RESEARCH

Researching Retirement: Myths and Realities About Asset Allocations

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KEY TAKEAWAYS

- An income-focused retirement asset allocation with a liability-driven bond portfolio can offer better risk management than conventional allocations, which typically rely on short-term, nominal fixed income.
- Despite being riskier, conventional allocations do not offer meaningfully higher retirement income.
- High equity exposure in retirement is risky and provides limited benefits.

Dimensional's Research team recently evaluated the ability of common investing and spending strategies to support smooth retirement consumption. We used simulations to compare an income-focused allocation with two wealth-focused allocations that are inspired by real-world target date funds.[1] We found that the income-focused allocation delivers similar retirement income with lower risk.

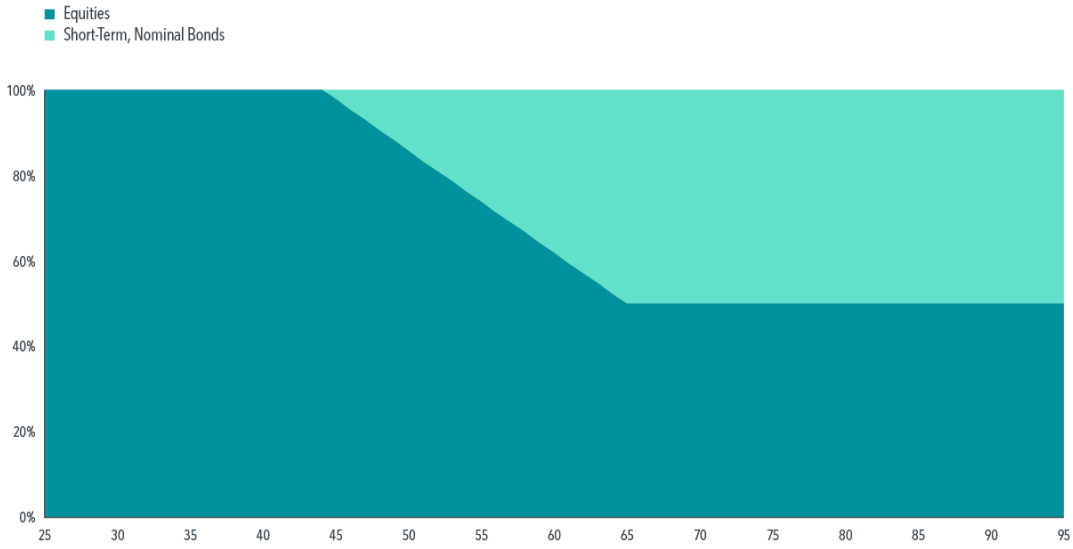
Our results differ from conventional wisdom about retirement investing. The three allocations we considered are shown in **Exhibit 1**. All allocations start with 100% allocated to equities at age 25 and maintain this exposure until age 45. Then, equity exposure in each allocation declines until reaching its landing point at age 65, either 25% or 50%. In the wealth-focused allocations, short-term nominal fixed income replaces equities, a common practice in target date funds.[2] In the income-focused allocation, fixed income is used to manage inflation and interest rate risks through a liability-driven investing (LDI) bond portfolio. Exposure to equities in retirement, at 25%, is lower than the equity allocation in the average target date fund, which is closer to 50%.[3]

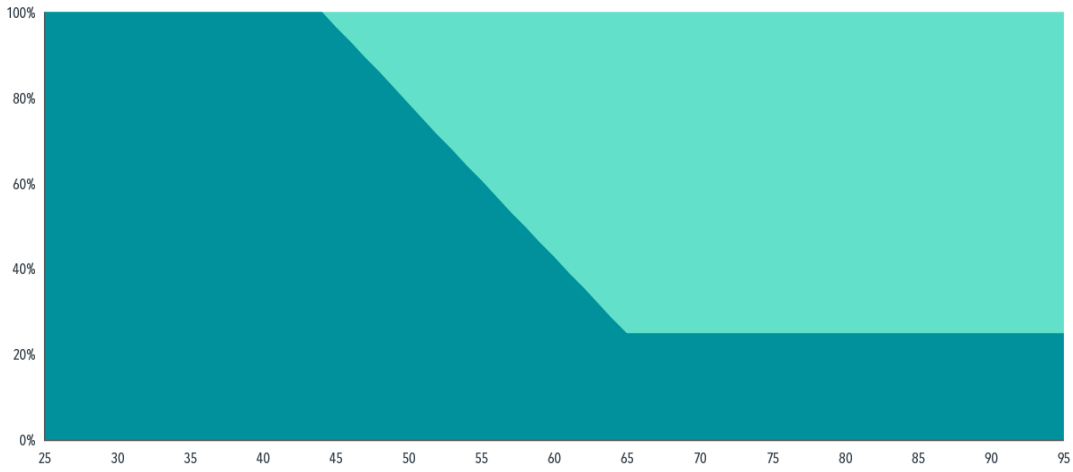
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Exhibit 1

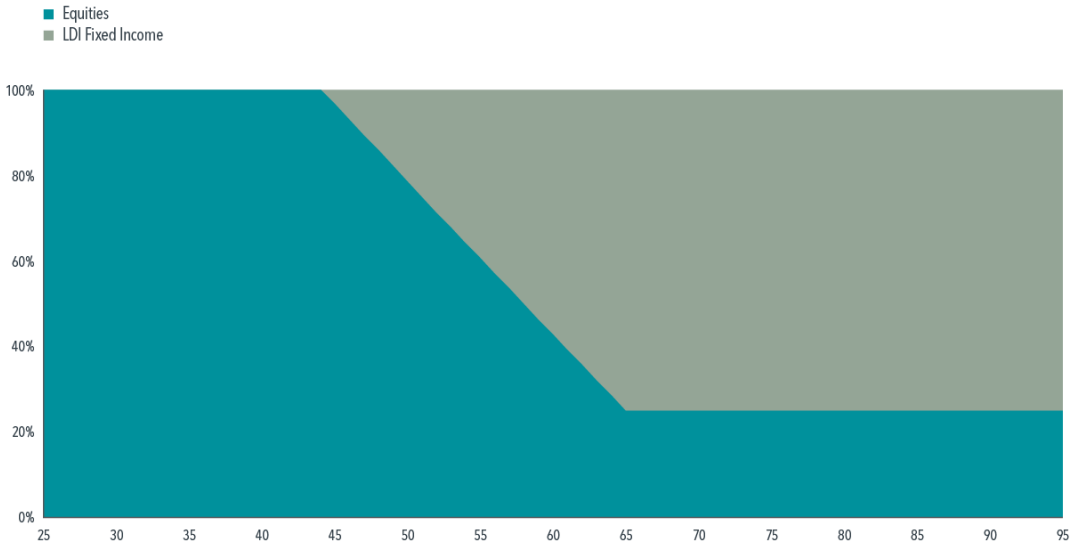
Portfolio Allocation by Age for the Wealth- and Income-Focused Glide Paths

Panel A: Wealth-Focused Glide Paths





Panel B: Income-Focused Glide Path



We simulate the experience of an investor who makes 40 annual contributions of $12,500 to a retirement account and invests according to the asset allocations outlined in Exhibit 1. At age 65, the investor plans for a 30-year retirement. She computes the present value of 30 equal inflation-indexed payments to determine her annual spending. Spending is constant (in real terms) through retirement. **Exhibit 2** shows the distribution of initial retirement income for 100,000 simulations, as well as the failure rate, defined as the percentage of scenarios in which the investor runs out of assets.

Exhibit 2
Initial Spending and Failure Rates for the Three Asset Allocations

		Wealth-focused, 50% landing point	Wealth-focused, 25% landing point	Income-focused, 25% landing point
Initial spending (Real dollars)	P_{10}	$19,893	$21,121	$22,118
	P_{50}	$44,691	$43,384	$44,967
	P_{90}	$111,383	$99,816	$103,180
Failure rate		30.1%	27.7%	20.2%

Hypothetical performance is no guarantee of future results.

For illustrative purposes only. All simulations are based on a hypothetical probability distribution, not historical data. See Appendix for details.

The income-focused allocation delivers similar initial spending to the wealth-focused allocations. Moreover, it does so with a lower failure rate—a lower probability of running out of assets during retirement. From this simple table, we can address three common myths about retirement investing.

MYTH NO. 1: SHORT-TERM BONDS ARE SAFER THAN LONG-MATURITY BONDS.

Reality: Short-term bonds may actually be riskier when retirement income is the goal.

Consider the wealth-focused allocation with a 25% landing point and its income-focused counterpart. The only difference is the composition of their fixed income sleeves. The wealth-focused allocation holds short-term, nominal bonds, while the income-focused allocation holds an LDI portfolio of inflation-indexed bonds.[4]

Comparing those 25% landing point allocations, the income-focused allocation has higher spending at all percentiles shown in **Exhibit 2**. The failure rate of the income-focused strategy is also lower. From the perspective of a retirement investor, the LDI bond portfolio appears less risky than short-term, nominal bonds. Why, then, does this myth persist?

The confusion stems from the definition of risk. When measuring risk using price volatility, the LDI portfolio is indeed more volatile because the LDI portfolio seeks to match the duration (interest rate sensitivity) of the future retirement payments. Since retirement payments occur over a long period, the LDI portfolio will typically have a long duration. When interest rates change, large price fluctuations can occur.

However, when measuring risk in terms of retirement income, the LDI portfolio is less risky. The intuition is simple. If an investor must meet a $25,000 liability in 10 years, a bond that pays $25,000 in 10 years is the relevant risk-free asset. No matter how much the bond's market value fluctuates in the interim, an investor who holds the bond to maturity will successfully meet her liability. This is the concept at the core of LDI.

MYTH NO. 2: A GLIDE PATH WITH A HIGHER EQUITY LANDING POINT LEADS TO HIGHER RETIREMENT INCOME.

Reality: A higher equity landing point increases the dispersion of outcomes and does not always lead to more income.

Compare the two wealth-focused allocations. The only difference is their equity exposure. The 25% landing point allocation provides similar income to the 50% landing point allocation, except at the 90th percentile.

To see why, remember that in Exhibit 2, spending is proportional to the account balance at retirement. In the paper, we find that median assets at retirement are $1,051,940 and $1,021,311, respectively, for the 50% and 25% landing point allocations. Even though the 50% landing point allocation has higher exposure to equities between ages 45 and 65, initial retirement assets are only slightly higher.

A high equity landing point does not generally lead to better outcomes. Median initial income is no higher, and the higher equity exposure during retirement does not help sustain spending. In fact, the allocation with a 50% landing point has the highest failure rate; for investors interested in smooth retirement consumption, transitioning toward a moderate exposure to equities as they approach retirement may be a better alternative.

MYTH NO. 3: HIGHER EQUITY EXPOSURE IN RETIREMENT CAN HELP MANAGE LONGEVITY RISK.

Reality: Proper planning, solid risk management, and annuity income can help manage longevity risk.

In the US, the conditional life expectancy at 65 is 21 years for women and 18 for men.[5] Therefore, the 30-year retirement shown in Exhibit 2 corresponds to a high-longevity scenario. Yet the allocation with the highest equity exposure in retirement has the highest failure rate. The income-focused allocation, which addresses market, interest rate, and inflation risk, has the highest chance of supporting retirement consumption until age 95.

High equity exposure in retirement is risky and may be unnecessary for many investors. Retirement investors likely have more control over their savings and spending behavior, which can be more reliable tools to address longevity risk. Annuities, which are specifically designed to manage longevity risk, are another option. For example, US investors can delay Social Security until 70 and replace the income they would normally receive by increasing spending from their own assets during the first five years of retirement.[6] The initial Social Security payment is then increased, and this higher payment amount is the baseline to which cost-of-living adjustments are applied; payments are thus higher for life. The transaction is equivalent to buying additional amounts of an inflation-indexed annuity backed by the US government.[7] All those avenues may be more sensible ways to address longevity risk without doubling down on stock market risk.

This article is the first of a two-part series. The second installment, Researching Retirement: The Impact of Inflation, Interest Rates, and Market Risks, looks at the performance of different retirement strategies in difficult market environments.
VIEW THE RESEARCH ON SSRN ↗

1. See Appendix for an overview of the simulation model.
2. Smita Chirputkar et al., "Making STRIDEs in Evaluating the Performance of Retirement Solutions" (white paper, S&P Dow Jones Indices, November 2019). The average fixed income duration for 2020 target date funds was approximately six years in November 2019.
3. Hamish Preston and Adrián Carranza Araujo, "S&P Target Date Scorecard" (white paper, S&P Dow Jones Indices, March 2021). Report 1 in the document shows the allocation to equities by vintage. Also note the small allocation to TIPS.
4. Inflation-indexed bonds are bonds whose principal (face value) and interest payments (coupons) are adjusted to reflect increases or decreases in the price level. For example, if annual inflation is 3%, the principal would increase from $100 to $103. These bonds are designed to provide payoffs with more predictable purchasing power.
5. "Period Life Tables," Social Security Administration, 2020.
6. Other public pension systems allow participants to delay collecting their benefits in exchange for higher lifetime income. Examples include public pensions in the UK (State Pension), Canada (Old Age Security, Canada Pension Plan), and Singapore (CPF Life scheme).
7. Alicia H. Munnell, Gal Wettstein, and Wenliang Hou, "How Best to Annuitize Defined Contribution Assets?" *Journal of Risk and Insurance* (November 2020).

APPENDIX

All returns are based on computer-generated random numbers.

A hypothetical investor makes $12,500 deposits adjusted for inflation at the beginning of each year, from age 25 to 64 inclusively. Assets are invested according to the glide paths shown in Exhibit 1. Allocations are rebalanced annually. The balance evolves based on returns drawn from a simulated probability distribution. At retirement, the investor divides her current balance by the present value of 30 inflation-indexed payments to determine her initial spending. The present value is based on inflation-indexed yields from a simulated yield curve.

Real (net of inflation) stock returns are 5% on average with a standard deviation of 20%. Inflation follows an AR(1) process with a mean of 2% and a 1.5% standard deviation. Real yields are modeled according to a three-factor dynamic Nelson-Siegel model (see Appendix A in the paper for details). Instantaneous real yields are 1% on average with a standard deviation of 1.5%, while long-term real yields have a 2% mean and 1% standard deviation. Nominal yields are derived from real yields and the expected inflation implied by the model. All bond returns are derived from the evolution of the corresponding yields.

The results presented in this blog are sensitive both to modeling assumptions and the parameter values chosen to calibrate the model. Section 2 and Appendix A in the paper provide a more complete description of the simulation methodology.

A liability-driven investment (LDI) strategy is designed to focus on assets that match future liabilities. LDI strategies contain certain risks that prospective investors should evaluate and understand prior to making a decision to invest. These risks may include, but are not limited to, interest rate risk, counterparty risk, liquidity risk, and leverage risk.

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