RETIREMENT INSIGHTS

Retirement by the Numbers

How retirement saving and spending patterns
can add up to more successful funding outcomes

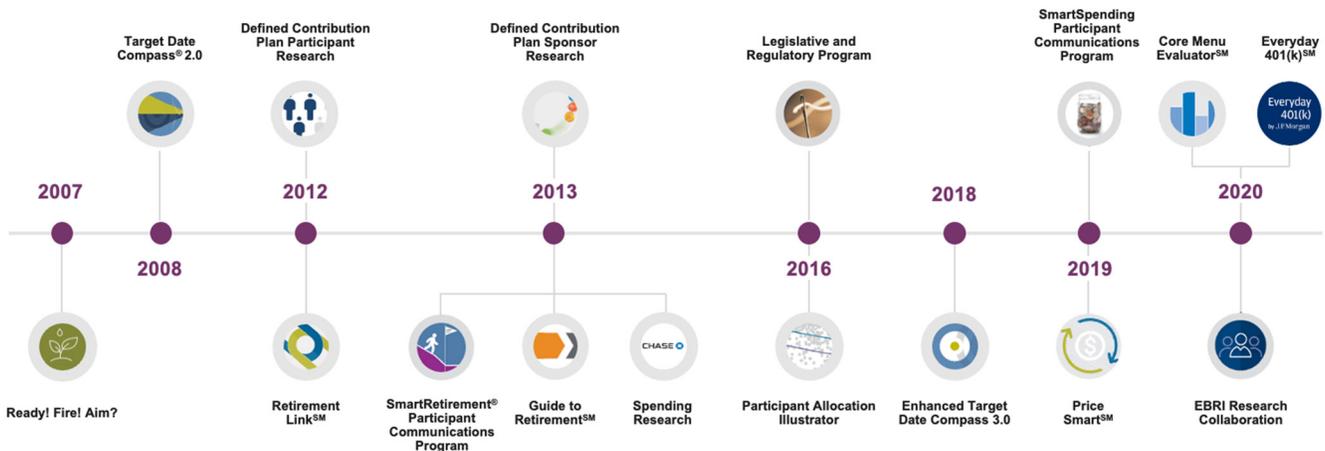J.P.Morgan
Asset Management

BY THE NUMBERS

J.P. Morgan Asset Management has a long history of providing defined contribution (DC) plan sponsors with original, data-driven research to help them better understand the numbers around how people are realistically interacting with their employer-sponsored retirement plans. This year, we are proud to introduce **Retirement by the Numbers**, which combines our popular **Ready! Fire!** *Aim?* research with an even more comprehensive view into the trends and data driving potential DC participant outcomes across both the accumulation and the decumulation journeys. This year's findings draw from:

- 20 years researching and tracking participant saving and withdrawal patterns
- 9 years researching and tracking retirement household spending patterns
- 26 years of insights from J.P. Morgan's Long-Term Capital Market Assumptions that help apply realistic investment expectations to portfolio modeling
- 50-plus years of experience designing and managing multi-asset class, outcome-oriented portfolio solutions, including our JPMorgan SmartRetirement® target date fund (TDF) series, which has helped investors save for retirement since 2005

Throughout this research, you will find key numbers behind real-world investment and spending behavior patterns, and their implications for the TDF design and drawdown strategy that help position more participants for potential retirement funding success.

Providing advisors, plan sponsors and consultants with the insights and tools to help build stronger retirement plans

J.P. MORGAN ASSET MANAGEMENT DC RESEARCH AND PROGRAMS THROUGH THE YEARS

Source: J.P. Morgan Asset Management. For illustrative purposes only.

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WE FIRST PUBLISHED READY! FIRE! *AIM?* **IN 2007 TO ANALYZE WHAT WE THEN SAW AS TWO CRITICAL, BUT LARGELY INCOMPLETE, AREAS OF DC INDUSTRY RESEARCH:**

1. How realistic were the industry's modeling of participants' career-long saving and spending patterns?

2. What type of target date portfolio design was best positioned to stand up to the stresses of real-life saving and investing?

It was the first study to evaluate actual participant saving patterns and how those behaviors were likely to interact with various TDF glide paths in the marketplace to shape long-term retirement outcome potential. TDFs have considerable flexibility in glide path design, and we wanted to provide plan sponsors with a quantifiable way to evaluate how various approaches might affect participants' investment experience.

Many of our findings were groundbreaking at the time and showed that the participant behavioral conventions being used to help construct many popular glide paths were often incorrect. On average, participants were contributing less, borrowing and withdrawing more, and leaving their plans much sooner than most TDF providers assumed. What's more, this cash flow volatility amplified the effects of market volatility on retirement outcomes.

Our research helped to inform the SmartRetirement glide path, as we wanted to provide plan sponsors and their advisors with a target date design that was positioned to help as many participants as possible retire with the income they needed. At the core of this concept: setting a prudent, quantifiable goal of what the glide path was designed to achieve.

The goal for SmartRetirement has always been clear—to get as many participants as possible over the retirement finish line as safely as possible. Measuring TDF success has always been more nuanced than just trying to maximize account balances or focusing on short-term returns, given the wide variance in participant cash flows and the fact that participants with different retirement target dates can experience widely different investment environments. Instead, we continue to believe that a more pragmatic focus *should be to increase the odds that participants are able to reach at least a minimum level of adequate replacement income*, even those who demonstrate less favorable saving and cash flow behaviors or who are unlucky enough to experience difficult investment climates.

The reaction to our initial research in 2007 was extremely positive, and we have consistently updated it through the years, first in 2009 and then again in 2012, 2015 and 2018. Each of these subsequent studies has helped to confirm, and potentially evolve, our glide path design, as appropriate, in order to ensure that it remains well positioned to deliver on this objective.

We pay close attention to participant behaviors because they are one of the four pillars that we have consistently applied to help guide our SmartRetirement investment process since inception. The other three are long-term market expectations, the regulatory environment and Social Security. When one or any combination of these inputs changes, we reevaluate and adjust as necessary.

A PROCESS OF CONTINUOUS EVOLUTION

We now have two decades of participant behavior knowledge and are continuously looking for new ways to expand and refine our data to offer practical, actionable research that helps plan sponsors and their advisors position their plans for greater outcome success. Almost a decade ago, we began to analyze JPMorgan Chase Bank, N.A.'s (Chase) consumer banking data to examine spending behaviors at various life stages. In 2020, we formed a research collaboration with the Employee Benefit Research Institute (EBRI) through which we are now able to create a full financial picture of households.

With this year's research, we are once again taking a major step forward by combining our research into household spending patterns with our participant saving and withdrawal research. This provides a more comprehensive view of how individuals are using their DC plans as a savings vehicle and how they are spending as they move through retirement. We purposely set aside 2020 data for now in order not to skew the research with reactive behaviors during the COVID-19 pandemic. We plan to evaluate 2020 in a longer-term context in the future.

Among the key findings from this year's study:

- **Substantially more participants are keeping assets in the plans after retiring.** Our earliest studies showed that the vast majority of participants withdrew all of their plan assets within three years of retiring. In this year's study, we saw a significant leap in the number leaving at least a portion of their balances in the plans—more than double from 10 years ago.

- **Retirees' income needs as they transition into retirement are higher than conventional wisdom suggests and do not remain constant but decline with age.** A long-standing rule of thumb has been that retirees should plan on needing to replace around 70%–80% of their working income. Our research shows that the average figure is more than 90%, primarily due to increased household spending, though these spending levels steadily decline in real terms through retirement.

- **Both factors point to the need to evolve our glide path.** Our focus remains the same: increasing the odds that participants are able to reach at least a minimum level of adequate replacement income. However, we now have a clearer picture that the average participant needs a much higher savings balance to realistically reach this target. Additionally, as more participants use their plans as investment vehicles post-retirement, it is important to consider how the distinct accumulation and decumulation phases work together, to help enhance the participant experience.

Additional research highlights are presented in the sections that follow. We look forward to continuing to update these results in the future and hope that you find this year's report useful in helping to put more participants on an appropriate retirement saving and spending path.

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RESEARCH METHODOLOGY

PARTICIPANT BEHAVIOR

Actual saving and withdrawal patterns drawn from approximately 4,500 DC plans with more than 1.4 million participants.[1]

PROJECTED RETIREMENT OUTCOMES

Based on 10,000 portfolio simulations using the range of identified participant behavior applied to a broad mix of market scenarios.[2]

RETIREE SPENDING

Actual annual spending patterns drawn from more than 5 million de-identified Chase households.

PROJECTED DECUMULATION OUTCOMES

Based on a patented decumulation methodology that includes 10,000 portfolio simulations using a broad mix of market scenarios.

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[1] Source: Participant data from MassMutual Financial Group.

[2] Modeling uses Equilibrium Long-Term Capital Market Assumptions, which are projected returns based purely on economic forecast, and not starting point prices (current valuations and corporate margins).

SAVING PATTERNS

SAVING PATTERNS BY THE NUMBERS
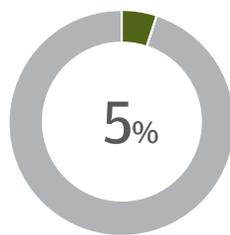
5% AVERAGE STARTING CONTRIBUTION RATES, similar to past years
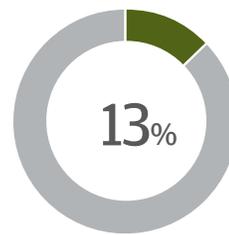
13% NUMBER TAKING ACCOUNT LOANS, notably lower than in earlier studies
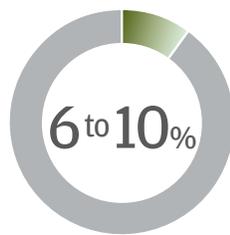
6 to 10% NUMBER OF PRE-RETIREES OVER AGE 59½ WITHDRAWING ASSETS, slightly fewer than prior years
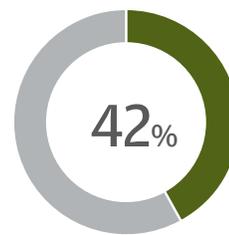
42% NUMBER OF PARTICIPANTS REMAINING IN THE PLAN THREE YEARS AFTER RETIRING, more than double from 10 years ago

Source: J.P. Morgan retirement research, 2018–19. For illustrative purposes only.

DC PLANS REPRESENT A UNIQUE PARTNERSHIP BETWEEN PLAN SPONSORS AND PARTICIPANTS. While plan sponsors have the ability to use automatic features and investment selection to help influence positive saving and investing behaviors, ultimately participants must do their part by consistently saving enough and staying invested in their plans. Even the most well-constructed TDF design cannot completely compensate for participants who invest too little or not at all.

Our research has repeatedly found that persistent and wide variations in participant saving and withdrawal behaviors often compromise the likelihood of long-term retirement funding success. This trend continued to hold true in this year's findings, which tracked participant behaviors from 2018 through 2019 (see **EXHIBIT 1**).

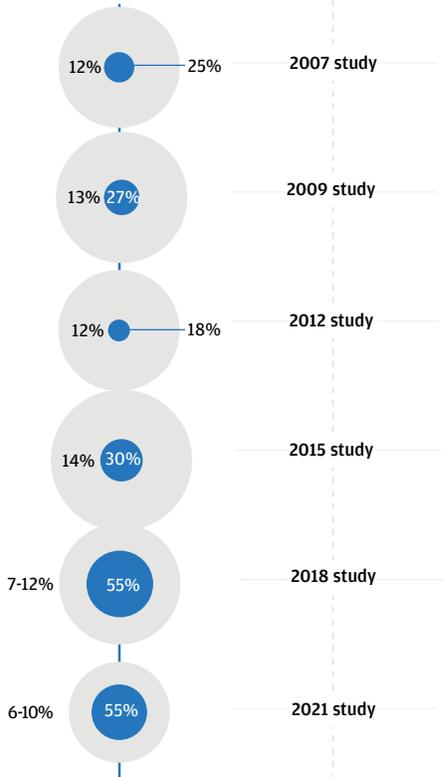## KEY FINDINGS ON SAVING PATTERNS

Sluggish salary growth

Salary is a core retirement planning input. Pre-retirement income levels both influence contribution amounts and help determine the standard of living that needs to be replaced in retirement. The frequency of salary increases appears to have remained stable in this year's study, with participants receiving pay raises, on average, every two out of three years. However, more problematic is the fact that inflation-adjusted salary averages have been relatively flat (see **EXHIBIT 2**).

Key finding: Our most recent study found small improvements in contribution rates, loans and pre-retirement distributions, and a sharp jump in the participants staying in their plans past retirement

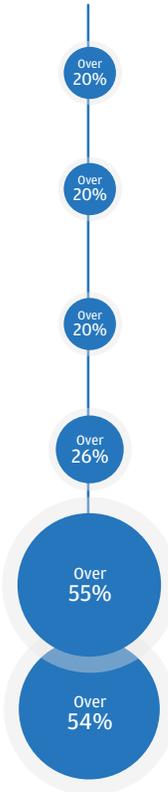EXHIBIT 1: PARTICIPANT BEHAVIOR AND SALARY PATTERNS

PRE-RETIREMENT DISTRIBUTIONS

○ % over age 59.5 withdrawing assets ● Average withdrawal %

- 2007 study — 12% / 25%
- 2009 study — 13% / 27%
- 2012 study — 12% / 18%
- 2015 study — 14% / 30%
- 2018 study — 7-12% / 55%
- 2021 study — 6-10% / 55%

POST-RETIREMENT DISTRIBUTIONS

Average withdrawal % per year at or soon after retirement for those with distributions

- 2007 study — Over 20%
- 2009 study — Over 20%
- 2012 study — Over 20%
- 2015 study — Over 26%
- 2018 study — Over 55%
- 2021 study — Over 54%

AVERAGE SALARY RAISES

Participants get raises

- 2007 study — ↑ ↑ ○ Every two out of three years
- 2009 study — ↑ ○ ↑ Every other year
- 2012 study — ↑ ↑ ↑ Every year
- 2015 study — ↑ ◐ ↑ Every two to three years
- 2018 study — ↑ ↑ ○ Every two out of three years
- 2021 study — ↑ ↑ ○ Every two out of three years

AVERAGE CONTRIBUTIONS

	5%	6%	7%	8%	9%	10%
2007 study				age 25		age 40 / age 55
2009 study				age 25		age 45 / age 57
2012 study	age 25			age 44		age 59
2015 study	age 25			age 50		Never
2018 study	age 25	age 50				Never
2021 study	age 25	age 45				Never

Contribution rates

LOANS

○ Average % of balance borrowed
◯ % of participants taking loans

- 2007 study — 21% / 19%
- 2009 study — 25% / 18%
- 2012 study — 22% / 18%
- 2015 study — 20% / 23%
- 2018 study — 20% / 18%
- 2021 study — 20% / 13%

% OF PARTICIPANTS REMAINING IN PLAN THREE YEARS AFTER RETIREMENT*

- 2009 study — 42%
- 2012 study — 32%
- 2015 study — 28%
- 2018 study — 20%
- 2021 study — 17%
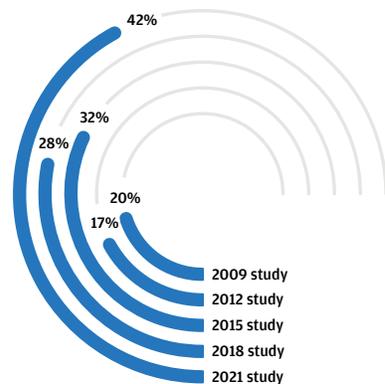
Source: J.P. Morgan retirement research, 2001-19. 2007 study = 2001-06 trends; 2009 study = 2007-08 trends; 2012 study = 2009-11 trends; 2015 study = 2012-14 trends; 2018 study = 2015-17 trends; 2021 study = 2018-19 trends.

Note: Slight differences in numbers reported from earlier studies may exist due to the reclassification of certain participant behavior. Those differences are not material.

*Began tracking in 2006

Key finding: Relatively little real salary growth in the past five years

EXHIBIT 2: INFLATION-ADJUSTED AVERAGE SALARIES IN 2019 DOLLARS
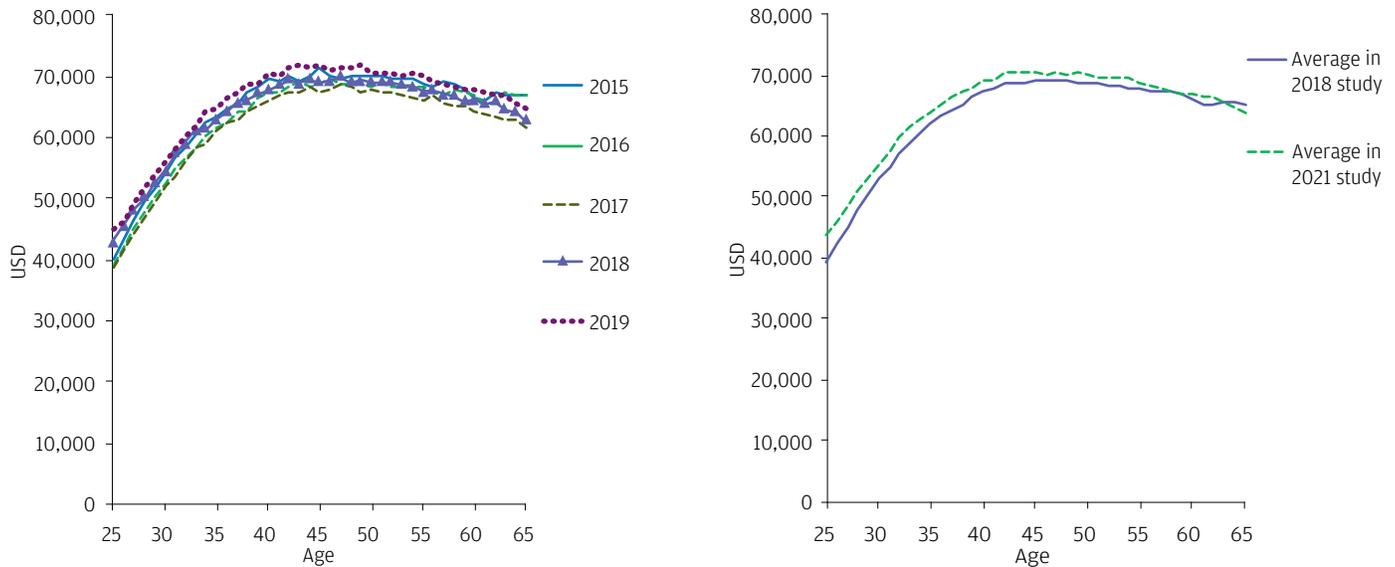
Source: J.P. Morgan retirement research, 2018-19.

Note: Inflation using the consumer price index (CPI).

This can weigh on retirement outcomes in two major ways. First, it affects participants' ability to save in their working years. If they are spending more of what they earn, they tend to accumulate less. Second, it can affect how much income Social Security may replace in retirement. Given higher average spending levels, discussed later, more replacement income will need to come from private or employer sources in order to maintain lifestyle standards.

Low contribution rates

In line with past studies, far too few participants appear to be saving enough to realistically meet their retirement funding needs. Moreover, average contribution rates have generally drifted lower over the years. Average starting contribution rates in this year's study began at 5%, reached 6% of salary by age 45 and never reached 10% before retirement. The only way participants can be certain to achieve adequate income in retirement is to save enough. Automatic enrollment and automatic escalation programs can be powerful drivers of success in this arena. However, our 2018 study showed that automatic enrollment used alone can actually weigh down average contribution rates, given the large number of passive participants who never make adjustments to their saving levels.

The good news is that, as we found in our biennial participant survey, published earlier this year, participants largely think they should be saving more than they are, and almost all of those automatically enrolled with their contributions automatically increased reported being satisfied with the actions. Based on these findings, plan sponsors can implement automatic escalation programs with confidence, making it as easy as possible for participants to help themselves by saving more.

Fewer, but still sizable, account loans

Fewer participants are taking loans, but those who do continue to borrow substantial amounts from their accounts. This year's study found that 13% of participants borrow, on average, 20% of their account balances (noticeably improved in terms of the number taking loans in prior studies, but with similar average amounts). It is important to consider how this cash flow volatility can potentially interact with market returns. For example, taking a loan at a market bottom and repaying it at a market top illustrates classic "sell low, buy high" behavior, which may have extremely dampening effects on long-term account balances. Many participants also stop making contributions while repaying loans and miss out on any company match.

Unpredictable pre-retirement leakage

This year's research found that modestly fewer working participants over the age of 59½ are taking pre-retirement withdrawals, though the number is still notable and the size of the average withdrawal amount remains quite large. A range of 6%–10% of participants over the age of 59½ withdrew, on average, 55% of assets.

More participants staying post-retirement

Our past studies found that most participants withdrew their entire account balances at, or soon after, retiring. Although this year's research shows that many participants continue to withdraw their entire account balances within three years of when they stop working, the volume has declined, with a notable increase in the number choosing to leave at least a portion of their balances in their plans—a full 42%, up significantly from 28% in our 2018 study and 20% in the 2009 research. This represents an important behavior change that is likely to gain momentum. Further supporting this view, our 2021 participant survey found that as many as 85% of respondents said they were at least somewhat likely to stay in their plans after retiring if there was an in-plan retirement income option.

The main observation from this updated data is that it remains broadly in line with past findings, with the exception of the sharp shift in post-retirement behavior, indicating that the behaviors that inhibit savers from achieving their goals are persistent. The bottom line is that average participant saving and withdrawal patterns remain far from optimal.

Plan sponsors hoping to improve outcome potential can take advantage of participant inertia to proactively place more individuals on a safer savings path through automatic plan design features that get more people in the plan earlier, saving more and increasing contribution rates quicker. They can also consider how these behavior trends are likely to interact with their TDF selections to better understand the type of glide path designs that may best position participants for retirement funding success.

SPENDING PATTERNS
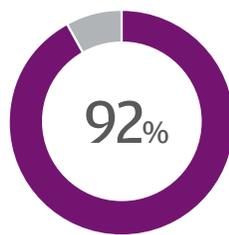
92% Average replacement income needed **AT THE POINT OF RETIREMENT**
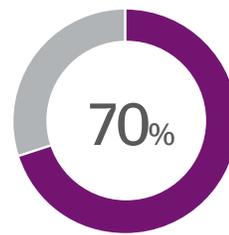
70% Average replacement income **NEEDED 20 YEARS LATER AT AGE 85**
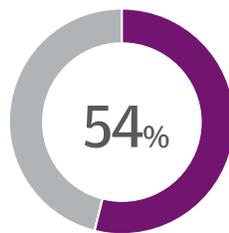
54% Average replaced **BY SOCIAL SECURITY**
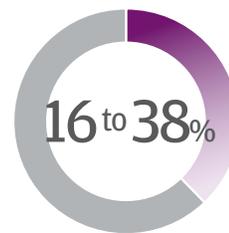
16 to 38% Average amount **NEEDING TO BE REPLACED BY PERSONAL SAVINGS AND EMPLOYER SOURCES,** depending on age

Source: J.P. Morgan retirement research, 2018-19. For illustrative purposes only.

A MAJOR ADVANCEMENT WITH THIS YEAR'S STUDY IS THE INCLUSION OF OUR RESEARCH INTO ACTUAL RETIREMENT SPENDING PATTERNS. Almost a decade ago, we began evaluating the lifetime spending behaviors of more than 5 million de-identified Chase households to gain insights into how these patterns can change as people transition into and move through retirement. The output from this research for 2017 through 2019 is presented in **EXHIBIT 3**.

Similar to our original 2007 study that examined the industry's modeling of participants' saving behaviors, our retirement spending findings call into question many of the common baseline assumptions used in setting broad replacement income targets. Our research shows that people, on average, are spending much more than expected in the early years of retirement, with a gradual decline at older ages. This has significant implications for setting more realistic accumulation targets and more efficient decumulation models.

KEY FINDINGS ON SPENDING PATTERNS AND REPLACEMENT INCOME NEEDED AT VARYING AGES

Higher spending levels

We observed that both pre-retiree and retiree households are spending more, on average, than in past periods, which has been the trend over the past decade. This increased spending naturally creates a higher

Key finding: This year's research includes actual retirement spending patterns

EXHIBIT 3: AVERAGE ANNUAL HOUSEHOLD SPENDING BY AGE FOR RETIRED AND PARTIALLY RETIRED HOUSEHOLDS,* 2017 THROUGH 2019
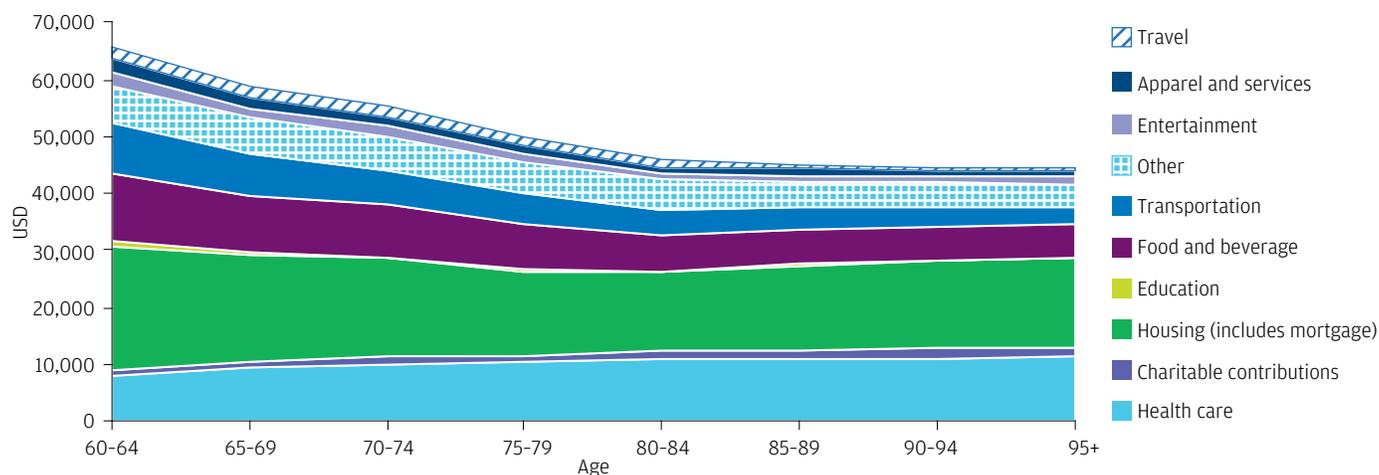
Source: Total spending and all category subtotals except checks and cash: Chase data, including select Chase credit and debit card, electronic payment, ATM withdrawal and check transactions from January 1–December 31, 2017 through 2019. Check and cash distribution: 2019 CE Survey, J.P. Morgan analysis. Information that would have allowed identification of specific customers was removed prior to the analysis. Other includes: tax payments, insurance, gambling, personal care and uncategorized items. Asset estimates for de-identified and aggregated households supplied by IXI/Equifax, Inc.

*Partially and fully retired households with $250,000–$750,000 in wealth. We include partially retired households, as most households don't go immediately from fully working to fully retired. Typically, there is a transition period: One partner may continue to work after the other partner retires, or workers may begin to reduce hours worked and start to receive some form of retirement income. To account for this transitional period in which income may comprise both earned income and retirement income, we are looking at the spending curve of both fully and partially retired.

Note: Based on the average spending of households between the 25th and 75th percentile in total spending.

level of lifestyle that needs to be replaced in retirement. The average retirement income needed to sustain this elevated lifestyle at the point of retirement is 92%[3] of the average pre-retirement salary of $70,000.[4]

Spending is not constant

There is an overall downward trend in average post-retirement spending in real terms that levels out around age 85. On average, people are not following a fixed, reduced spending rate relative to their pre-retirement income that immediately goes into effect once they stop working and stays constant (accounting for inflation) across their retirement years. Instead, many follow a more gradual transition period

to reduced spending levels that should be incorporated into withdrawal modeling.

In our research, we found average income replacement levels declined from 92% at age 65 to 78% at age 75 and 70% at age 85 (see **EXHIBIT 4**). There are two key takeaways from this. First, Social Security can be expected to replace 54% of the pre-retirement salary to support this level of spending for the average participant. This means that an additional 38% will need to be funded in the early retirement years—either from a self-funded retirement account or from another source—with gradual declines to 16% at later ages. Second, these spending declines with age are stated in real terms, which does not take into account the effects of inflation, suggesting that the constant purchasing power expectations embedded in many withdrawal models may be overstated.

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[3] Source: J.P. Morgan Asset Management analysis, 2021. Household income replacement rates are derived from an inflation-adjusted analysis of Consumer Expenditure Survey (BLS) data (2017-19).

[4] We use the highest average salary across age cohorts rather than at retirement because higher income individuals tend to retire earlier than average participants, and this tends to reduce the average salary near retirement (average salary near retirement is $65,000.) We wanted to remain conservative in our research modeling, and to account for different retirement ages and to more accurately reflect an average participant, we assume the highest salary of $70,000 as our base case.

Key finding: Translating actual spending patterns into replacement income forecasts shows a higher, 92% target at the start of retirement that steadily moves lower to 70% by age 85

EXHIBIT 4: RETIREMENT SPENDING NEEDS BY FUNDING SOURCE

■ Personal savings and employer sources
■ Social Security

92% income replacement at retirement

70% income replacement at age 85

38% funded by savings

16% funded by savings

54% funded by Social Security

% of gross pre-retirement salary

Age
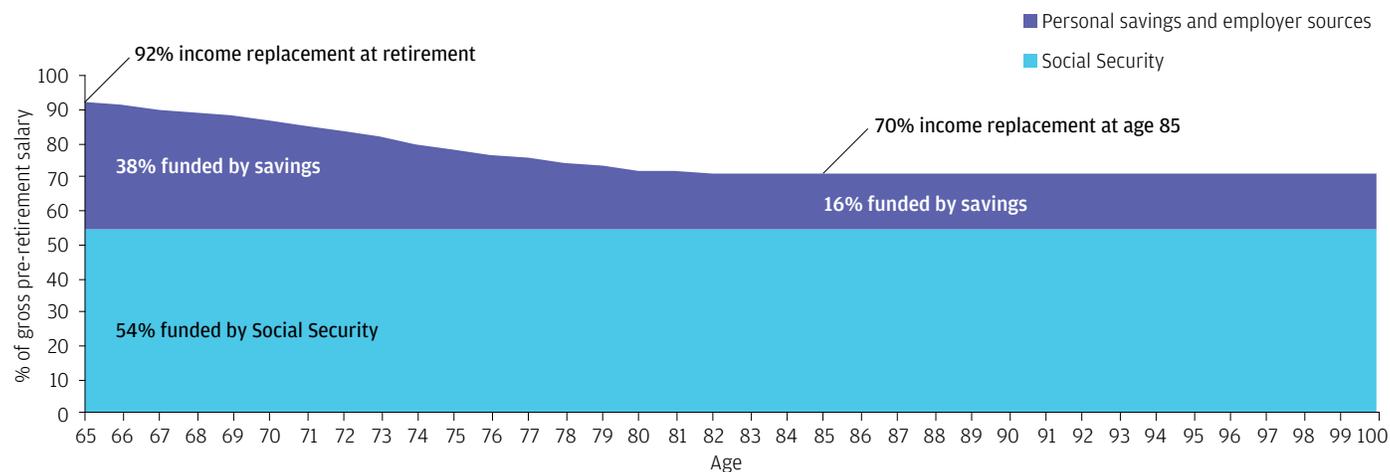
Source: J.P. Morgan retirement research, 2018-19.

Increased Social Security benefits

Social Security replaces notably higher income than in prior studies, based on several key inputs. Cost of living adjustments account for a sizable portion of the increase. To avoid double-counting Medicare Part B premiums that may be captured in reported household spending, the estimated Social Security benefit is no longer reduced for the current premium in our assumption.[5]

The main observation with the addition of this new data is that most people will likely need to save more in their retirement accounts than traditional targets suggest if they hope to maintain their current lifestyles.

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[5] Other adjustments with more modest impact include an assumption that married households had a two-year age difference between spouses rather than three years, based on the average age differential at first marriage (the most broadly quantifiable data available), which slightly increases the spousal benefit. The projection is also based on a full retirement age of 67 and assumes that the household retires when the primary earner is age 65, which means claiming reduced benefits. We wanted to be conservative in our modeling, and this behavior is typical for many retirees. According to the 2020 Retirement Confidence Survey by the Employee Benefit Research Institute and Mathew Greenwald & Associates, Inc., the median expected retirement age is 65. A majority of Americans claim Social Security before their full retirement age once they stop working; in 2018, 53% claimed Social Security before their full retirement age, according to the Social Security Administration.

QUANTIFYING RETIREMENT ACCUMULATION AND DECUMULATION TARGETS

PRE- AND POST-RETIREMENT TARGETS BY THE NUMBERS

$70,000

AVERAGE SALARY that needs to be replaced in retirement, flat from 2018 study

35 years

POTENTIALLY SPENT IN RETIREMENT, based on participants reaching age 100

$575,000

AVERAGE RETIREMENT SAVINGS TARGET up 34% from 2018 study

Source: J.P. Morgan retirement research, 2018–19. For illustrative purposes only.

OUR PRIOR RESEARCH MEASURED TDF SUCCESS AS GETTING AS MANY PARTICIPANTS AS POSSIBLE TO THE RETIREMENT SAVINGS TARGET needed to generate a safe level of replacement income for the average participant. For our modeling, we applied our experience as a defined benefit asset manager to use a reasonable proxy of the asset threshold needed to purchase an annuity that could replace a comparable pre-retirement lifestyle in retirement. This approach was well suited, based on what we knew about replacement income modeling at the time without the actual spending data that we have now, especially given that most participants were quickly leaving their plans once they retired.

We now have a much clearer picture around how people actually spend in retirement and know that more are staying in their plans after they retire. With these considerations in mind, we wanted to evolve our TDF design benchmarking to include the following:

A higher accumulation target

The savings target used in our research continues to represent the total account balance the average participant needs to accumulate by the point of retirement to fund at least a minimum level of adequate replacement income. Keep in mind that decumulation rates are a critical input to help inform realistic accumulation targets. Knowing this target now starts much higher, at 92% of pre-retirement working income, and generally declines to 70% by age 85 in real terms allows us to define the asset threshold necessary to achieve retirement income success more precisely.

Based on this more robust methodology, as well as the updated Social Security inputs discussed earlier, the savings target to provide the average participant with at least a minimum level of adequate replacement income, while accounting for longevity risk, is now $575,000, up from $430,000 in our 2018 analysis. While this accumulation target has climbed substantially, the average salary it is designed to replace has not.

Key finding: The minimum savings target has climbed significantly

EXHIBIT 5: AMOUNT NEEDED TO FUND AT LEAST A MINIMUM LEVEL OF ADEQUATE REPLACEMENT INCOME

	Study year					
	2007	2009	2012	2015	2018	2021
Salary high point	$65,000	$65,000	$72,000	$85,000	$70,000	$70,000
Initial replacement income level	75%	77%	77%	77%	80%	92% ▲
Social Security replaces	40%	43%	42%	42%	46%	54% ▲
Personal savings and other sources replace	35%	34%	35%	35%	34%	38% ▲
Minimum savings target	$400,000	$400,000	$505,000	$500,000	$430,000	$575,000 ▲

Source: J.P. Morgan retirement research, 2001-19.

Both studies identify $70,000 as the average pre-retirement salary high point. It is the spending levels that have increased. **EXHIBIT 5** shows how these accumulation targets have changed through the years.

New decumulation insights

With the increase in retired participants keeping their assets in their plans, we wanted to measure how participants might make the most of their withdrawals across a wide range of potential market climates, based on how people are actually spending in their golden years. Our recent research with the Employee Benefit Research Institute shows that many people default to required minimum distributions (RMDs) as their withdrawal strategy. Other popular approaches include the 4% rule and the 5% endowment model. While these approaches may make sense from a longevity risk perspective, we wanted to evaluate whether they offer the most efficient asset decumulation approach that supports the actual spending behaviors we observe in Chase household data. We set a 35-year time horizon for this analysis to help ensure spending could be supported through age 100, taking a conservative approach to help solve for longevity risk.[6]

This evolution in benchmarking provides a more realistic measurement of success, based on the shifts in retirement investor behaviors and our expanded insights into these saving and spending patterns.

Maintaining a formula for success

The SmartRetirement glide path continues to focus on increasing the odds that participants are able to reach at least a minimum level of adequate replacement income. While that has not changed since our original 2007 study, the measurement of how to achieve that goal has expanded, given our latest research:

- **Pre-retirement:** Help increase the odds that participants reach the spending amount needed in retirement.

- **Post-retirement:** Enhance the withdrawal efficiency in spending down savings throughout retirement to help support actual spending behavior while minimizing the risk of outliving assets.

SMARTRETIREMENT APPROACH

Broader diversification
+
Tight risk controls
=
Greater accumulation success
+
Dynamic withdrawals
=
Greater decumulation success

Source: J.P. Morgan Asset Management. For illustrative purposes only.

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[6] According to the Social Security Administration's Period Life Table published in 2020, the probability of a 65-year-old today living to age 100 or beyond is less than 5%.

While it is useful to recognize these two distinct phases, it is equally important to remember that they remain inherently connected. If participants plan to spend more in retirement without risking exhausting their assets prematurely, they need to accumulate more pre-retirement.

We continue to believe that target date strategies represent one of the most important retirement investment strategies available to participants. The potential benefits of these strategies—professional management, easy-to-access asset class diversification and an increasingly conservative risk/reward profile as retirement approaches—continue to offer a powerful way plan sponsors can help place most participants on a safer retirement investment path.

However, this year's research indicates that the investment hurdles for a successful glide path design continue to rise. First, most participants are still not contributing enough to reach safe funding levels, with many exhibiting less optimal saving patterns that risk significantly weighing on long-term outcome potential. Second, people are spending at higher levels, which means they must accumulate more in their account balances to maintain their living standards.

A third challenge is that expectations for market performance have shifted lower over the past several years. Market returns are a key input into the long-term outcome potential of any glide path design. It is important to recognize that how markets have performed in the past may be dramatically different from how they might perform in the future, especially over shorter time frames. With this in mind, we use forward-looking expectations in our glide path reviews, based on J.P. Morgan Asset Management's Long-Term Capital Market

Assumptions (LTCMAs). This rigorous asset class analysis is used by many institutional investors, including pension plans, which employ it to develop and support their anticipated return assumptions for financial reporting purposes.

Our LTCMA expectations have continued to trend downward in recent years. While past market performance tailwinds may have helped to lift long-term retirement outcomes and make up some of the funding gaps resulting from the impact of participant saving behaviors, we anticipate a challenging investment environment moving ahead (see **EXHIBIT 6**). This means that a glide path design will need to work even harder to provide what is likely to be less return.

Key finding: J.P. Morgan's LTCMAs point to a low return environment and greater asset class divergence

EXHIBIT 6: STOCK-BOND FRONTIERS: 2021 VS. 2020 AND 2008 ASSUMPTIONS
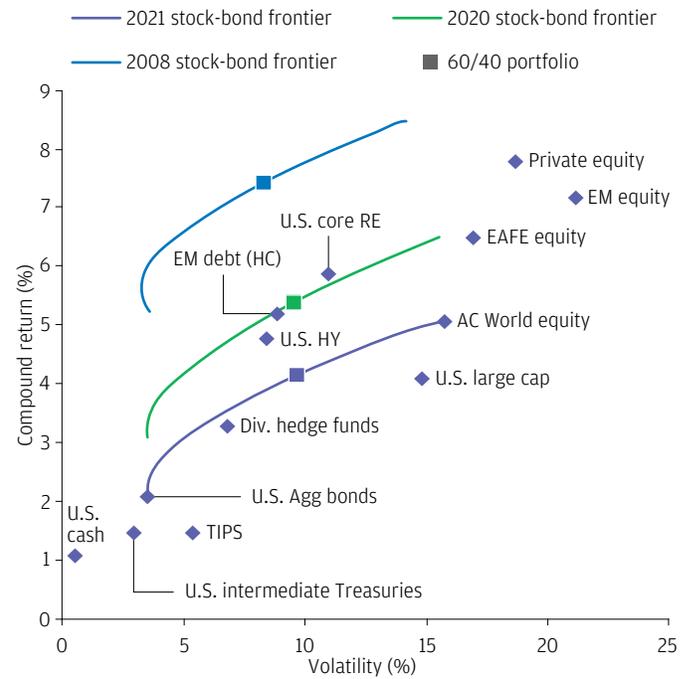
Source: J.P. Morgan Asset Management; estimates as of September 2020 and September 2019. EM: emerging markets; DM: developed markets.

GLIDE PATH IMPLICATIONS

GIVEN THESE INPUTS, WE ARE ADJUSTING THE SMARTRETIREMENT GLIDE PATH.
The primary change is an increased equity allocation across the glide path: a 3% increase in equity for the youngest participants and a 7.5% increase in equity for participants near retirement, with a total 40% equity allocation at the point of retirement.[7]

We believe these are prudent allocations in the current landscape and with the substantially higher accumulation target. What has not changed is the emphasis on increasing risk/reward efficiency through broader diversification and the relatively rapid reduction in equity exposure to reduce downside risk in the critical years leading to retirement.

Additionally, with more participants staying in their plans after retiring, we are introducing a dynamic retirement income strategy into the glide path, starting at the point of retirement. This includes actively managing the glide path and portfolio components to be even more volatility aware through changing market cycles to help reduce sequencing risk—the risk of making ongoing withdrawals when there are market declines, especially in the early years of retirement, as this can significantly reduce portfolio longevity. We then apply our proprietary withdrawal model, which incorporates key inputs such as average retirement spending patterns at various ages, market expectations and the current investment climate, and longevity projections. These collectively help to set an optimized annual spend-down amount that changes each year.

The new glide path is highlighted in **EXHIBIT 7**.

PLANNING FOR DYNAMIC WITHDRAWALS

Our calculator can help individuals decide how much to withdraw each year. This easy-to-use tool is based on sample withdrawal amounts estimated as a percentage of participants' account balances that may be safely withdrawn each year, while allowing for redemption in future years. It is adjusted annually based on our research and market conditions, and is determined at the beginning of the year. The sample withdrawal amount is typically 4%–7% of the initial investment, based on current assumptions.*

*When determining the sample withdrawal amount, we account for various factors, such as assumptions regarding future market performance, past market performance's impact on portfolio value, the time horizon, data on the spending behavior of investors, the impact of mortality, and so on. The initial investment in the fund is assumed to be at age 66.

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[7] While this 40% allocation at the target date was determined through our proprietary research and portfolio risk/reward modeling, it is supported by our recent study with the Employee Benefit Research Institute, "Mystery no more: Portfolio allocation, income and spending in retirement," August 19, 2021. In this study, we found that participants with greater than 40% equity in their 401(k)s tended to de-risk after making an IRA rollover, and if this de-risking were to happen at an inopportune time in the market, retirement success might suffer by locking in potential market losses.

Key finding: A higher accumulation target, changing behaviors and low market expectations warrant a glide path evolution

EXHIBIT 7: NEW SMARTRETIREMENT GLIDE PATH

SAVING PHASE* SPENDING PHASE*

Early Career
Focus on growth by leveraging diversification

Mid Career
Accelerate de-risking as cash flow volatility picks up

Pre-Retirement
Maintain moderate glide path to reduce drawdown risk while generating return

Post-Retirement
Control risk to support spending needs and offer spending insights

% of portfolio allocation

5% Cash**
55% Bonds
40% Stocks

Legend:
- Cash and cash alternatives
- Inflation managed
- Core fixed income
- High yield
- Emerging market debt
- REITs
- Emerging equity
- International equity†
- U.S. small cap
- U.S. mid cap
- U.S. large cap

YEARS TO RETIREMENT (40 ... 25 ... 0)

YEARS AFTER RETIREMENT (0 ... 35)

The strategic asset allocation depicts the Fund's targeted weights based on J.P. Morgan's internal analysis. Starting on or about September 8, 2021, portfolios will gradually move toward this target allocation. The effective date of this new glide path allocation is on or about March 18, 2022. The Fund's actual allocations may differ due to changes to these strategic allocations or due to tactical allocations. Diversification and asset allocation do not guarantee investment returns and do not eliminate the risk of loss. Past performance does not guarantee future results.

*Saving Phase reflects the current SmartRetirement funds, while Spending Phase shows the current SmartSpending funds. The target date of integration is March 2022.

**Cash and cash equivalents.

†As represented by the EAFE Index.

Inflation managed is allocated to TIPS (Treasury Inflation-Protected Securities): Treasury bonds adjusted to eliminate the inflation effects on interest and principal payments, as measured by the consumer price index (CPI). REITs (real estate investment trusts): Companies that own or finance income-producing real estate, providing investors of all types with regular income streams, diversification and long-term capital appreciation.

PROJECTED RETIREMENT OUTCOMES

TO PUT THIS GLIDE PATH TO THE TEST, WE 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. These 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.

MEASUREMENT OF OUTCOMES

Accumulation phase

The first part of this review evaluated how well our glide path design performed compared with the average TDF glide path, as measured by the S&P Target Date Index. Our benchmark for success 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 (the minimum savings target of $575,000 discussed earlier). J.P. Morgan's capital market assumptions served as the starting point for the simulations; our forecasts had a generally dampening effect on the range of outcomes likely to be experienced because the chances of less favorable market returns have increased in recent years.

Results

Based on our analysis, our glide path consistently outperformed the average TDF design across the full spectrum of participant behaviors and market conditions (see **EXHIBIT 8**). It delivered a much stronger outcome than the average TDF design when markets and behaviors were ideal (5th percentile). Even more importantly from a fiduciary perspective, it helped more participants achieve the minimum savings target (45% vs. 41% at median) and also delivered stronger relative performance when market conditions and/or participant behavior were less than favorable (95th percentile). These are the segments we are much more concerned with, as we believe it is more prudent to strive to help as great a number of participants as possible reach safe funding levels, as well as protect those most at risk of falling short, than simply trying to secure as high a return as possible.

THE PAIN OF FALLING SHORT

To help illustrate the importance of reaching safe retirement funding levels, our original 2007 study used the concept of being in a cafeteria, where a cheeseburger costs $4 and you have $5. You can get lunch and also a cookie. If you only have $3, however, you cannot afford the cheeseburger at all. Having $1 too little hurts far more than the extra $1 helps. Consider this scenario on a far bigger scale in retirement—and the fact that the prices of that cheeseburger and cookie have climbed substantially higher.

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

EXHIBIT 8: RANGE OF EXPECTED ACCOUNT BALANCES AT RETIREMENT
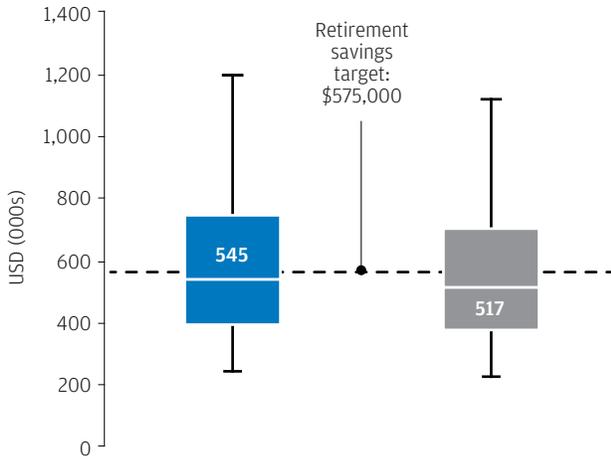
USD (000s)	JPM SmartRetirement	S&P TD Index
5th percentile	1,196	1,127
50th percentile	545	517
95th percentile	241	228
Target	575	575
% above target	45%	41%
Probability of loss +3 years	11%	13%

SAVINGS NEEDED

Someone who earns a pre-retirement salary of **$70,000** needs **$575,000** in retirement savings to be able to replace a comparable lifestyle in retirement

RETIREMENT OUTCOME:
Median account value at age 65*

JPM SmartRetirement
$545,000

S&P TD Index
$517,000

$28,000
additional savings** to replace first full year of spending in retirement

Source: J.P. Morgan retirement research, 2018–19.

Note: Modeling uses Equilibrium Long-Term Capital Market Assumptions, which are projected returns based purely on economic forecast, and not starting point prices (current valuations and corporate margins).

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

**When compared with S&P TD Index.

While we were pleased that these projections showed that the SmartRetirement glide path positioned more participants for success, it is important to note that achieving at least the minimum savings target has become harder over time due to low average contributions, higher average retirement spending that increases the baseline lifestyle that needs to be replaced and low market return expectations going forward. These factors should serve as a serious call to action for plan sponsors. To help ensure greater outcome potential, plan design needs to encourage higher savings. Investment design alone can only do so much.

Key finding: Achieving at least the minimum savings target for the average participant has become harder over time

EXHIBIT 9: SMARTRETIREMENT GLIDE PATH CONTINUES TO OUTPERFORM, BUT SUCCESS RATES ACROSS THE BOARD HAVE MOVED LOWER DUE TO LOW AVERAGE CONTRIBUTIONS, HIGHER AVERAGE RETIREMENT SPENDING AND LOW MARKET RETURN EXPECTATIONS

	Study year	
Success rates	2007	2021
SmartRetirement	76%	45%
Representative competitor glide path	69%	41%

Source: J.P. Morgan retirement research, 2001-06, 2018-19.

Note: Representative competitor glide path in 2021 is S&P Target Date Index and in 2007 is the average of the outcomes across Aggressive, Concentrated and Conservative competitor designs from that study.

Decumulation phase

We ran our proprietary withdrawal model compared with generic industry approaches: RMDs, the 4% rule and the 5% endowment model. We once again applied a broad mix of market scenarios, from incredibly strong to incredibly difficult climates occurring at various times, from early retirement to later years. We set a targeted 35-year time frame for portfolio depletion (age 100, assuming a retirement age of 65).

Results

Based on our projections, our proprietary withdrawal model delivered an optimized solution compared with the other approaches (see **EXHIBIT 10**). First, it generated an income stream that best supported the actual spending behaviors that we observed in retired households; other approaches led to underconsumption in the critical early years of retirement. Second, it efficiently exhausted account assets by the period's end, fully optimizing consumption over a lifetime while adequately addressing longevity risk. The other approaches left sizable portfolio values at the end of the period, which may be fine if that was indeed a retirement goal (for example, long-term care or a bequest). However, for those goals outside consumption, the assets could be managed more proactively with an appropriate risk/reward profile based on the time horizon.

Key finding: Our proprietary decumulation approach offers a more efficient withdrawal solution

EXHIBIT 10A: MEDIAN PAYOUTS IN REAL DOLLARS
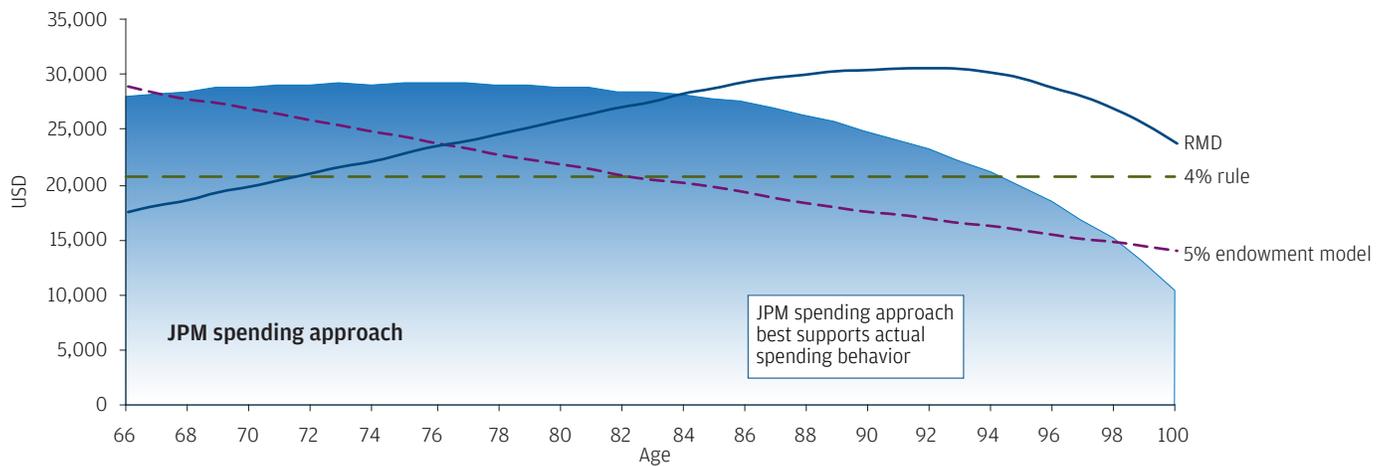
EXHIBIT 10B: MEDIAN REMAINING PORTFOLIO VALUE IN REAL DOLLARS
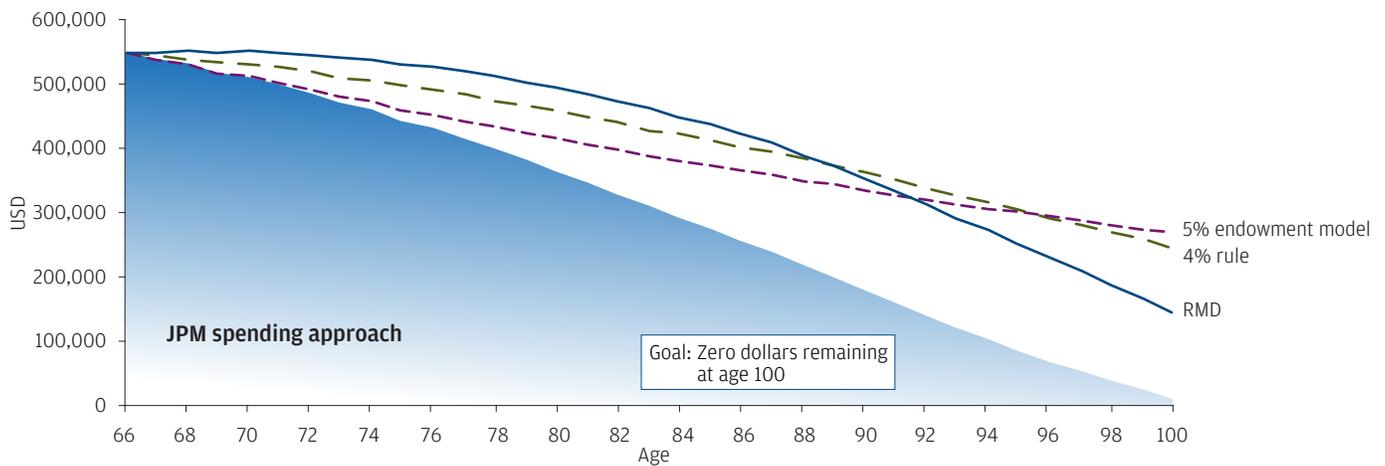
Source: J.P. Morgan retirement research, 2018-19.

Note: Assuming $550,000 initial portfolio value. The 50th percentile market performance is based on 10,000 portfolio simulations. Inflation of 2% is assumed.

CONCLUSION

OVER A DECADE AGO, OUR RESEARCH INTO DC PLAN SAVING AND WITHDRAWAL PATTERNS HELPED TO REDEFINE THE DIALOGUE AROUND THE GLIDE PATH DESIGN that best positioned the most participants for retirement funding success. The inclusion this year of how people are actually spending in retirement—and how this affects both accumulation targets and how to optimize asset decumulation—offers new, deeper insights that can help further strengthen potential outcomes across participants' entire retirement journeys.

In our view, the four main takeaways from our latest study are that:

1. **Average contribution rates remain too low.** Most people are still not contributing enough to reach safe funding levels.

2. **Retirees are spending at higher than expected levels.** Elevated average spending rates in the early years of retirement suggest that many people will likely need to accumulate more in their retirement account balances to maintain their living standards and reduce the risk of outliving their assets.

3. **More people are staying in their plans after they retire.** This represents a meaningful shift from our earlier studies, with significant implications for post-retirement investment strategies.

4. **Market performance expectations continue to remain low.** Consequently, retirement outcomes are likely to face mounting pressures as returns stay muted looking ahead.

Collectively, these research insights offer three major implications for DC plan and TDF glide path designs:

1. **Getting more participants to save more:** Plans can help participants help themselves through the broader use of automatic contribution and escalation programs at much higher starting levels and rate increases than are typically used today.

2. **Evolving the SmartRetirement glide path:** To help address the significantly higher accumulation target for the average participant and our low long-term market expectations, we will increase equity allocations across the glide path while maintaining our emphasis on increasing risk/reward efficiency through broad diversification and a relatively rapid reduction in equity exposure in the critical years leading up to retirement. This approach continues to outperform the average TDF glide path by delivering stronger retirement outcome projections for more participants.

3. **Including an efficient decumulation option:** Our glide path enhancements include a proprietary decumulation methodology that can help enhance the potential efficiency for spending down assets through retirement, based on actual spending behaviors, while minimizing longevity risk.

Looking ahead, we remain deeply committed to continuing to provide this type of industry-leading DC research and product innovation. By understanding the numbers driving retirement outcomes, we can all help increase the odds that participants are able to achieve the replacement income they need to retire safely, when and how they want.

Disclosures

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