Florida Public Pension Trustee Association

September 23, 2024

Pension Risk Disclosure

SAGE
INVEST WITH WISDOM

Biography

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Actuarial Standard of Practice (ASOP) No. 51

Commentary on Valuation and Funding

The disclosure of risk associated with measuring pension obligations and determining pension plan contributions.

Source: Actuarial Standards Board (ASB), American Academy of Actuaries (AAA)

ASOP 51 Pension Risk Disclosure

History & Development

Effective November 1, 2018

Developed to provide guidance on assessing and communicating risks in pension measurements.

ASOP 51 Pension Risk Disclosure: History & Development

Why do we need ASOP 51?

Asset/Liability Mismatch

Corporate ERISA Funding

Calendar Year	00	01	02	07	08	21	22	23
Assets								
Traditional Asset Allocation Model	-2%	-5%	-9%	7%	-23%	14%	-15%	7%
Liabilities (Corporate)								
FTSE Liability Index	19%	13%	22%	-3%	18%	-3%	-21%	-3%
Return Difference Assets/Liabilities	-21%	-18%	-31%	10%	-40%	17%	6%	10%
Funded Status	129%	109%	81%	106%	69%	104%	112%	124%

Source: SAGE

Source: Sage Advisory Services

Asset/Liability Mismatch

Public Pension Funding

Calendar Year	00	01	02	07	08	21	22	23
Assets								
Traditional Asset Allocation Model	-2%	-5%	-9%	7%	-23%	14%	-15%	8%
Liabilities (Public/Multi-Employer)								
7% Assumed ROA	7%	7%	7%	7%	7%	7%	7%	7%
Return Difference Assets/Liabilities	-9%	-12%	-16%	-1%	-30%	7%	-22%	1%
Funded Status	89%	78%	65%	75%	53%	89%	70%	72%

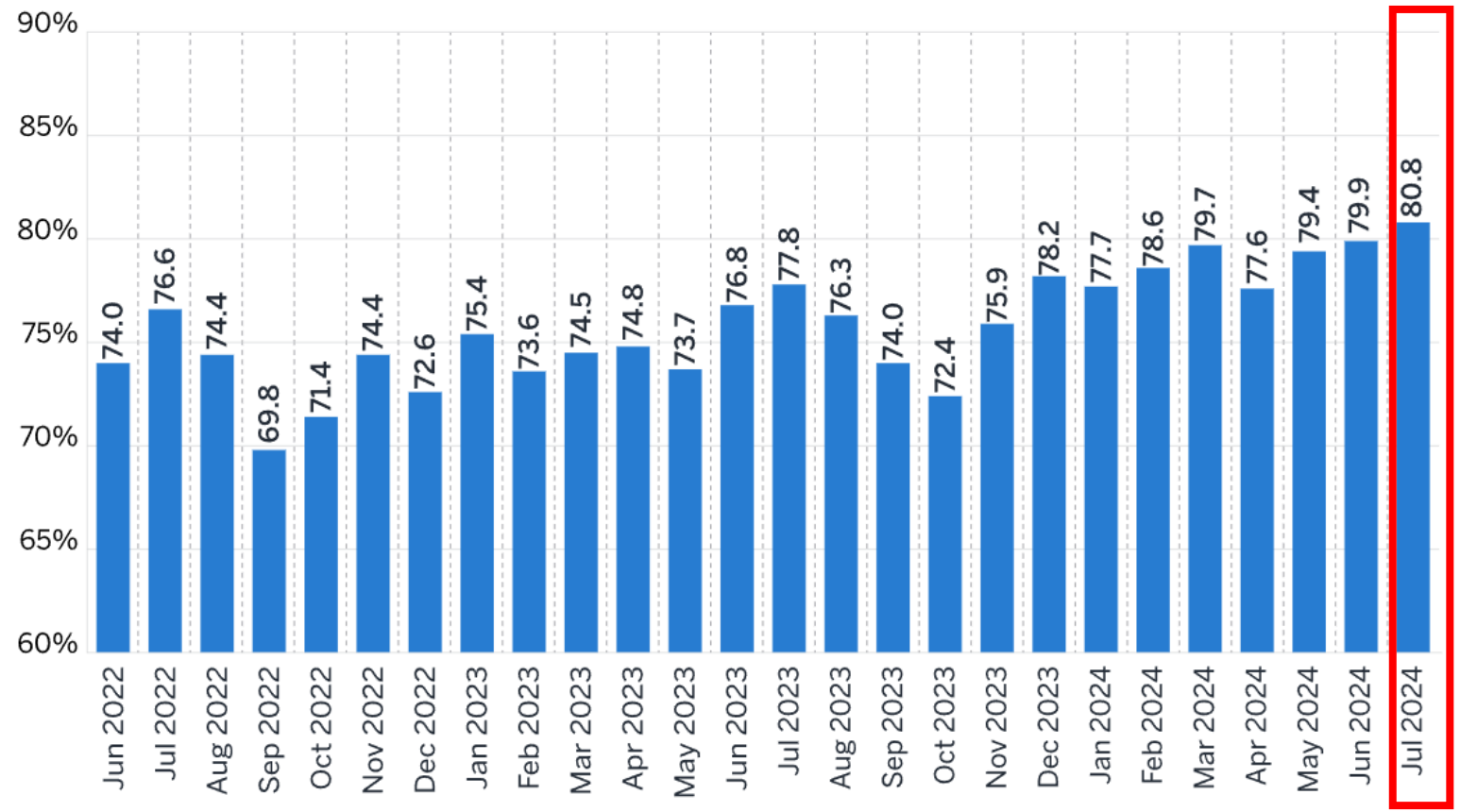
Source: SAGE

Source: Sage Advisory Services

Public Pension Funding

Ending July 2024 (Milliman)

Figure 1: PPFI funded ratio



Source: Milliman

Source: Milliman

Blue Ribbon Committee on Public Pension Funding (April 2013)

Recommendations

1. Funding principals
2. Governance
3. Risk management

https://www.soa.org/blueribbonpanel/

Source: SOA website

Five Key Findings

1. 100% funded
2. Intergenerational Equity
3. Contribution stability
4. Impact of maturity/longevity
5. Disclosure of Liability cash flows

https://www.soa.org/blueribbonpanel/

Source: SOA website

Recommendations for Actuaries

1. Discount Liabilities @Yield Curve (ASOP 4 LDROM) + Risk Premium
2. Liability amortization limited to 15 to 20 years
3. Asset smoothing limited to 5 years
4. Direct rate smoothing

https://www.soa.org/blueribbonpanel/

Source: SOA website

Recommendations for Trustee Governance

1. Maximize funding
2. Pay the contribution
3. Timely contributions
4. Informed trustees
5. Thoughtful plan design changes

https://www.soa.org/blueribbonpanel/

Source: SOA website

Types of Risk

1. Investment Risk
2. Longevity Risk
3. Interest Rate Risk
4. Longevity & Demographic Risks
5. Contribution Risk

Actuarial Commentary of the numbers

1. Practical commentary
2. Usefulness, reliability, timeliness
3. Cost efficiency
4. Professional judgement

Detailed Assessment on Risk

1. Plan size to sponsor
2. Funding
3. Asset allocation
4. Current/Future contributions
5. Last detailed assessment
6. Significant changes in risks
7. Cash Flow Analysis

ASOP 51 Road Map for Plan Sponsors

Can we use ASOP 51 as a road map?

Florida Public Pension Plans

Plan Size to Plan Sponsor Balance Sheet

City	Plan Liabilities	Sponsor Balance Sheet Unrestricted Net Assets	Liabilities to Sponsor Net Worth
Pension Plan T	$1,707,453,593	733,141,00	2.3
Pension Plan J	$4,992,481,312	415,649,000	12
Pension Plan M	$1,113,516,916	397,300,000	2.8
Pension Plan O	$280,867,746	203,700,000	1.3

A $1 problem at the Pension Plan T is a $2.30 problem at the plan sponsor level

Florida Public Pension Plans

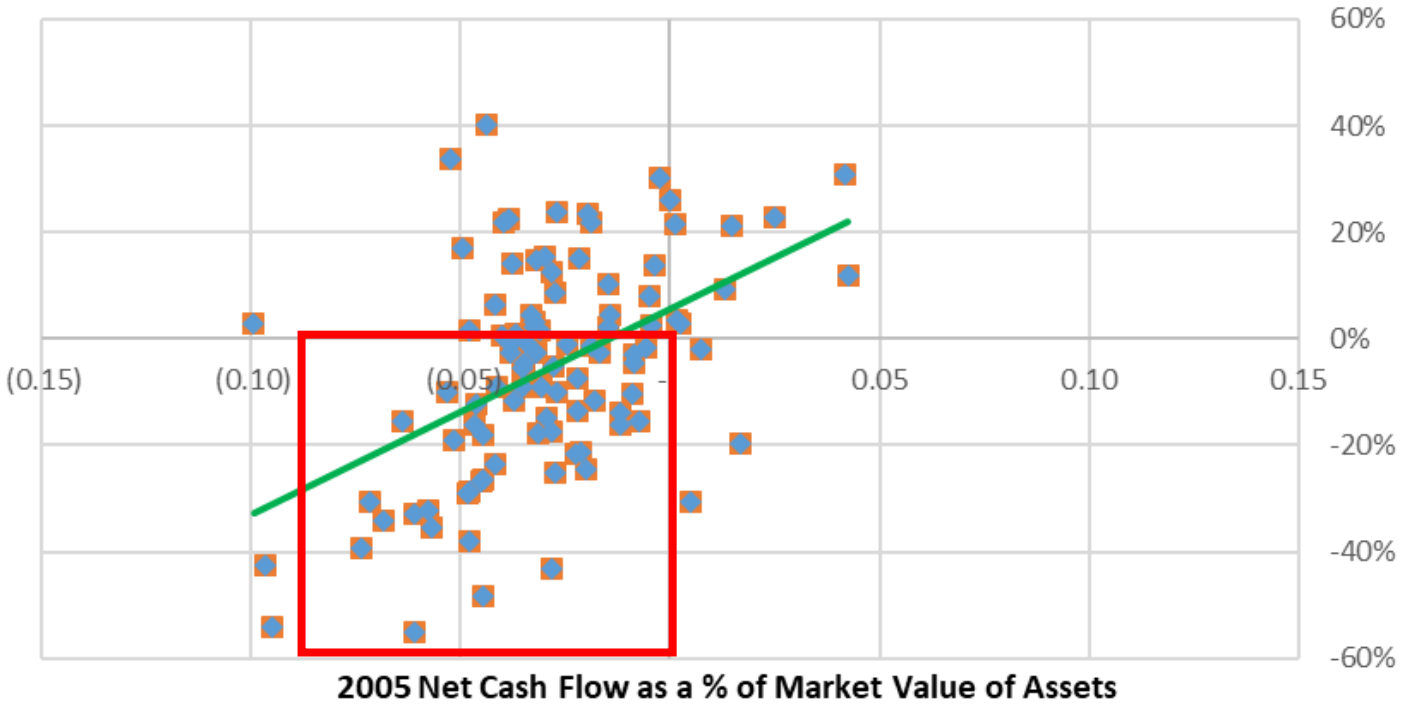
Asset Burn Rate

Pension Plan	Pension Assets	Funding (%)	Contributions	Distributions	Asset Burn Rate (%)	Observation Date
Pension Plan J	$1,486,932,333	93%	69,537,298	105,155,273	7.07%	10/1/2023
Pension Plan M	$2,191,853,854	44%	1,724,810,316	233,761,398	10.67%	10/1/2023
Pension Plan O	$697,812,937	79%	38,875,574	57,121,207	8.19%	10/1/2022
Pension Plan T	$208,355,939	82%	$8,291,400	21,108,029	10.13%	10/1/2023

Funding Level is a snapshot in time; asset burn rate captures the maturity of the plan

Asset Burn Rate

Change in Funded Ratio 2005 – 2020



*Selected plans are the 100 largest multiemployer pension plans by asset size in 2005

Exhibit shows plan's net cash flow before the market dislocation and the change in its funding levels since 2005, source First Actuarial.

Asset Burn Rate

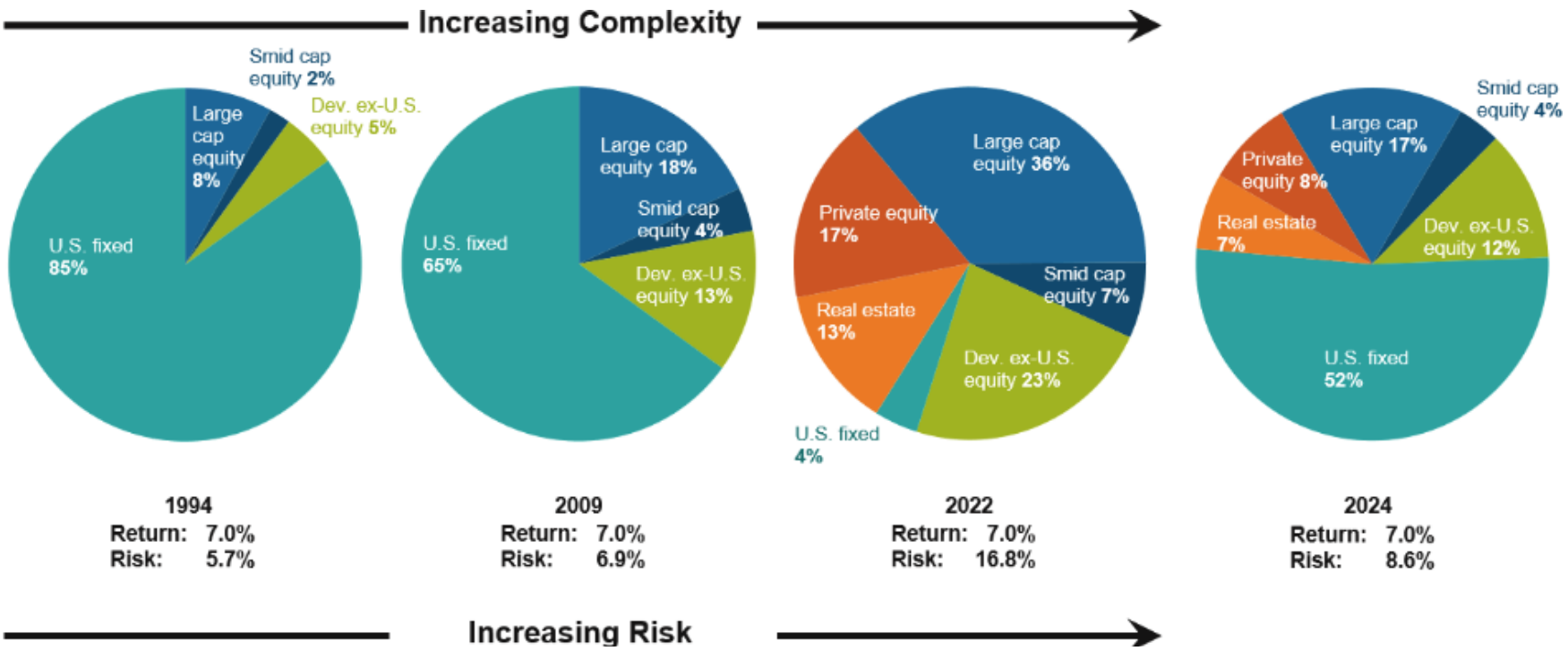
Precursor to Risk

Elevate risk awareness for asset burn rates > -5%

- *Review Asset allocation*
- *Reduce risk and overall portfolio volatility*
- *Plans with negative cash flow and a (5%) asset burn rate may be negatively impacted by a market dislocation*
- *Hedge the retired lives or a portion of the retire lives liabilities*

Asset Allocation (Increased Risk)

7% Expected Returns Over Past 30 Years



Source: Callan

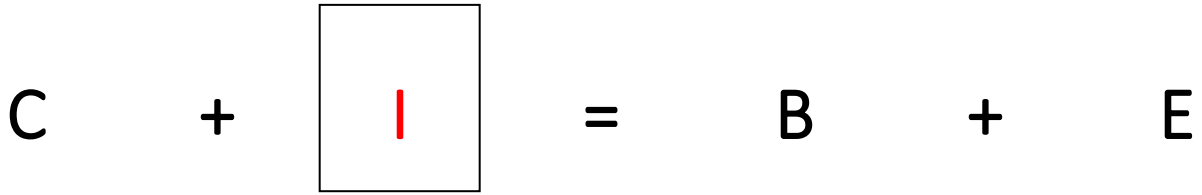
Liability Driven Asset Allocation

Asset allocation based on liability term structure

Short Assets	fund	Short Liabilities
Intermediate Assets	fund	Intermediate Liabilities
Long Assets	fund	Long Liabilities
Very Long Assets	fund	Very Long Liabilities

Structure assets to outgrow liabilities with the same behavior pattern

Actuarial Funding Equation only Works Ex-Post



Contributions + Income = Benefits + Expenses

Actuarial Funding Equation only Works Ex-Post

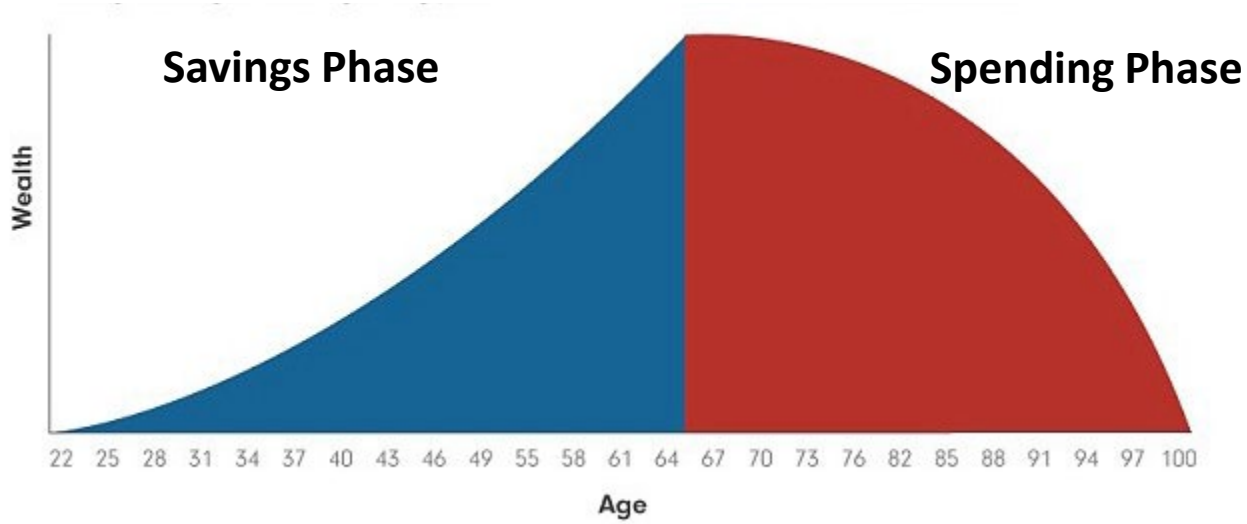
$$C + \boxed{I} = B + E$$

Contributions + Income = Benefits + Expenses

$$\boxed{V} = H + P$$

Cost of Vacation = Hotel Expense + Poker Losses (winnings)

Risk | Accumulation vs. Decumulation



Accumulation: Maximizing asset return and minimizing portfolio volatility

Decumulation: Maximize certainty of outcome

Climbing

Descent

- Harder to descend
- Exhausted from the ascent
- Air is thinner
- Avalanches and falling rocks
- Technical climbs, icefalls demand a new set of experience

Risk: Sequence of Returns Risk Scenarios

Year	Assumed Benefit Payments	Assumed Contributions	7.5% ROA					
			Scenario 1		Scenario 2		Scenario 3	
			Ann Return	MVA	Ann Return	MVA	Ann Return	MVA
12/31/2023				**289,191**		**289,191**		**289,191**
1	(18,998)	14,500	7.5%	306,217	-12.4%	249,202	24.3%	354,412
2	(20,554)	14,500	7.5%	322,906	-13.3%	210,314	24.4%	434,235
3	(22,132)	14,500	7.5%	339,211	24.4%	253,146	-13.3%	369,187
4	(23,845)	14,500	7.5%	354,962	-3.5%	235,037	24.4%	448,894
5	(25,213)	14,500	7.5%	370,477	-8.9%	203,920	23.8%	543,914
6	(26,385)	14,500	7.5%	385,940	7.5%	206,921	3.3%	549,769
7	(27,367)	14,500	7.5%	401,545	-1.8%	190,478	15.5%	621,213
8	(28,333)	14,500	7.5%	417,318	6.4%	188,352	15.3%	701,327
9	(29,145)	14,500	7.5%	433,433	0.6%	174,786	-8.9%	625,011
10	(29,741)	14,500	7.5%	450,138	8.8%	174,345	6.4%	649,130
11	(30,267)	14,500	7.5%	467,552	3.3%	164,069	8.8%	690,093
12	(30,724)	14,500	7.5%	485,797	8.5%	161,102	8.5%	731,793
13	(31,168)	14,500	7.5%	504,950	8.8%	157,850	7.5%	769,504
14	(31,467)	14,500	7.5%	525,229	23.8%	176,575	-1.8%	738,960
15	(31,762)	14,500	7.5%	546,724	24.3%	200,215	0.6%	726,053
16	(31,984)	14,500	7.5%	569,601	15.5%	212,480	23.8%	879,586
17	(32,090)	14,500	7.5%	594,083	23.8%	243,531	8.8%	938,399
18	(32,315)	14,500	7.5%	620,169	8.1%	244,629	-3.5%	887,799
19	(32,523)	14,500	7.5%	647,994	24.4%	284,282	-12.4%	761,091
20	(32,728)	14,500	7.5%	677,695	15.3%	308,170	8.1%	803,449
Annualized Return			**7.5%**		**7.5%**		**7.5%**	
Annualized Volatility			**0.0%**		**12.0%**		**12.0%**	

Solutions

Public Pension Case Study Hedging Sequence of Returns Risk

Solution

De-risking Rules – “Take Something off the Table Over Time”

- House wins if you stay too long at the table
- As you win, harvest your gains by taking some bets off the table
- Reduce risk over time and secure your victory

Public Pension Case Study

Assets & Liability Allocation

Cash Flow	Millions $	%
Market Value Assets	289.1	100.0
Fixed Income	83.1	28.7
Return Seeking	206.0	71.3
Liabilities	317.9	100.0
Retired Lives	153.3	48.2
Active & TV	164.6	51.7
Difference (Funding)	28.7	91.0

Public Pension Case Study

Asset Burn Rate (%)

Cash Flow	Pre-ALM	Row	Formula
Market Value Assets	$289.1 M	A	
Contributions	$14.5 M	B	
Disbursements	$19.5 M	C	
Net Cash Flow	-5.0M	D	
Asset Burn Rate (%)	-6.75%	E	C / A

Extend the Investment Horizon

Hedging Retired Liabilities

Cash Flow	Pre-ALM	Post ALM	Difference	Row
Market Value Assets	$289.1 M	$103.5 M	$153.3	A
Contributions	$14.5 M	$14.5 M		B
Disbursements	$19.5 M			C
Net Cash Flow	-5.0M			D
Asset Burn Rate (%)	-6.75%	+14%		C/A

Fixed Income pays the retired lives benefits avoiding selling the Return Seeking Portfolio early

Solution: Hedging Retired Live Liabilities

Hedging Bucket (Fixed Income)

Fund Your Retired Liabilities

No more contributions for Retired Liabilities

Pay benefits from fixed income

Return Seeking Asset (RSA) Bucket

Fund Your Active & TV Liabilities

New contributions fund new promises

Avoid selling RSA early to pay benefits

Lengthen investment horizon

Final Comments | Cash Flows Matter

- Accumulation vs the Decumulation Phase
- Calculate Dollar Weighted Returns
- Liquidity Management is Key
- Review Cash Flow Needs Annually
- Avoid Forced Sale of Return Seeking Assets

Appendix

ASOP 4 LDROM

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ASOP 4 - Low Default Risk Option Method

Disclosure Measurement for:

Pension obligations
Funded status
Solvency risk
Pricing of benefits
Recommended contributions

Yield Curves may include:

- US Treasury yields
- Settlement rates
- Corporate bonds
- Municipal Borrowing Rate

Note: Return on asset assumption (ROA) is not one of the approved rates

Beginning Assets:	$100.00
Returns:	Year 1 -10%,
	Year 2 +10%
Payouts:	
Scenario D,	4% Distribution
Scenario Zero,	0% Distribution
Scenario C,	4% Contribution

Cash Flow Matters

Dollar Weighted Returns

Beginning Assets:	$100.00
Returns:	Year 1 -10%
	Year 2 +10%
Payouts:	Scenario D, 4% distribution

Scenario D	
Beginning of Year 1	100.00
Cash Flow	-4.00
Dollar Return	-10.00
End of Year 1	86.00
Beginning of Year 2	86.00
Cash Flow	-3.44
Dollar Return	8.60
End of Year 1	91.16

Cash Flow Matters

	Distribution	Zero	Contribution
Beginning of Year 1	100.00	100.00	100.00
Cash Flow	-4.00	0.00	4.00
Dollar Return	-10.00	-10.00	-10.00
End of Year 1	86.00	90.00	94.00
Beginning of Year 2	86.00	90.00	94.00
Cash Flow	-3.44	0.00	3.76
Dollar Return	8.60	9.00	9.40
End of Year 1	91.16	99.00	107.16
		8.60%	17.55%

- Decumulation Scenario 1 ending Asset = $91.16
- Ending Asset for Scenario 2 is 8.60% higher
- Ending Asset for Scenario 3 is 17.55% higher

Definitions

Credit Quality: For an individual security, the credit rating represents the credit worthiness of the underlying issuer and their ability to ultimately repay their debt. For a portfolio, average credit quality is the market value weighted credit quality of each security held.

Average Coupon: A bond's coupon is the percentage of the par value of the bond that will be paid in interest annually (the payments may occur on different intervals, depending on the security). The average coupon of a portfolio is the market value weighted coupon of all bonds in the portfolio.

Coupon Income: Coupon income is the total dollar amount received in coupon interest from a security.

Return of Principal: This is the portion of coupon income that offsets the amortization of principal for premium bonds.

Average Maturity: The average market value weighted maturity date of the portfolio.

Duration: Duration is a measure of the sensitivity of a bond or portfolio's price to changes in interest rates.

Yield to Worst: This is the total return an investor will receive (coupon income less premium amortization) if they purchase a bond and hold it to maturity or call, whichever offers the lower yield.

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