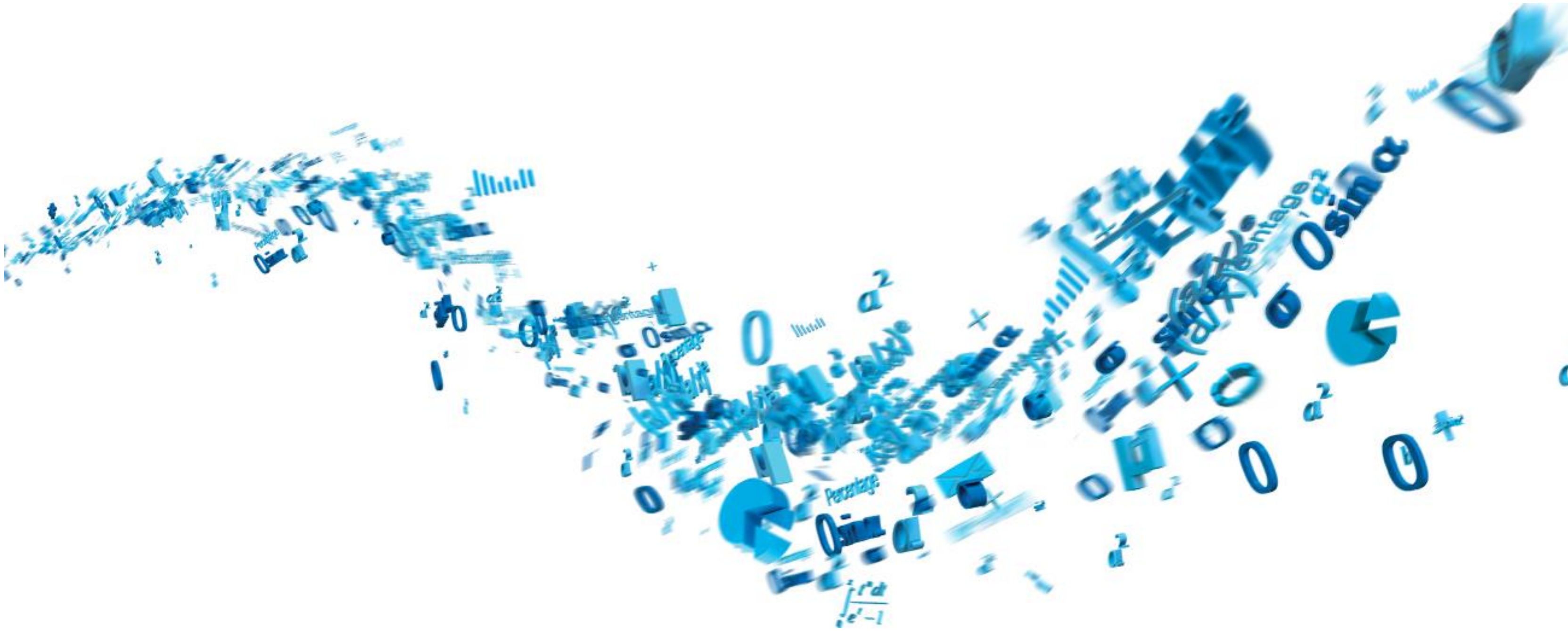

PSERS Follow-Ups to Asset-Liability Study

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Aon Hewitt
Retirement and Investment

Empower Results®

Contents

Section 1: Executive Summary

Empower Results®

Executive Summary

Asset-Liability Study Follow-Ups

- PSERS asked AHIC to illustrate how the cumulative returns from Black Skies scenario (used in the Liquidity Analysis) compare to the ten (10) worst trials from the asset-liability study
  - Under the Long-Term Target asset allocation, the cumulative 10-year return for the Black Skies scenario is -28.2% while the ten (10) worst cumulative 10-year returns from the asset-liability range from -31.4% to -51.2%

Liquidity Analysis Follow-Ups

- PSERS asked AHIC to identify the additional amount of illiquid assets that would impair the liquidity of the portfolio in a Black Skies scenario
  - **10%** added illiquids (on top of the Long-Term Target asset allocation) appears to get to the precipice of "breaking the model" – anything more would be unmanageable.

Section 2: Black Skies Scenario vs. Ten Worst Asset-Liability Trails

Black Skies Scenario vs. Ten Worst Asset-Liability Trails

PSERS asked AHIC to illustrate how the cumulative returns from Black Skies scenario (used in the Liquidity Analysis) compare to the ten (10) worst cumulative trials from the asset-liability study

- The chart below is based on the Long-term Target asset allocation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative Return
Black Skies Scenario	-22.1%	-16.4%	-7.8%	1.7%	2.1%	2.2%	2.5%	2.9%	3.2%	3.5%	-28.2%
Ten Worst Cumulative 10-year Trials from Asset-Liability Study											
1	-8.7%	-16.2%	-15.7%	-9.4%	7.8%	4.0%	-14.6%	-9.5%	-6.4%	3.0%	-51.2%
2	3.5%	-24.2%	-12.0%	-10.3%	-10.6%	-5.6%	-2.4%	7.7%	4.0%	-3.1%	-44.6%
3	-14.7%	2.0%	12.1%	-5.4%	-19.4%	-0.5%	2.8%	1.8%	-14.7%	-13.8%	-43.0%
4	-3.9%	-20.4%	2.7%	9.1%	-13.9%	-16.3%	3.4%	16.7%	-8.3%	-7.3%	-36.7%
5	-16.2%	2.5%	0.3%	7.0%	5.8%	-19.7%	4.9%	-17.8%	9.6%	-13.8%	-36.2%
6	12.4%	-5.0%	-26.9%	-5.8%	-6.1%	-20.9%	11.2%	-16.3%	23.1%	2.1%	-36.2%
7	6.8%	-1.3%	10.2%	-19.0%	-9.8%	0.1%	12.5%	1.5%	-28.9%	-6.0%	-35.3%
8	-3.1%	-14.1%	-3.0%	9.5%	-21.1%	-1.5%	-4.7%	10.7%	-10.9%	0.7%	-35.0%
9	8.6%	-8.2%	11.5%	17.5%	-25.1%	-4.4%	4.5%	-19.1%	4.5%	-19.4%	-33.4%
10	5.3%	17.1%	-18.3%	-8.0%	-14.0%	10.0%	-6.2%	-19.3%	-5.6%	9.4%	-31.4%

Trials shown represent the 10 worst of the 5,000 scenarios studied or 0.2% of scenarios

Section 3: Liquidity Analysis Follow-Ups

Liquidity Analysis Follow-Ups
Overview

- PSERS asked AHIC to identify the additional amount of illiquid assets that would impair the liquidity of the portfolio in a Black Skies scenario

- In order to perform this analysis, AHIC added 10% illiquid assets to the Current Long-Term Target asset allocation
  - 10% was added on a pro-rata basis to the existing illiquid assets
  - Correspondingly, 10% was deducted on a pro-rata basis from the liquid asset classes

- **10%** added illiquids (on top of the Long-Term Target Asset allocation) appears to get to the precipice of “breaking the model” – anything more would be unmanageable

Liquidity Analysis Follow-Ups

Asset Allocation and Liquidity Category (Long-Term Target + Additional 10% Illiquids)

Asset Class	Target Allocations				
	Total Portfolio	Liquid	Quasi-Liquid	Illiquid: 5-10 Years	Illiquid: 10+ Years
Cash	2.4%	2.4%			
LIBOR - Financing	-16.1%	-16.1%			
Public Equities	16.1%	16.1%			
Private Equity	18.1%				18.1%
Core Fixed Income	4.0%	4.0%			
Long Treasuries	4.0%	4.0%			
Global Inflation Linked	12.1%	12.1%			
Non-US Fixed Income	0.8%	0.8%			
Emerging Market Debt	1.6%	1.6%			
High Yield Bonds / Private Debt[1]	9.6%			9.6%	
REITs	1.6%	1.6%			
Broad Real Estate[2]	9.6%			9.6%	
Commodities	4.0%	4.0%			
Gold	2.4%	2.4%			
Infrastructure (Public / Private)[3]	9.6%		4.8%		4.8%
Hedge Funds	12.0%		12.0%		
Risk Parity	8.0%	8.0%			
Total	**100.0%**	**41.0%**	**16.9%**	**19.3%**	**22.9%**

[1] In Distressed debt with limited liquidity from closed end funds
[2] Closed end Real Estate Fund
[3] 50% Public (MLPs) / 50% Private

Liquidity Analysis Follow-Ups

Analysis (Long-Term Target + Additional 10% Illiquids)

Base Case

Recession

Black Skies