

Strategic Shields – LDI, CDI, and Liquidity Management

September 19, 2025

Introduction

Building on our previous discussion of sequence risk, this chapter focuses on actionable strategies to mitigate its impact. We explore how Liability-Driven Investing (LDI) and Cash-Flow-Driven Investing (CDI) can serve as strategic shields against forced liquidation and funding deterioration.

Key Topics

- Structuring investment-grade bond portfolios to match liabilities
- Portfolio comparisons: LDI-heavy vs. traditional allocations
- Liquidity management as a cornerstone of sustainability
- Governance triggers: burn rate thresholds, funding ratio declines

Takeaway

Plans that adopt LDI/CDI frameworks are better equipped to weather market volatility. Liquidity-focused strategies reduce exposure to early-period downturns and preserve capital.

Figure 2. Sample Plan 2 - Problem: Sequence Risk with Negative Cash Flows

Sequence of Returns

Year	Benefit Pmts	Ctbts	SCENARIO 1		SCENARIO 2		SCENARIO 3	
			Return	MV	Return	MV	Return	MV
0				\$ 26,183		\$ 26,183		\$ 26,183
1	(\$ 1,840)	171	6.8%	\$ 26,226	20.1%	\$ 29,626	-9.9%	\$ 22,019
2	(\$ 1,872)	174	6.8%	\$ 26,241	20.1%	\$ 33,731	-7.0%	\$ 18,848
3	(\$ 1,886)	175	6.8%	\$ 26,244	13.2%	\$ 36,357	-10.7%	\$ 15,221
4	(\$ 1,897)	176	6.8%	\$ 26,237	20.6%	\$ 41,950	6.6%	\$ 14,454
5	(\$ 1,888)	175	6.8%	\$ 26,239	-1.1%	\$ 39,803	7.7%	\$ 13,786
6	(\$ 1,856)	172	6.8%	\$ 26,270	7.7%	\$ 41,109	-1.1%	\$ 11,965
7	(\$ 1,813)	168	6.8%	\$ 26,344	7.1%	\$ 42,317	-2.5%	\$ 10,041
8	(\$ 1,771)	164	6.8%	\$ 26,462	5.7%	\$ 43,074	21.4%	\$ 10,422
9	(\$ 1,735)	161	6.8%	\$ 26,621	3.2%	\$ 42,833	7.7%	\$ 9,594
10	(\$ 1,699)	158	6.8%	\$ 26,826	7.4%	\$ 44,421	20.1%	\$ 9,837
11	(\$ 1,655)	153	6.8%	\$ 27,085	13.0%	\$ 48,601	13.2%	\$ 9,536
12	(\$ 1,602)	149	6.8%	\$ 27,412	-10.7%	\$ 42,046	3.2%	\$ 8,361
13	(\$ 1,549)	144	6.8%	\$ 27,810	7.7%	\$ 43,837	7.1%	\$ 7,498
14	(\$ 1,498)	139	6.8%	\$ 28,283	21.4%	\$ 51,733	20.1%	\$ 7,519
15	(\$ 1,450)	134	6.8%	\$ 28,833	-9.9%	\$ 45,388	20.6%	\$ 7,622
16	(\$ 1,404)	130	6.8%	\$ 29,463	6.6%	\$ 47,083	7.4%	\$ 6,868
17	(\$ 1,355)	126	6.8%	\$ 30,181	0.9%	\$ 46,279	0.9%	\$ 5,696
18	(\$ 1,305)	121	6.8%	\$ 30,995	20.7%	\$ 54,567	13.0%	\$ 5,178
19	(\$ 1,251)	116	6.8%	\$ 31,914	-2.5%	\$ 52,080	20.7%	\$ 5,003
20	(\$ 1,194)	111	6.8%	\$ 32,949	-7.0%	\$ 47,412	5.7%	\$ 4,174
Annualized Return			6.7%		6.7%		6.7%	
Annualized Volatility			0.0%		10.0%		10.0%	

Figure 2 presents a Sequence of Returns analysis for another sample Pension Plan, illustrating how different market return patterns can impact the plan's market value (MV) over a 20-year horizon, even when the average return is the same.

Sequence risk refers to the danger that poor investment returns early in a withdrawal period (such as during retirement or pension payouts) can significantly reduce the longevity and sustainability of a portfolio, even if long-term average returns are favorable.

Figure 2. The table compares three scenarios:

Scenario	Return Pattern	Outcome
Scenario 1	Steady 6.8% annual return	Market value remains stable and predictable.
Scenario 2	Strong returns early (e.g., 20.1%, 13.2%)	Market value grows significantly, reaching \$48.6M by year 11.
Scenario 3	Poor returns early (e.g., -9.9%, -7.0%)	Market value drops sharply, falling to \$15.2M by year 3 and struggling to recover.

Despite all scenarios having the same average return (6.75%), the timing of those returns dramatically affects the ending market value due to the impact of early withdrawals (benefit payments).

- Scenario 3 shows how early negative returns combined with ongoing benefit payments can deplete assets quickly, leading to a much lower ending value - even with recovery later.
- This highlights the importance of return sequencing in pension planning and the potential need for liability-driven investing (LDI) or cash flow matching strategies to mitigate this risk.

Figure 3. Solution: Structure an Investment Grade Bond portfolio to hedge the liabilities

Sequence of Returns: 50% Cash Match / 50% Return-Seeking

Cash Match Portfolio				Return-Seeking Portfolio					
Year	Benefit Pmts	LDI	Net Ctbts	SCENARIO 1		SCENARIO 2		SCENARIO 3	
				Return	MV	Return	MV	Return	MV
0		\$ 15,632			\$ 10,551		\$ 10,551		\$ 10,551
1	(\$ 1,840)	\$ 14,500	\$ 171	6.8%	\$ 11,440	20.1%	\$ 12,863	-9.9%	\$ 9,674
2	(\$ 1,872)	\$ 13,281	\$ 174	6.8%	\$ 12,391	20.1%	\$ 15,644	-7.0%	\$ 9,168
3	(\$ 1,886)	\$ 11,989	\$ 175	6.8%	\$ 13,408	13.2%	\$ 17,893	-10.7%	\$ 8,356
4	(\$ 1,897)	\$ 10,624	\$ 176	6.8%	\$ 14,495	20.6%	\$ 21,768	6.6%	\$ 9,092
5	(\$ 1,888)	\$ 9,202	\$ 175	6.8%	\$ 15,654	-1.1%	\$ 21,712	7.7%	\$ 9,971
6	(\$ 1,856)	\$ 7,745	\$ 172	6.8%	\$ 16,889	7.7%	\$ 23,556	-1.1%	\$ 10,037
7	(\$ 1,813)	\$ 6,262	\$ 168	6.8%	\$ 18,202	7.1%	\$ 25,397	-2.5%	\$ 9,952
8	(\$ 1,771)	\$ 4,750	\$ 164	6.8%	\$ 19,601	5.7%	\$ 27,012	21.4%	\$ 12,265
9	(\$ 1,735)	\$ 3,202	\$ 161	6.8%	\$ 21,090	3.2%	\$ 28,027	7.7%	\$ 13,380
10	(\$ 1,699)	\$ 1,617	\$ 158	6.8%	\$ 22,676	7.4%	\$ 30,275	20.1%	\$ 16,247
11	(\$ 1,655)	\$ 0	\$ 153	6.8%	\$ 24,366	13.0%	\$ 34,375	13.2%	\$ 18,553
12			(\$ 1,453)	6.8%	\$ 24,509	-10.7%	\$ 29,337	3.2%	\$ 17,662
13			(\$ 1,405)	6.8%	\$ 24,711	7.7%	\$ 30,145	7.1%	\$ 17,458
14			(\$ 1,359)	6.8%	\$ 24,975	21.4%	\$ 35,107	20.1%	\$ 19,484
15			(\$ 1,316)	6.8%	\$ 25,302	-9.9%	\$ 30,400	20.6%	\$ 22,049
16			(\$ 1,274)	6.8%	\$ 25,693	6.6%	\$ 31,101	7.4%	\$ 22,369
17			(\$ 1,230)	6.8%	\$ 26,157	0.9%	\$ 30,150	0.9%	\$ 21,338
18			(\$ 1,184)	6.8%	\$ 26,699	20.7%	\$ 35,096	13.0%	\$ 22,854
19			(\$ 1,135)	6.8%	\$ 27,328	-2.5%	\$ 33,097	20.7%	\$ 26,342
20			(\$ 1,084)	6.8%	\$ 28,053	-7.0%	\$ 29,749	5.7%	\$ 26,728
Annualized Return				6.75%		6.75%		6.75%	
Annualized Volatility				0.00%		10.00%		10.00%	

Figure 3. Outlines a solution to the sequence risk problem by recommending the structuring of an **Investment Grade Bond portfolio**, specifically a **Liability-Driven Investment (LDI)** strategy - to hedge the pension plan's liabilities.

Solution: Investment Grade Bond Portfolio to Hedge Liabilities

This approach is detailed in the "Sequence of Returns: 50% Cash Match / 50% Return-Seeking" section (figure 3) and further supported by the portfolio risk characteristics and funded status sensitivity analysis. Here's how it works:

Portfolio Structure

- **LDI Fixed Income Allocation:** 50% of assets are allocated to investment-grade bonds designed to match the liability cash flows.
- **Return-Seeking Allocation:** The remaining 50% is invested in equities and other growth assets.

Impact on Sequence Risk

- By matching the liability cash flows with high-quality bonds, the plan reduces its exposure to early-period market downturns.
- This mitigates the risk of asset depletion due to poor returns early in the payout phase - a key concern highlighted in Scenario 3 of the sequence risk analysis.

Performance Comparison

Portfolio	Interest Rate Hedge Ratio	Funded Status Volatility	Surplus/Deficit Range
Current	16%	8.3%	- \$3.4M to + \$9.1M
Portfolio 1	33%	7.9%	- \$2.3M to + \$8.2M
Portfolio 2 (LDI-heavy)	53%	5.4%	- \$172K to + \$6.5M

Portfolio 2, structured with a full LDI overlay, shows the **lowest volatility** and **most stable surplus outcomes**, making it the most effective hedge against sequence risk.

Strategic Importance of Liquidity Management in Pension Plans

Effective liquidity management is a cornerstone of pension plan sustainability. It ensures that benefit obligations are met without disrupting the investment strategy or triggering forced asset sales during market downturns. Forced liquidation of equities during periods of market stress can lead to a downward spiral in funding levels and exacerbate deficits.

To mitigate this risk, trustees should consider cash matching a portion of retiree benefits with fixed-income assets. This approach allows plans to maintain a stable asset allocation and avoid selling equities at distressed prices. With interest rates now higher than in recent years, fixed income investments have regained their appeal, offering predictable cash flows that can be aligned with benefit obligations.

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We would also note that most portfolios have some allocation to fixed income. However, rather than utilizing this portion of the portfolio to protect against the sequence of return risk, the investments are typically in aggregate bond portfolios. Taking this portion of the portfolio and moving it to a bond portfolio built around the risks of the plan the assets are supporting can be a good first step.

LDI and CDI as Strategic Shields

LDI/CDI strategies can stabilize funding and reduce volatility.

- **Cash Matching:** Aligning bond maturities with expected benefit payments ensures liquidity without equity sales.
- **Dynamic Asset Allocation:** Adjusting investment policy based on maturity plan and cash flow needs.
- **Scenario Analysis:** Modeling adverse market conditions to guide strategic decisions.
- **Custom Liability Benchmarking:** Tracking liability sensitivities to interest rates and credit spreads.

These strategies are not just theoretical - they are actively used by plans that have maintained solvency and protected retiree benefits through turbulent markets. The lesson from these case studies is clear: cash flow matters. Plans that ignore these risks have a greater chance of insolvency, while those that embrace LDI/CDI strategies can preserve capital, maintain stability, and fulfill their fiduciary duty to retirees. The time to act is before the next crisis, not during it.

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