

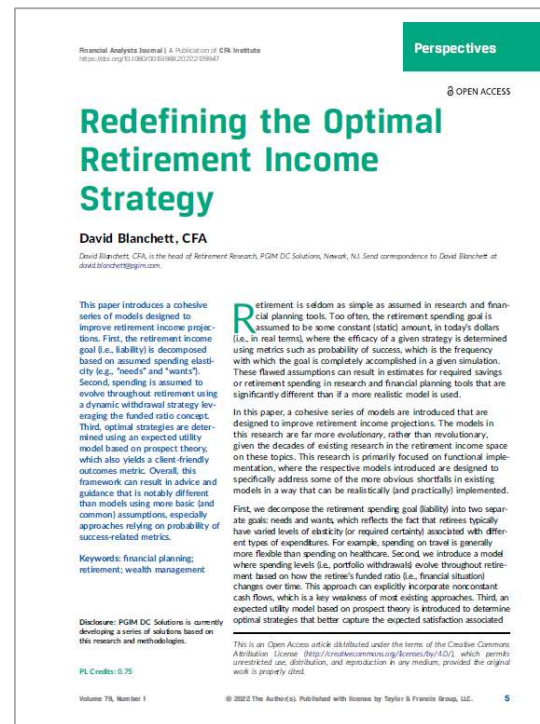


GUIDED SPENDING RATES: RETHINKING “SAFE” INITIAL WITHDRAWAL RATES

XXX, 2025

THE PURSUIT OF OUTPERFORMANCE

For Financial Professional use only. Not for use with the public. PGIM DC Solutions is an SEC-registered investment adviser. Registration with the SEC does not imply a certain level of skill or training.



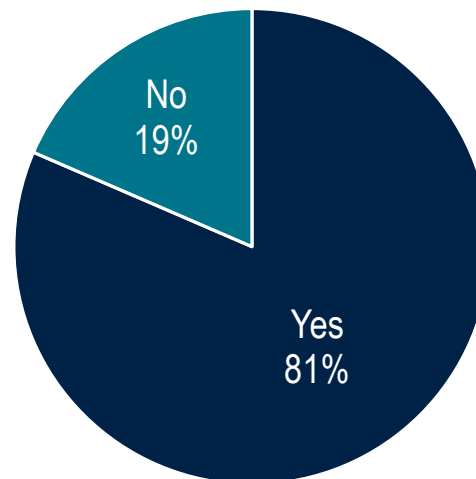
Access: Guided Spending: <https://www.pgim.com/dc-solutions/article/guided-spending-rates-rethinking-safe-initial-withdrawal-rates>
 Redefining: <https://www.tandfonline.com/doi/full/10.1080/0015198X.2022.2129947>

WHERE WE ARE TODAY

The Rise of Monte Carlo



Question: Do you use Monte Carlo projections as part of your financial plans for retirement?



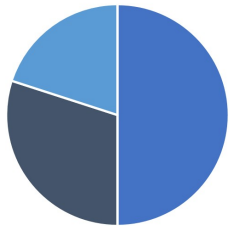
Source: Results of a PGIM Pulse poll of financial advisors fielded between January 13th and January 19th, 2023 with 189 respondents. Projections are not guaranteed and subject to change.

Embrace the Uncertainty!

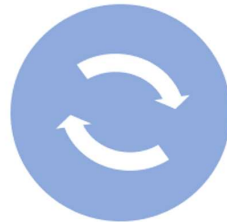


Shown for illustrative purposes only.

Improving Retirement Projections



Decomposing the retirement liability into a series of goals based on spending flexibility



Applying dynamic adjustments to better reflect investor decisions throughout retirement

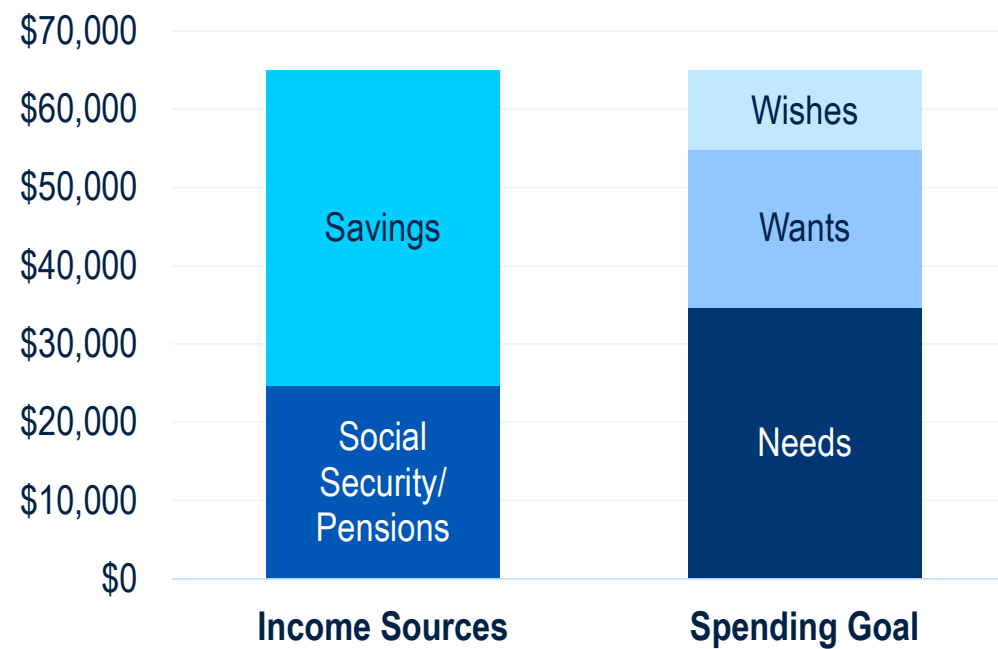


A more informed approach to quantifying investor outcomes that focuses on goal completion

Shown for illustrative purposes only.

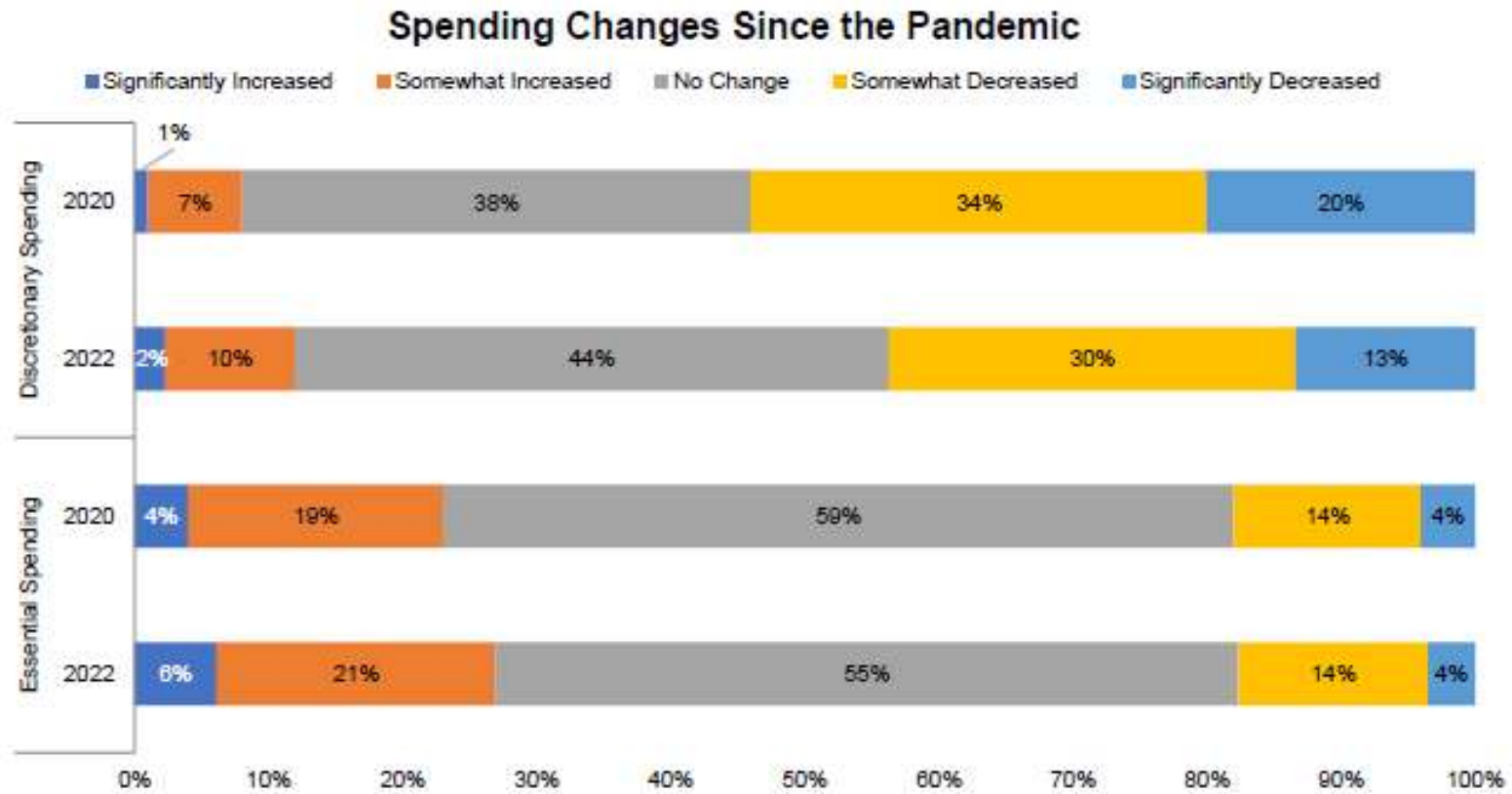
PGIM DC SOLUTIONS

The (Marginal) Role of Savings Funding Retirement Income



Shown for illustrative purposes only.

Retirees Have the Capacity to Adjust Spending



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.

Static vs. Dynamic Retirement Models

Most Existing
Market Solutions

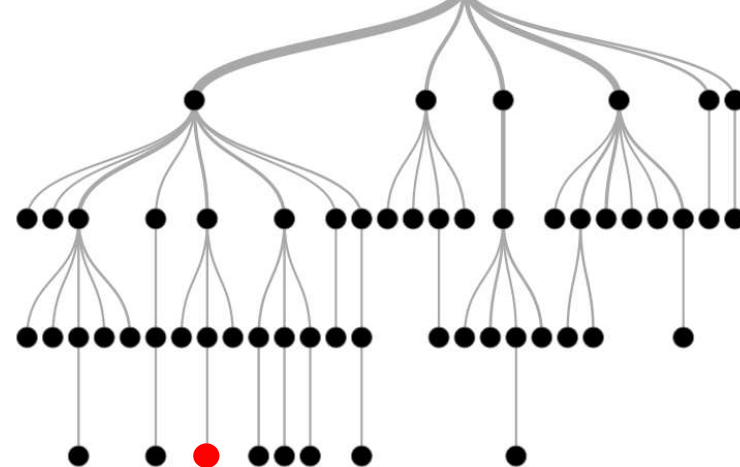
Retirement



Outcome

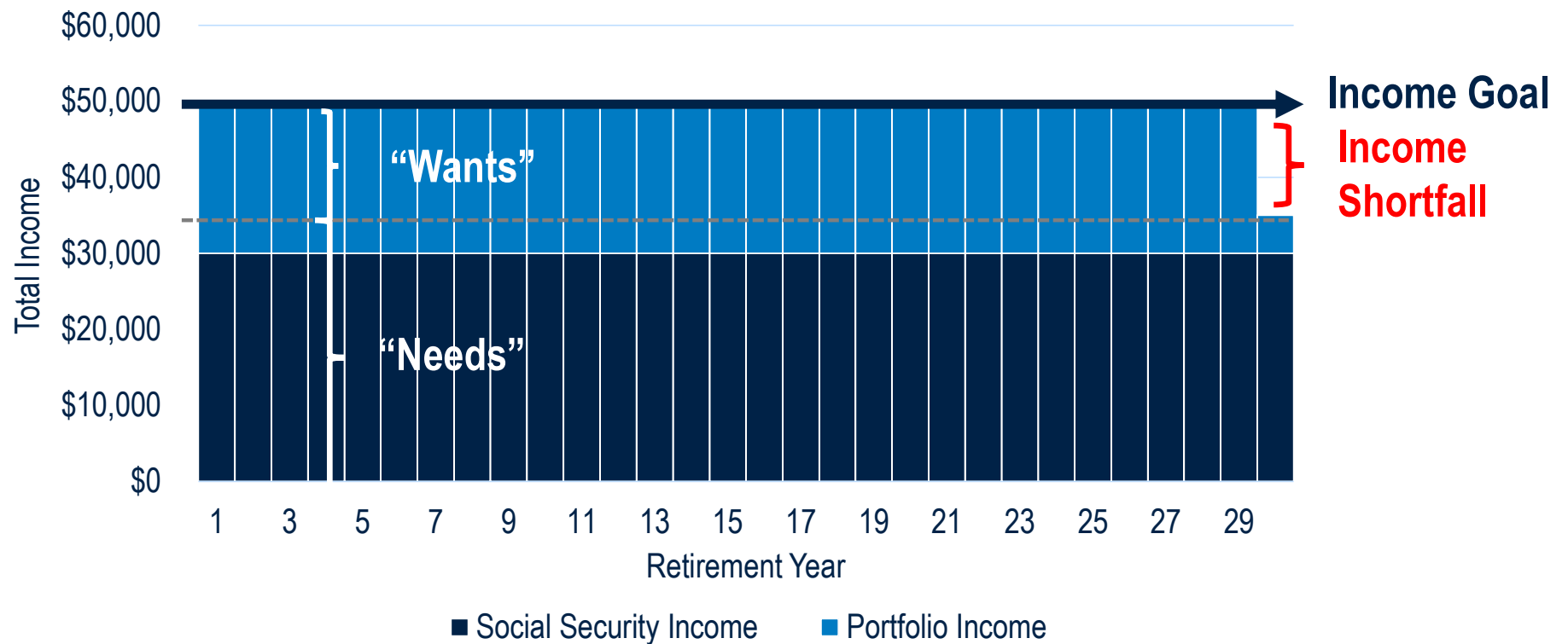
Reality

Retirement



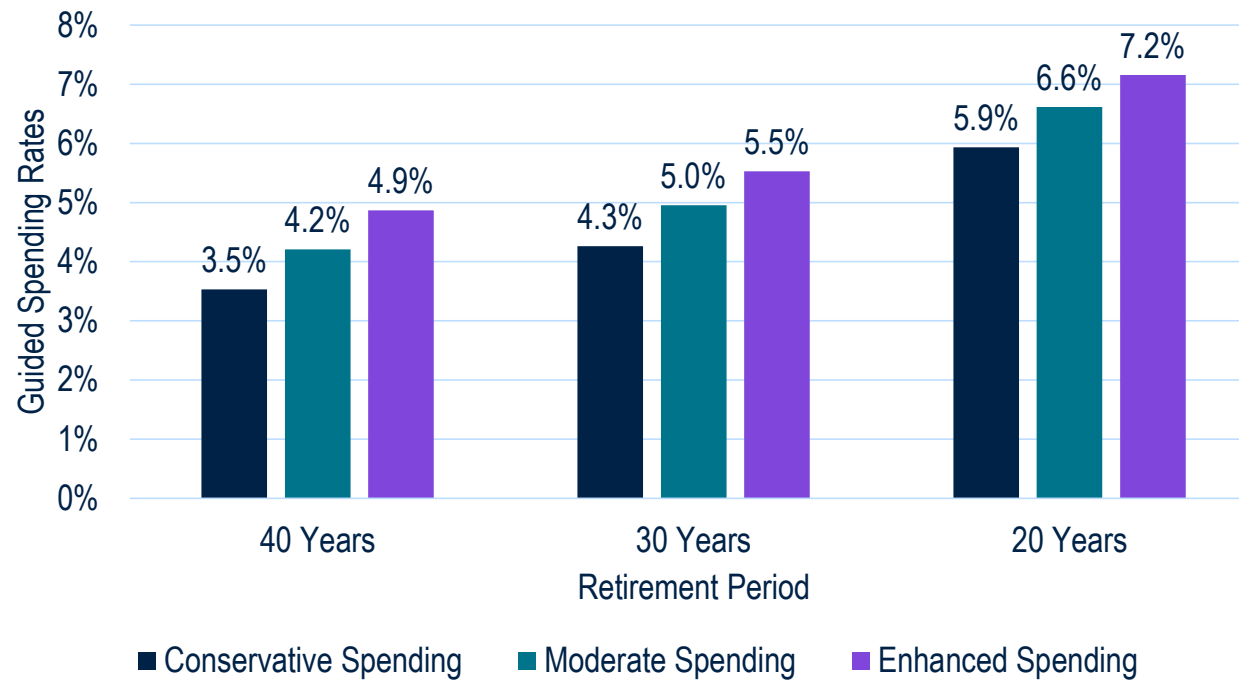
Outcome

The Probability of Success Ignores the Magnitude of Failure



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

Guided Spending Rates



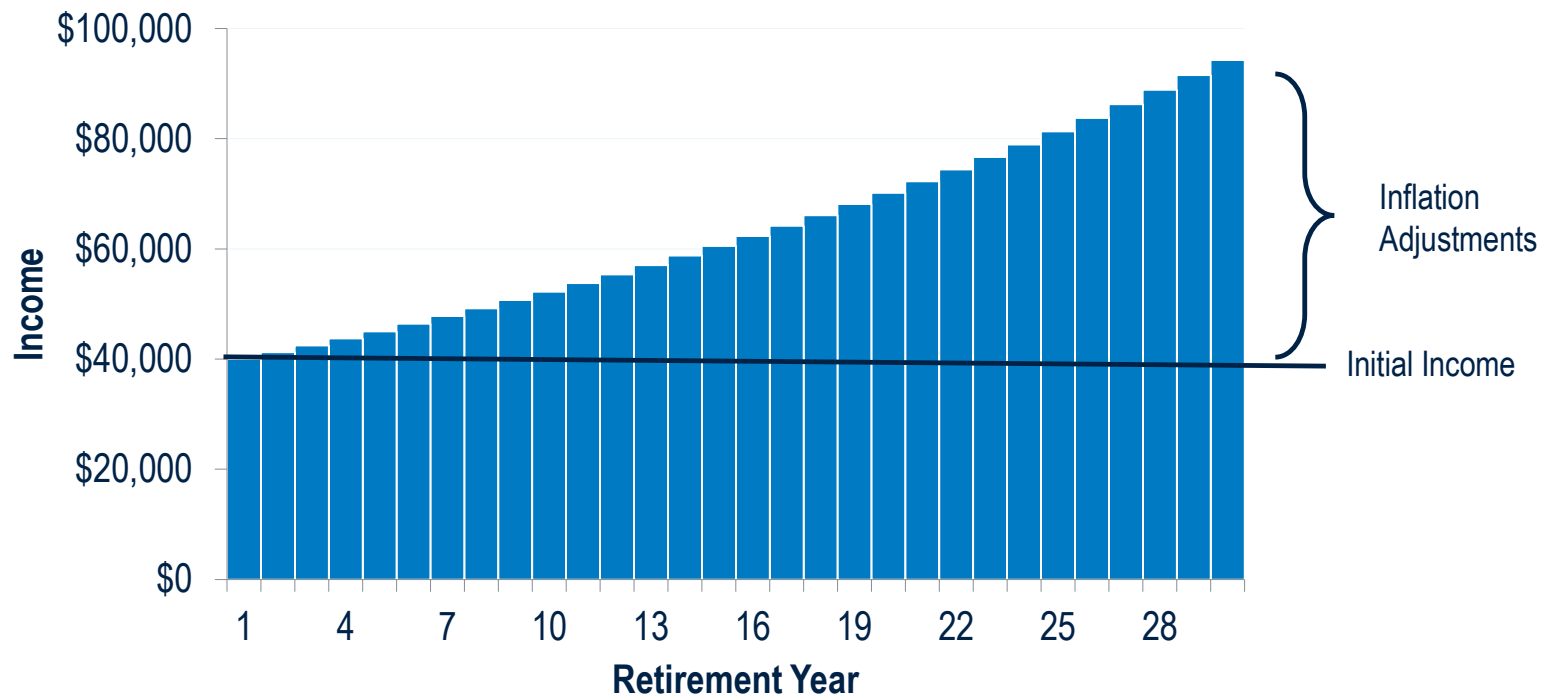
Shown for illustrative purposes only.

Source: "Guided Spending Rates: Rethinking 'Safe' Initial Withdrawal Rates" by David Blanchett. PGIM White Paper. Available here: <https://www.pgim.com/dc-solutions/article/guided-spending-rates-rethinking-safe-initial-withdrawal-rates>

PGIM DC SOLUTIONS

DECOMPOSING THE GOAL

Spending in Retirement: The 4% Rule



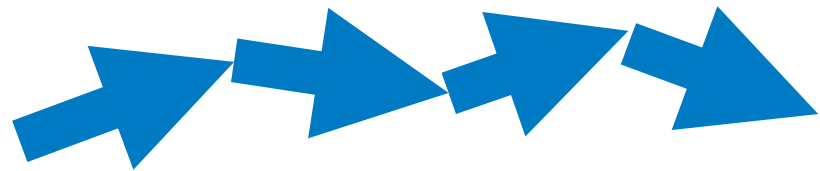
Shown for illustrative purposes only. Source: PGIM DC Solutions.

Soft versus Hard Liabilities

Hard Liabilities



Soft Liabilities



Shown for illustrative purposes only.

PGIM DC SOLUTIONS

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)



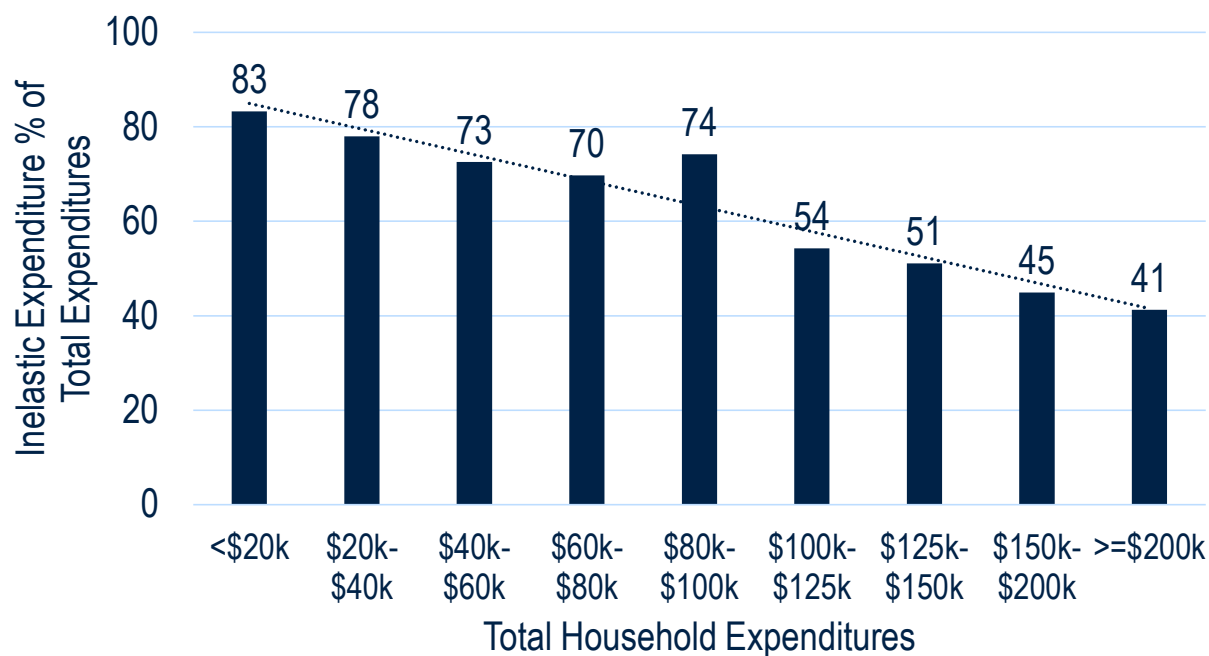
Impact of a 20% Spending Drop on Retirement Lifestyle

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%

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.

Spending Flexibility Increases at Higher Spending Levels

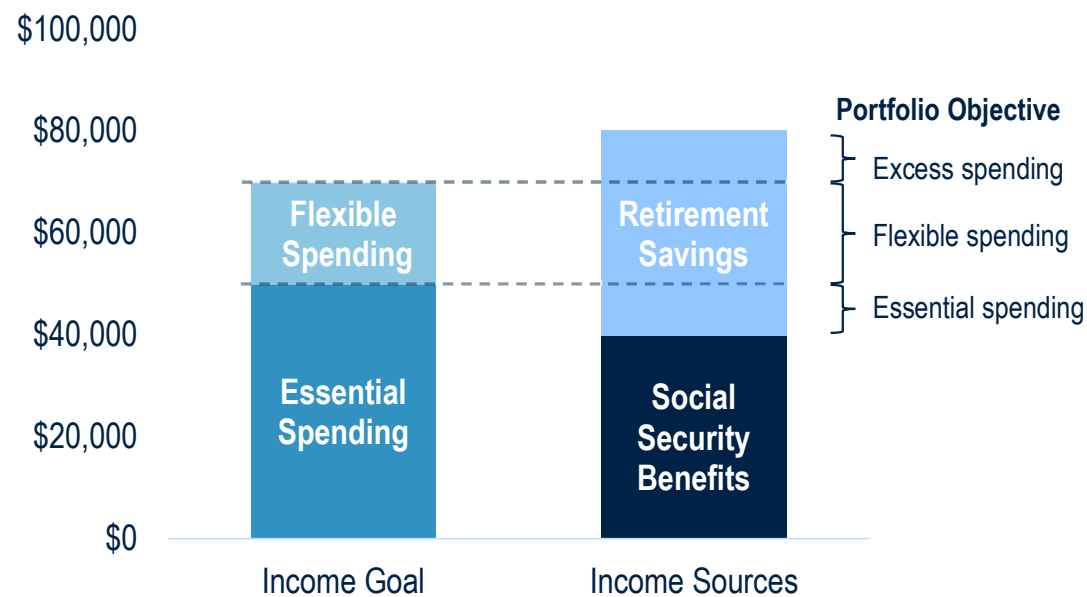
Estimated Percentage of Total Expenditures that are Inelastic/Essential



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

Expenditure data from the 2020 Interview file of the Consumer Expenditure Survey (CES). Dataset only includes respondents between the ages of 65 and 80 (inclusive) where the household is coded as being retired. Expenditures are categorized as being either elastic or inelastic.

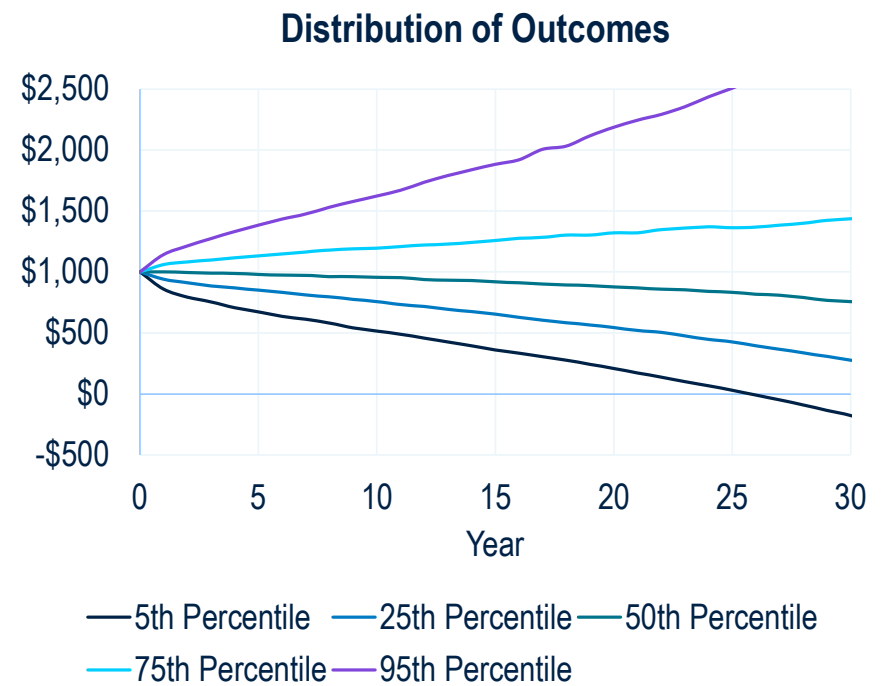
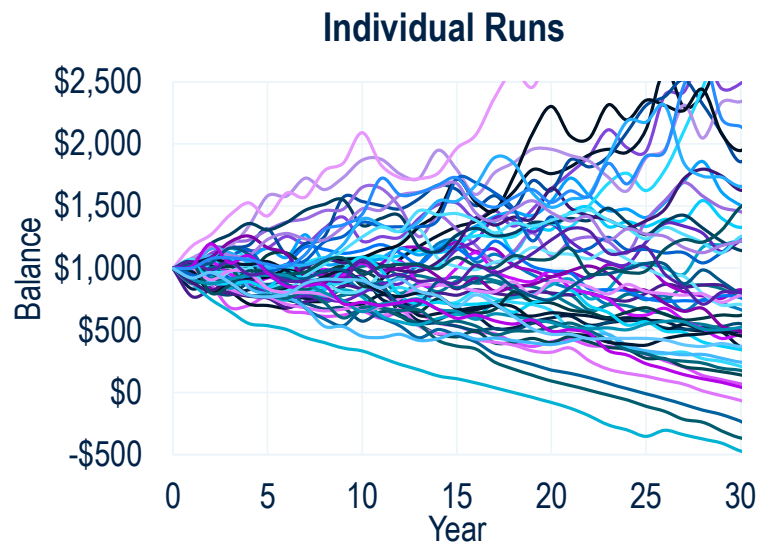
Decomposing the Retirement Goal: Essential & Flexible Spending



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

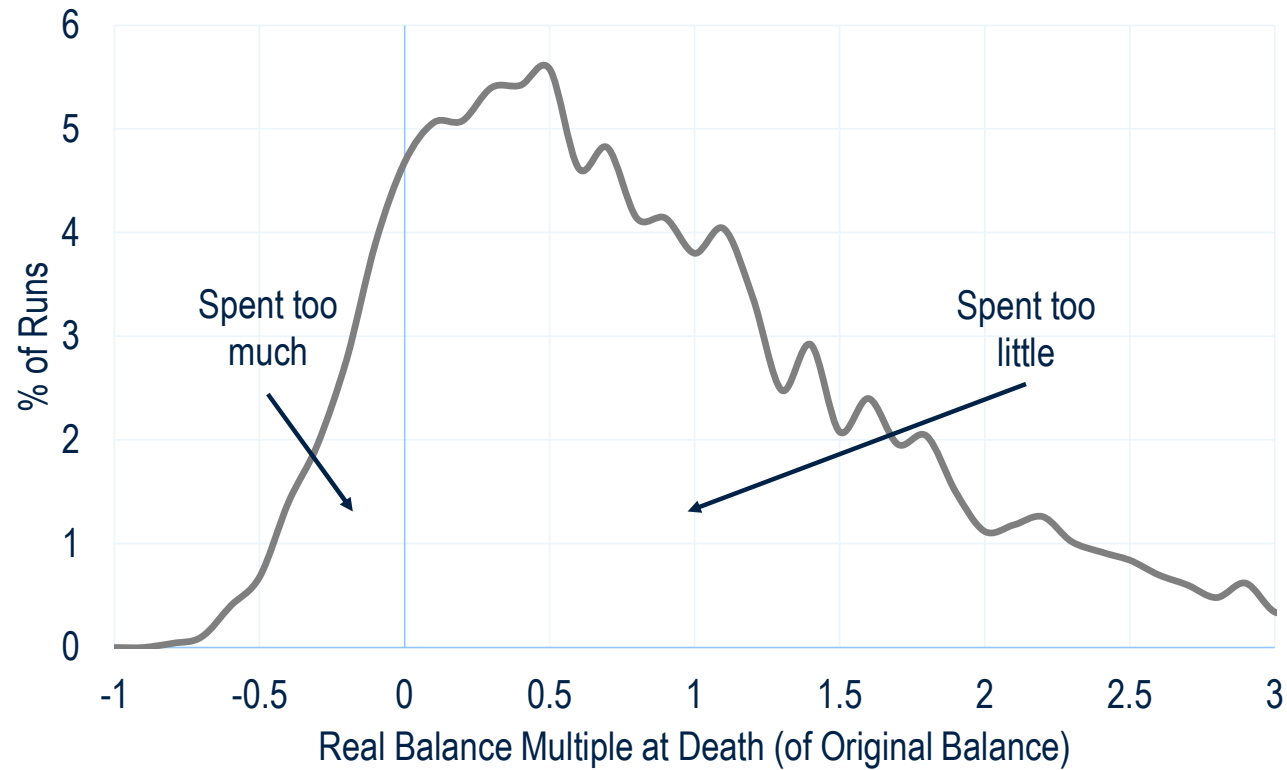
DYNAMICALLY ADJUSTING SPENDING

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



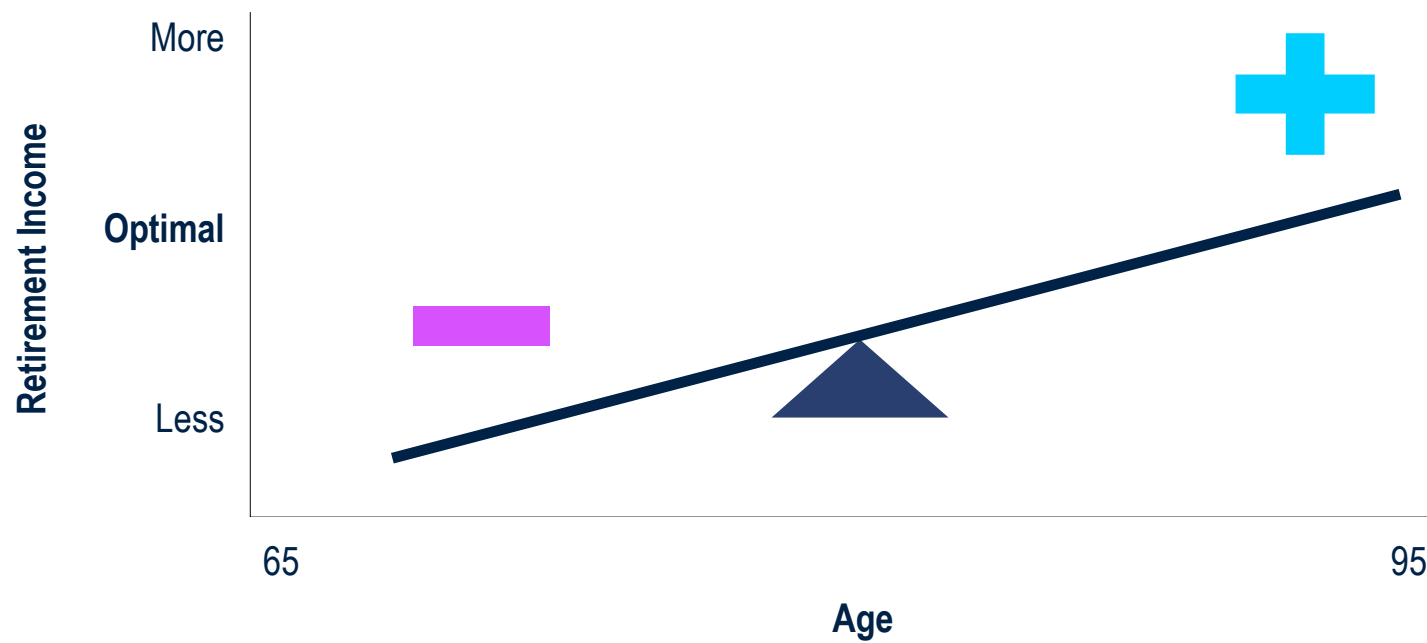
Shown for illustrative purposes only. Source: PGIM DC Solutions.

Distribution of Balance at Death for Static Withdrawals



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

This is a Different Type of “Failure”



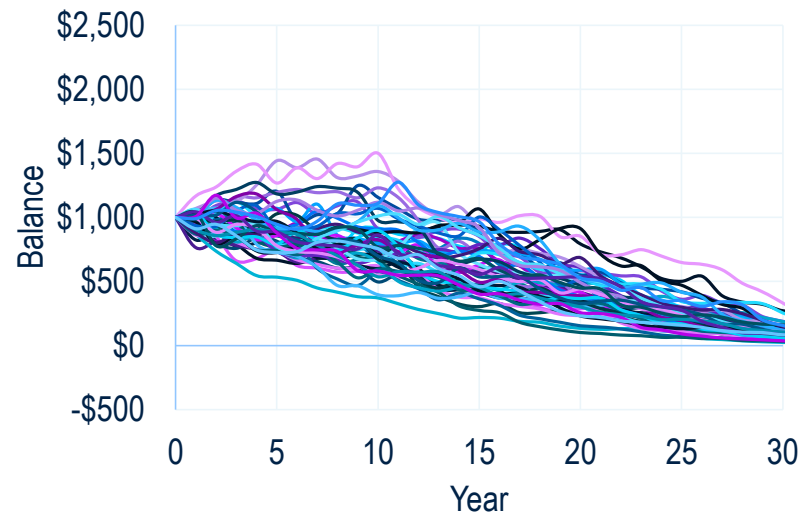
Shown for illustrative purposes only. Source: PGIM DC Solutions.

Static vs. Dynamic Spending Models

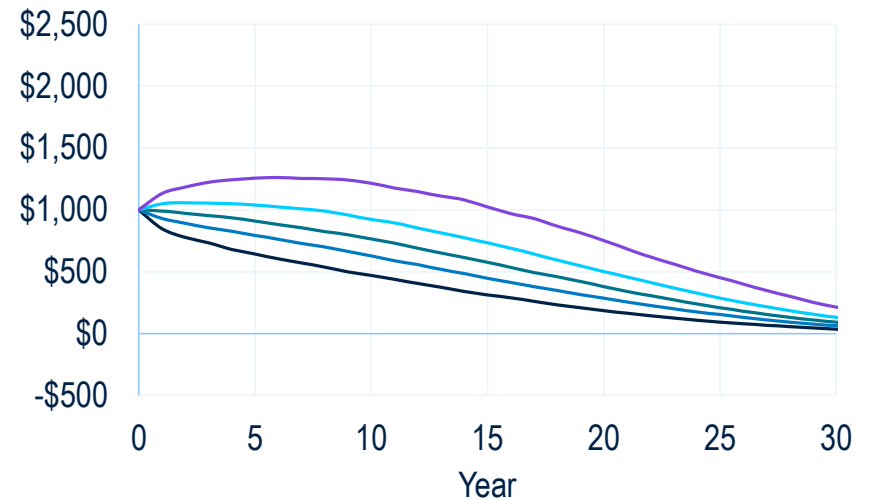
- Earliest retirement spending research (e.g., Bengen 1994) assumed retiree spending was effectively static (i.e., completely inelastic)
- More recent research (last ~two decades) has introduced a variety of dynamic spending models, where the assumed portfolio withdrawal (i.e., retiree spending/consumption) 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)

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

Individual Runs



Distribution of Outcomes



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

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

A Complete Financial Picture is Required



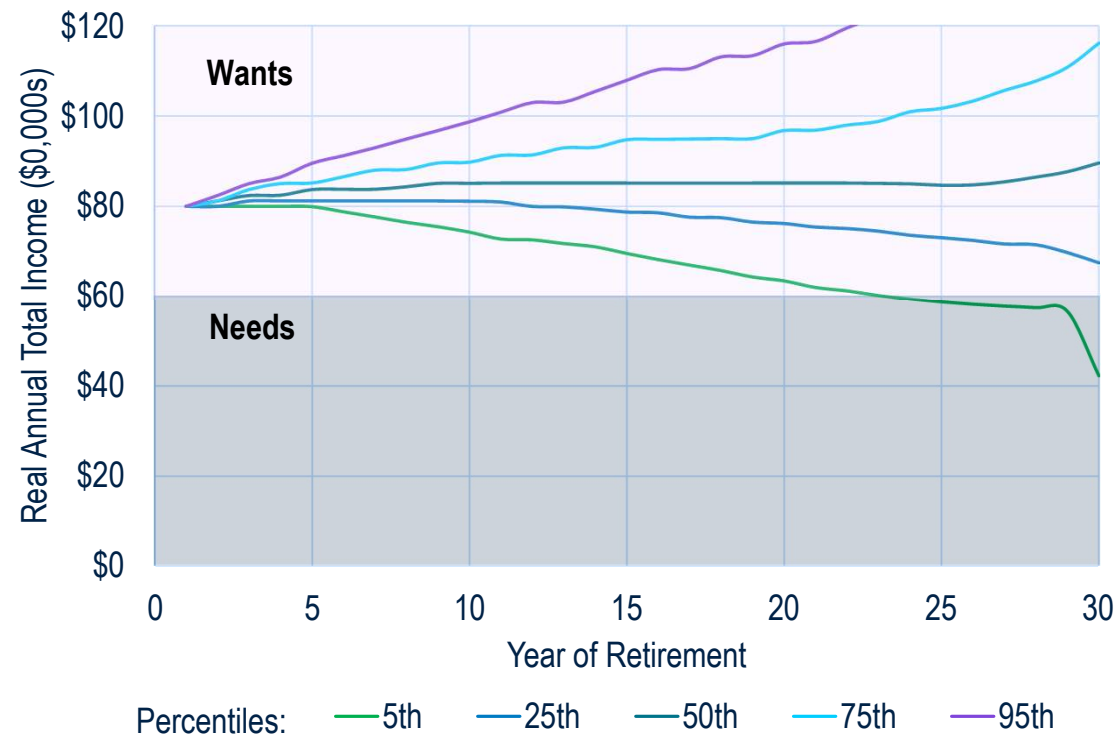
Assets



Liabilities

Shown for illustrative purposes only.

Spending Evolves as the Scenario Evolves



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

PGIM DC SOLUTIONS

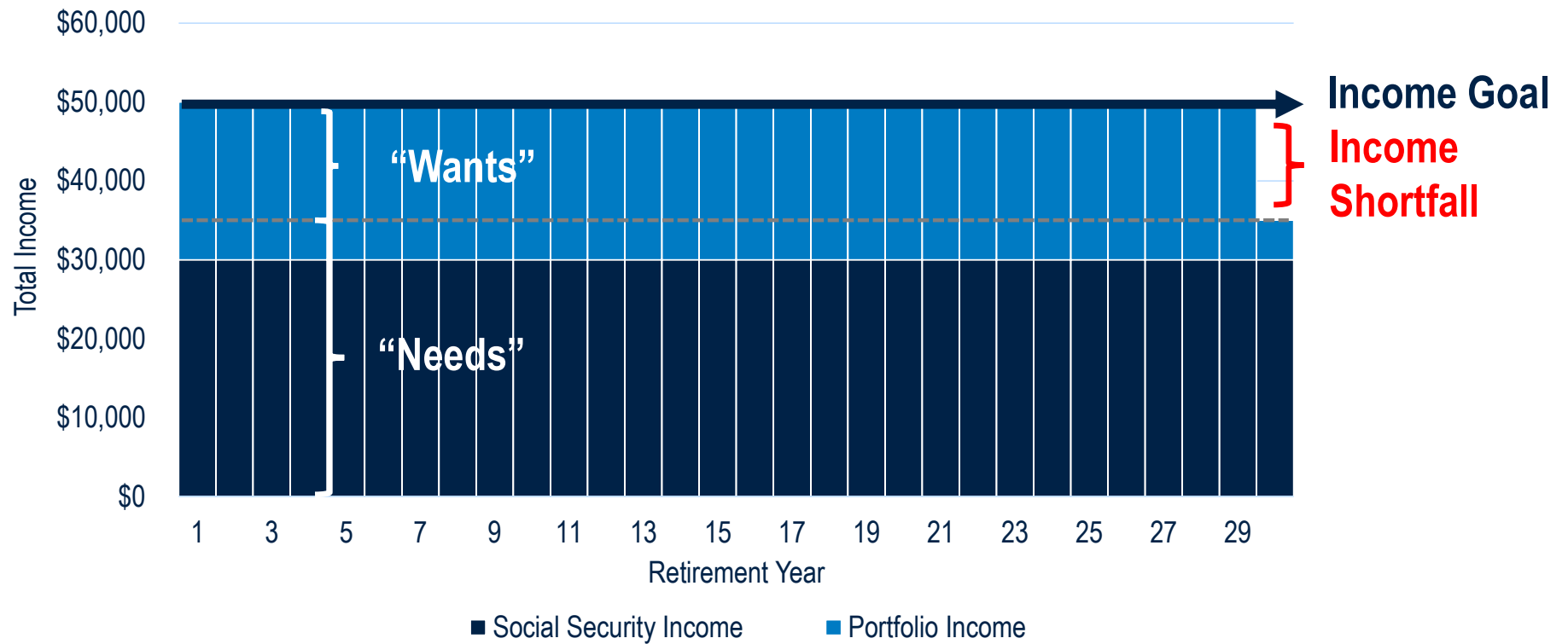
A BETTER OUTCOMES METRIC

Defining Outcomes



Shown for illustrative purposes only.

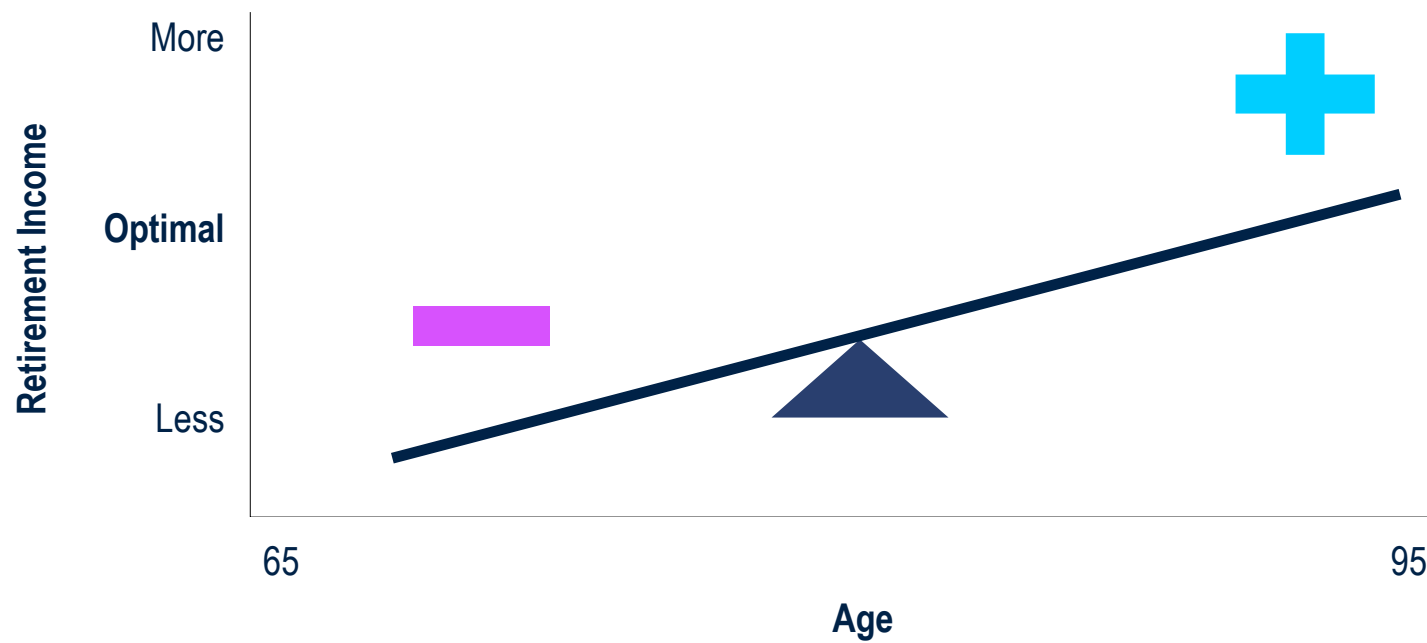
The Probability of Success Ignores the Magnitude of Failure



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

PGIM DC SOLUTIONS

This is a Different Type of “Failure”



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

PGIM DC SOLUTIONS

A Better Model to Quantify Outcomes

Most retirement income tools treat the retirement goal as binary, where there is only success or failure, thus ignoring the magnitude of failure and how a potential shortfall may affect the retiree.

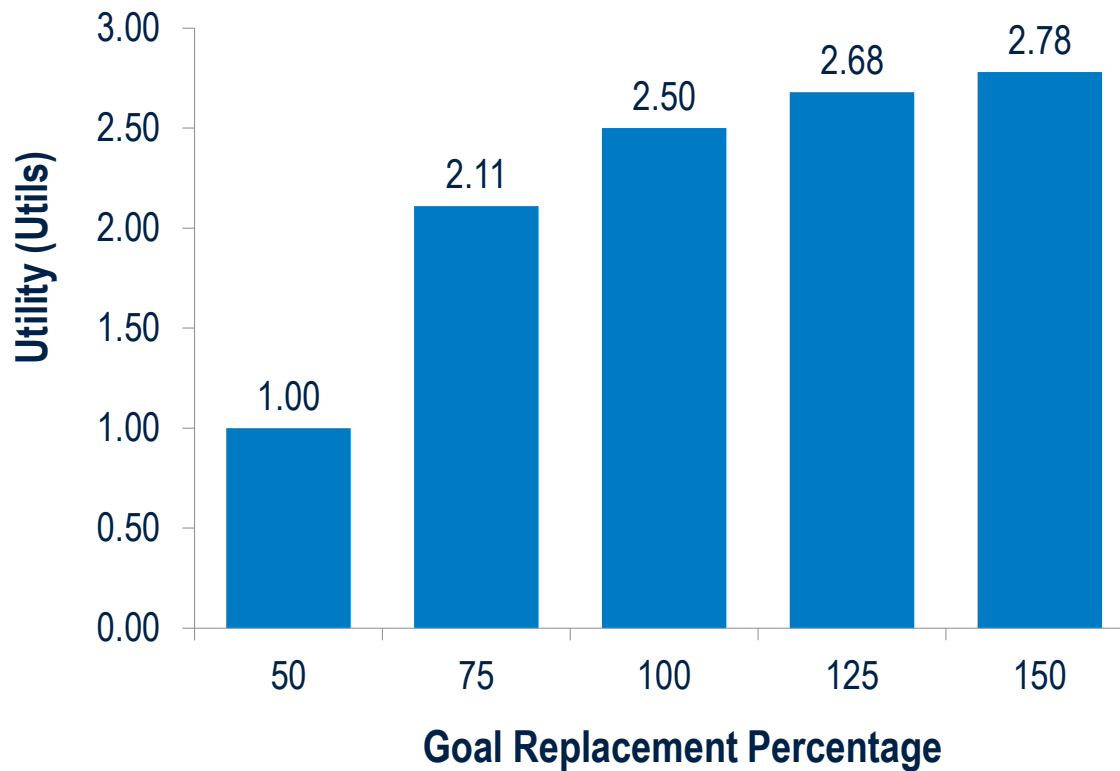
We use an expected utility model based on prospect theory that better captures how retirees experience outcomes.

		Year										Pass or Fail?	% of Goal
		1	2	3	4	5	6	7	8	9	10		
Run#	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%

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

PGIM DC SOLUTIONS

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

Needs Shortfall



Wants Shortfall



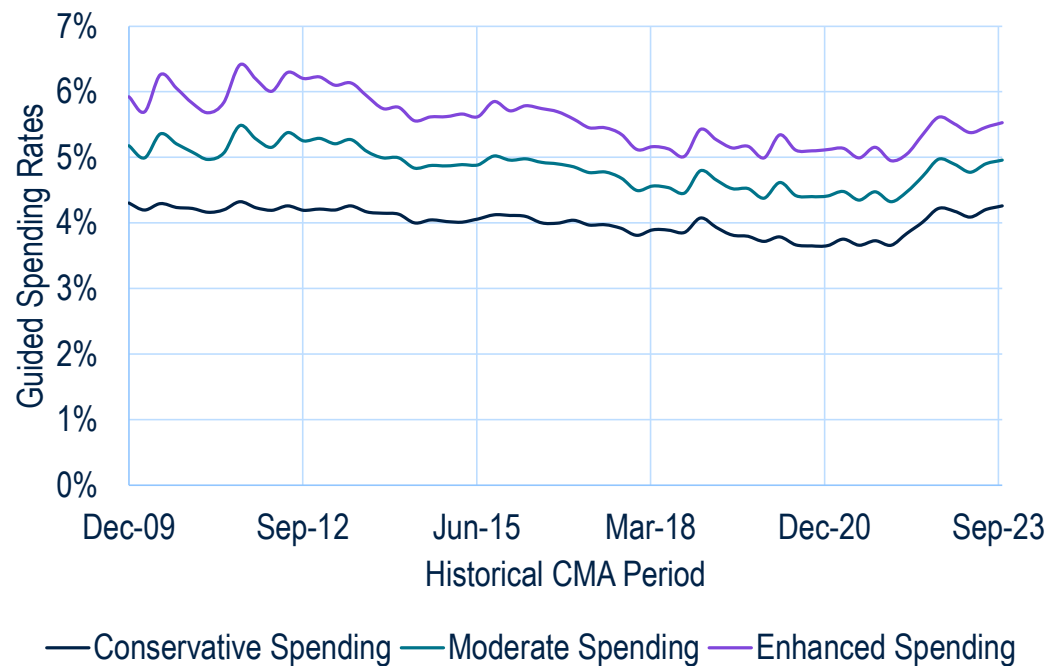
Excess



Shown for illustrative purposes only.

GUIDED SPENDING RATES

Guided Spending Rates for Scenarios: Q4 2009 to Q4 2023, Assuming a 30 Year Retirement Period

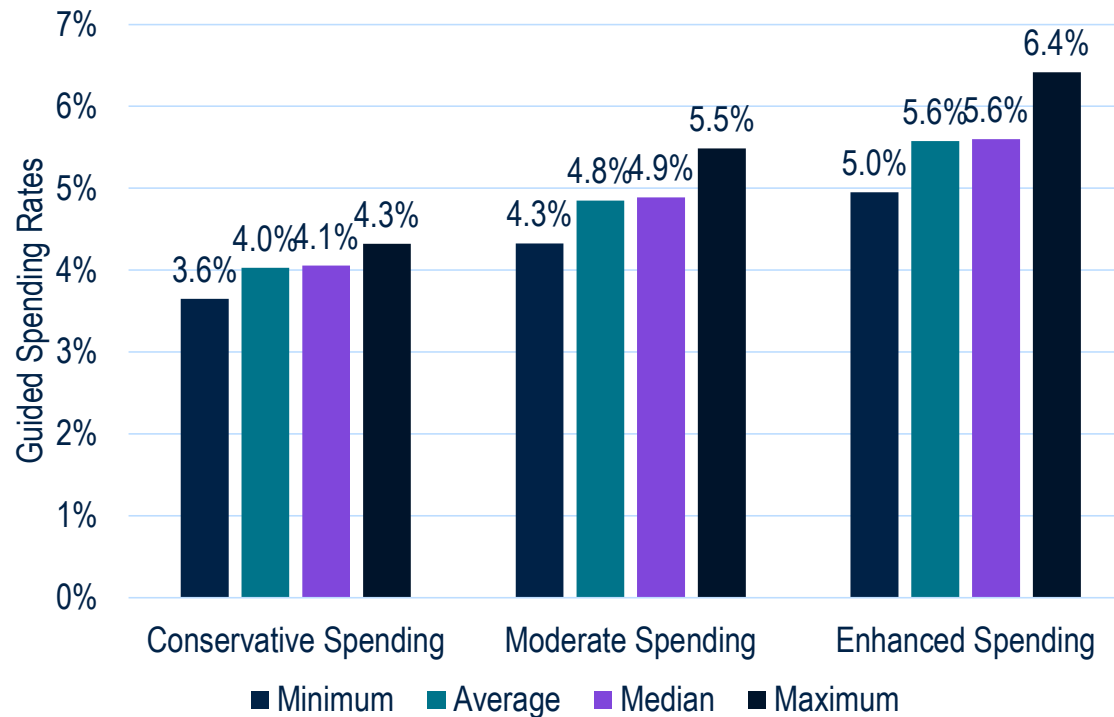


Shown for illustrative purposes only.

Source: "Guided Spending Rates: Rethinking 'Safe' Initial Withdrawal Rates" by David Blanchett. PGIM White Paper. Available here: <https://www.pgim.com/dc-solutions/article/guided-spending-rates-rethinking-safe-initial-withdrawal-rates>

PGIM DC SOLUTIONS

Guided Spending Rates for Scenarios: Q4 2009 to Q4 2023, Assuming a 30 Year Retirement Period



Shown for illustrative purposes only.

Source: "Guided Spending Rates: Rethinking 'Safe' Initial Withdrawal Rates" by David Blanchett. PGIM White Paper. Available here: <https://www.pgim.com/dc-solutions/article/guided-spending-rates-rethinking-safe-initial-withdrawal-rates>

PGIM DC SOLUTIONS

Guided Spending Rates for Scenarios: Q4 2023

	Retirement Period (Years)						
Flexibility Level	40	35	30	25	20	15	10
Conservative	3.5%	3.9%	4.3%	5.0%	5.9%	7.7%	11.0%
Moderate	4.2%	4.5%	5.0%	5.6%	6.6%	8.3%	11.9%
Enhanced	4.9%	5.1%	5.5%	6.1%	7.2%	9.0%	12.8%

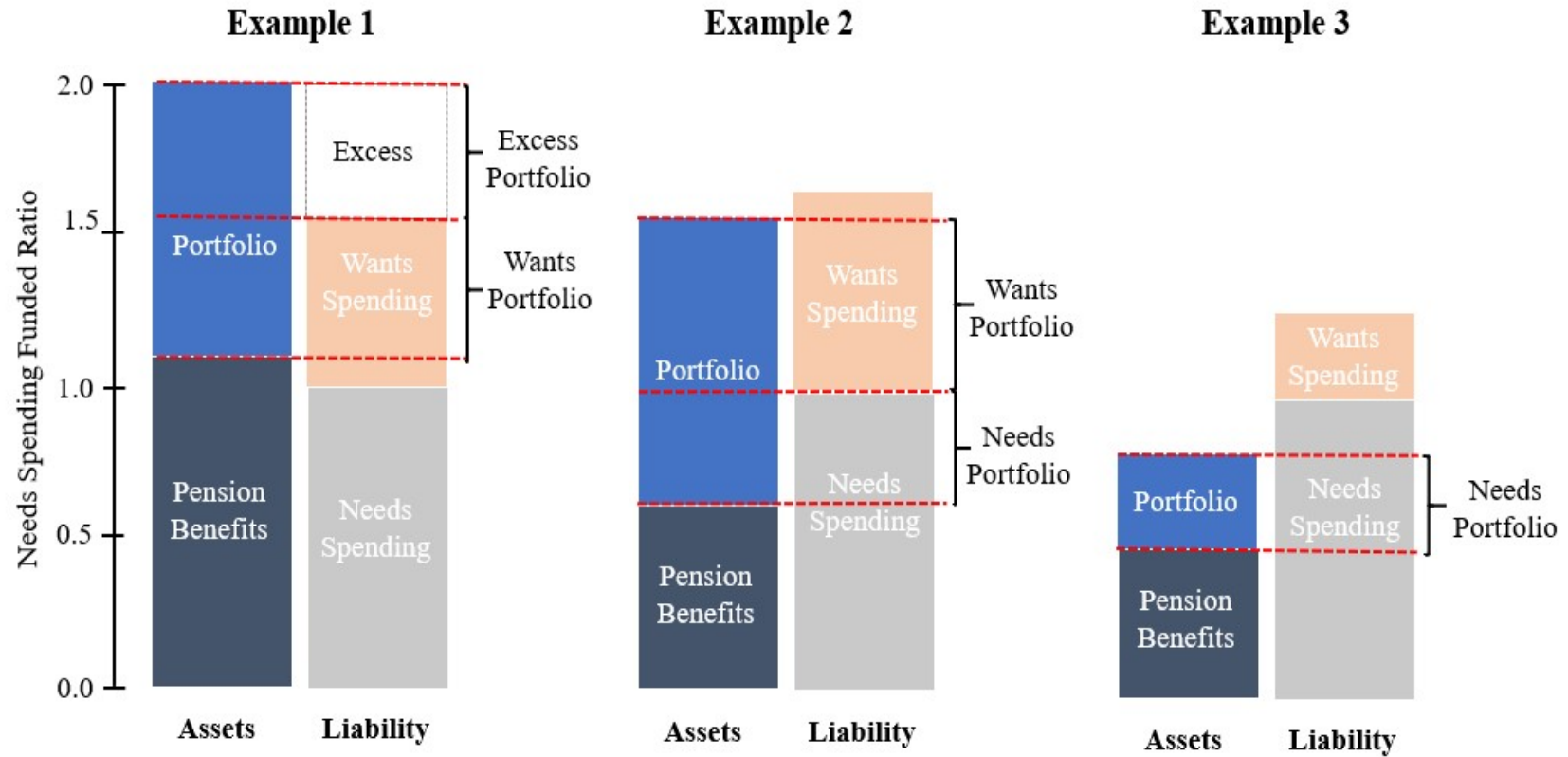
Shown for illustrative purposes only.

Source: "Guided Spending Rates: Rethinking 'Safe' Initial Withdrawal Rates" by David Blanchett. PGIM White Paper. Available here: <https://www.pgim.com/dc-solutions/article/guided-spending-rates-rethinking-safe-initial-withdrawal-rates>

PGIM DC SOLUTIONS

PORTFOLIO IMPLICATIONS

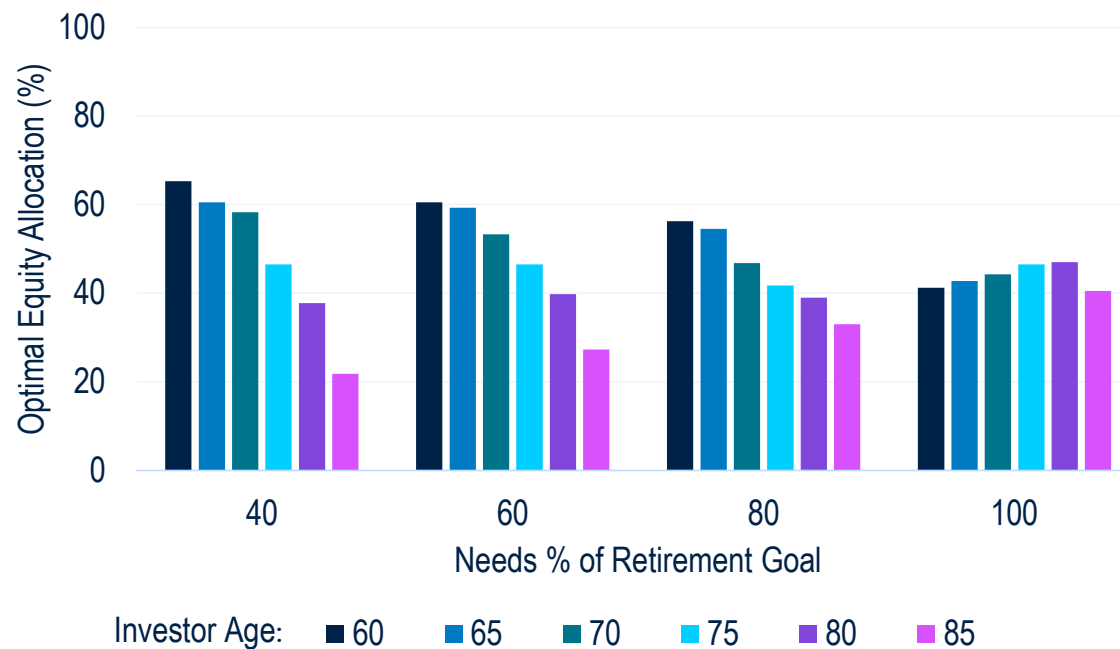
Decomposing the Income Goal: Asset Liability Mapping



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

PGIM DC SOLUTIONS

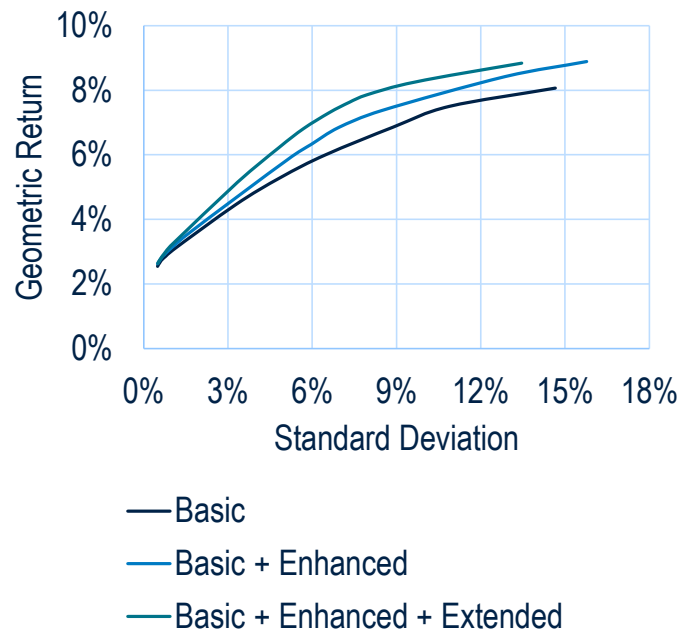
How Optimal Equity Allocations Vary by Spending Flexibility



Source: "Spending Elasticity and Optimal Portfolio Risk Levels" by David Blanchett and Jeremy Stempien. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4175484. Published 4 Aug 2022.

Moving Beyond “Basic” Asset Classes to Extend the Efficient Frontier

Extending the Efficient Frontier



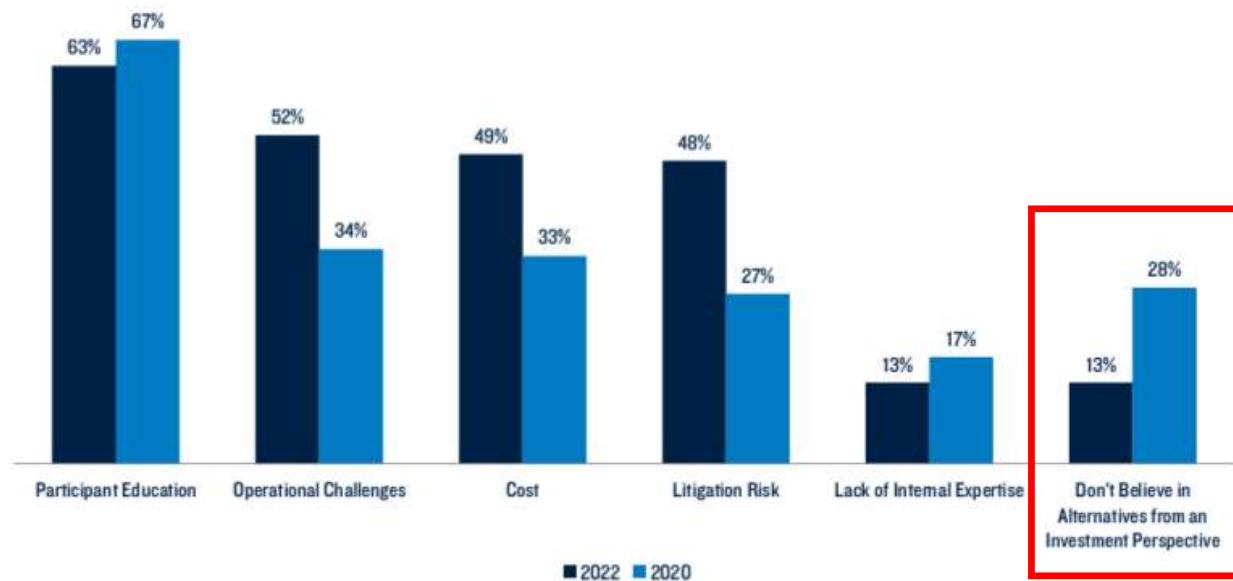
Asset Class Core Coverages

BASIC	ENHANCED	EXTENDED
US Large Cap	Emerging Markets Equity	Private Real Estate Equity
US Small Cap	REITs	Private Real Estate Debt
Non-US Equity	Commodities	Long Duration Bonds
Core Fixed Income	High Yield Bond	Infrastructure Equity
Cash	TIPS	Defensive Equity

Shown for illustrative purposes only.
Source: "The Building Blocks for Better Portfolios" by David Blanchett and Jeremy Stempien. PGIM White Paper.

PGIM DC SOLUTIONS

Reasons Plan Sponsors Don't Consider Alternatives



Shown for illustrative purposes only.
 Source: PGIM DC Landscape Report. Available here: https://cdn.pfcdn.com/cms/dcsolutions/sites/default/files/PGIM_The_Evolving_DC%20Landscape_ADA.pdf

Optimal Portfolios by Equity Risk Target and Risk Definition

	Accumulation Portfolios					Retirement Portfolios					Retirement - Accumulation				
	Risky Asset Target (%)					Risky Asset Target (%)					Risky Asset Target (%)				
	10	25	50	75	90	10	25	50	75	90	10	25	50	75	90
Cash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intermediate Bond	34	28	18	8	4	36	32	20	9	3	2	4	2	1	-1
Long Bond	8	6	4	2	1	8	7	5	2	1	1	1	1	0	0
Inflation-Protected Bond	25	21	13	6	3	27	24	15	7	2	2	3	2	1	-1
High Yield Bond	21	20	15	9	2	0	0	0	0	0	-21	-20	-15	-9	-2
World Bond	2	0	0	0	0	0	0	0	0	0	-2	0	0	0	0
Large Cap	2	5	13	21	26	6	6	10	17	21	4	1	-3	-4	-5
Small Cap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign Large	3	7	17	27	33	0	0	13	21	26	-3	-7	-4	-5	-6
Emerging Markets	0	5	13	21	26	0	6	10	17	21	0	1	-3	-4	-5
Commodities	5	8	6	5	3	16	16	16	14	13	10	8	10	10	10
Real Estate	0	0	0	1	2	7	9	11	12	13	7	9	11	12	11
Total	100	100	100	100	100	100	100	100	100	100	0	0	0	0	0
Fixed Income	90	75	50	25	10	71	63	40	18	5	-19	-12	-11	-7	-5
Equity	5	17	44	70	85	6	13	33	56	69	1	-4	-11	-14	-16
Alternative	5	8	6	5	5	23	24	27	26	26	17	17	21	21	21
Total	100	100	100	100	100	100	100	100	100	100	0	0	0	0	0

Shown for illustrative purposes only.

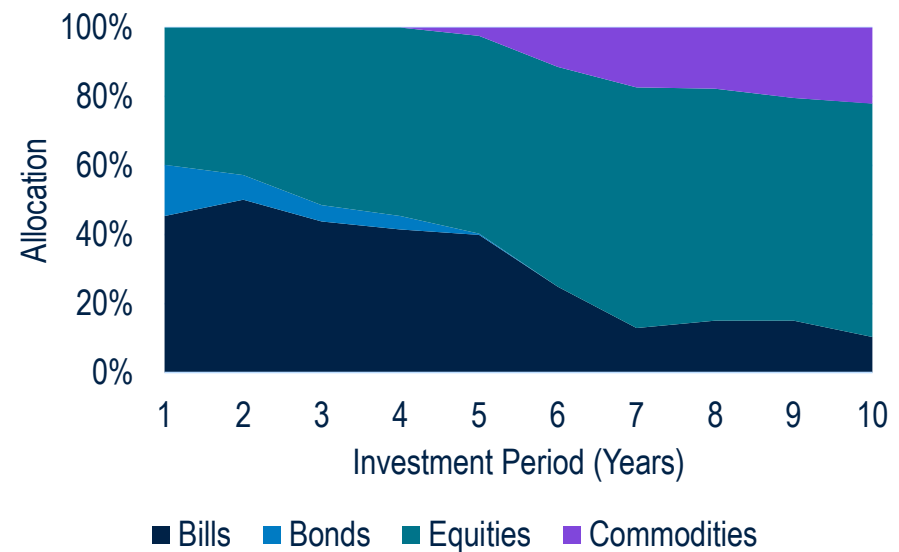
Source: "Enhancing Core Menus to Get 401(k)s in Better Shape for Retirement" by David Blanchett. PGIM White Paper.

PGIM DC SOLUTIONS

New Research on Optimal Portfolios and Investment Horizon



Optimal Asset Class Allocations by Investment Period Assuming a 40% Equity Risk Target: Historical Returns and Inflation-Adjusted Wealth



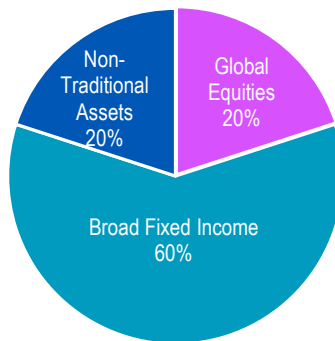
Shown for illustrative purposes only.

Source: "Investment Horizon, Serial Correlation, and Better (Retirement) Portfolios" by David Blanchett and Jeremy Stempien. CFA Research Institute. 2024.

PGIM DC SOLUTIONS

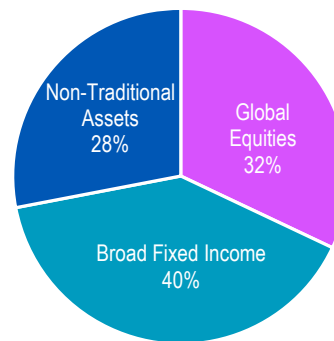
PGIM's Hypothetical Retirement Income Asset Allocation

Conservative Spending



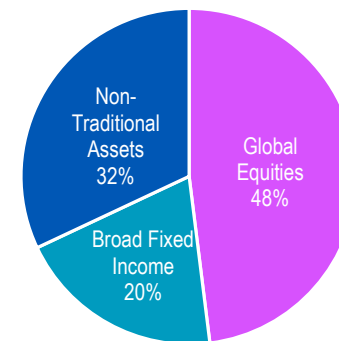
Objective: to provide downside protection and an inflationary hedge with some exposure to growth.

Moderate Spending



Objective: to provide a balance of growth exposure, downside protection, and an inflationary hedge.

Enhanced Spending



Objective: to provide modest growth with downside protection, and an inflationary hedge.

Global Equities include US large cap, US mid cap, US small cap, International, and Emerging Markets. Non-Traditional Assets includes private real estate, private real estate debt, global REITs, global infrastructure, and defensive equities. Broad Fixed Income includes TIPS, high yield, emerging market debt, long-duration gov/credit, core bonds and short-duration. Real Assets include TIPS, Private Real Estate, Global REITs, Global Infrastructure, and Commodities.

CONCLUDING THOUGHTS

Key Takeaways

- 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.
- Optimal spending rates from portfolios varies significantly across retirees, making a “one size fits all approach” difficult
- Optimal portfolio allocations vary by spending flexibility and optimal retirement income portfolios can look very different than optimal accumulation portfolios

QUESTIONS

Disclosures



PGIM, Inc. ("PGIM") is the primary asset management business of Prudential Financial, Inc. ("PFI") and is a registered investment adviser with the US Securities and Exchange Commission. PGIM DC Solutions LLC is an SEC-registered investment adviser, a Delaware limited liability company and an indirect wholly-owned subsidiary of PGIM, Inc., the principal asset management business of Prudential Financial, Inc. ("PFI") of the United States of America. Registration with the SEC does not imply a certain level of skill or training. PFI of the United States is not affiliated in any manner with Prudential plc incorporated in the United Kingdom or with Prudential Assurance Company, a subsidiary of M&G plc, incorporated in the United Kingdom.

Receipt of these materials by anyone other than the intended recipient does not establish a relationship between such person and PGIM DC Solutions LLC ("PGIM DC Solutions") or any of its affiliates. These materials are not intended as an offer or solicitation with respect to the purchase or sale of any security. The information presented is not intended as investment advice and is not a recommendation about managing or investing retirement savings. These materials do not take into account individual investment objectives or financial situations.

This document may contain confidential information and the recipient hereof agrees to maintain the confidentiality of such information. These materials represent the views, opinions and recommendations of the author(s) regarding the economic conditions, asset classes, securities, issuers, or financial instruments referenced herein. Distribution of this information to any person other than the person to whom it was originally delivered and to such person's advisers is unauthorized, and any reproduction of this document, in whole or in part, or the disclosure of any of its contents, without PGIM's prior written consent, is prohibited. This document contains the current opinions of the manager and such opinions are subject to change. Certain information in this document has been obtained from sources that PGIM believes to be reliable as of the date presented; however, the PGIM cannot guarantee the accuracy of such information, assure its completeness, or warrant such information will not be changed. PGIM has no obligation to update any or all such information; nor do we make any express or implied warranties or representations as to its completeness or accuracy. Any information presented regarding the affiliates of PGIM is presented purely to facilitate an organizational overview and is not a solicitation on behalf of any affiliate. These materials are not intended as an offer or solicitation with respect to the purchase or sale of any security or other financial instrument or any investment management services. These materials do not constitute investment advice and should not be used as the basis for any investment decision. Past performance is not a guarantee or a reliable indicator of future results.

These materials are for informational or educational purposes. In providing these materials, PGIM is not acting as your fiduciary and is not giving advice in a fiduciary capacity. The information contained herein is provided on the basis and subject to the explanations, caveats and warnings set out in this notice and elsewhere herein. Any discussion of risk management is intended to describe the PGIM's efforts to monitor and manage risk but does not imply low risk. No investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment. These materials do not purport to provide any legal, tax or accounting advice. These materials are not intended for distribution to or use by any person in any jurisdiction where such distribution would be contrary to local law or regulation.

Certain information contained in this document constitute "forward-looking statements," which can be identified by the use of forward-looking terminology such as "may", "will", "should", "expect", "anticipate", "target", "project", "estimate", "intend", "continue" or "believe" or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events or results or the actual performance of the investments may differ materially from those reflected or contemplated in such forward-looking statements. Any projections or forecasts presented herein are as of the date of this presentation and are subject to change without notice. Actual data will vary and may not be reflected here. Projections and forecasts are subject to high levels of uncertainty. Accordingly, any projections or forecasts should be viewed as merely representative of a broad range of possible outcomes. Projections or forecasts are estimated, based on assumptions, and are subject to significant revision and may change materially as economic and market conditions change. PGIM has no obligation to provide updates or changes to any projections or forecasts.

©2024 PFI and its related entities. PGIM, the PGIM logo, and the Rock symbol are service marks of PFI and its related entities, registered in many jurisdictions worldwide.

PGIM DCS - 3566734

