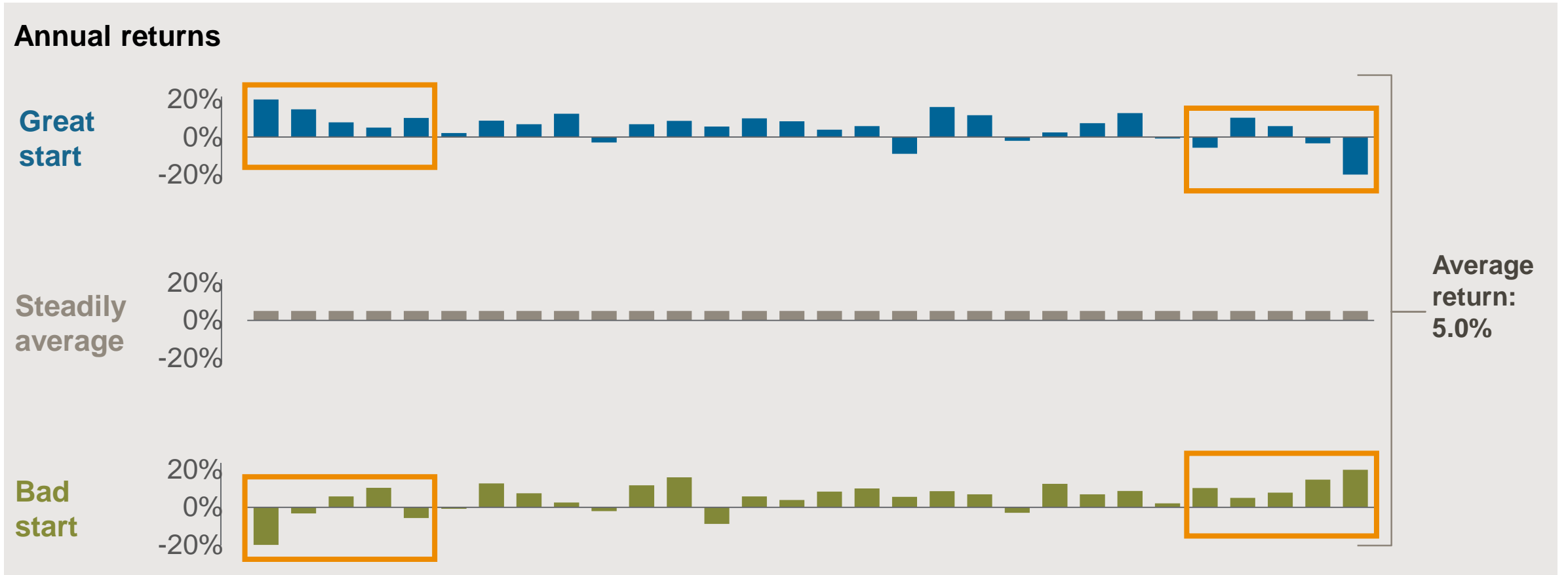

Ready! Fire! *Aim?* 2018

Incorporating insights from more than a decade of real-world participant behavior

Myth: Returns are all that matter

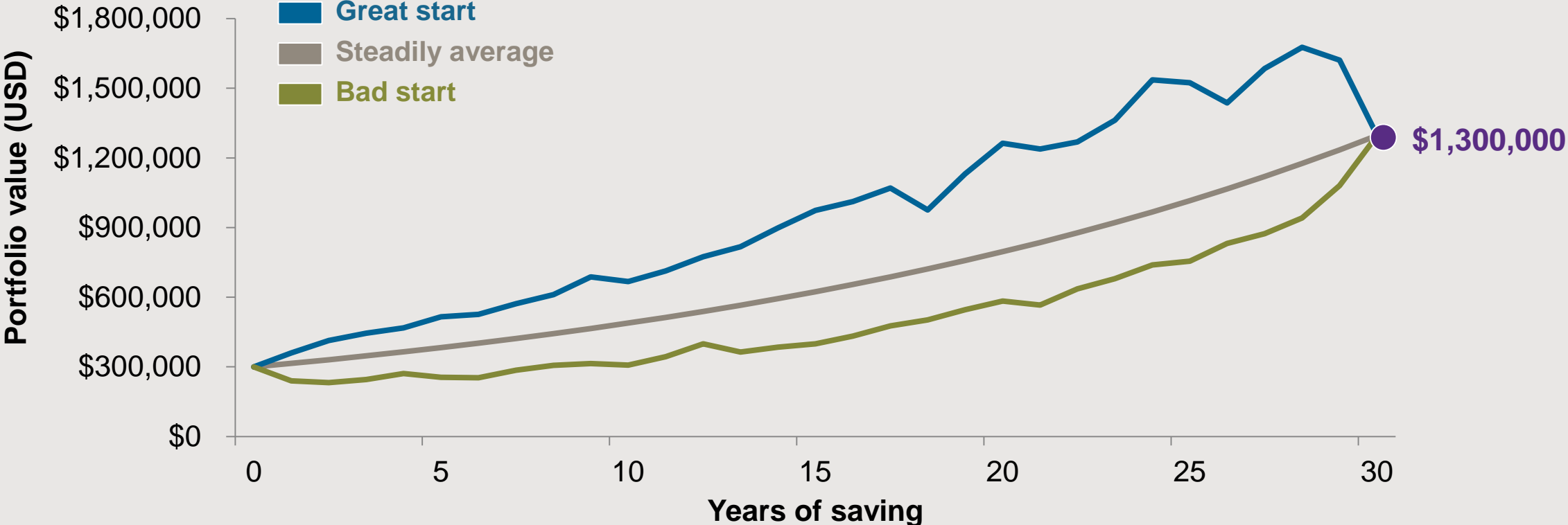
Equal average returns with different sequence



Note: Hypothetical return scenarios are for illustrative purposes only and are not meant to represent an actual asset allocation.

Myth: Returns are all that matter...

Value of three portfolios with equal average returns and equal lump sum amount
USD 300,000 lump sum investment at the start

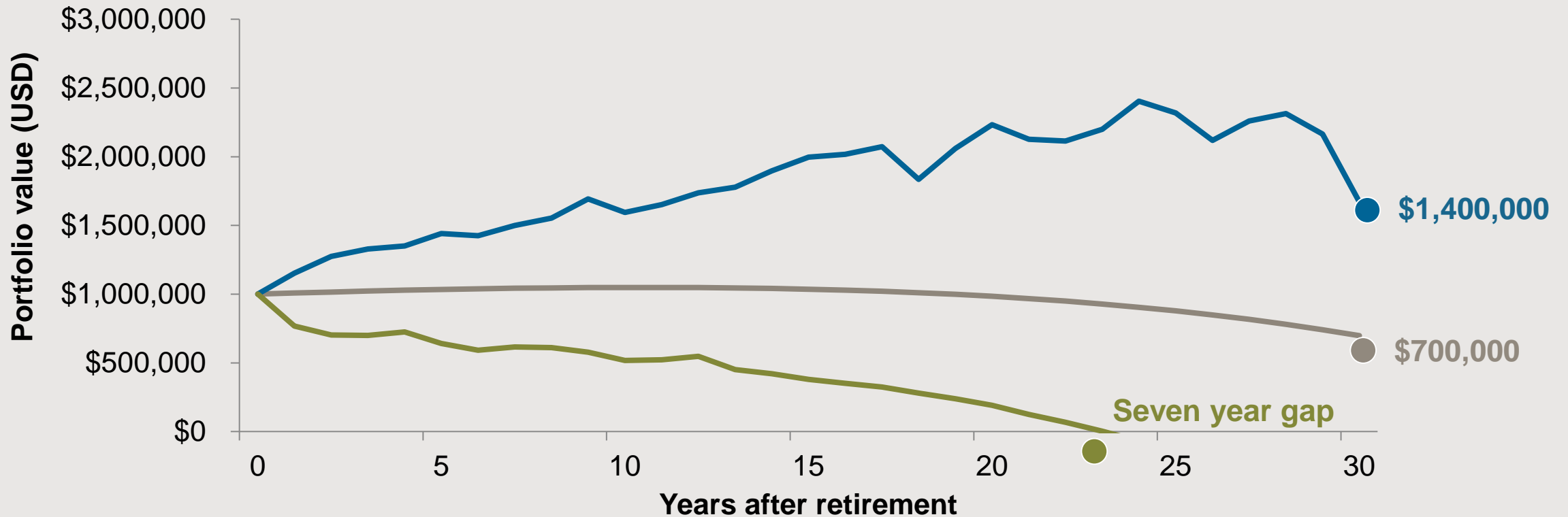


For illustrative purposes only. Illustration assumes lump sum investment of USD 300,000 which was kept invested for 30 years. Average return is the compound annualized rate. Currency in USD. For return sequence scenarios, see slide 2.

Myth: Returns are all that matter

Value of three portfolios with equal average returns and equal annual withdrawal amounts

Withdrawal is equal to 4% of initial portfolio value and then annually adjusted for inflation



For illustrative purposes only. Illustration assumes withdrawal amount is 4% of the initial portfolio and is then inflation adjusted over the period (2.25%). Average return is the compound annualized rate. Currency in USD. For return sequence scenarios, see page 2. Hypothetical return scenarios are for illustrative purposes only and are not meant to represent an actual asset allocation. Spending in retirement chart assumes an initial \$1,000,000 and a 4% withdrawal adjusted annually for inflation of 2%.

Plan sponsors taking steps to fortify DC Plans

Use of innovative plan features and strategies

64%

**AUTOMATIC
ENROLLMENT**

50%

**AUTOMATIC
CONTRIBUTION
ESCALATION**

62%

**TARGET DATE
FUNDS**

78%

**TARGET DATE
FUNDS
AS A QDIA**

Note: 2017 Total n = 968, Large (>\$250M) = 165.

*For those with a QDIA, Total n = 540; Large (>\$250M) = 110.

Source: J.P. Morgan Plan Sponsor Research 2017.

What's more, participants are supportive

Participant attitudes toward and usage of target date funds surveyed ...

88%

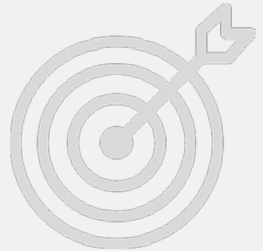
Appeal of target date funds (% stating “somewhat” or “very appealing”)

71%

Invested in target date funds (if available in plan)*

54%

of “do it yourself” investors still choose to invest in target date funds



Note: 2018 Total n=1,295; “Do it for me” investors n=773; “Do it yourself” investors n= 522.

*Of those invested in TDFs if offered in plan, total n=635; “Do it for me” investors n=397; “Do it yourself” investors n=238.

Source: J.P. Morgan Plan Participant Research 2018.

More than a decade of data-driven insights

Big data can help us understand how people save and invest for retirement

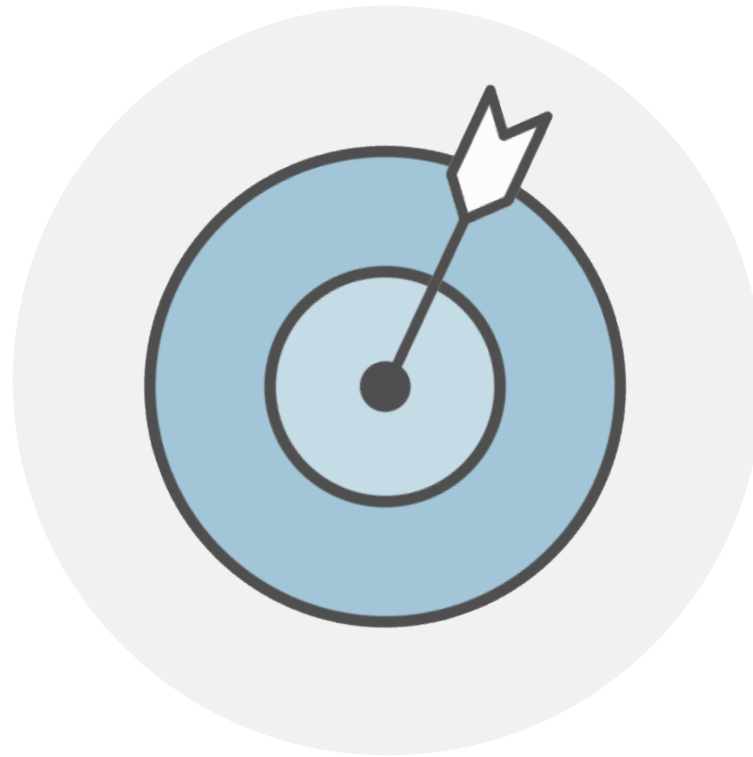
The image displays a sequence of four overlapping document covers for 'Retirement Insights' reports, arranged from left to right in an ascending staircase pattern. Each cover features the 'RETIREMENT INSIGHTS' header in an orange arrow shape. The reports are:

- Ready! Fire! Aim? 2018:** Updated findings from over a decade of research into real-world participant saving and withdrawal patterns. The cover features a grid of 24 circles with several icons: a purple circle with a gear, a green circle with a plant, a teal circle with a hand holding a document, and a blue circle with a target.
- Ready! Fire! Aim? 2015:** Incorporating insights from more than 10 years of into target date fund design. The cover features a blurred image of a grid with a yellow cube and an orange cylinder.
- Off balance:** The unintended consequences of... The cover features a close-up of a dark, smooth stone.
- Ready! Fire! Aim? 2015 (partial):** The cover features a dark background with a white circle.

At the bottom right of the 2018 report cover is the J.P.Morgan Asset Management logo. At the top right of the 2018 report cover is the text 'FOR INSTITUTIONAL USE ONLY | NOT FOR PUBLIC DISTRIBUTION'.

Purpose of our research

“Evaluating real-world participant behavior to inform effective target date fund design”



Understand

Evaluate

Assess

Our participant data population

Contributions



2M+ participants



4,000 companies

Distributions

pre-retirement and post-retirement

Loans

Salary raises

Source: J.P. Morgan retirement research, 2015-2017

More than a decade of insights into participant behaviors

	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
Salary raises	On average, participants get raises every two out of three years.	On average, participants get raises every other year.	On average, participants get raises every year.	On average, participants get raises every two to three years.	On average, participants get raises every two out of three years.
Contributions	On average, contribution rates start at 6% and increase slowly, reaching 8% of salary by age 40 and 10% not until age 55.	On average, contribution rates start at 6% and increase even more slowly, reaching 8% of salary by age 45 and 10% not until age 57.	On average, contribution rates start at 5% and increase slowly, reaching 8% of salary by age 44 and 10% not until age 59.	On average, contribution rates start at 5% and increase slowly, reaching 8% of salary by age 50 and do not reach 10% before retirement.	On average, contribution rates start at 5% and increase slowly, reaching 6% by age 45 and only reach 7% before retirement.
Loans	19% of participants borrow, on average, 21% of account balance ¹ .	18% of participants borrow, on average, 25% of account balance.	18% of participants borrow, on average, 22% of account balance.	23% of participants borrow, on average, 20% of account balance.	19% of participants borrow, on average, 20% of their account balance.
Pre-retirement distributions	12% of participants over the age of 59.5 withdraw, on average, 25% of assets.	13% of participants over the age of 59.5 withdraw, on average 27% of assets.	12% of participants over the age of 59.5 withdraw, on average, 18% of assets.	14% of participants over the age of 59.5 withdraw, on average 30% of assets.	Around 10% of participants over the age of 59½ withdrew, on average, 55% of assets.
Post-retirement distributions	The average participant withdraws over 20% of remaining balance per year at or soon after retirement.	The average participant withdraws over 20% of remaining balance per year at or soon after retirement.	The average participant withdraws over 20% of remaining balance per year at or soon after retirement.	The average participant withdraws over 26% of remaining balance per year at or soon after retirement.	The average participant withdrew more than 55% of remaining balance in any given year at or soon after retirement.
Remain in plan three years after retirement	Not available (began tracking in 2006).	20% of participants remain in the plan.	17% of participants remain in the plan.	32% of participants remain the plan.	28% of participants remain in the plan.

Source: J.P. Morgan retirement research, 2001–17.

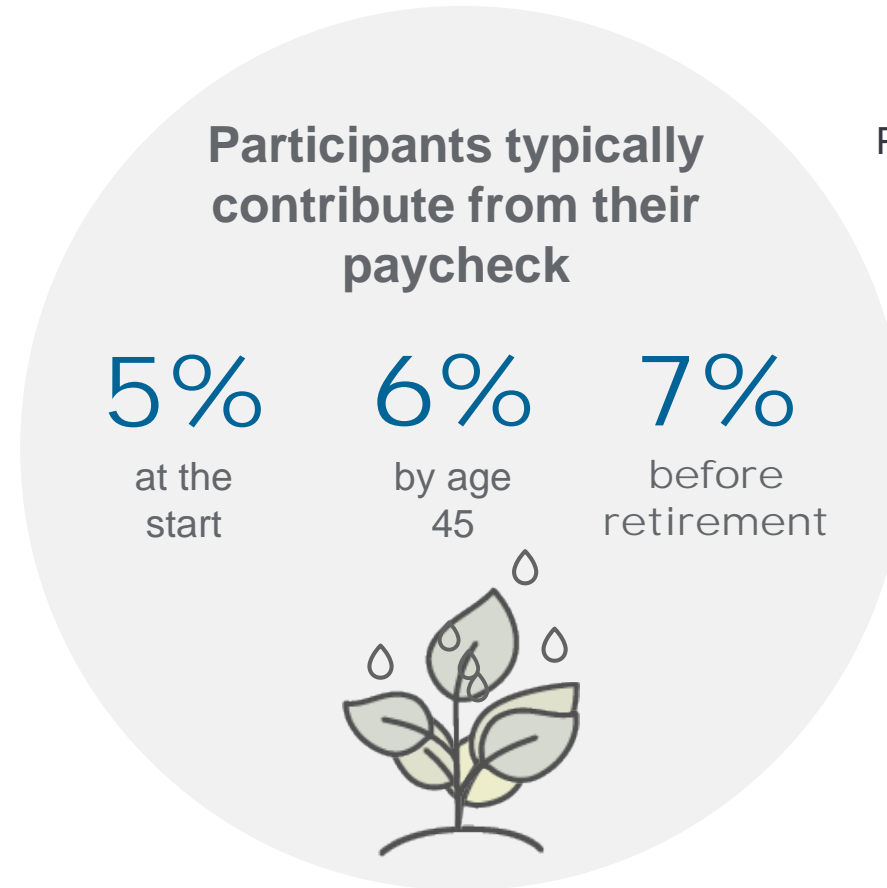
Slight differences in numbers reported from earlier studies may exist due to the reclassification of certain participant behavior. Those differences are not material.

¹ Due to a methodology change, 15% of account balance reported in 2006 is revised to 21% in this presentation.

Insufficient contribution rates

KEY INSIGHT

Most investors are not saving enough.



PLAN DESIGN IMPLICATION

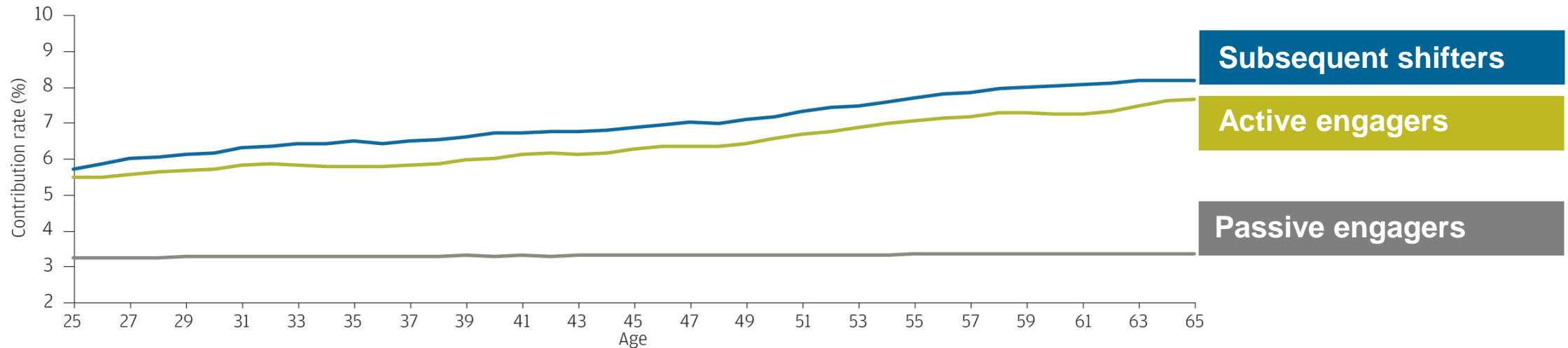
Automatic enrollment must be paired with automatic contribution escalation.

Source: J.P. Morgan retirement research, 2015-2017

Consequences of automatic enrollment

Automatic enrollment continues to expand engagement...
...but it's also weighing on lower contribution rates

Average contribution rates by enrollment type

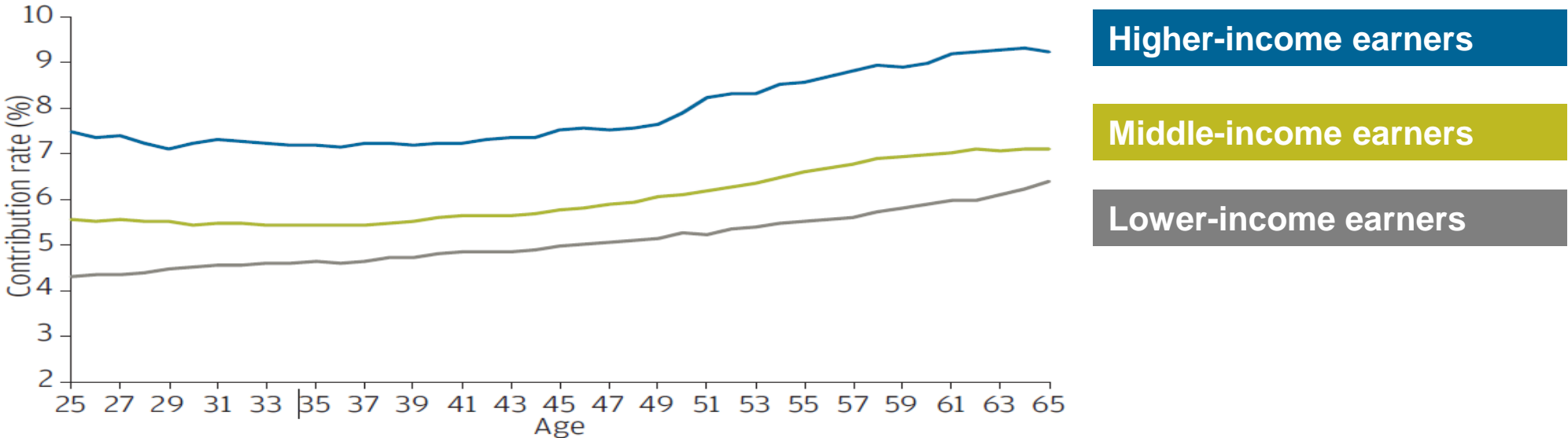


Source: J.P. Morgan retirement research, 2015-2017

Higher-income earners tend to contribute the highest rates

Distinct behaviors and patterns were observed across salary levels

Average contribution rates by salary level

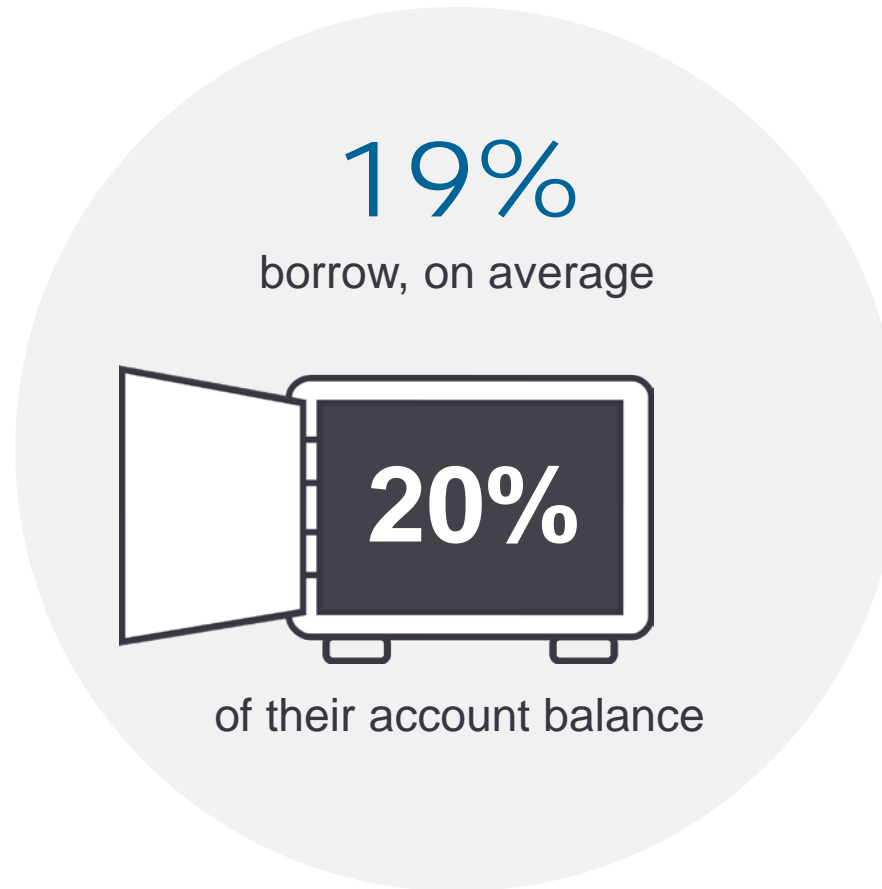


Source: J.P. Morgan retirement research, 2015-2017

Borrowing behaviors

KEY INSIGHT

Tight volatility controls are crucial to help manage the amplifying effects of cash flow volatility on market volatility.



GLIDE PATH IMPLICATION

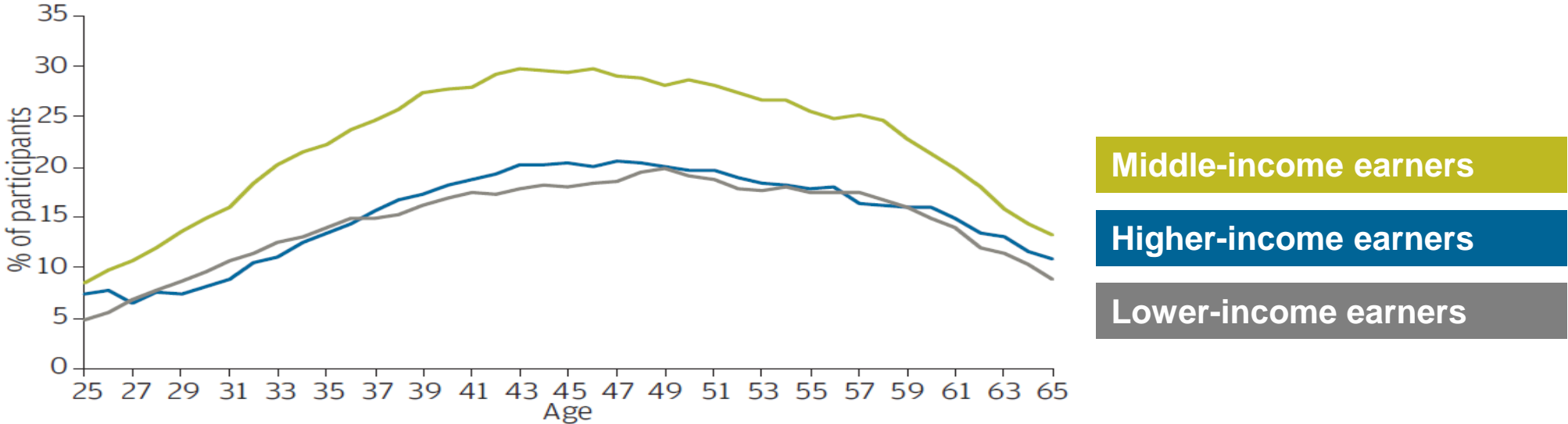
Diversification and risk management are important to glide path design.

Source: J.P. Morgan retirement research, 2015-2017

Middle-income earners are most likely to take a loan

Distinct behaviors and patterns were observed across salary levels

Percentage of participants with loans by salary level



Source: J.P. Morgan retirement research, 2015-2017

Withdrawal behaviors

KEY INSIGHT

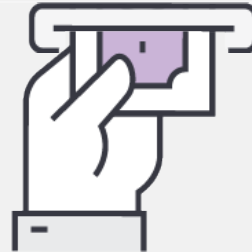
Sharp risk reduction
in the years leading up to
retirement is crucial.

10%

over age 59½ withdraw, on average

55%

of their assets



GLIDE PATH IMPLICATION

**Shape and slope of
the glide path near
retirement and
diversification are key.**

Source: J.P. Morgan retirement research, 2015-2017

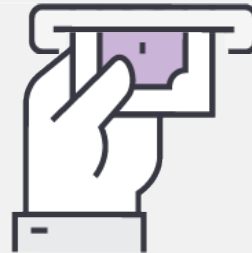
Post-retirement exodus

KEY INSIGHT

The majority are not using the investment vehicle post-retirement.

72%

of participants are no longer in the plan 3 years into retirement



GLIDE PATH IMPLICATION

Static glide path at and post retirement is appropriate given high levels of cash flow volatility.

Source: J.P. Morgan retirement research, 2015-2017

Our spending data population

Real-life retiree spending behaviors from analyzing Chase[®] data

Deposits

5.8M

households

Spending

Income



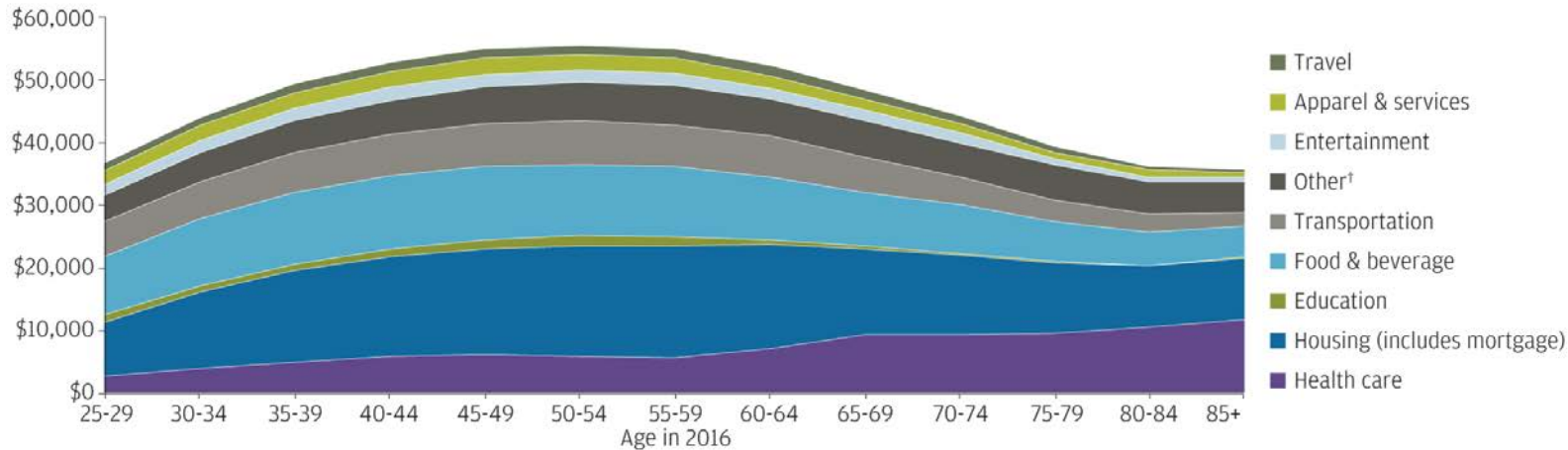
Age

25–100

Source: J.P. Morgan Asset Management, based on Chase data.

Lifetime spending curve

Median spending – Chase® data with estimated categorization of checks and cash



KEY INSIGHT

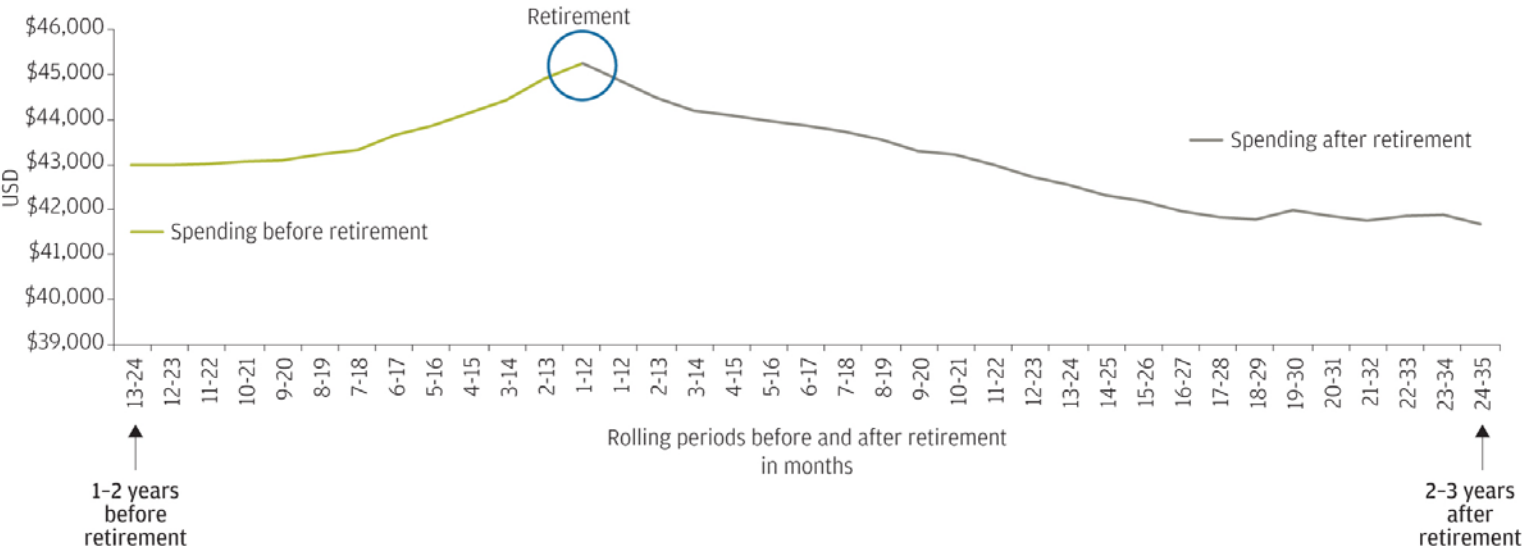
Overstating actual spending by 26% at age 95 forces retirees to spend less when they are young and healthy.

Source: Total spending and all category sub-totals except checks, cash and health care costs: Chase data, including Chase credit card (excluding some co-branded cards), debit card, electronic payment, ATM withdrawal and check transactions from January 1–December 31, 2016; J.P. Morgan analysis. Health care costs age 65+: Employee Benefit Research Institute (EBRI) data as of December 31, 2016; SelectQuote data as of January 16, 2017; J.P. Morgan analysis. Health care costs pre-age 65 and check and cash distribution excluding health care costs after age 65: 2016 Consumer Expenditure Survey, College Educated; J.P. Morgan analysis. Information that would have allowed identification of specific customers was removed prior to the analysis.

[†]Other includes: gifts and donations, gambling, personal care, tax payments, insurance and uncategorized items.

Retirement spending surge

Rolling monthly one-year median spending before and after retirement (Retirement age 60 to 69)

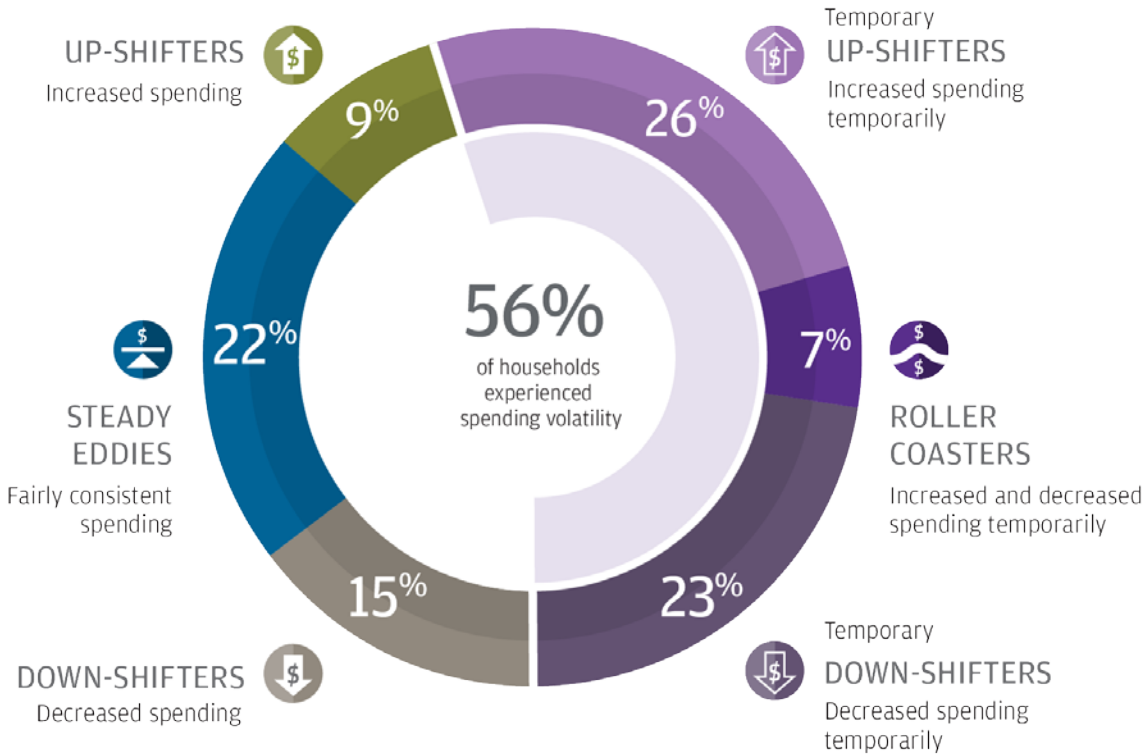


KEY INSIGHT

Surge in spending in early retirement years can ravage portfolio value.

Note: For those who retired age 60–69. Percentages may not add to 100 due to rounding.
 Source: Chase credit card, debit card (excluding some co-branded cards), 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.

Retirement spending volatility



KEY INSIGHT

Spending volatility requires a new investment solution that provides spending flexibility while addressing sequencing of return risk.

Note: For those who retired age 60–69. Total may be more than 100% due to rounding.
 Source: Chase credit card (excluding some co-branded cards), 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.

Better data leads to better decisions

Adopt

automatic features

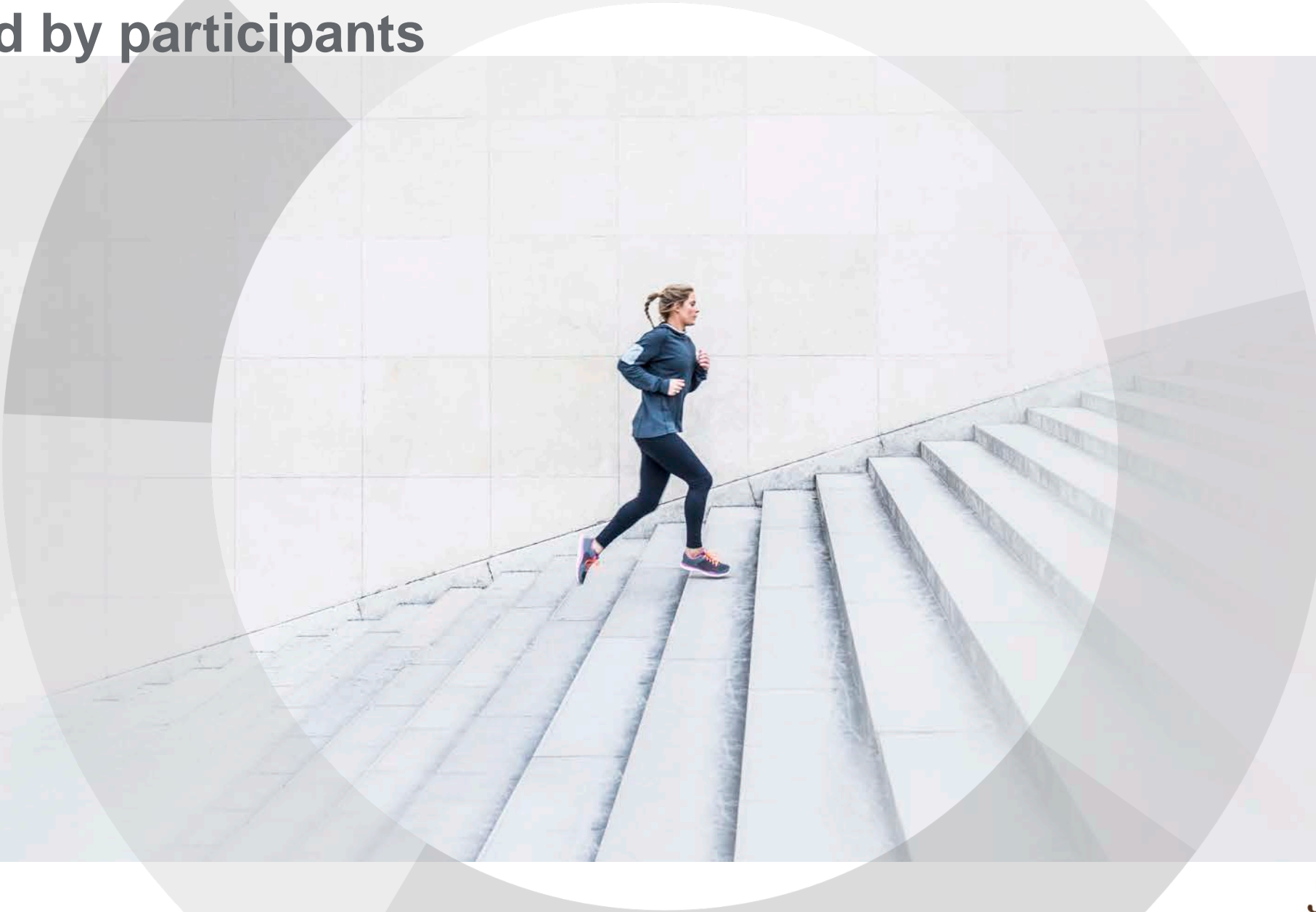
Select

the most appropriate TDF

Conduct

a re-enrollment

Powered by participants

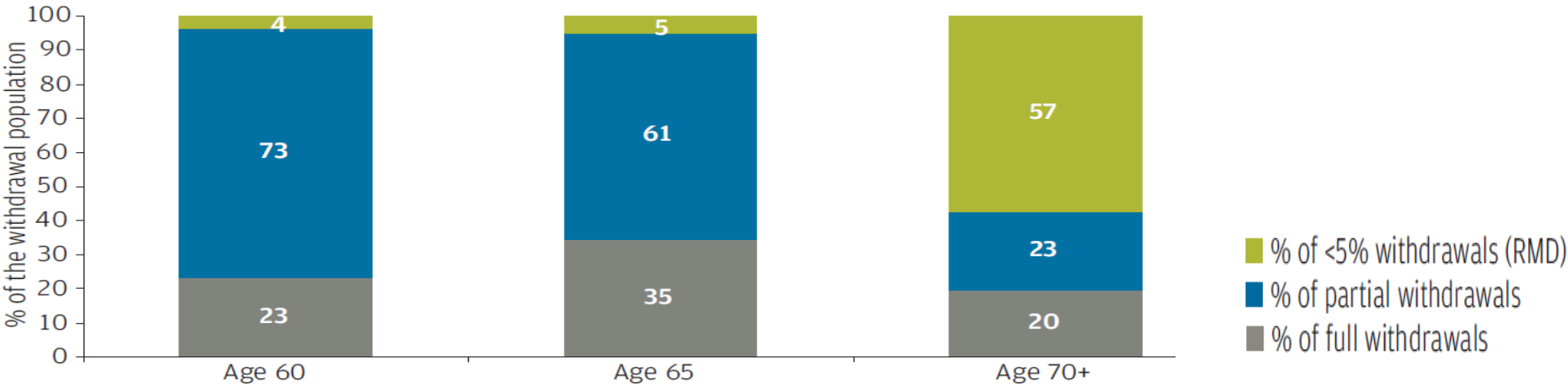


Appendix

Key findings

Most assets leave the plan within three years of retirement

Mix of types of withdrawals

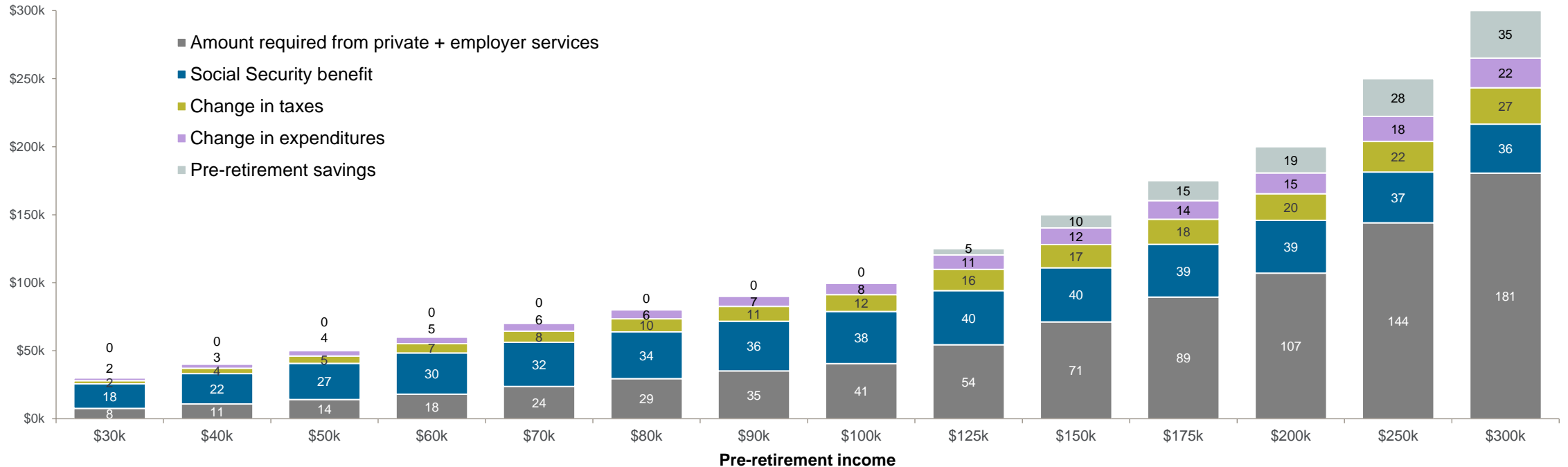


Source: J.P. Morgan retirement research, 2015-2017

Note: Due to full withdrawals between ages 59 ½ and 70+, our sample size shrinks. At age 60, the number of participants included in the analysis is around 20k; at age 65, the number of is around 9.5k; at age 70, the number of participants is around 5k.

The target: income replacement

Replacement rate detail by household income



Source: J.P. Morgan Asset Management analysis, 2019. Household income replacement rates are derived from an inflation-adjusted analysis of: Consumer Expenditure Survey (BLS) data (2013-2016); Social Security benefits using modified scaled earnings in 2019 for a single wage earner at age 65 and a spousal benefit at age 62 reduced by Medicare Part B premiums. The income replacement needs may be lower for households in which both spouses are working and the second spouse's individual benefits are greater than their spousal benefit. Single household income replacement needs may vary as spending is typically less than a two-spouse household; however, the loss of the Social Security spousal benefit may offset the spending reduction. Percentages and values may not sum due to rounding.

Getting to the savings finish line

Salary	TDF total at 65	Social Security	DC Balance/ Other Savings	Total income replacement ratio
\$30,000	\$140,000	60%	26%	86%
\$40,000	\$195,000	56%	27%	83%
\$50,000	\$255,000	54%	28%	82%
\$60,000	\$330,000	51%	30%	81%
\$70,000	\$430,000	46%	34%	80%
\$80,000	\$540,000	43%	37%	80%
\$90,000	\$640,000	41%	39%	80%
\$100,000	\$750,000	38%	41%	79%
\$125,000	\$970,000	32%	43%	75%
\$150,000	\$1,300,000	27%	47%	74%
\$175,000	\$1,600,000	22%	51%	73%
\$200,000	\$2,000,000	19%	54%	73%
\$250,000	\$2,650,000	15%	58%	73%
\$300,000	\$3,300,000	12%	60%	72%

Source: J.P. Morgan Asset Management analysis, 2019. Household income replacement rates are derived from an inflation-adjusted analysis of: Consumer Expenditure Survey (BLS) data (2013-2016); Social Security benefits using modified scaled earnings in 2019 for a single wage earner at age 65 and a spousal benefit at age 62 reduced by Medicare Part B premiums. The income replacement needs may be lower for households in which both spouses are working and the second spouse's individual benefits are greater than their spousal benefit. Single household income replacement needs may vary as spending is typically less than a two-spouse household; however, the loss of the Social Security spousal benefit may offset the spending reduction. Percentages and values may not sum due to rounding.

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