



Institutional Investment Approaches and Post-Retirement Solutions for Defined Contribution Schemes

November 2020

Josh Cohen, CFA
Head of Institutional Defined Contribution
Managing Director, IRG

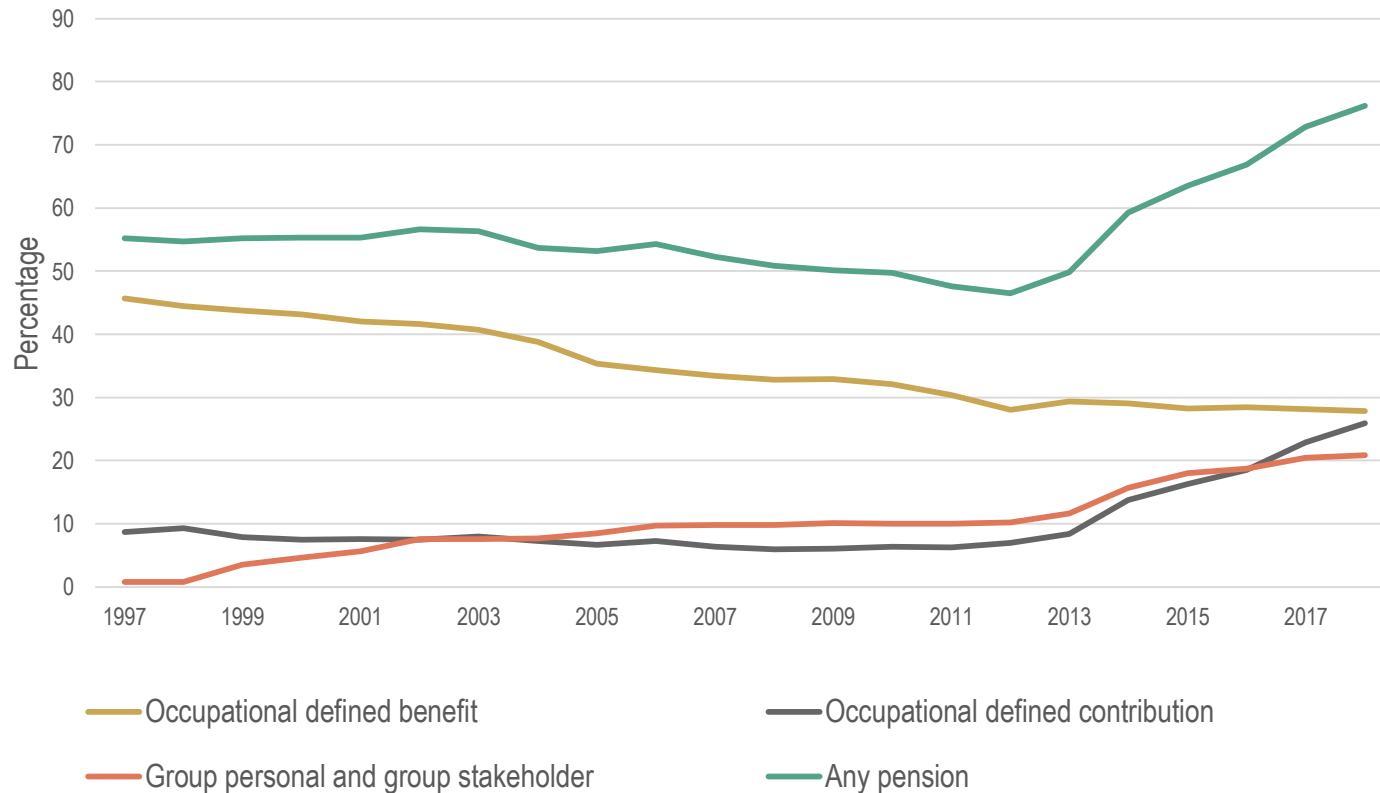
INSTITUTIONAL RELATIONSHIP GROUP

PGIM does not establish or operate pension plans. For Professional Investors only. All investments involve risk, including the possible loss of capital. Confidential – Not for further distribution.



Defined Contribution Industry at a Glance

Proportion of employees with workplace pensions: by type of pension, UK, 1997 to 2018



Source: Office for National Statistics – Annual Survey of Hours and Earnings as of 2018.

DC Investment Approaches

A spectrum of approaches, but they generally fall in to three broad categories

- 1. The Retail Approach**
- 2. The Simple Approach**
- 3. The Institutional Approach**

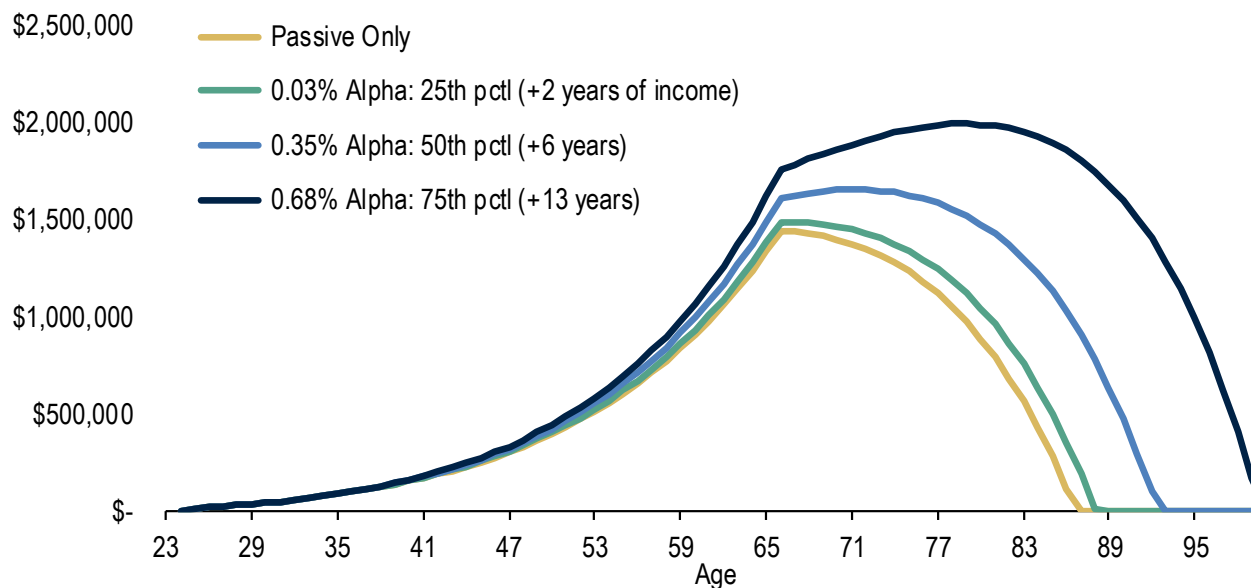
Characteristics of Institutional Approach

Characteristics	Applications Within Defined Contribution Plans
Outcome-oriented investments	Target-date funds, stable value, retirement income solutions, and managed accounts
Broad asset class diversification	Extended sectors, alternatives, and private assets
Best-of-breed investment management	Skilled investment managers that are institutional in nature
Thoughtful mix of active and passive	Hybrid target-date strategies and customized open-architecture funds
Vehicle agnostic	Institutional mutual funds, collective trusts, and separate accounts

Institutional Investments

Alpha potential can be a powerful driver of additional income in retirement

Effects of Alpha on Retirement Income



Source: PGIM. Total retirement savings over an individual's lifetime. Participant assumptions: initial age of 23, initial salary of \$40,000 with 3% annual salary growth, 10% savings rate, and withdrawal rate of 71% of final salary with subsequent 3% annual cost-of-living adjustments beginning at age 66. Investment assumptions (arithmetic): annual portfolio return of 7%, passive investment fee of 0.10%, active investment fee of 0.60%, and 1.0% gross of fee alpha assumption with a tracking error of 3% normally distributed. Alpha percentiles net of fees (geometric): 0.03% at 25th percentile, 0.35% at 50th percentile, and 0.68% at 75th percentile. **Hypothetical example for illustrative purposes only.**

Designing an Investment Menu

Streamlining investment menu choice is critical for improving participant outcomes, but should not come at the cost of capital markets coverage and diversification.

Levels of Investment Choice



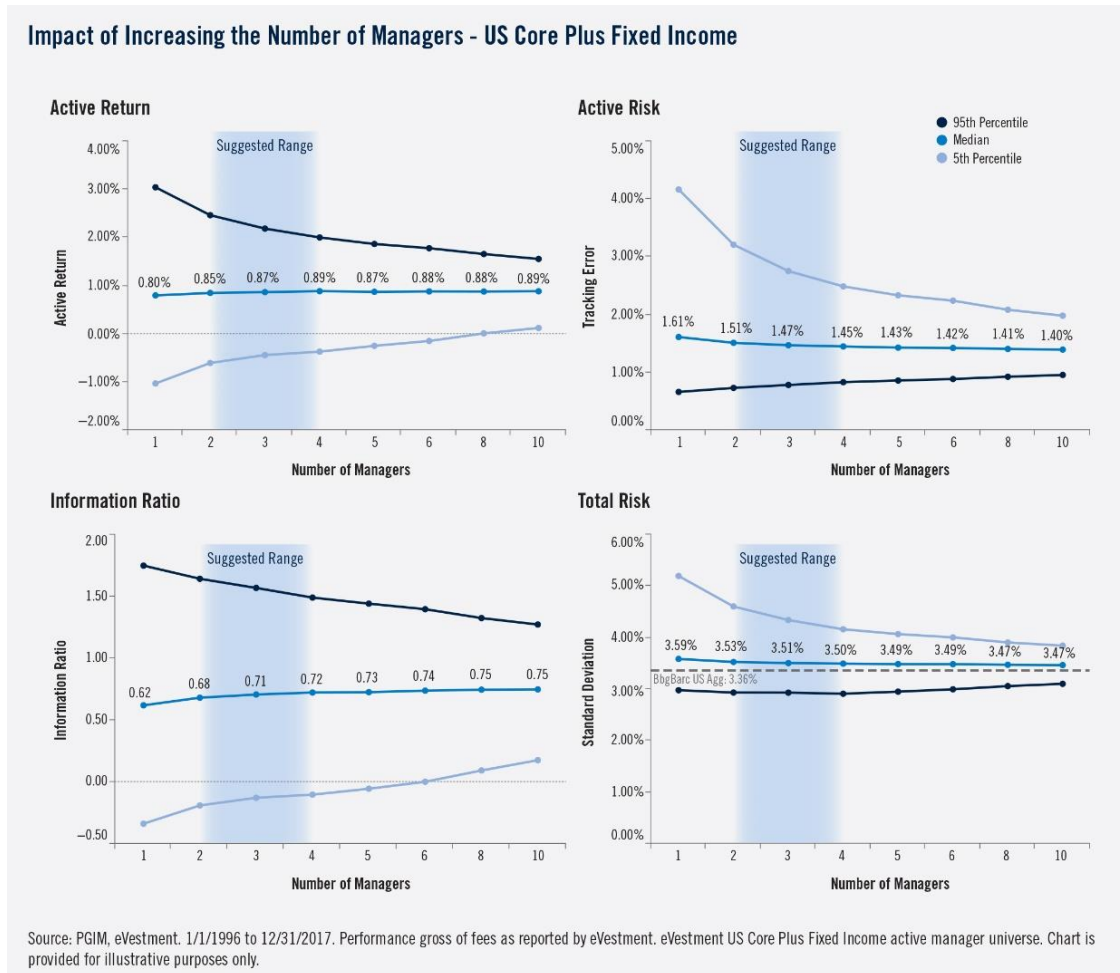
Chart assumes active and passive offered in several asset classes and excludes the default option.

Source: Institutional Relationship Group, PGIM.

For illustrative purposes only.

Determining the Optimal Number of Managers

For US Core Plus Fixed Income, we find that optimal range of managers is 2-4.

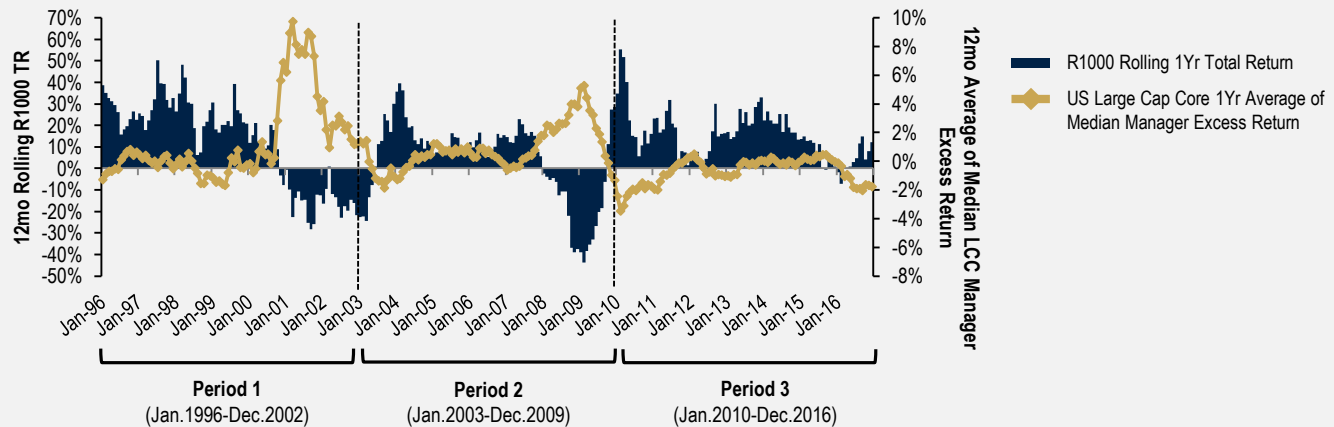


Using eVestment, we source monthly gross of fee return data of the US Core Plus Fixed Income active manager universe. From 1/1/1996 to 12/31/2017, we calculate 3-year performance (rolling annually) resulting in 20 different 3-year return periods or time steps. For multi-manager portfolios, we run 2,000 simulations for every 3-year period for all number-of-manager combinations (2-10). All multi-manager portfolios are equal-weighted and rebalance monthly. Over every 3-year time step, we calculate active return, active risk, information ratio, and total risk for all combinations. Each percentile result over all 20 time steps (for all four measures) is averaged to provide a summary result. Benchmark relative performance calculations are run against the Bloomberg Barclays US Aggregate index. **Past performance is not a guarantee or reliable indicator of future results.** The performance information shown for illustrative purposes only and is not indicative of past or future performance of any PGIM product.

Looking at Active and Passive By Asset Class

A thoughtful mix of active and passive management can help provide a more consistent and fee-friendly experience for participants.

Active Equity Manager Results are Counter-Cyclical in Nature¹



Fixed Income Alpha in Rising Rate Environments²

	Jan '09 – Dec '09	Sept '10 – March '11	Aug '12 to Dec '13	Aug '16 to Oct '18
10Y Treasury Rate Increase (bps)	+160	+97	+154	+169
Median Active Manager Return (%)	11.60	0.34	0.12	-0.21
BBG Barclays US Aggregate Return (%)	5.93	-0.77	-1.14	-0.94
Excess Return (+/-)	+5.67	+1.12	+1.27	+0.73

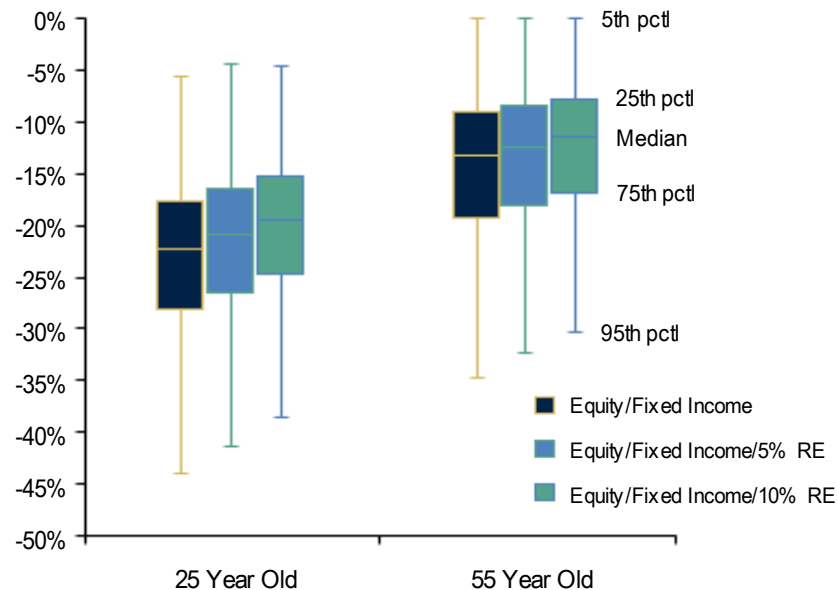
¹ Source: PGIM IAS, Datastream, eVestment. Performance gross of fees as reported by eVestment. **Past performance is not a guarantee or a reliable indicator of future results.** Chart is provided for illustrative purposes only and is not indicative of past or future performance of any PGIM product and is not indicative of past or future performance of any PGIM product. ² Source: eVestment. **Past performance is not a guarantee or a reliable indicator of future results.** Performance gross of fees as reported by eVestment. Peer group composed of eVestment US Core Bond & US Core Plus Bond active manager universes. Chart is provided for illustrative purposes only and is not indicative of past or future performance of any PGIM product.

Institutional Investments

Improving portfolio downside protection with private real estate

	25 Year Old			55 Year Old		
	Median	75th Pctl	95th Pctl	Median	75th Pctl	95th Pctl
Equity/Fixed Income	-22.3%	-28.2%	-43.9%	-13.2%	-19.4%	-34.8%
Equity/Fixed Income/10% RE	-19.4%	-24.6%	-38.6%	-11.5%	-16.8%	-30.3%
Max Drawdown Reduction	2.9%	3.6%	5.3%	1.7%	2.6%	4.5%

**Accumulation Phase Projected Maximum Drawdowns
by Age and Real Estate Exposure**

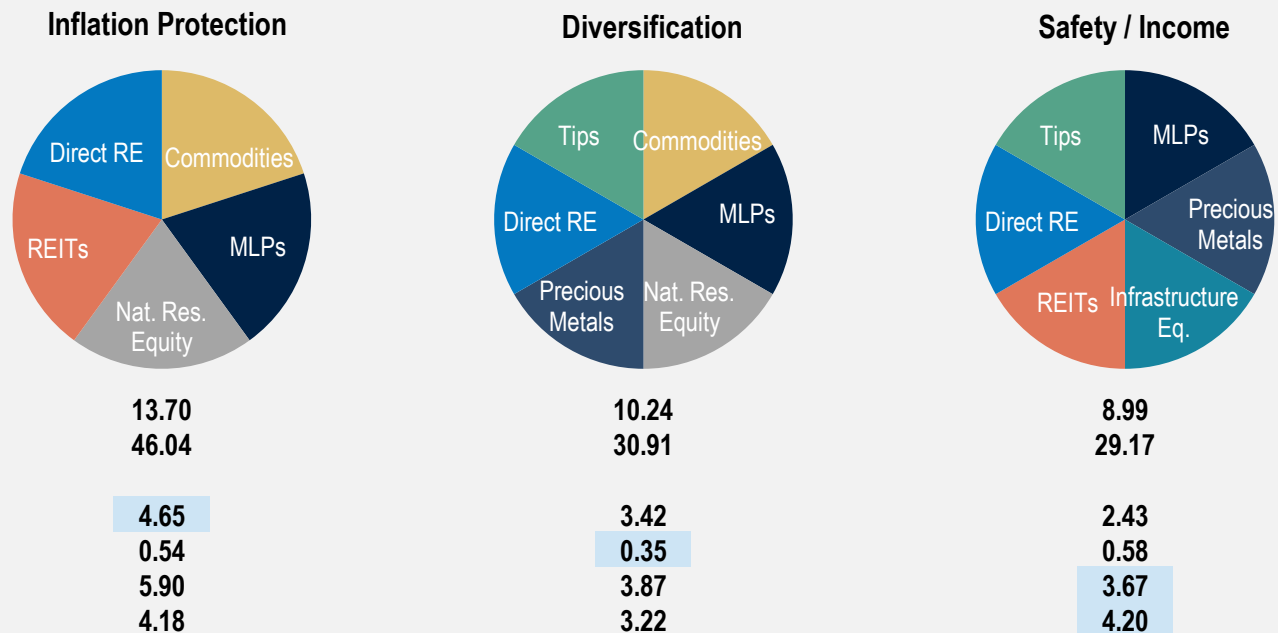


Source: PGIM as of 3/31/2018. Stochastic analysis using Moody's Analytics Economic Scenario Generator compared two-asset portfolios of domestic equities and fixed income with three-asset portfolios of domestic equities, fixed income, and private real estate. Projections were done for 2 different age cohorts (25 & 55) up to an assumed retirement at age 65 using 5,000 trials. Portfolio asset allocation was modeled similar to a target-date glide path based on age. The base two-asset portfolio of domestic equities and fixed income was as follows: 85% (equities)/15% (fixed income) from age 25-35, 75%/25% from age 35-45, 65%/35% from age 45-55, and 55%/45% from age 55-65. Portfolios including private real estate held static allocations to the asset class over the glide path, coming from the existing equity allocation. Static allocations to real estate of 5% and 10% were used. Analysis is not meant for investment advice. **Hypothetical example for illustrative purposes only.**

Expanding into Real Assets

For real asset portfolios, plan sponsors need to identify their objectives as they will heavily influence the overall asset allocation.

Example Real Asset Allocations

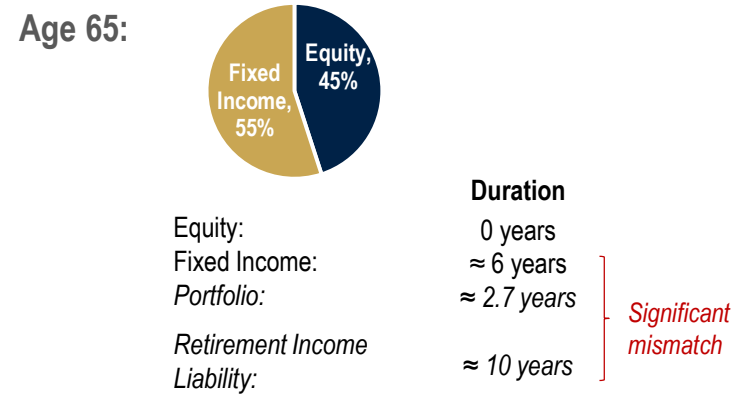
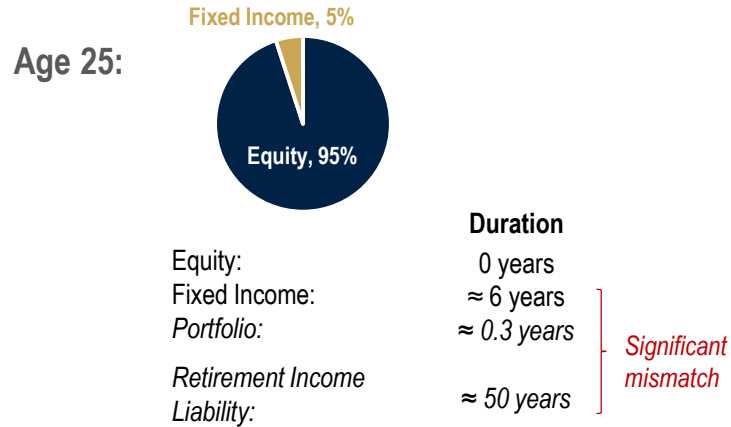


Source: PGIM, Bloomberg, S&P, Alerian, FTSE, MSCI, Bloomberg Barclays, and NCREIF. 3Q1999 to 2Q2018. Inflation Beta relative to CPI-U, Diversification R-Squared relative to 50/50 global stock/bond portfolio, and Growth Beta relative to US GDP. Portfolios equal-weighted for illustrative purposes only.

The time period we analyze is 7/1/1999 to 6/30/2018 – the longest common period of the representative indexes. All data is quarterly given the lack of monthly data for private real estate. Also, because private real estate data is appraisal-based, resulting in high autocorrelation and underrepresentation of extreme values, the returns are unsmoothed using the Geltner approach. Based on the results of the analysis, we determine thresholds for what constitutes an asset's ability to achieve each objective. For inflation protection, we use a beta to CPI greater than that of global stocks. For diversification, we use an R-squared less than or equal to 0.60 to the global stock/bond portfolio. For safety/income, we use either a beta to GDP less than that of the global stock/bond portfolio or a current yield greater than or equal to 1.5x that of a global stock/bond portfolio. To get a sense of the risk profile of each of these portfolios, we backtest performance using the representative indexes and annual rebalancing over the same time period of the quantitative analysis. We also conduct the same quantitative analysis using the backtested performance of these equal-weighted portfolios to confirm the general framework.

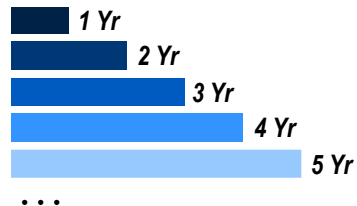
Liability-Driven Investing (LDI) in DC

Duration Mismatch



Comparing LDI Approaches

Cash Flow Matching
w/ Bond Fund Ladder:



Key Rate Duration Targeting
w/ Target Duration Funds:



Post-Retirement

Spectrum of retirement income solutions

- It is likely that participants will need access to a variety of products and services

- Top concerns for plan sponsors in offering such solutions include:
 - Difficulty in communicating to participants
 - Cost
 - Administrative complexities

In-Plan Solutions		Out-of-Plan Solutions
Non-Guaranteed	Guaranteed	
Annuity Tracking Asset Class	Immediate Income Annuities	Immediate Income Annuities
Managed Accounts	Deferred Income Annuities	Deferred Income Annuities
Managed Payout Funds	Guaranteed Lifetime Withdrawal Benefit	Guaranteed Lifetime Withdrawal Benefit
Target-Date Funds		

Important Information

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. Registration with the SEC does not imply a certain level of skill or training.

In the United Kingdom and various European Economic Area jurisdictions, information is issued by PGIM Limited with registered office: Grand Buildings, 1-3 Strand, Trafalgar Square, London, WC2N 5HR. PGIM Limited is authorised and regulated by the Financial Conduct Authority of the United Kingdom (Firm Reference Number 193418) and duly passported in various jurisdictions in the EEA. PGIM Limited is a wholly-owned subsidiary of PGIM, Inc., the principal investment management business of Prudential Financial, Inc. ("PFI"). 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. These materials are being issued by PGIM Limited to persons who are professional clients or eligible counterparties as defined in Directive 2014/65/EU (MiFID II), investing for their own account, for fund of funds, or discretionary clients.

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.

Any financial indices referenced herein as benchmarks are provided for informational purposes only. The use of benchmarks has limitations because portfolio holdings and characteristics will differ from those of the benchmark(s), and such differences may be material. You cannot make a direct investment in an index. Factors affecting portfolio performance that do not affect benchmark performance may include portfolio rebalancing, the timing of cash flows, credit quality, diversification and differences in volatility. In addition, financial indices do not reflect the impact of fees, applicable taxes or trading costs which reduce returns. Unless otherwise noted, financial indices assume reinvestment of dividends.

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.