No one is average*, which highlights how retirement planning averages, on their own, may be distorting. In order to meet the needs of the broadest swath of participants possible, the strongest target date funds should be designed for the edges as well as the middle.

Key finding: Average contribution rates remain well below 10%

EXHIBIT 4: CONTRIBUTION RATES BY SALARY LEVEL

Salary level	Lower end	Median	Higher end
Higher-income earners	7.1%	7.5%	9.3%
Middle-income earners	5.4%	5.7%	7.1%
Lower-income earners	4.3%	5.0%	6.4%

Source: J.P. Morgan retirement research, 2015-17.

MIDDLE EARNERS ARE THE MOST LIKELY TO TAKE LOANS

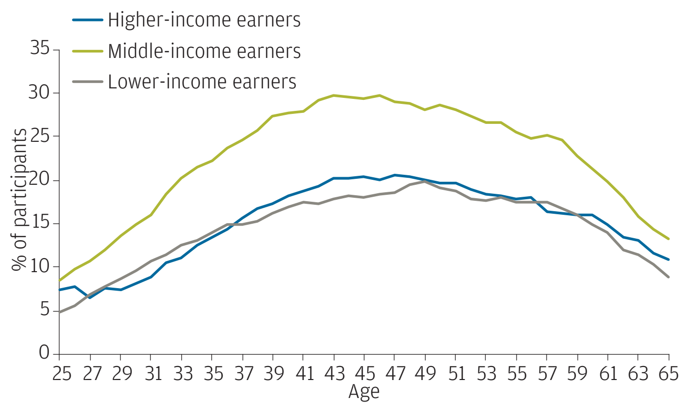
A sizable number of participants across all three salary levels took large account loans. On average:

- 18% of **higher-income earners** borrowed 18% of account balances
- 28% of **middle-income earners** borrowed 20% of account balances
- 17% of **lower-income earners** borrowed 22% of account balances

Middle-income earners were 50% more likely to take a loan compared with the other two segments. This might be because lower-income earners are simply less engaged with their plans overall and higher-income earners are less prone to need to tap into retirement assets early due to generally greater financial security. Interestingly, there was no material difference in the size of the average loan across all three groups as a percentage of account assets, though **lower-income earners**, on average, borrowed slightly more at all ages.

Key finding: Middle-income earners are most likely to take a loan

EXHIBIT 5: PERCENTAGE OF PARTICIPANTS WITH LOANS BY SALARY LEVEL



Source: J.P. Morgan retirement research, 2015-17.

OTHER SAVING BEHAVIOR HIGHLIGHTS

Salary increases

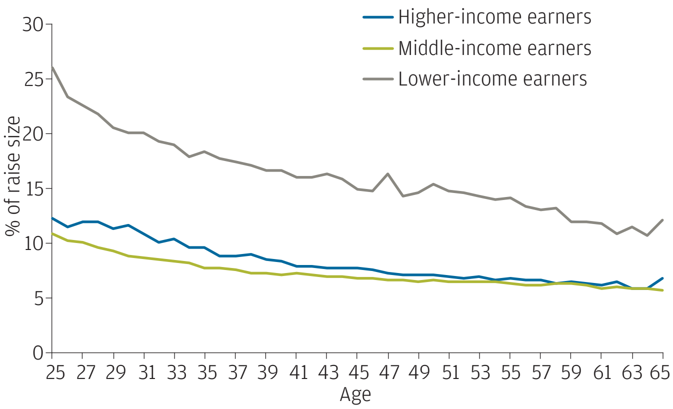
The odds of receiving a raise were fairly consistent across salary levels, with participants, on average, getting pay increases approximately every two out of three years. However, both average frequency and raise percentage size across all three groups markedly fell at age 35. Further, the average raise size was notably higher for **lower-income earners**, particularly in their earlier career years. These trends can be observed in **EXHIBITS 6 AND 7** on the following page.

Withdrawals

Middle- and **lower-income earners** were more likely to take pre-retirement withdrawals, with 11.3% and 11.5%, respectively, tapping into assets once reaching age 59½, compared with 7.7% of higher-income earners. The average withdrawal size as a

Key finding: Lower-income earners tend to experience the highest raise percentage increase

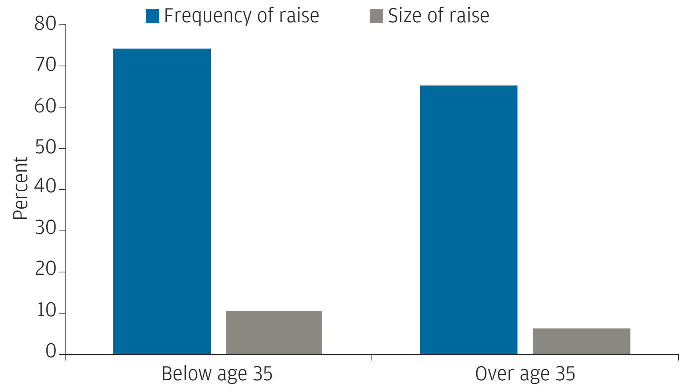
EXHIBIT 6: AVERAGE RAISE SIZE BY SALARY LEVEL



Source: J.P. Morgan retirement research, 2015-17.

Key finding: Younger participants tend to receive higher percentage raises most often

EXHIBIT 7: AVERAGE FREQUENCY AND RAISE SIZE ACROSS SALARY LEVELS



Source: J.P. Morgan retirement research, 2015-17.

percentage of overall account assets for **lower-income earners** was 61%—substantially higher than the average 51% for **middle-income earners** and 49% for **higher-income earners**.

Lower-income earners continued to make larger post-retirement withdrawals relative to the other two segments. Still, most participants, regardless of salary level, exited the plan within three years of retirement, with an average withdrawal of 49% to 62% per year and around 42% of participants withdrawing 100% of assets. More insights into these withdrawal patterns can be found in Part three of this year's research, *Withdrawal trends*.

IMPLICATIONS FOR PLAN SPONSORS

These findings indicate a real need to pay even greater attention to educational efforts targeting employees at middle and lower salary levels, who tend to save less, borrow more and withdraw earlier than other participants. Automatic enrollment and automatic contribution escalation programs have proven to be effective strategies for placing these participants on a more secure retirement savings path, though default contribution rates and subsequent increases should both be set at adequate levels that are higher than most plans currently use. In our related research *(2018 DC Plan Participant Survey Findings)*, participants experienced high satisfaction rates with both automatic enrollment and automatic contribution escalation programs, and 80% of those with both features anticipated that their retirement savings would last throughout their lifetime, compared with only 47% of those who were just automatically enrolled.

On a positive note, plan sponsors appear to have a strong tailwind with higher earners in terms of getting these participants to start investing earlier at consistently higher levels and to stay invested as long as possible. This can help shape communication efforts targeting this group to increase contribution rates even more, since they are still falling behind recommended levels, on average.

In addition, the higher average frequency and percentage size of raises for participants across all salary ranges in their earlier career years points to a window of opportunity. Targeting younger participants to increase contribution rates at higher increments when their salaries are most likely to rise may help establish more constructive saving behaviors across their lifetimes.

PART THREE

Withdrawal trends

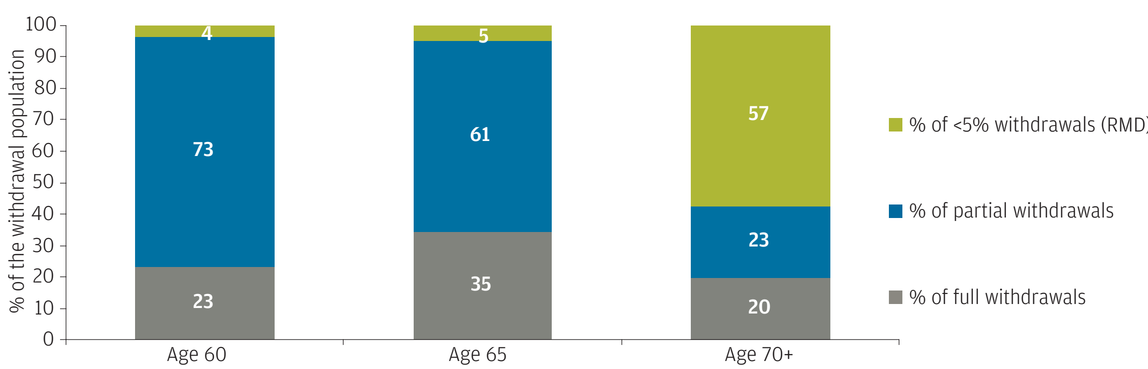
MOST ASSETS LEAVE WITHIN THREE YEARS OF RETIREMENT

Withdrawals have the greatest impact on cash flow volatility, since they permanently remove assets from participants' accounts. This year's research was consistent with past trends that found that the majority of participants made substantial withdrawals soon after retiring. Most also took all of their account assets within three years. Our latest research found that:

- the average participant withdrew more than 55% in any given year at or soon after retirement
- only 28% of participants remained in the plan three years after retirement
- most participants who remained in the plan after age 70 started to follow required minimum distribution (RMD) withdrawal rates, though there is some variability

Key finding: Participants still withdraw most of their assets around retirement, and we continue to see great variability of how people withdraw

EXHIBIT 8: MIX OF TYPES OF WITHDRAWALS



Note: Due to full withdrawals, at age 65, the number of participants included in the analysis decreases to 47% of the population we examined at age 60. At age 70+, the population has decreased to 24%. Total may be more than 100% due to rounding.

Source: J.P. Morgan retirement research, 2015-17.

Looking at withdrawals from an age perspective in **EXHIBIT 8** (previous page), we again found that once participants reached 59½, distributions were substantially higher than general industry expectations. At age 60, 9% of participants withdrew an average of 51% of their account balances, with 23% of that 9% taking out 100% of their assets; at age 65, 13% of participants withdrew an average of 57% of their balances, with 35% of that 13% taking out 100% of their assets; and by age 70, 52% of remaining participants withdrew an average 33% of their balances, with 20% of that 52% taking all of their assets.

WHERE ARE ASSETS GOING?

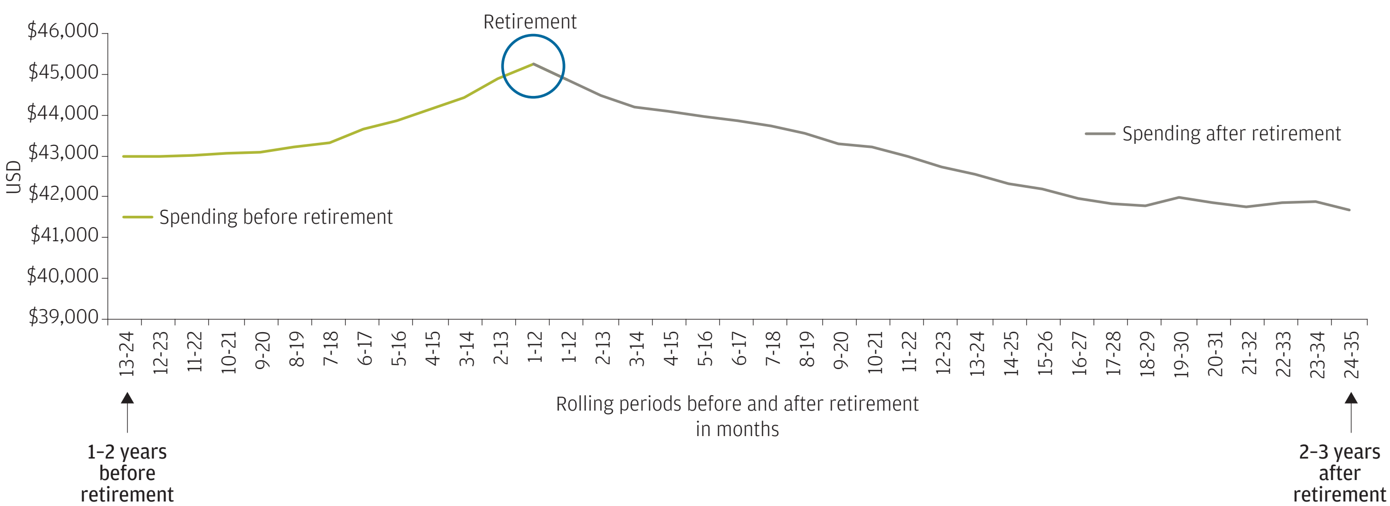
In our related research *Three ways to manage spending volatility as clients transition into retirement*, based on proprietary, anonymized Chase data of nearly 60,000 households, we found that spending may change as people adjust to a new phase of life. First, we found median household spending increases six to 12 months prior to retirement and then declines and remains in a more steady state one to two years after retirement (**EXHIBIT 9**).

As we looked beyond the median in **EXHIBIT 10** (next page), we found the majority (56%) experienced spending volatility: temporary spending changes of more than 20% in the years after retirement compared with the year before retirement. Those who experienced spending volatility were about evenly split between those who increased spending temporarily (26%) and those who decreased spending temporarily (23%) in one or two of the three years after retirement, while 7%, dubbed the **roller coasters**, had both spending ups and downs. The remainder either decreased spending consistently (15%), increased spending consistently (9%) or stayed fairly steady (20%) during the three years post retirement.

Based on these findings, the conventional view that assets leaving a plan are usually rolled over into an individual retirement account (IRA) may be inaccurate. The bottom line is that spending often increases around the point of entering retirement, and the money leaving plans as participants near and reach retirement age could easily be funding this spending volatility.

Key finding: Evidence of spending surge at retirement

EXHIBIT 9: MEDIAN SPENDING ROLLING PERIODS BEFORE AND AFTER RETIREMENT

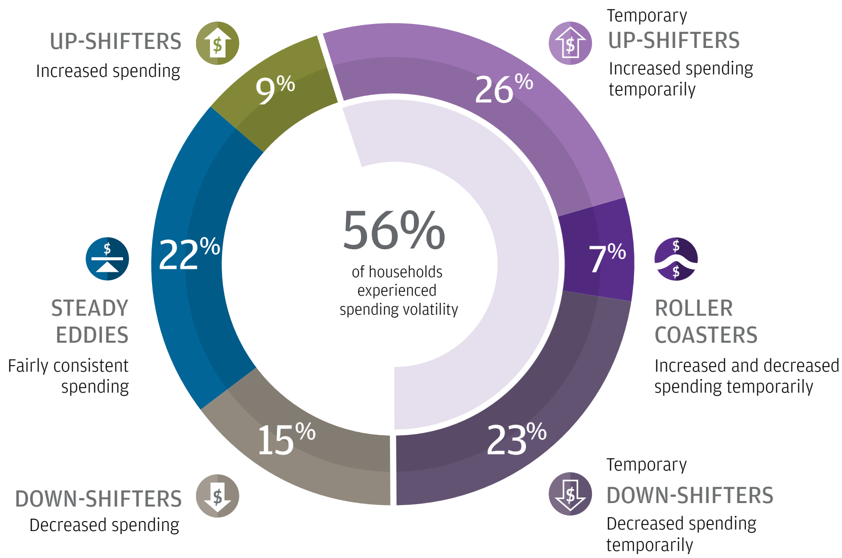


Note: For those who retired age 60–69. Percentages may not add to 100 due to rounding.

Source: Chase credit card, debit card, electronic payment, ATM withdrawal and check transactions from October 1, 2012 to December 31, 2016. Outliers in each asset group were excluded (0.1% of top spenders in each spending category). Information that would have allowed identification of specific customers was removed prior to the analysis. Excludes some co-branded cards.

Key finding: Most had spending volatility when adjusting to a new phase of life

EXHIBIT 10: POST-RETIREMENT SPENDING VOLATILITY



Note: For those who retired age 60–69. Total may be more than 100% due to rounding.

Source: Chase credit card, debit card, electronic payment, ATM withdrawal and check transactions from October 1, 2012, to December 31, 2016. Outliers in each asset group were excluded (0.1% of top spenders in each spending category). Information that would have allowed identification of specific customers was removed prior to the analysis. Excludes some co-branded cards.

IMPLICATIONS FOR PLAN SPONSORS

These numbers illustrate the highly personal nature of retirement spending. While many participants are quick to cash out from their plans, some take nothing until required minimum distributions prompt withdrawals. Some roll over their assets into other retirement accounts, and some appear to use them to help fund increased post-retirement spending.

Plan sponsors and their advisors/consultants should incorporate the full range of these behaviors into plan design, including evaluating appropriate levels of equity exposure in target date fund glide paths. Given the large withdrawal volumes and wide variance in spending patterns, tightly managing volatility exposure and drawdown risk can be incredibly important in the years leading up to retirement and immediately after. Participant assets are most vulnerable to account losses at this point, a risk that can be greatly amplified if sizable withdrawals are made after valuations fall due to equity market declines (discussed further in our related research *Glide path design: Why 'retirement' shouldn't mean 'decline'*).

| PART FOUR

Evaluating target date fund design

GETTING MORE PARTICIPANTS SAFELY OVER THE RETIREMENT FINISH LINE

The core of our research focused on the type of target date fund design most likely to position more participants for safer levels of retirement funding, given the wide range of real-world saving and investment behaviors.

Projected retirement outcomes

To put our own *JPMorgan SmartRetirement®* glide path to the test, we again projected retirement outcomes based on 10,000 portfolio simulations. We took the full assortment of identified participant behaviors in this year's findings and applied them to a broad mix of market scenarios. This included all types of investment climates, from incredibly strong rallies to potentially devastating market losses, to help gauge how well our glide path design might weather the various conditions and timing that could be experienced across a lifetime of investing.

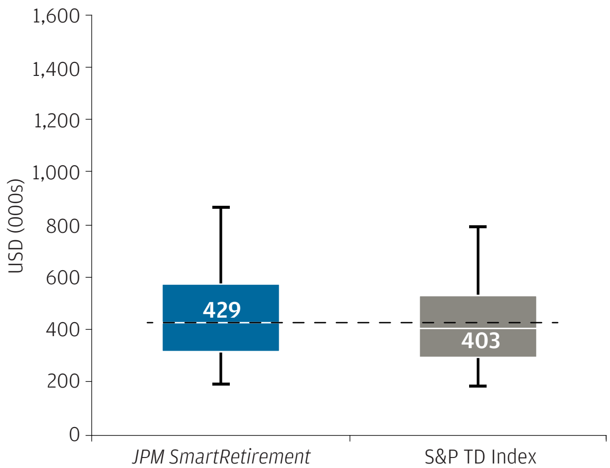
IN OUR PROJECTIONS, THE *SMARTRETIREMENT* DESIGN:

- Helped more participants reach their replacement income goals
- Outperformed under more ideal participant saving behaviors and more favorable market conditions
- Offered greater protection to participants who had poorer saving behaviors and/or experienced more difficult investment conditions
- Lowered participants' risk of account losses for the three years prior to retirement, a particularly sensitive time to experience market declines

This overall trend of getting a greater number of participants safely over the retirement finish line with less risk remained consistent with past *Ready! Fire! Aim*? research.

Key finding: ***SmartRetirement*** **continued to deliver more participants to safer retirement funding levels—and achieved stronger outcomes at the median as well as downside and upside extremes**

EXHIBIT 11: RANGE OF EXPECTED ACCOUNT BALANCES AT RETIREMENT



USD (000s)	*JPM SmartRetirement*	S&P TD Index
5th percentile	874	794
50th percentile	**429**	**403**
95th percentile	189	181
Target	**430**	**430**
% above target	50%	44%
Probability of loss +3 years	8.3%	10.5%

Source: J.P. Morgan retirement research, 2015-17.

Measuring success

We then evaluated how well our glide path design held up to these rigors compared with the average target date fund glide path, as measured by the S&P Target Date indices. Our benchmark for success—the *retirement finish line*—was the account balance at the point of retirement needed to fund at least the minimum amount of adequate replacement income for the average participant.

Underlying market assumptions

J.P. Morgan's *Long-Term Capital Market Assumptions* served as the starting point for our market simulations. Keep in mind that these are forward-looking projections. With U.S. markets appearing to be at the top of a cycle, this year's assumptions reflect the reality that many investments may be entering a more subdued return period with greater volatility, at least over a shorter time horizon. This had a generally dampening effect on the range of outcomes likely to be experienced across participant behaviors, simply because the chances of less favorable market returns have increased.

Results

Based on our analysis, the *SmartRetirement* glide path consistently outperformed the average target date fund design across the full spectrum of participant behaviors and market conditions. This was because of its broader diversification, more efficient use of risk and greater volatility controls, especially around equity exposure in the years leading up to retirement.

LOOKING BEYOND AVERAGES

We also analyzed how glide path design might affect the success rates for the various participant segments discussed earlier at both the engagement level (see Part one) and the salary level (see Part two).

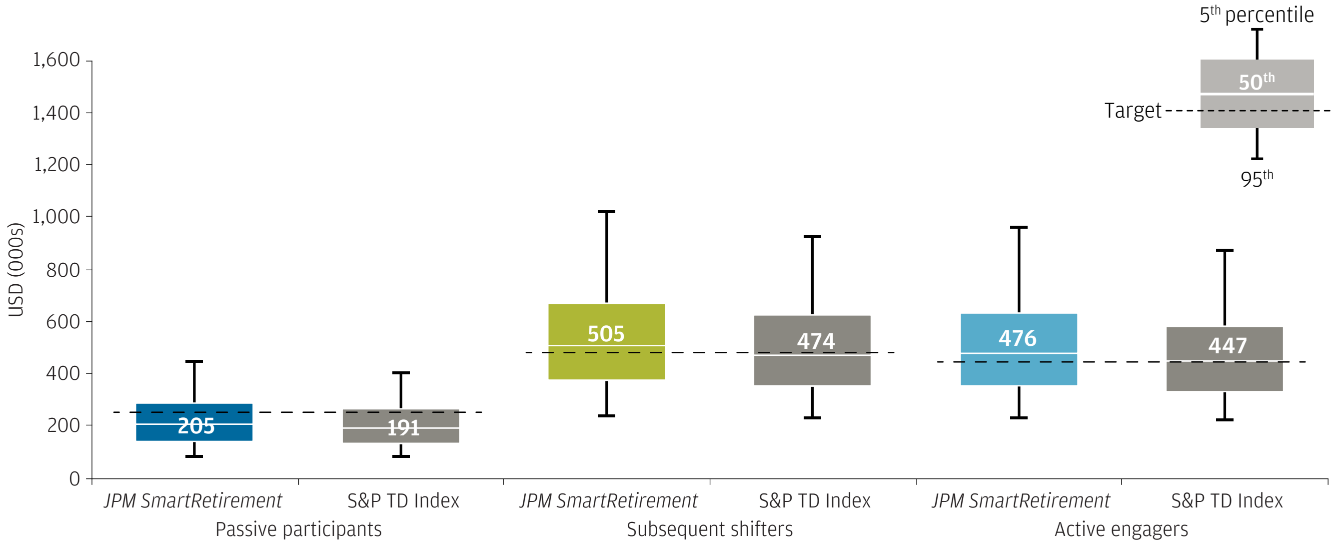
These outcomes illustrate how important contribution rates and constructive engagement can be to securing safer retirement funding levels. The only way to be certain to achieve a positive outcome is to save enough, and the relatively low success rates of passive participants show that the typical 3% default contribution rate of many plans is unlikely to result in adequate savings. This presents a strong argument for aggressively increasing starting rate levels for

PARTICIPANT SEGMENTS

- **Passive participants,** who were automatically enrolled in their plans and never made contribution changes beyond their initial default rates
- **Subsequent shifters,** who were automatically enrolled but had a later rate change (either through automatic contribution escalation or by making a change on their own)
- **Active engagers,** who both enrolled in their plans and set their contribution rates on their own

Key finding: *SmartRetirement* helped position more participants for retirement funding success across *all* levels of engagement

EXHIBIT 12: RANGE OF EXPECTED ACCOUNT BALANCES AT RETIREMENT BY ENGAGEMENT TYPE



USD (000s)	Passive participants		Subsequent shifters		Active engagers	
	JPM SmartRetirement	S&P TD Index	*JPM SmartRetirement*	S&P TD Index	*JPM SmartRetirement*	S&P TD Index
5th percentile	453	411	1,025	927	964	875
50th percentile	**205**	**191**	**505**	**474**	**476**	**447**
95th percentile	80	76	236	225	225	216
Target	**255**	**255**	**480**	**480**	**440**	**440**
% above target	33%	27%	55%	49%	57%	51%
Probability of loss +3 years	8.3%	10.5%	8.3%	10.5%	8.3%	10.5%

Note: These target lines correspond to peak salaries of passive participants, subsequent shifters and active engagers. We derive the income replacement rate for various income levels by considering reductions in income tax and expenditures in retirement. Social Security and private savings such as defined contribution plans together need to meet the income replacement rate. We define the target portfolio values based on the annuity cost required to meet an adequate level of retirement income.

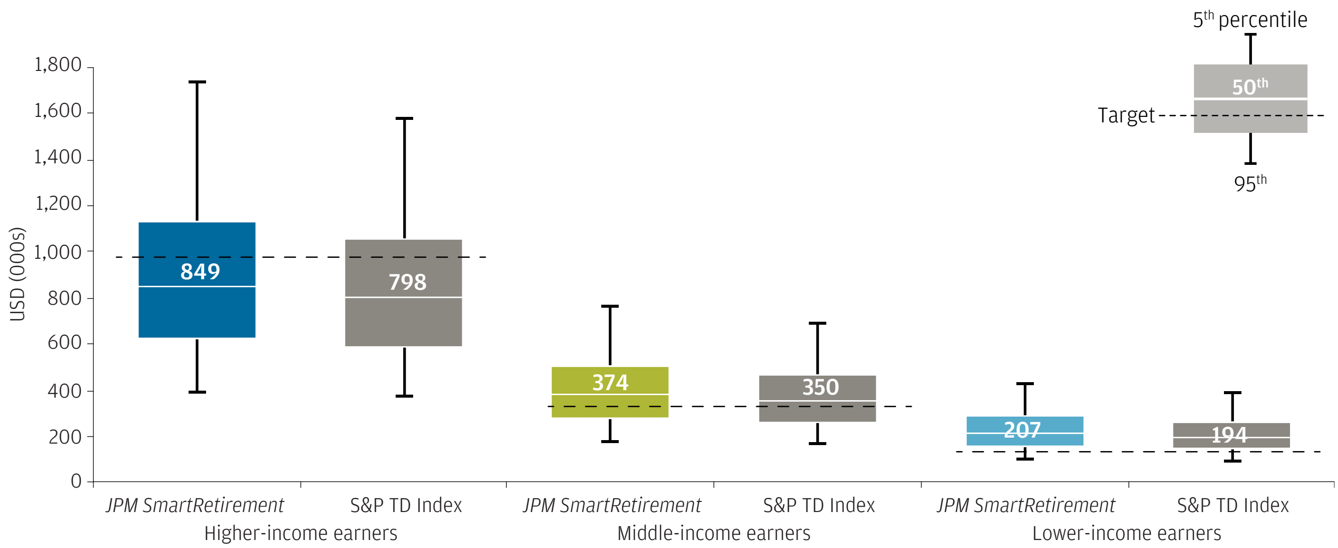
Source: J.P. Morgan retirement research, 2015–17.

defaulted participants and for implementing automatic escalation programs. Still, there is a silver lining: These participants were better off than if they had contributed nothing to the plan. The *SmartRetirement* glide path also helped them do more with the assets they did accumulate.

The much higher success rates for lower income earners may seem counterintuitive, given that higher income earners tended to make significantly larger contributions, on average, than the other segments. However, it is important to remember that higher income earners must replace a much greater level of income—hence, the higher finish-line hurdle and significantly lower success rates. Further, the proportion of retirement income provided by Social Security is much lower for this group than for the other segments, especially the **lower-income earners**, for whom it represents the vast bulk of replacement income. Consequently, it can be important for **higher-income earners** not to be lulled into a false sense of security just because many are making relatively larger contributions. Instead, they should assess if they are truly saving enough for realistic retirement income targets.

Key finding: ***SmartRetirement*** **helped position more participants for retirement funding success across *all* salary levels**

EXHIBIT 13: RANGE OF EXPECTED ACCOUNT BALANCES AT RETIREMENT BY SALARY



	Higher-income earners		Middle-income earners		Lower-income earners	
USD (000s)	*JPM SmartRetirement*	S&P TD Index	*JPM SmartRetirement*	S&P TD Index	*JPM SmartRetirement*	S&P TD Index
5th percentile	1,735	1,582	764	690	435	393
50th percentile	**849**	**798**	**374**	**350**	**207**	**194**
95th percentile	382	364	168	160	90	86
Target	**970**	**970**	**330**	**330**	**130**	**130**
% above target	38%	31%	61%	56%	83%	80%
Probability of loss +3 years	8.3%	10.5%	8.3%	10.5%	8.3%	10.5%

Source: J.P. Morgan retirement research, 2015-17.

BROADER DIVERSIFICATION + TIGHT RISK CONTROLS = GREATER PARTICIPANT SUCCESS

Throughout the past decade of *Ready! Fire! Aim?* research, we have consistently found that the long-term return potential and embedded volatility characteristics of a glide path design are largely shaped by two key portfolio decisions: asset class diversification and equity exposure. How a target date fund manager approaches these fundamental issues can have a significant impact on participants' ability to reach their retirement income targets.

Our own glide path is designed to work harder to capture attractive levels of return in comparison to more equity-concentrated target date strategies, but with lower levels of volatility and more limited downside risk. This focus on achieving greater risk efficiency is achieved through broad diversification, including asset classes such as emerging market equity, emerging market debt, direct real estate, REITs and high yield fixed income, and closely managed risk controls, such as a relatively rapid reduction in equity exposure in the five to 10 years leading up to retirement when account balances are likely at their highest.

Key finding: Our glide path—designed for real-world participant behavior—was once again validated to withstand a wide range of market cycles and participant behaviors

EXHIBIT 14: HOW PARTICIPANT BEHAVIOR INFORMS DESIGN

BEHAVIORS Participants typically contribute 5% of their paycheck at the start, reach 6% by age 45 and just reach 7% before retirement.	19% borrow, on average, 20% of their account balance.	10% over age 59½ withdraw, on average, 55% of their assets.	About 28% of participants remain in plan three years after retirement.
KEY INSIGHT Most investors are not saving enough. Early growth from their investments and protection from loss when approaching retirement are equally crucial to success.	Tight volatility controls are crucial to help manage the amplifying effects of cash flow volatility on market volatility.	Sharp risk reduction in the years leading up to retirement is crucial.	The majority are not using the investment vehicle post-retirement.

Source: J.P. Morgan retirement research, 2015–17.

IMPLICATIONS FOR PLAN SPONSORS

A well-designed defined contribution plan—including the right target date fund—offers a compelling opportunity to help position participants for the strongest chance of building their savings into a secure source of retirement income. This year's updated research once again reiterates how important target date design can be in potentially helping the most participants achieve more secure retirement outcomes.

First, plan sponsors and their advisors and consultants need to understand the wide variances in real-world participant behaviors and carefully weigh the implications of these patterns. Ultimately, no one is really average and the strongest plans should be designed for participant behaviors on the edges as well as the middle. Second, it is critical to understand how fundamental target date design differences may shape participant outcomes, not just in terms of upside potential but also considering embedded market volatility and cash flow volatility exposures. This may become even more important if investment returns begin to enter a more subdued period with greater volatility, as we expect.

Finally, when analyzing outcome projections from a fiduciary perspective, it is crucial to focus on the participants who end up below the median, particularly below minimum replacement income targets. Raising the bar for these groups—by encouraging more constructive behaviors and taking a more sophisticated approach to glide path risk efficiency—can notably increase overall plan success. In our analysis, a glide path that invests at controlled levels of risk without overly curtailing long-term return potential, through broader diversification and relatively rapid reduction in equity exposure in the years leading up to retirement, continued to increase the potential number of participants reaching their retirement income goals.

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U.S. Patents No. 8,255,308; 8,386,361 and patent(s) pending.

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