Redefining the Optimal Retirement Income Strategy

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REDEFINING THE OPTIMAL RETIREMENT INCOME STRATEGY

David Blanchett, PhD, CFA, CFP®
Head of Retirement Research
PGIM DC Solutions

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THE PURSUIT OF OUTPERFORMANCE

Overview

- Key assumptions in retirement income projections (e.g., Monte Carlo simulations) have changed relatively little in three decades (e.g., most models rely on static models and success rates and the primary outcomes metrics).

- In this presentation, I'm going to walk through a cohesive series of models that both improve retirement income projections and could actually be implemented in financial planning tools.

- Since most of you aren't software engineers, I'm not expecting you to build new tools that do these things, rather seek out those that do these things and understand the limitations of your current tools (and how to work around them, as best as possible).

Research

WHERE WE ARE TODAY

The Rise of Monte Carlo

Question: Do you use Monte Carlo projections as part of your financial plans for retirement?
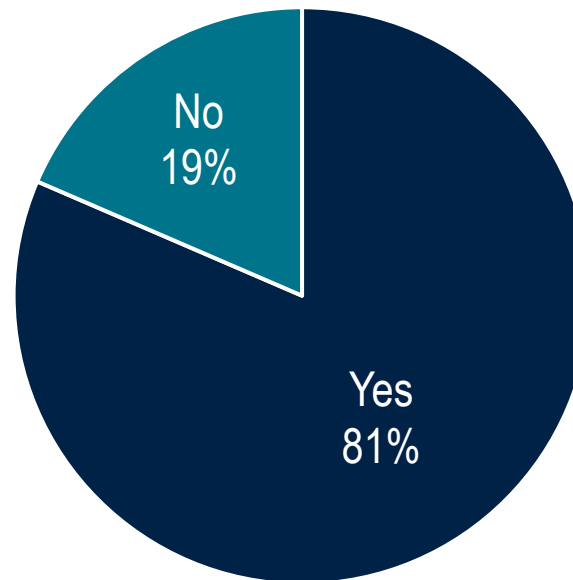
No 19%
Yes 81%

Embrace the Uncertainty!

Shown for illustrative purposes only.

Static vs. Dynamic Retirement Models

Most Existing
Market Solutions

Retirement

Outcome

Reality

Retirement
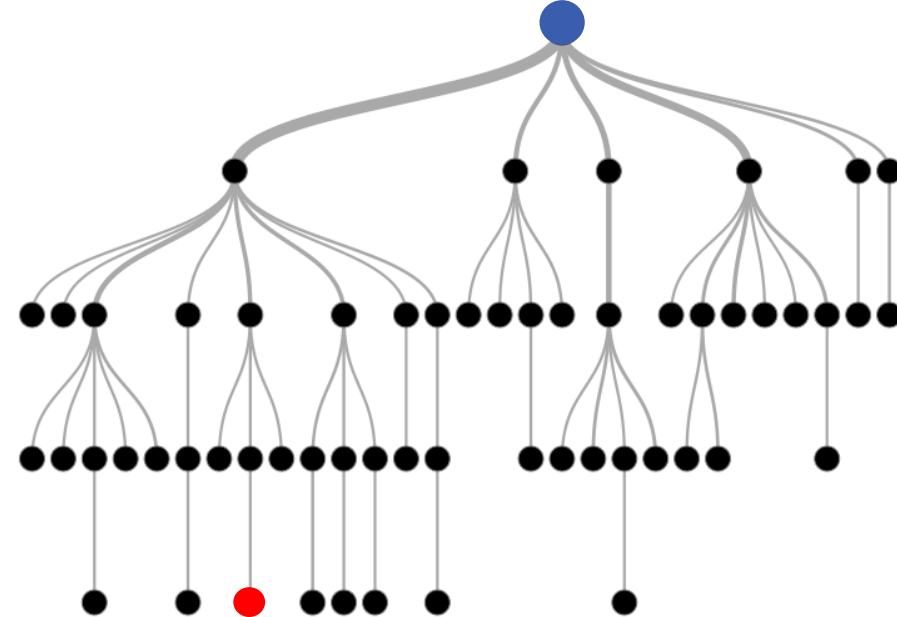
Outcome

Shown for illustrative purposes only.

Retirees Have the Capacity to Adjust Spending

Spending Changes Since the Pandemic

■ Significantly Increased ■ Somewhat Increased ■ No Change ■ Somewhat Decreased ■ Significantly Decreased

Discretionary Spending

Year	Significantly Increased	Somewhat Increased	No Change	Somewhat Decreased	Significantly Decreased
2020	1%	7%	38%	34%	20%
2022	2%	10%	44%	30%	13%

Essential Spending

Year	Significantly Increased	Somewhat Increased	No Change	Somewhat Decreased	Significantly Decreased
2020	4%	19%	59%	14%	4%
2022	6%	21%	55%	14%	4%

Source: "2022 Spending in Retirement Survey: Understanding the Pandemic's Impact" by Bridget Bearden. EBRI White Paper.
Available here: https://www.ebri.org/docs/default-source/ebri-issue-brief/ebri_ib_572_spendinginret-6oct22.pdf?sfvrsn=bba5382f_6.

The (Marginal) Role of Savings Funding Retirement Income
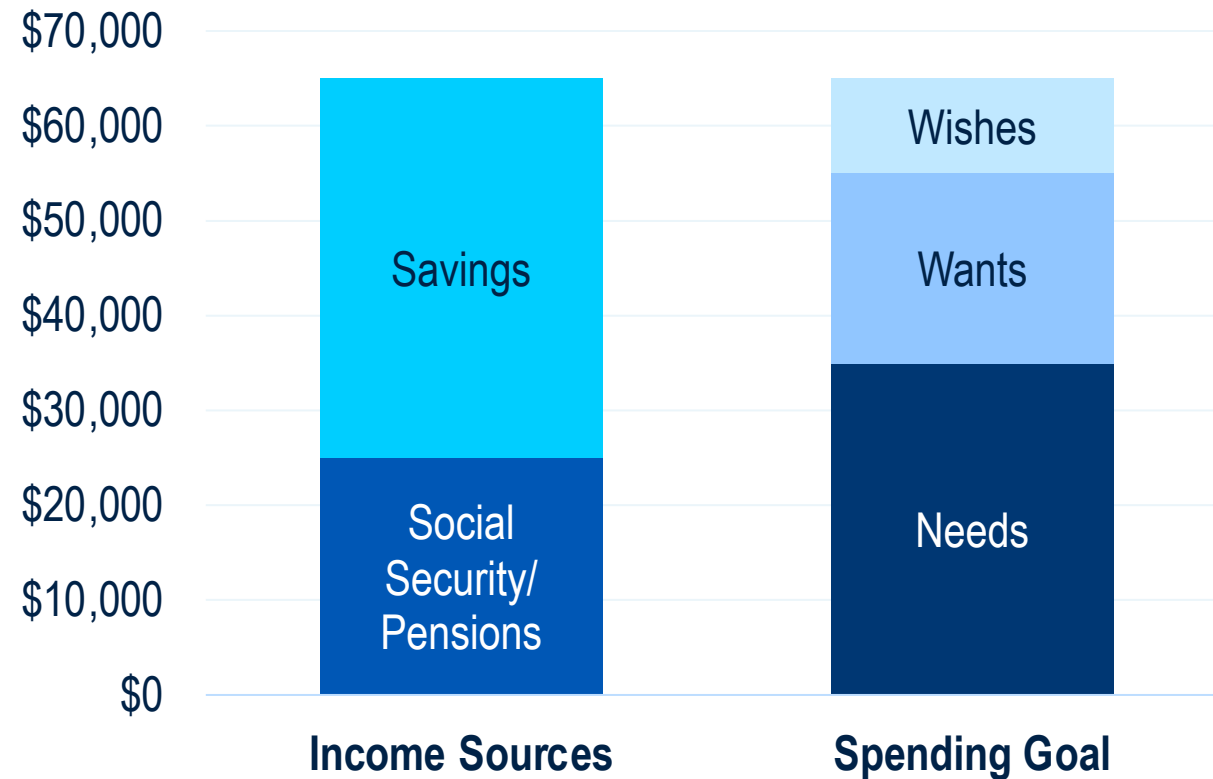
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The Probability of Success Ignores the Magnitude of Failure
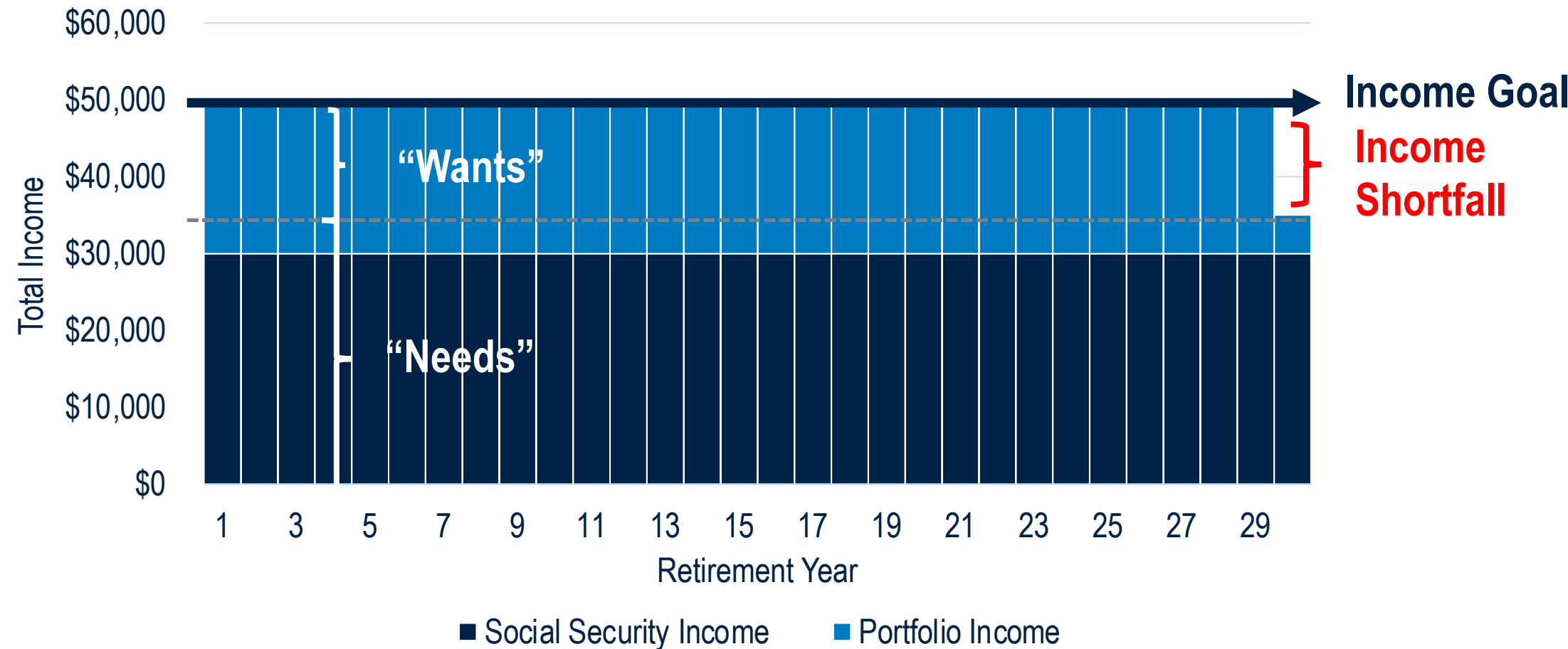
Shown for illustrative purposes only. Source: PGIM DC Solutions.

DECOMPOSING THE RETIREMENT LIABILITY

Spending in Retirement: The 4% Rule
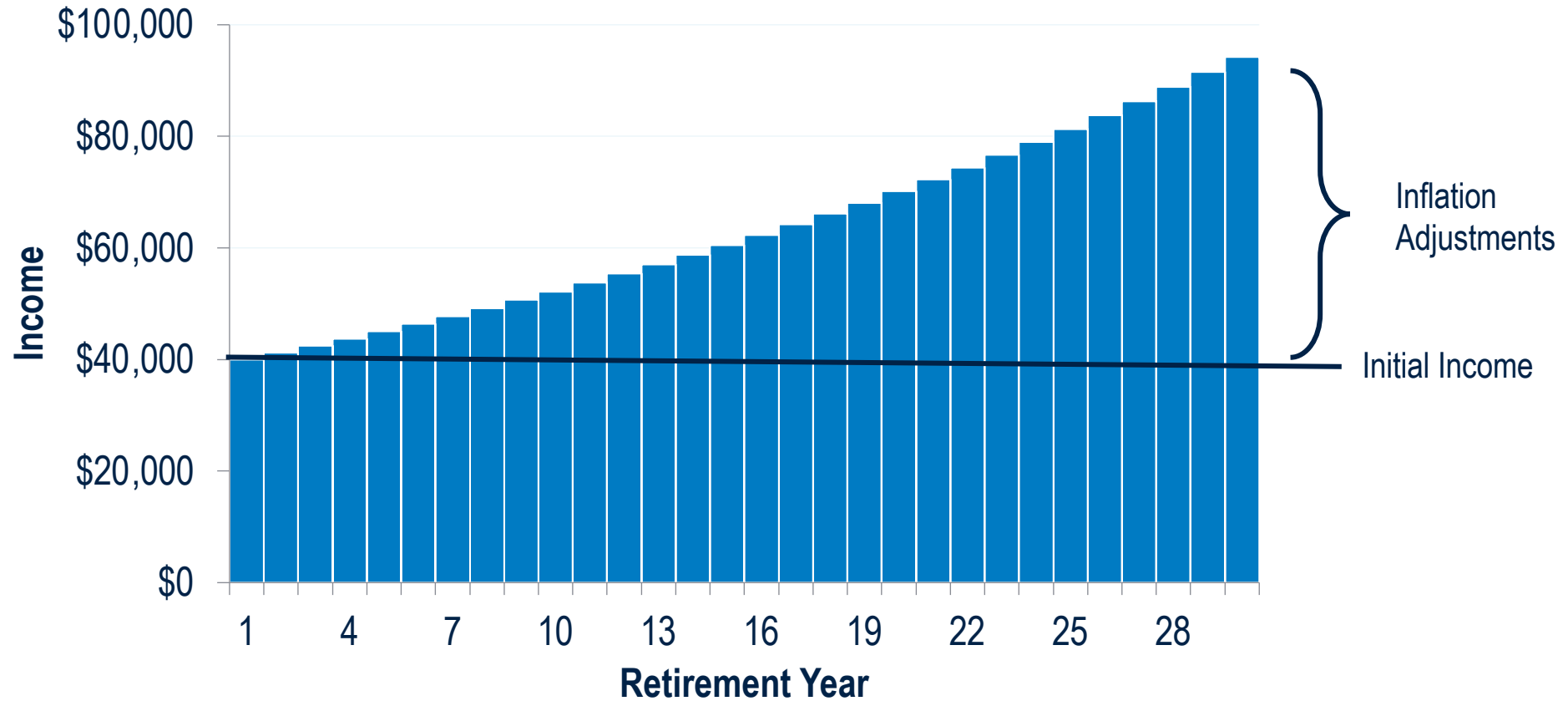
Shown for illustrative purposes only. Source: PGIM DC Solutions.

Soft vs. Hard Liabilities

Hard Liabilities

Soft Liabilities

Retiree Spending Flexibility Varies by Expenditure

Perceived Ability to Cut Back On Various Expenditures During Retirement

Spending Group	0% - Not willing to cut back	Reduce by 1% to 24%	Reduce by 25% to 50%	Reduce by >= 50%
Food (at home)	29%	42%	21%	7%
Food (away from home)	12%	41%	25%	20%
Housing	31%	29%	22%	12%
Vehicles/Transportation	13%	46%	26%	13%
Vacations/Entertainment	14%	36%	25%	20%
Utilities	31%	45%	16%	8%
Healthcare	43%	30%	17%	8%
Clothing	6%	44%	25%	22%
Insurance	32%	40%	19%	8%
Charity	18%	31%	12%	19%

Source: PGIM survey of 1,500 respondents sourced via a Toluna consumer panel from September 20-27, 2021 of individuals between the ages of 50-70 currently working full-time and participating in an employer sponsored.

Retirees Can Withstand a Spending Drop (to Varying Degrees)

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Impact of a 20% Spending Drop on Retirement Lifestyle

Little or no effect	9%
Few changes, nothing dramatic	31%
Some Changes, but can be accommodated	45%
Substantial changes and considerable sacrifices	13%
Devastating would fundamentally change lifestyle	2%

Retiree Spending Flexibility Varies

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Distribution of Responses Regarding the Composition of a Retirement Goal That Is "Need" vs. "Want"

~70% average

Y-axis: % of Total Respondents (0, 5, 10, 15, 20, 25, 30, 35)

X-axis: % of Retirement Income Goal that is a "Need" (0, 20, 40, 60, 80, 100)

Spending Flexibility Increases at Higher Spending Levels

Estimated Percentage of Total Expenditures that are Inelastic/Essential
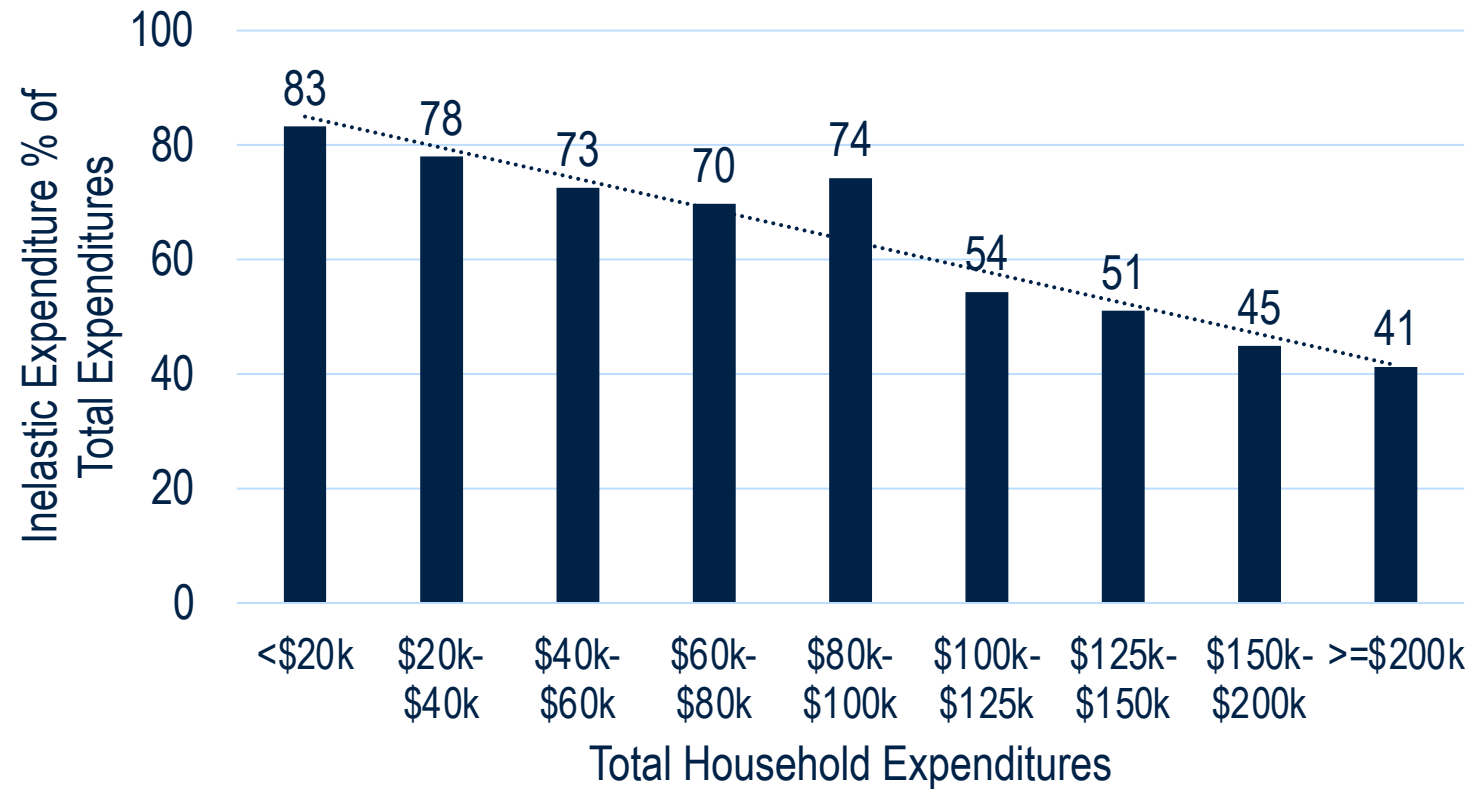
Bar chart — Y-axis: "Inelastic Expenditure % of Total Expenditures" (0 to 100). X-axis: "Total Household Expenditures"

Total Household Expenditures	Inelastic Expenditure %
<$20k	83
$20k-$40k	78
$40k-$60k	73
$60k-$80k	70
$80k-$100k	74
$100k-$125k	54
$125k-$150k	51
$150k-$200k	45
>=$200k	41

Decomposing the Income Goal: Asset Liability Mapping
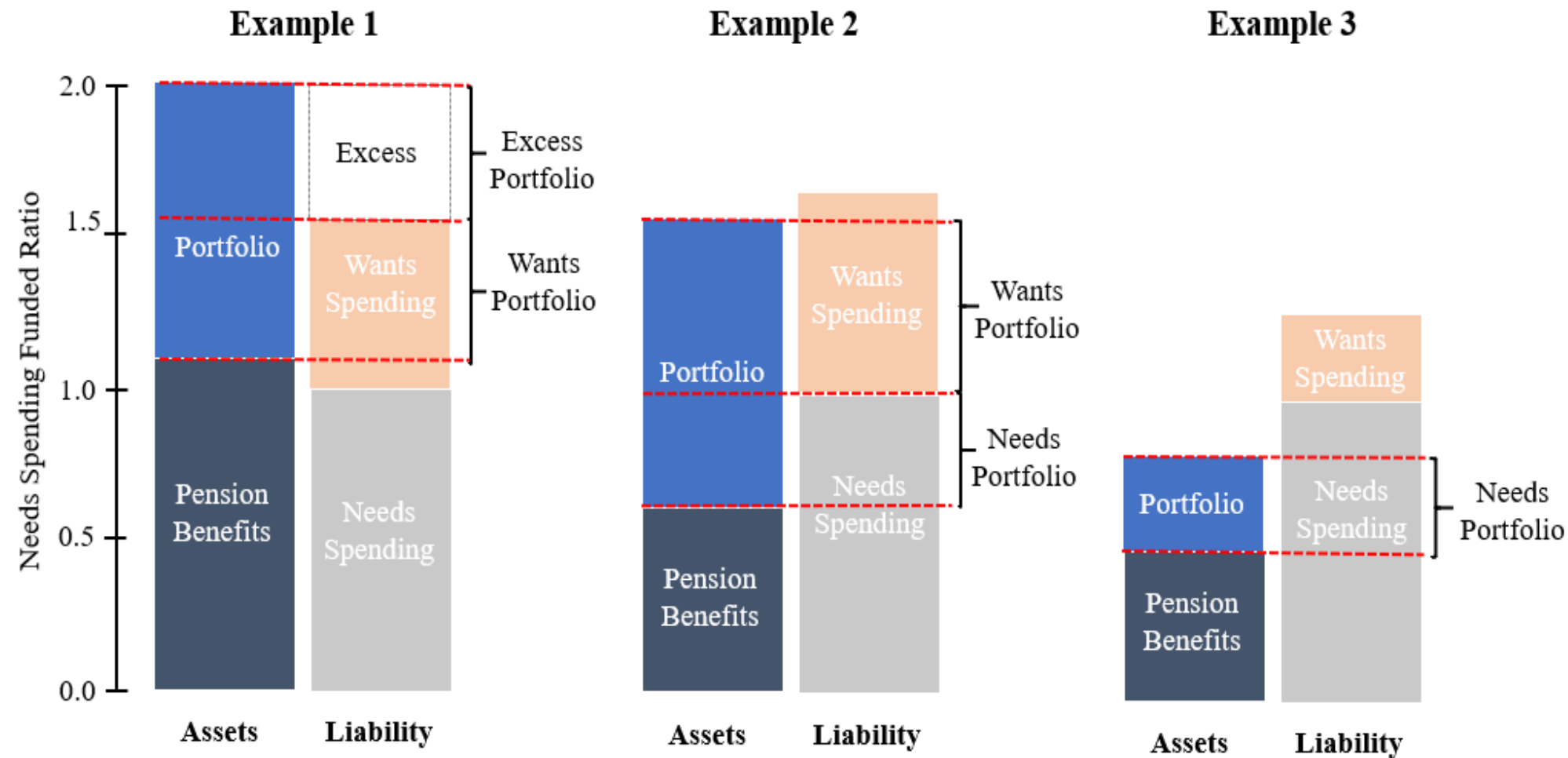
How Optimal Equity Allocations Vary by Spending Flexibility
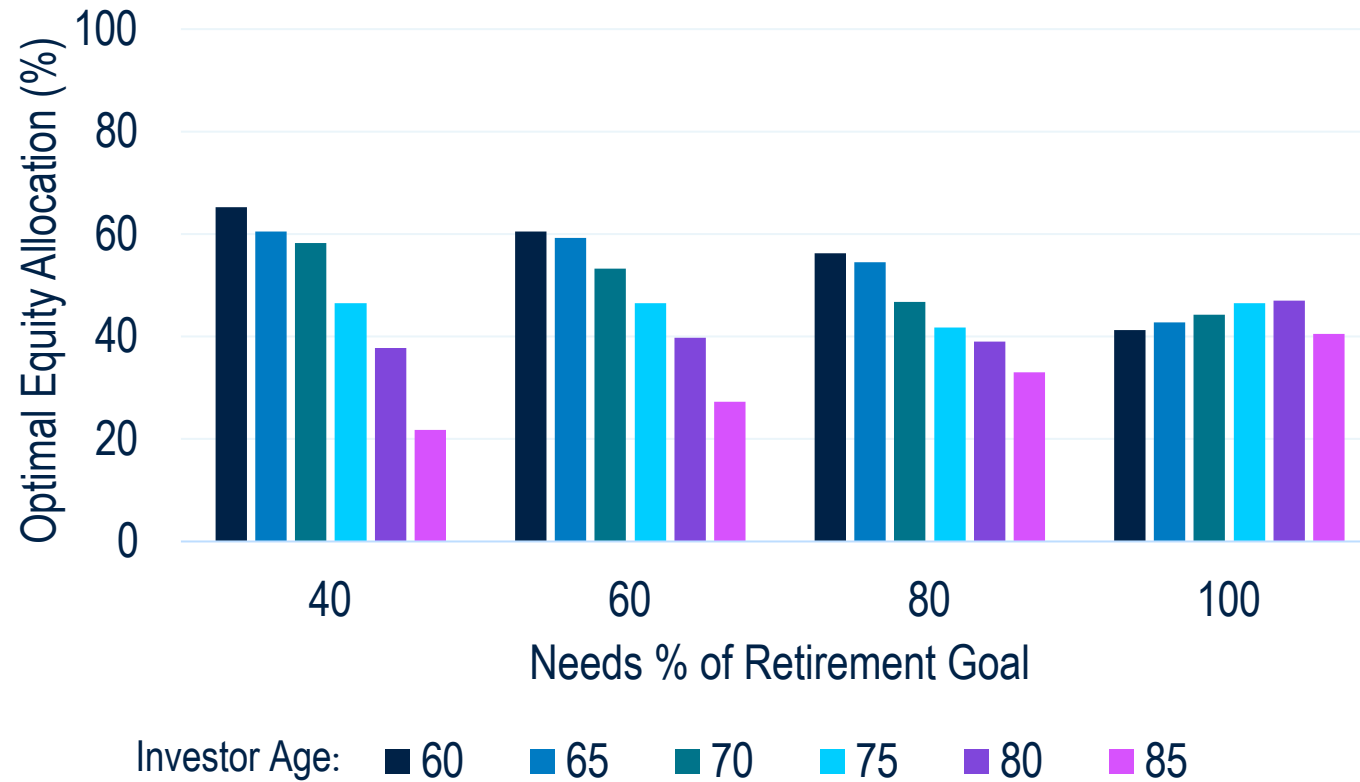
A MORE REALISTIC RETIREMENT SPENDING MODEL

The Evolution of Retirement Wealth in a Monte Carlo Simulation with Static Withdrawals

Individual Runs

Distribution of Outcomes

— 5th Percentile — 25th Percentile — 50th Percentile
— 75th Percentile — 95th Percentile

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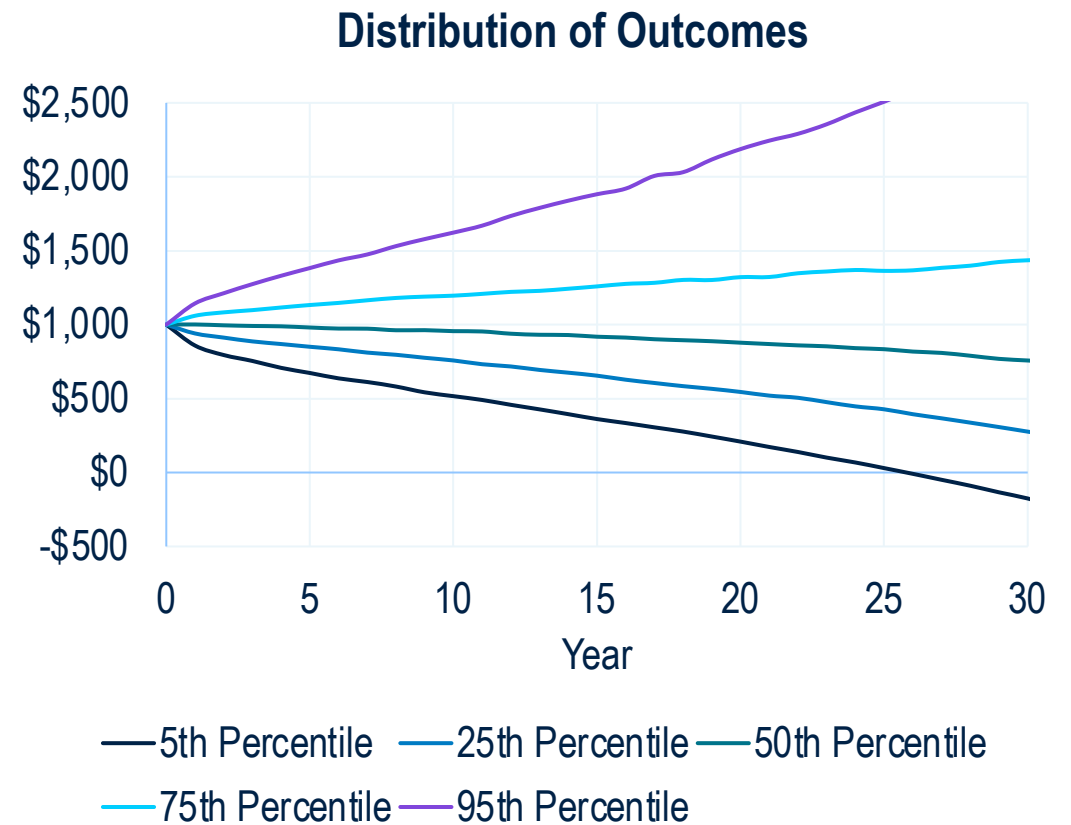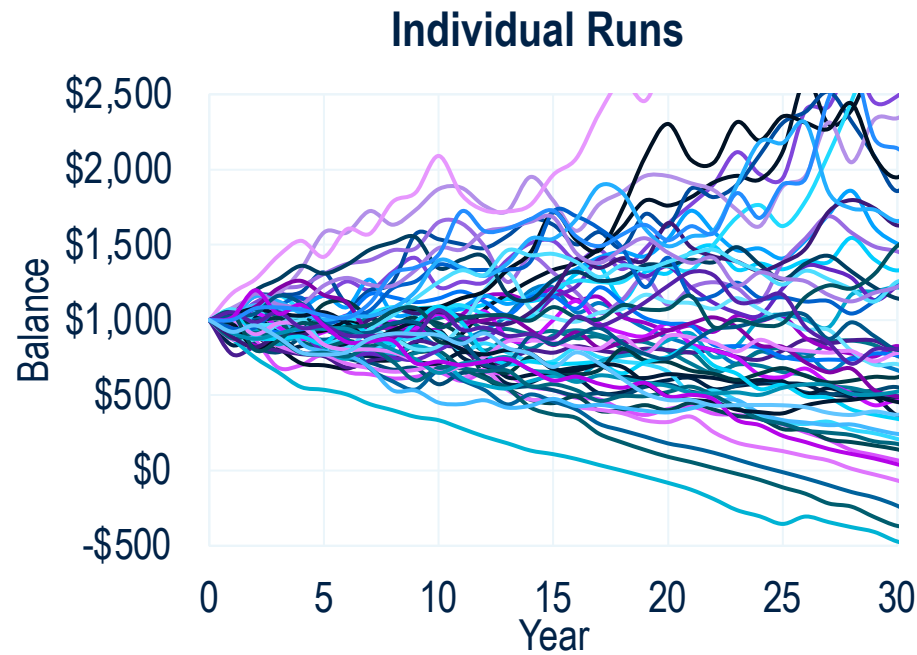
Distribution of Balance at Death for Static Withdrawals
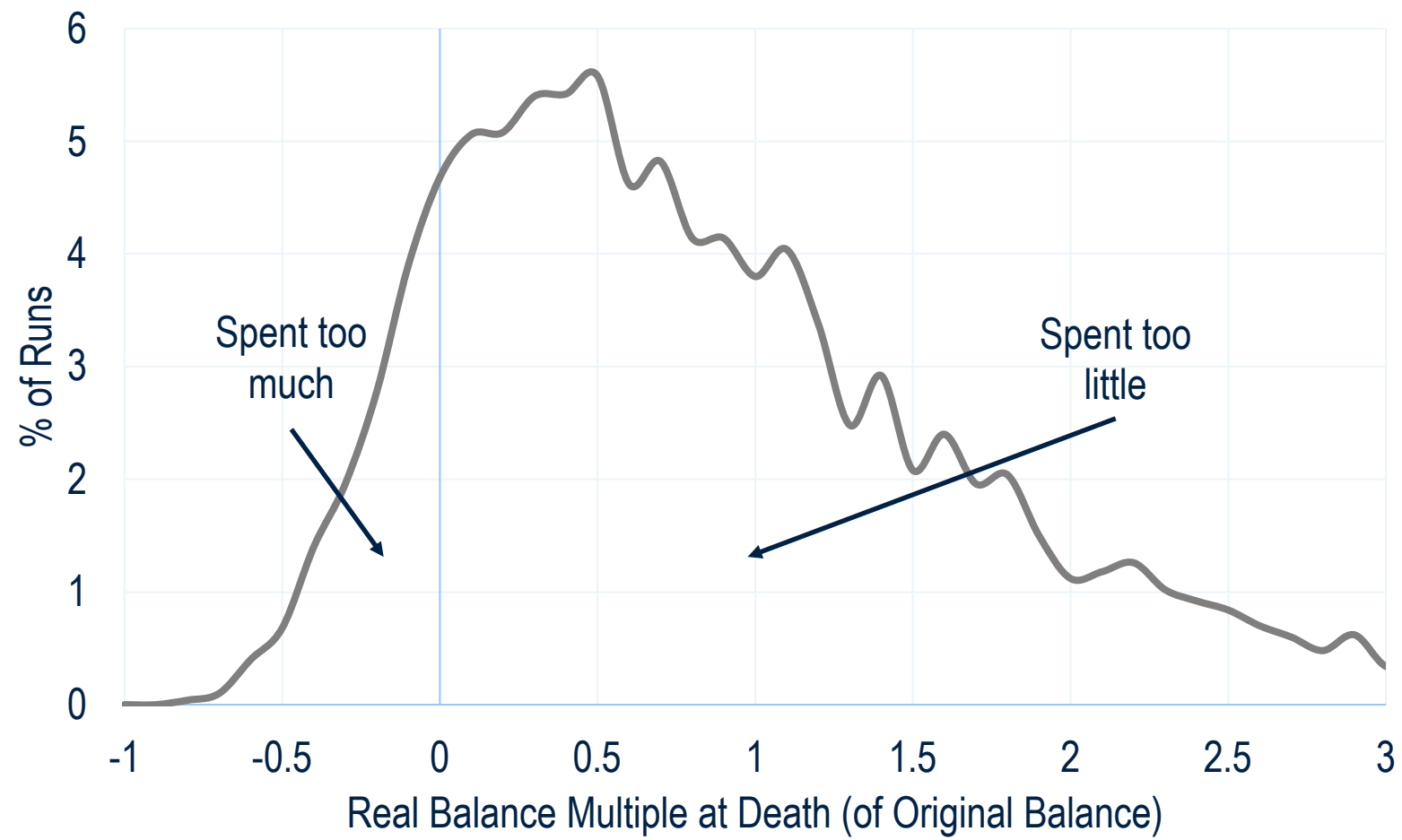
Shown for illustrative purposes only. Source: PGIM DC Solutions.

This is a Different Type of "Failure"
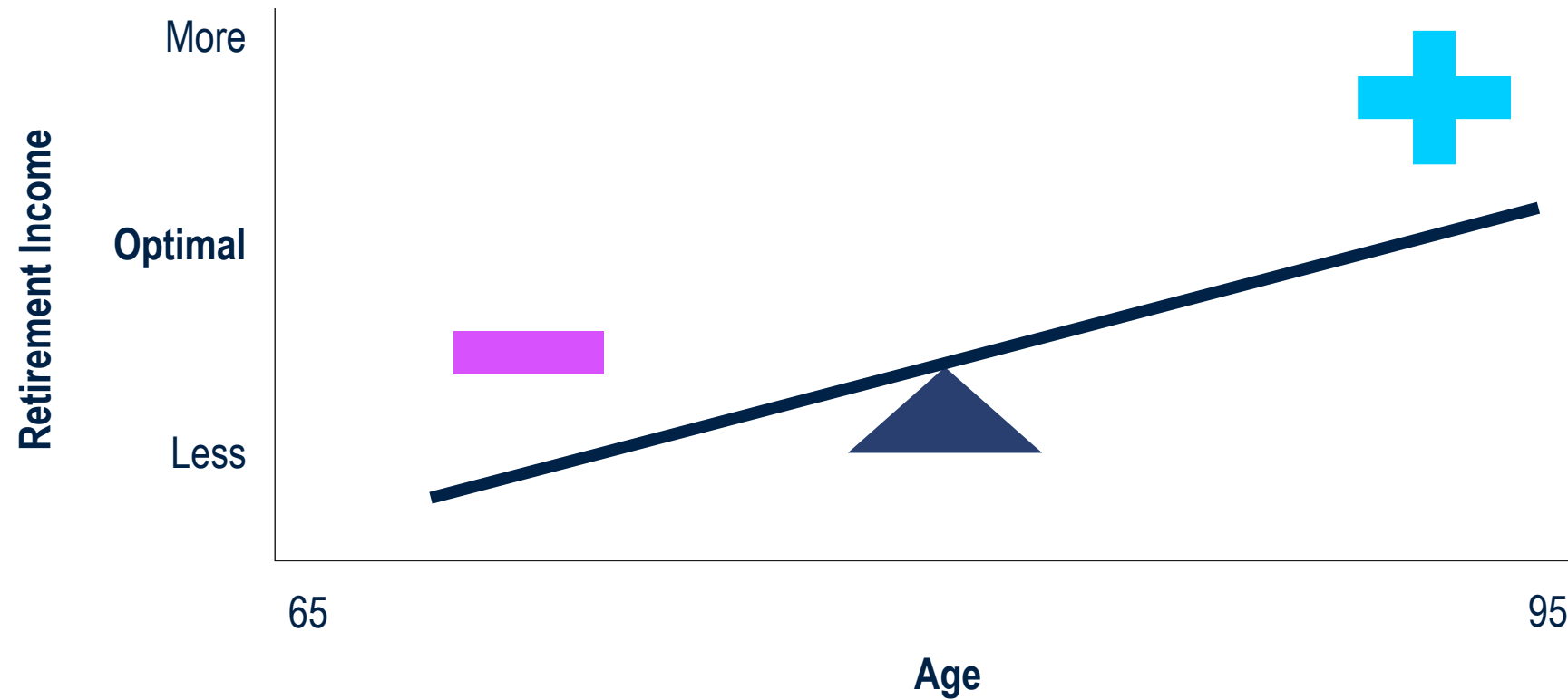
Static vs. Dynamic Spending Models

- Earliest retirement spending research (e.g., Bengen 1994) assumed retiree spending was effectively static (i.e., completely inelastic)
- More recent research (last ~two decades) has introduced a variety of dynamic spending models, where the assumed portfolio withdrawal (i.e., retiree spending/consumption) is adjusted throughout retirement, based on various criteria (primarily portfolio performance)
- While many dynamic spending models provide useful research insights, most cannot (easily) be implemented in financial planning tools because they are computationally intense or do not adequately consider the variations in client scenarios (e.g., cannot consider nonconstant cash flows)

~Easy Dynamic Spending Rule

$$\text{Modified RMD} = \frac{1}{\text{Retirement Planning Period}}$$

This should be a personalized life expectancy estimate plus about five years. Check out https://www.longevityillustrator.org/ for a great free tool!

The Evolution of Retirement Wealth in a Monte Carlo Simulation with Dynamic Withdrawals

Individual Runs

Distribution of Outcomes

Legend:
— 5th Percentile — 25th Percentile — 50th Percentile
— 75th Percentile — 95th Percentile

Shown for illustrative purposes only. Source: PGIM DC Solutions.
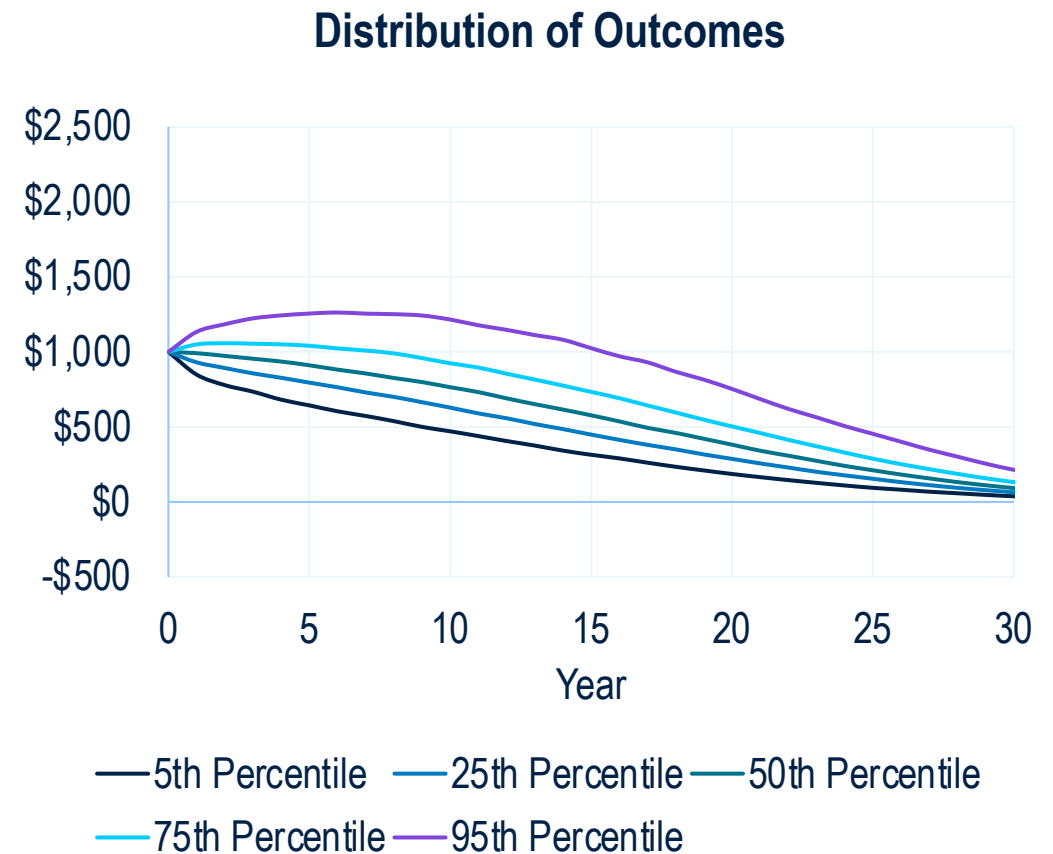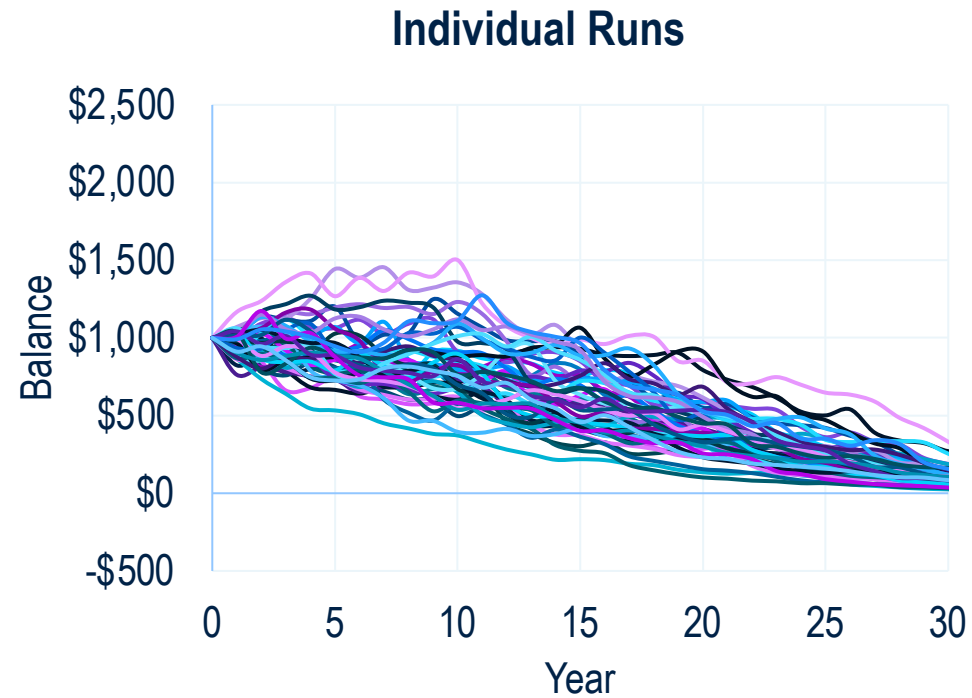
Why Most Dynamic Models Don't Work...

% of Total Spending Goal vs. Retiree Age

Legend: Social Security, Pension Benefit, Deferred Annuity, Portfolio Need
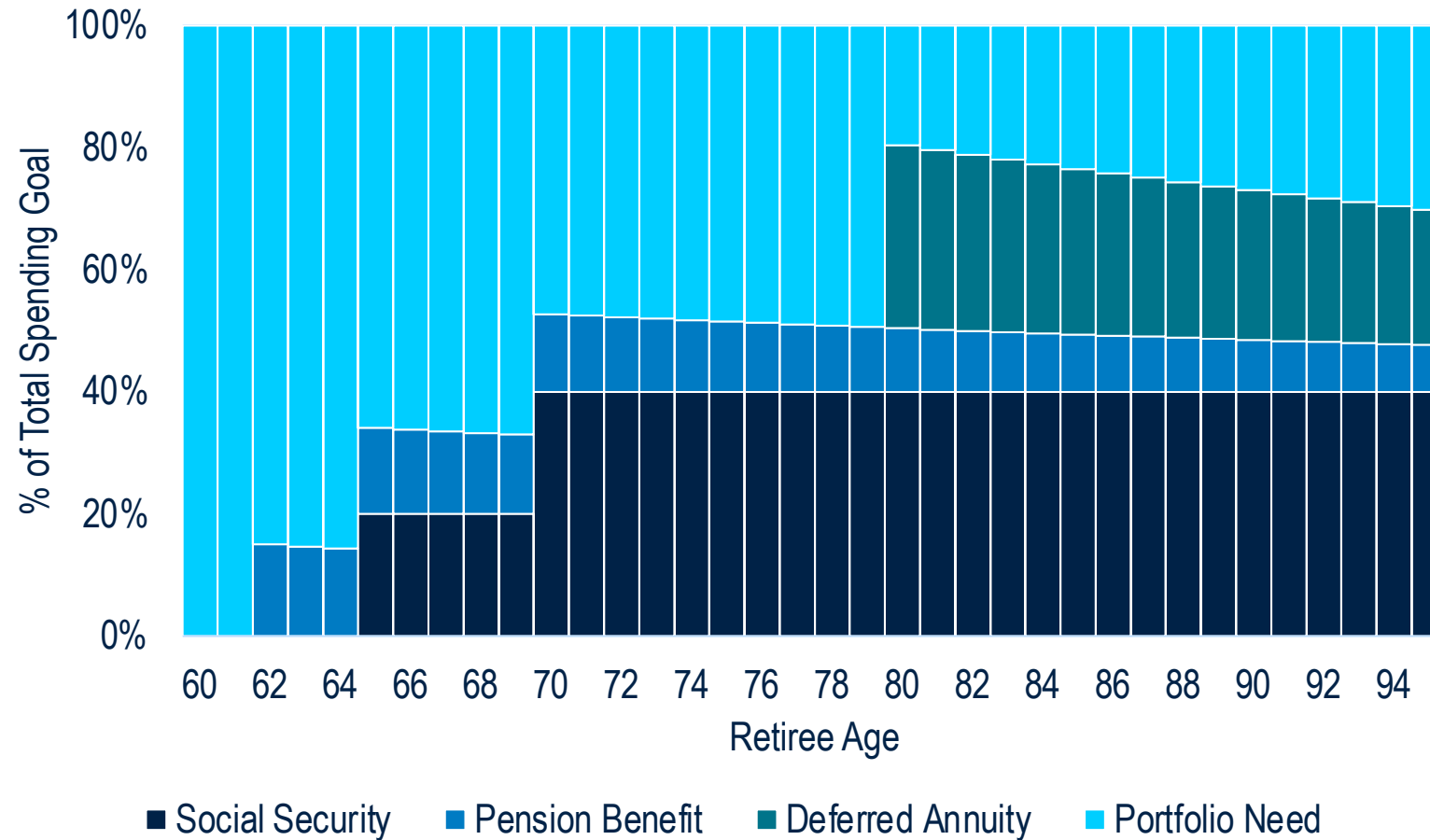
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A Complete Financial Picture is Required

Assets

Liabilities

Using the Funded Ratio to Access Retirement Readiness

- The funded ratio is a metric commonly used to describe the health of pension plans but can more generally be used to estimate the overall financial situation for any goal (i.e., retiree consumption, college planning, etc.).

- The funded ratio is the total value of the assets, which includes both current balances and future expected income, divided by the liability, which would be all current and future expected spending.

- A funded ratio of 1.0 would imply that an individual has just enough assets to fully fund that goal. A funded ratio greater than 1.0 implies the individual has a surplus, while a funded ratio of less than 1.0 implies an individual has a shortfall.

Adjusting Spending Based on the Funded Ratio

Assumed spending can be adjusted each year (of each run) based on the evolving funded ratios for the respective needs and wants goals.

Funded Ratio	Needs	Wants
0.00	-20%	-20%
0.25	-10%	-15%
0.50	-5%	-10%
0.75	0%	-5%
1.00	0%	0%
1.25	0%	2%
1.50	0%	4%
1.75	2%	8%
2.00	4%	10%

Spending Evolves as the Scenario Evolves
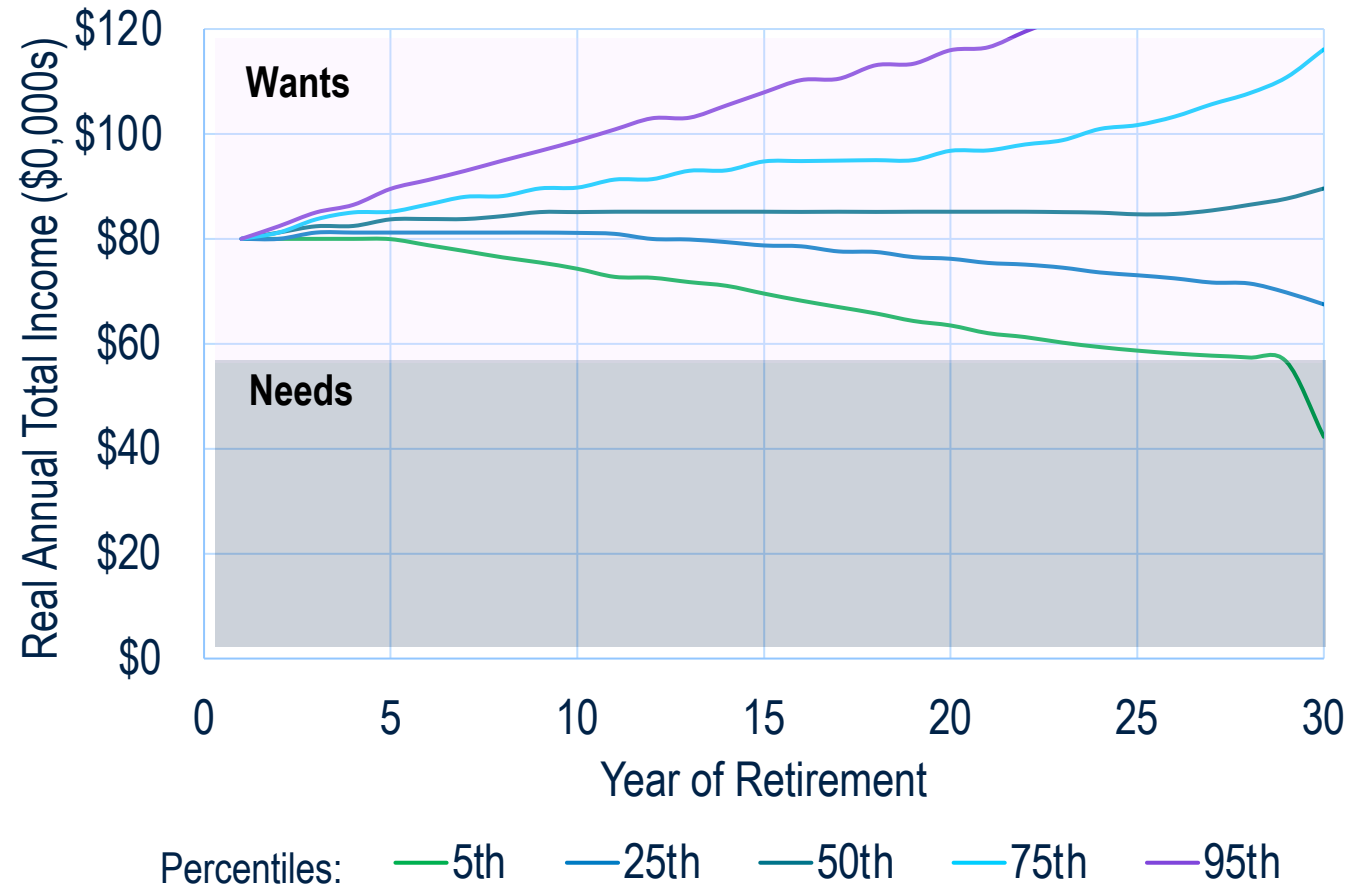
Actual Retiree Spending

What retirees spend money on costs more

+
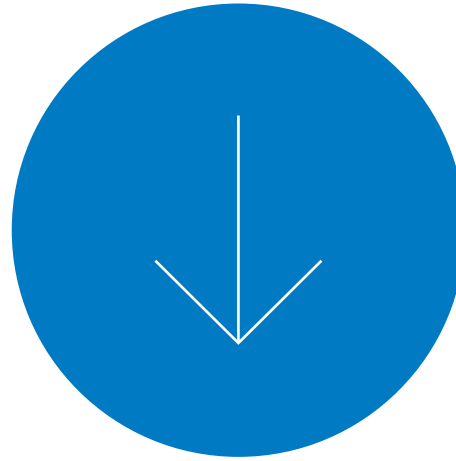
But they actually spend less

=

Spending declines… on average

QUANTIFYING OUTCOMES

Defining Outcomes

Shown for illustrative purposes only.

Success Rates vs. Goal Completion

	Year										Pass or Fail?	% of Goal
Run#	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
1	$100	$100	$100	$100	$100	$100	$100	$100	$100	$90	0	99%
2	$100	$100	$100	$100	$100	$100	$100	$100	$80	$80	0	96%
3	$100	$100	$100	$100	$100	$100	$100	$100	$70	$70	0	94%
4	$100	$100	$100	$100	$100	$100	$100	$60	$60	$60	0	88%
5	$100	$100	$100	$100	$100	$100	$100	$50	$50	$50	0	85%
6	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	1	100%
7	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	1	100%
8	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	1	100%
9	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	1	100%
10	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100	1	100%
Average											**50%**	**96%**

Dynamic Spending Strategies and Success Rates

Using Utility to Quantify Preferences
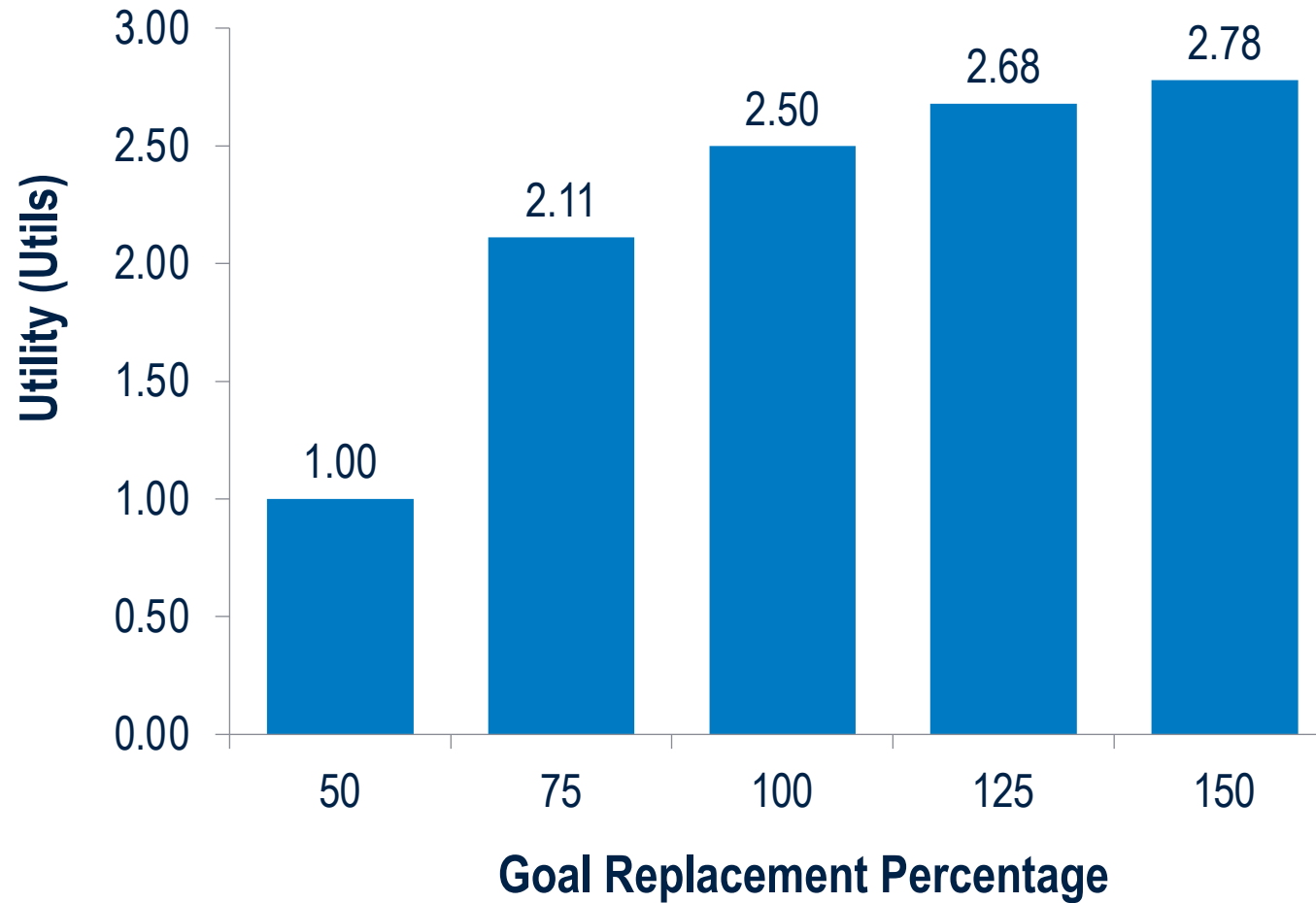
50% (1.00 utils) and 150% (2.78 utils) results in average utility of 1.89 versus 2.50 for a consistent 100% replacement.

Shown for illustrative purposes only. Source: PGIM DC Solutions.

Utility and Spending Goals

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Needs Shortfall

Wants Shortfall

Excess

Aggregating Utility Values Across Years and Runs
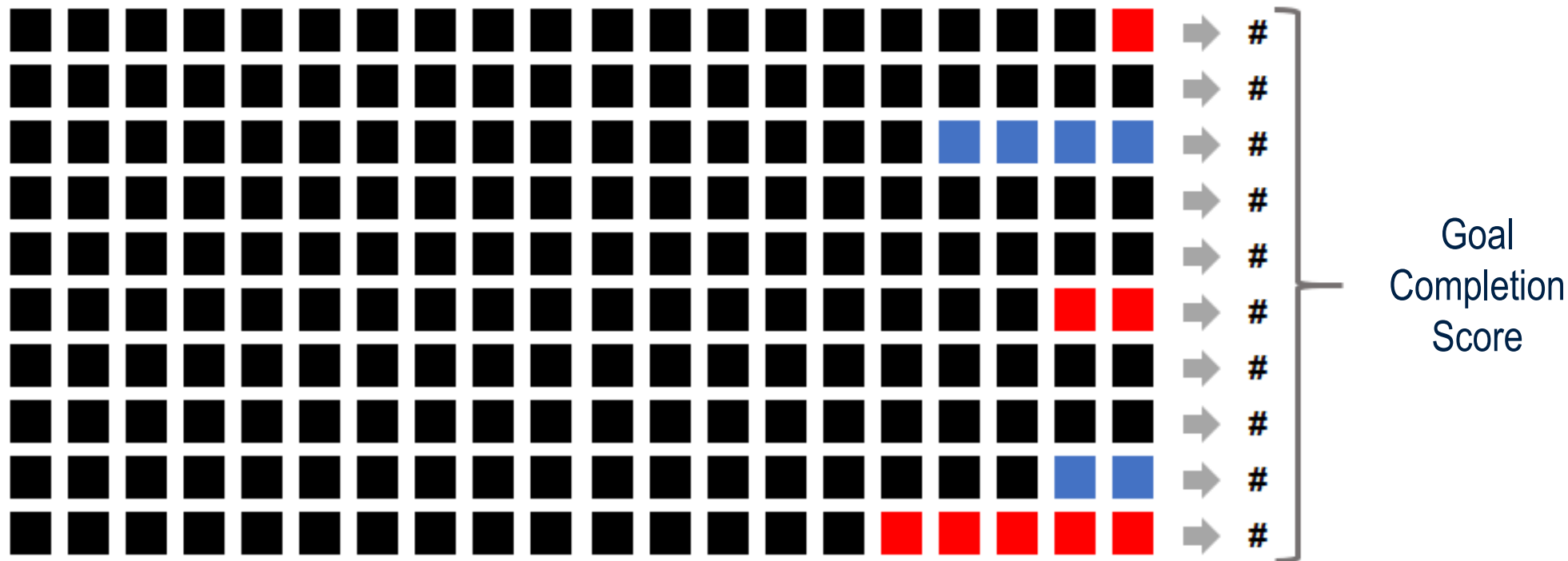
Goal Completion Score

Source: "Redefining the Optimal Retirement Income Strategy" by David Blanchett. Published on 15 Dec 2022 in the *Financial Analysts Journal*.

The Goal Completion Score

- The goal completion score can be used to convey the overall efficacy of a given strategy to a retiree, that is in the spirit of more common metrics used in financial plans, such as the probability of success (higher is better, with a target of ~100), but is more holistic, in that it considers preferences around spending elasticity.
- Could also be "mapped" to a more qualitative outcomes model

Shown for illustrative purposes only.

Goal Completion Can Yield Different Guidance/Advice

Traditional financial planning assumptions and probability of success-related recommendations are not necessarily affected by level of guaranteed income or spending elasticity, but these parameters can have a significant impact on optimal advice.

Initial Withdrawal Rates

		Need % of Goal		
	30%	**50%**	**70%**	**90%**
$10k	4.1	4.0	4.0	3.8
$30k	4.5	4.4	4.2	3.9
$50k	5.1	4.8	4.6	4.0
$70k	5.4	5.3	5.0	4.0
$90k	5.3	5.4	5.4	4.0

(Row labels under "Pension Income")

Annuity Allocations

		Need % of Goal		
	30%	50%	70%	90%
$10k	50	50	50	50
$30k	25	30	35	40
$50k	10	15	30	30
$70k	0	0	15	25
$90k	0	0	5	10

(Row labels under "Pension Income")

Source: "Redefining the Optimal Retirement Income Strategy" by David Blanchett. Published on 15 Dec 2022 in the *Financial Analysts Journal*.

NOW WHAT?

Now What?

Option 1: Focus on Outcome Percentiles vs. Success Rates

In the worst 1 in 10 projected outcomes, you will have $50,000 in income, in today's dollars at age 95

You have a 57.846% probability of success

Shown for illustrative purposes only. Source: PGIM DC Solutions.

45

Option 2: Reduce Your Target Success Rate

~80%

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Option 3: Assume a Spending Cut in Retirement
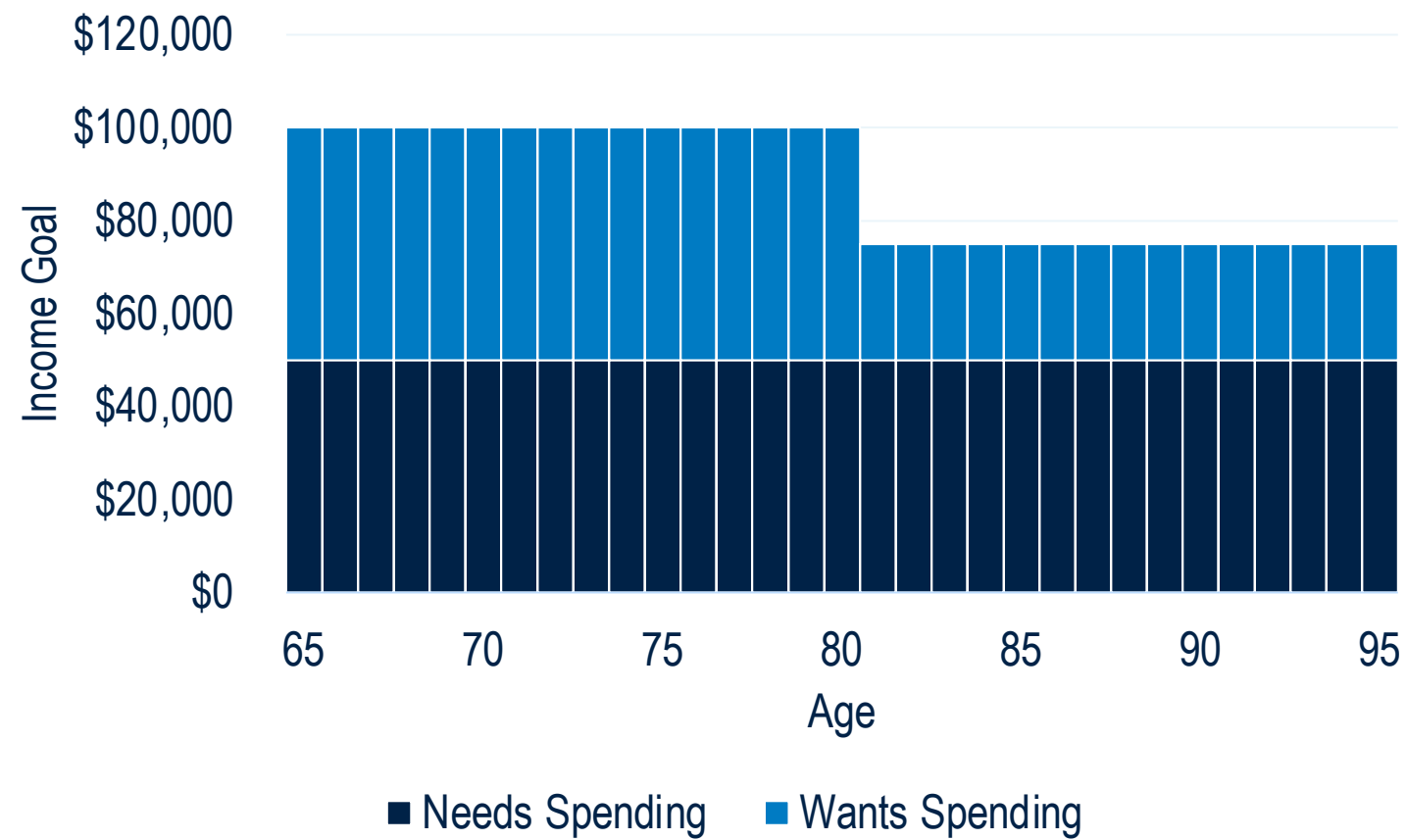
Shown for illustrative purposes only. Source: PGIM DC Solutions.

How Does This Model Affect Retirement Decisions?

Portfolio Withdrawal Rates

Portfolio Risk Levels

Allocations to Guaranteed Income

Needs

Wants
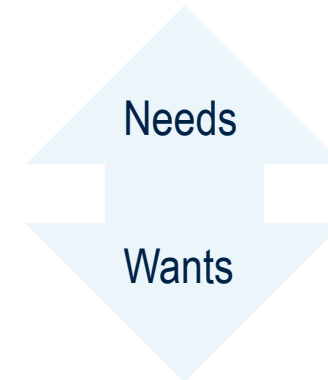
MORE RANDOM VARIABLES?

The Length of Retirement

Start   Stop

Retirement Expectations vs Reality

Relatively
consistent
~3 year gap

● Age expect to retire   ■ Age retired

Source: https://news.gallup.com/poll/394943/retiring-planning-retire-later.aspx
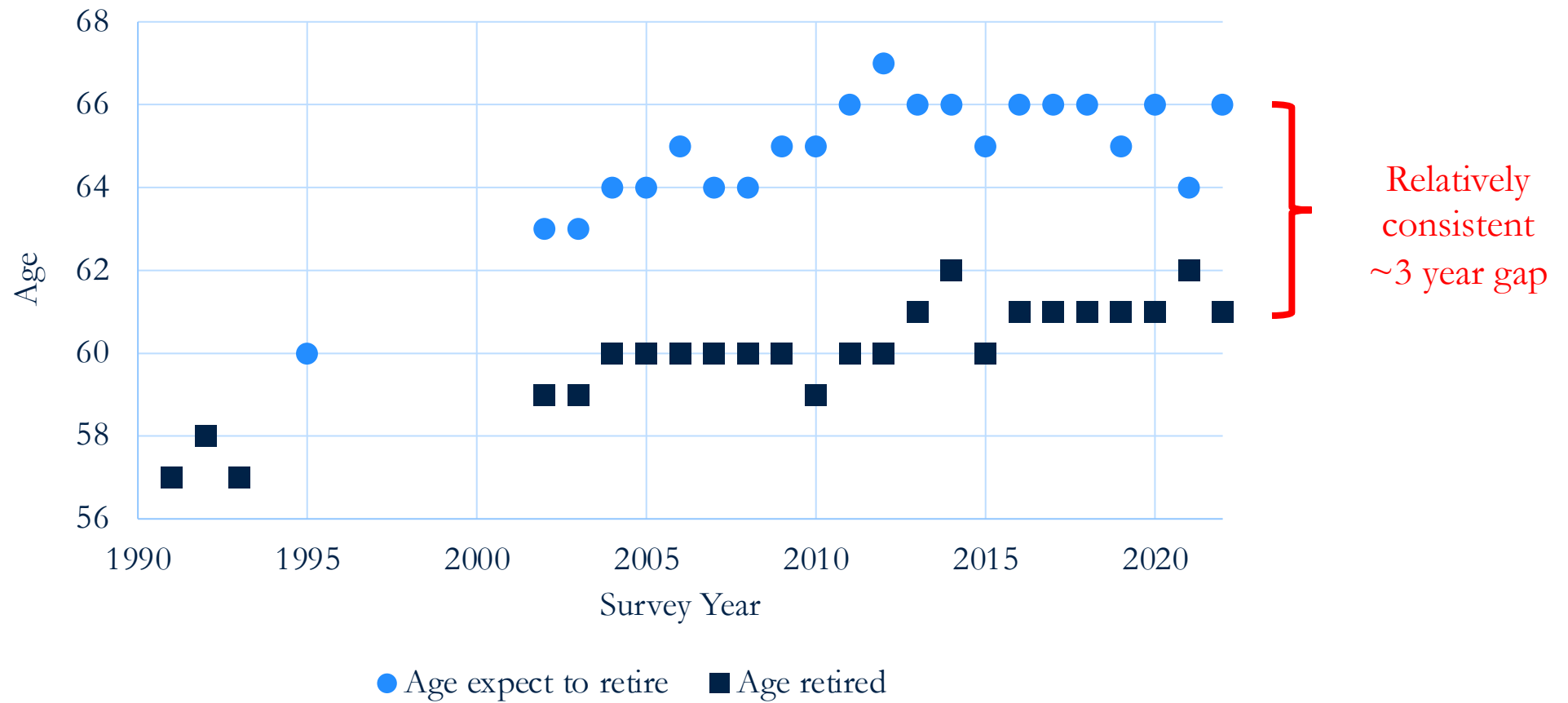
Life Expectancies by Income Level
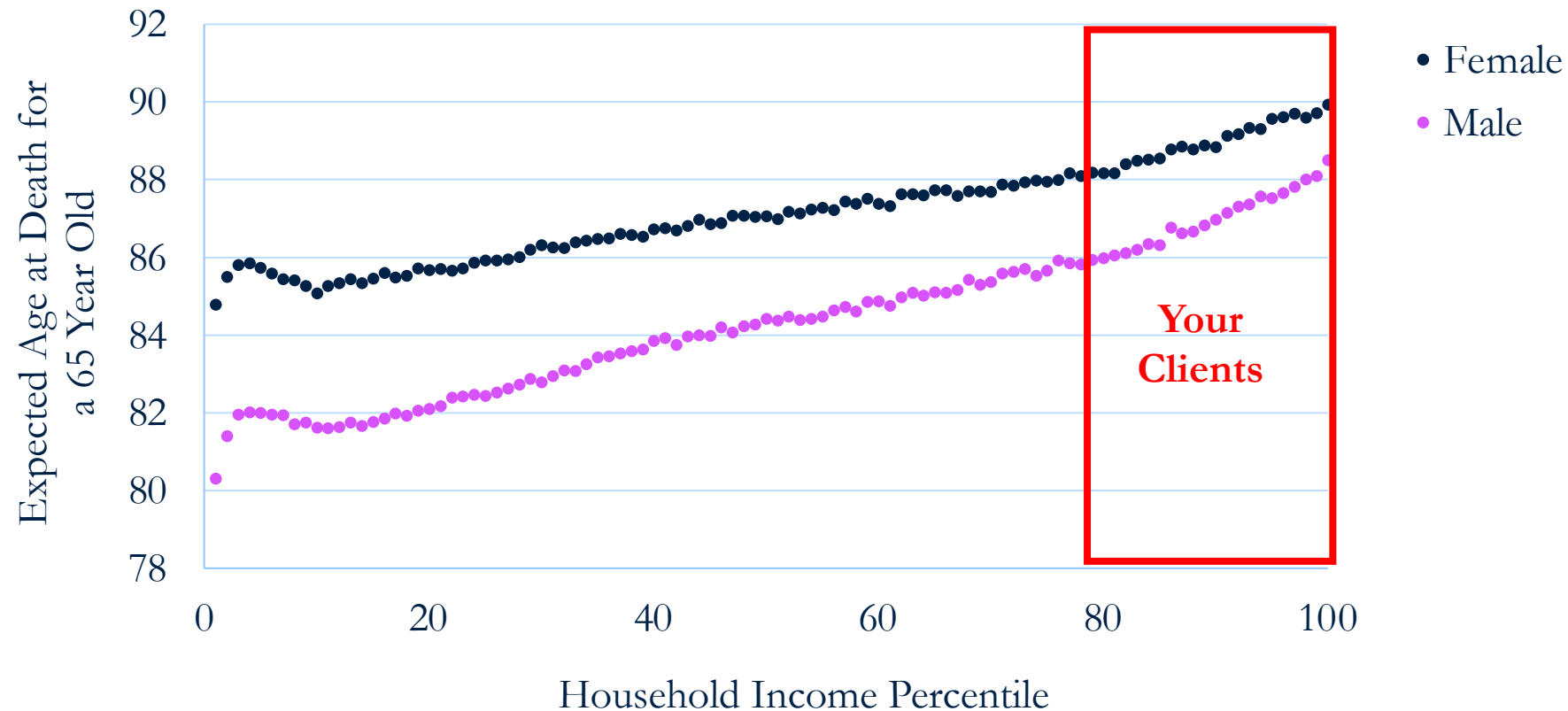
CONCLUSIONS

Conclusions

- Despite significant advances in computing power and a relatively extensive body of research on the nature of retirement, assumptions in retirement research and income planning tools have evolved only modestly over the last 30 years.

- Improving our retirement income models can have a notable impact on advice and guidance for clients in multiple domains (e.g., withdrawal rates, portfolio risk levels, annuity allocations, etc).

- Even if you can't implement some of these methodologies today (e.g., dynamic withdrawals) you can at least tweak your modeling assumptions/approach to better calibrate your advice/guidance with a more robust approach.

QUESTIONS

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