



City of Milwaukee
Employees' Retirement System

Bernard J. Allen
Executive Director

David M. Silber, CFA, CAIA
Chief Investment Officer

Melody Johnson
Deputy Director

November 27, 2024

Mr. Jim Owczarski
City Clerk
Room 205, City Hall

Dear Mr. Owczarski:

Please be advised that an Investment Committee Meeting of the Annuity and Pension Board has been scheduled for **Thursday, December 5, 2024 at 9:00 a.m.** This meeting will be conducted via teleconference and at the ERS, 789 N. Water St. in the 4th floor conference room.

Special Notice: Instructions for the public on how to observe the meeting will be available on the ERS's website (www.cmers.com) prior to the meeting.

The agenda is as follows:

- I. Callan Glide Path Analysis Presentation.
- II. Chief Investment Officer Report.
- III. Informational.
 - a. Callan 3rd Quarter 2024 Performance Report.

Sincerely,

A handwritten signature in black ink that reads "Bernard J. Allen".

Bernard J. Allen
Executive Director

BJA:jmw

December 5, 2024



City of Milwaukee Employees' Retirement System

Glide Path Analysis

John P. Jackson, CFA
Senior Vice President

Michael Joecken
Senior Vice President

Jason Ellement, FSA, CFA
Senior Vice President

Adam Lozinski, CFA
Senior Vice President

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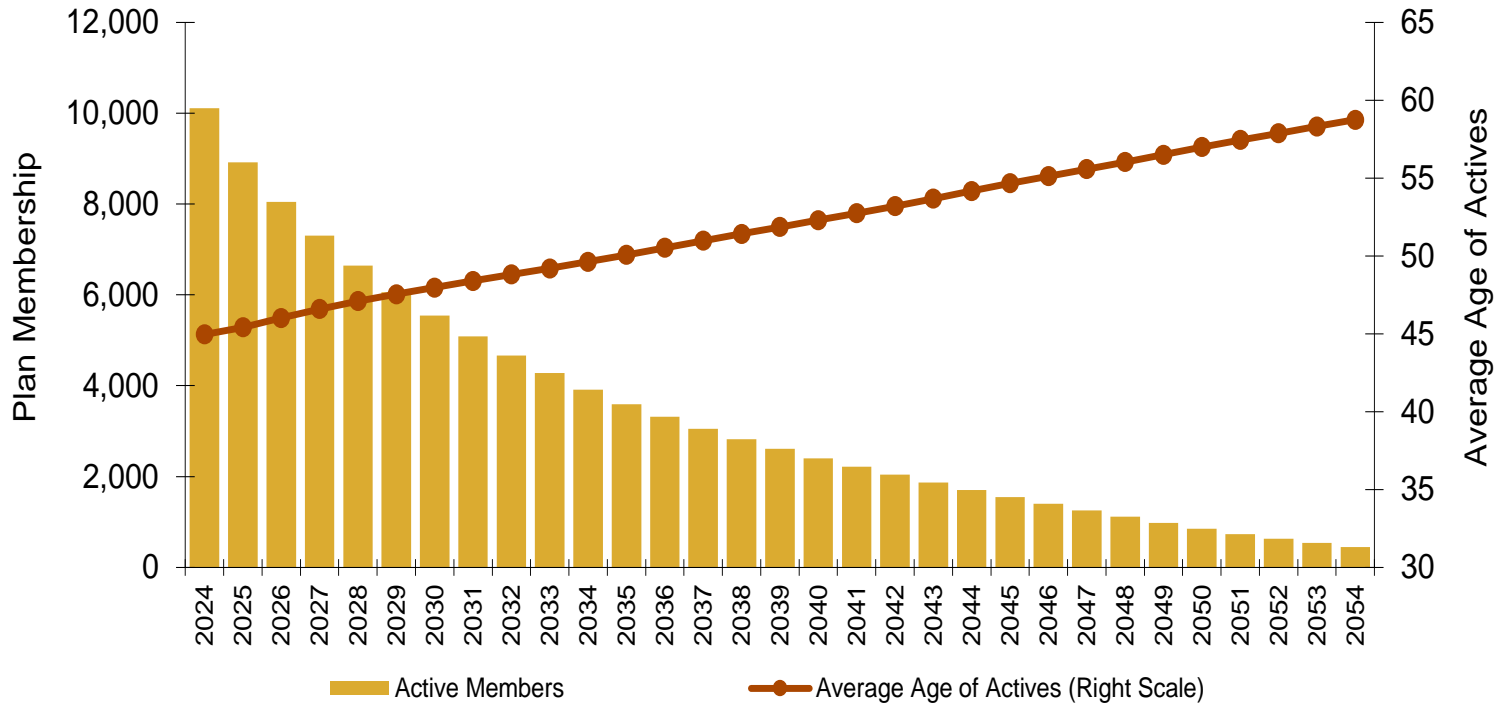
Outline

- Reassess Time Horizon
- Construction of Glide Paths
- Contribution Simulations under Act 12 Funding Policy
- Glide Path Analysis
 - Act 12 Funding Policy with no annual cap on employer contributions (current policy)
 - Act 12 Funding Policy with a hypothetical \$350M cap on employer contributions
 - Act 12 Funding Policy with a hypothetical \$250M cap on employer contributions
- Examine Liquidity Needs

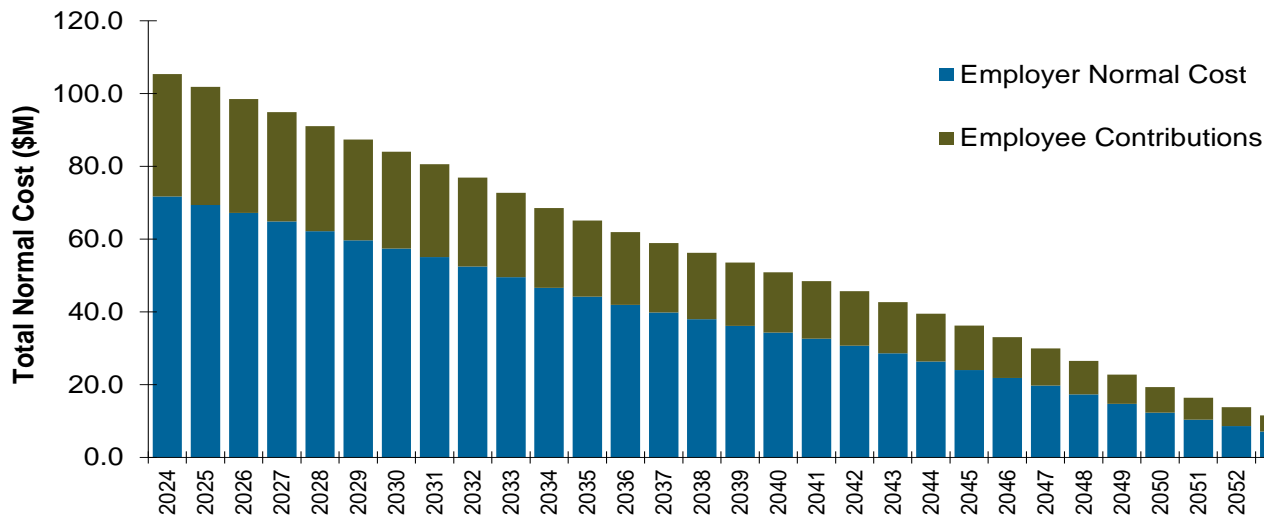


Reassess Time Horizon

Plan is Closed

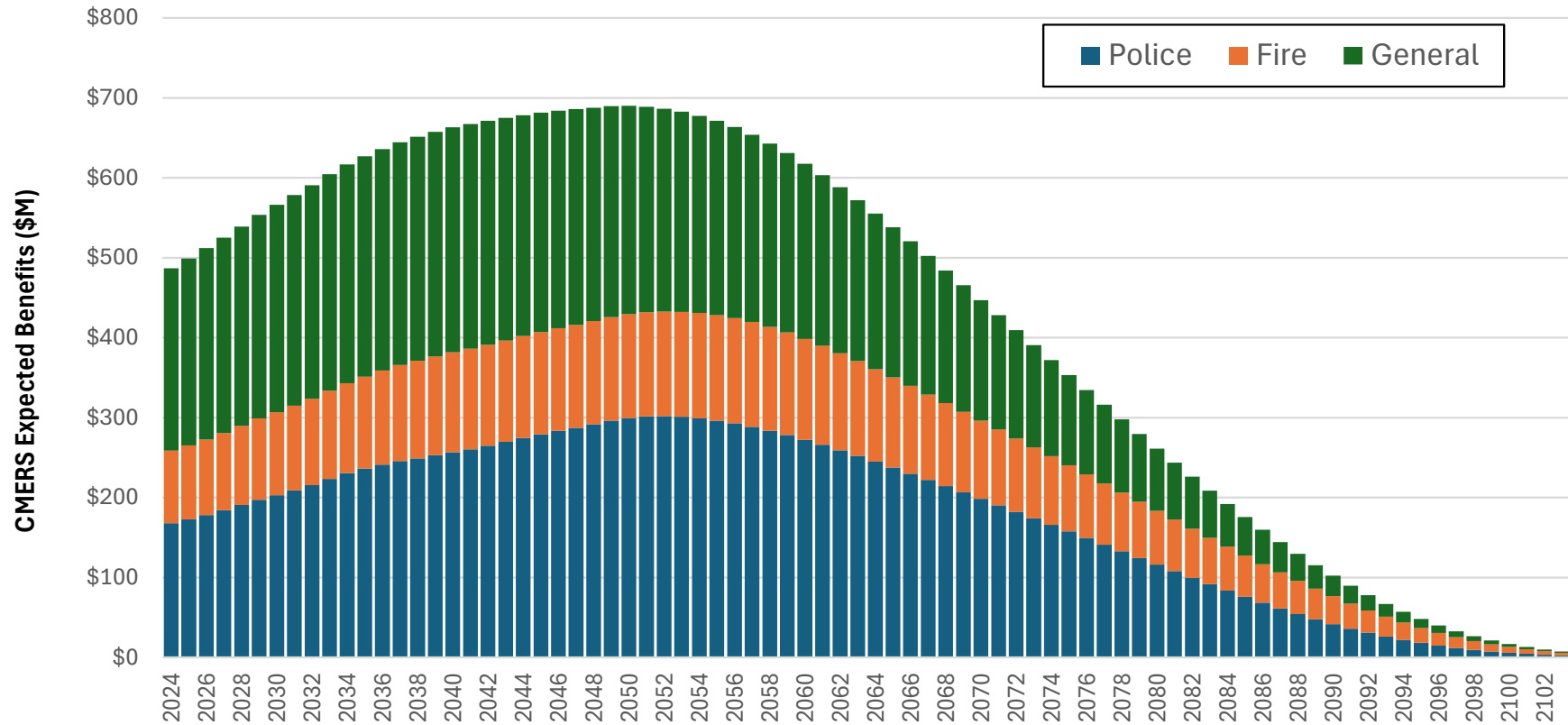


- Plan is closed to new hires
- In just 10 years, there is expected to be only 3,900 employees accruing a benefit with an average age of 50



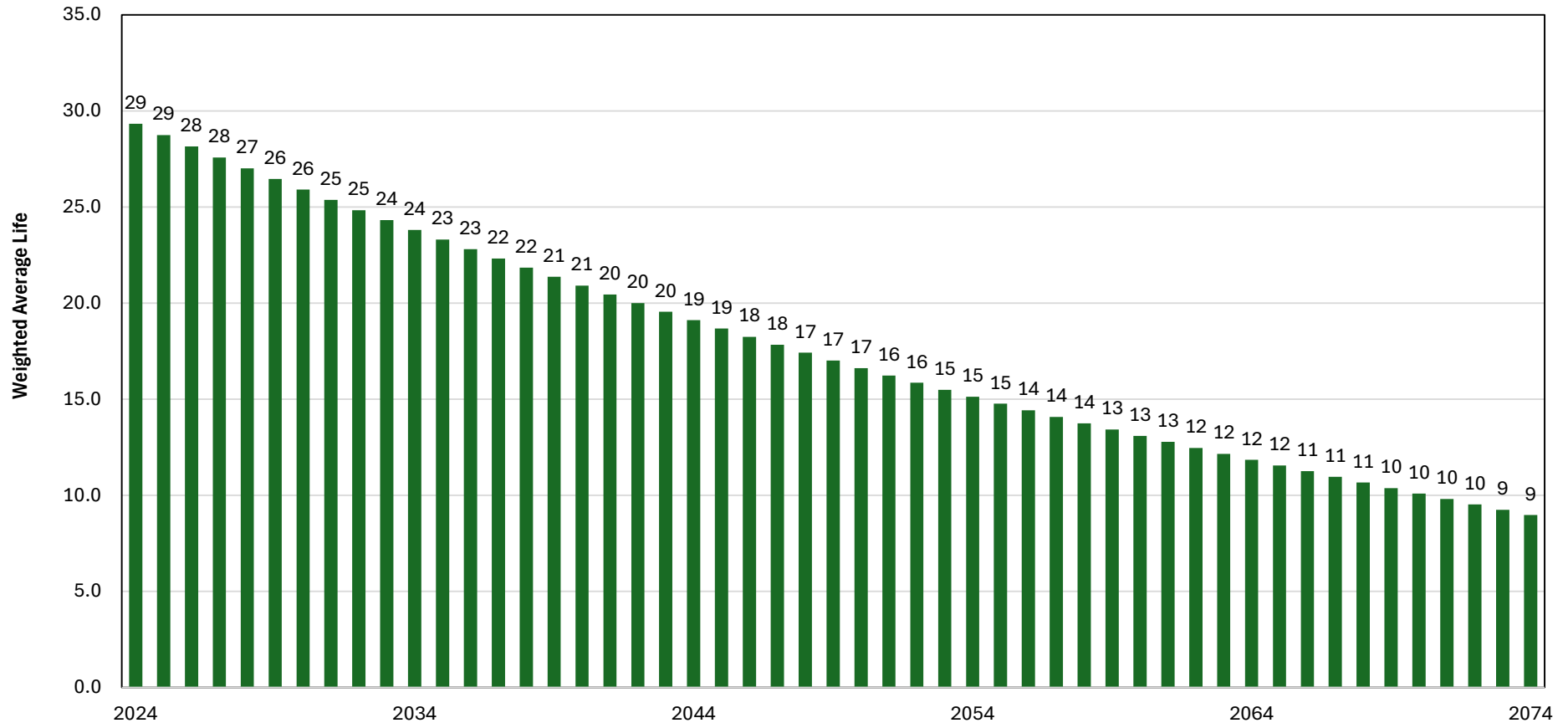
- Total Normal Cost (ongoing benefit accrual) will decrease as actives decrement from the Plan

Expected Benefit Payments Stretch For Many Years



- Despite the Plan being closed, benefit payments are expected to increase for the next 25 years

Time Horizon is Still Sufficiently Long to Take Investment Risk



- Weighted Average Life (WAL) is an estimate of the expected time horizon of a Plan
 - Time horizon is gradually shortening
- Time horizon is still long while the WAL > 20
 - WAL declines to 20 in 2042 (18 years from now)



Construction of Glide Paths

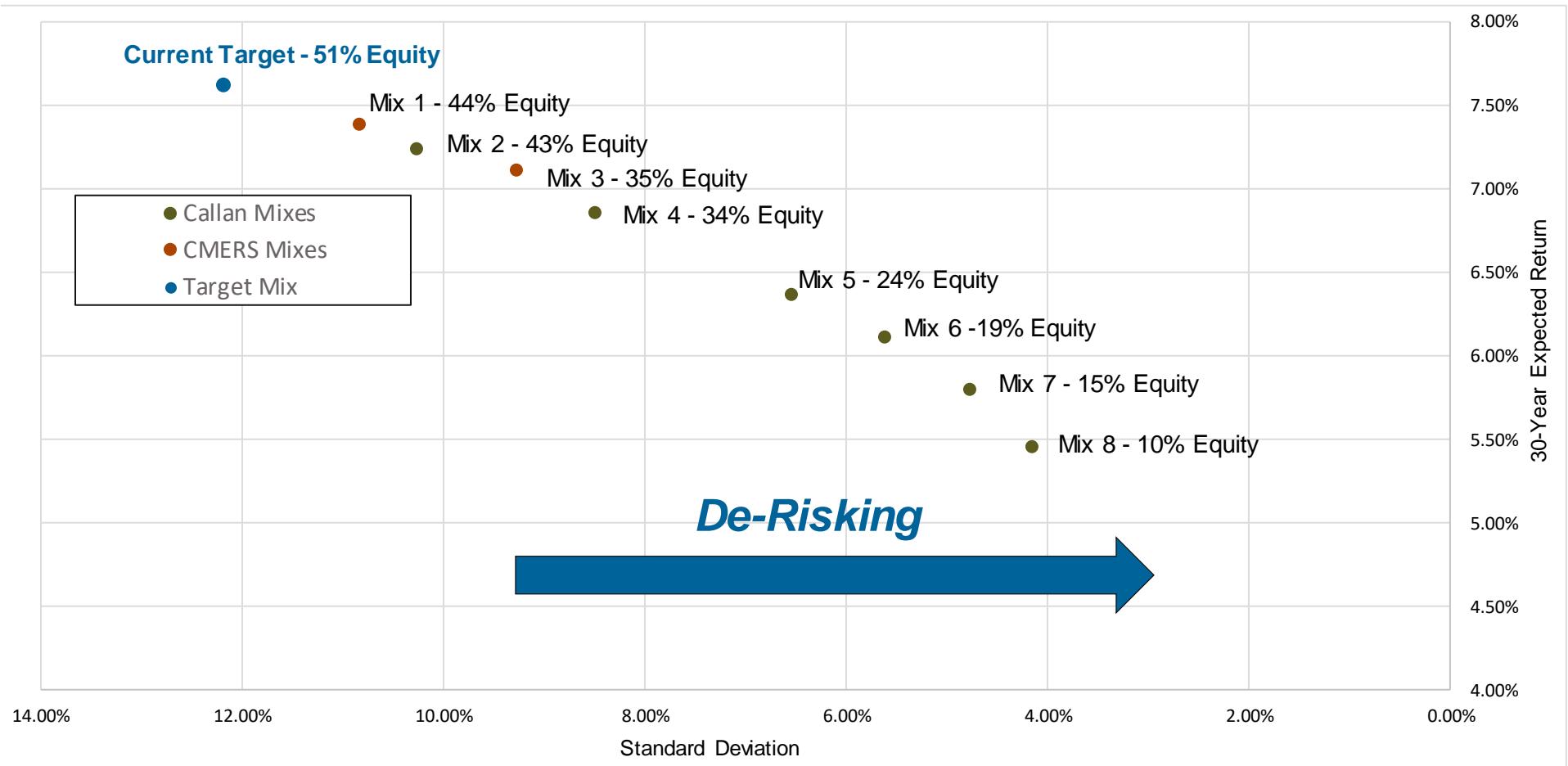
Alternative Asset Mixes

	Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5	Mix 6	Mix 7	Mix 8
Public Equity	39%	34%	35%	25%	30%	24%	19%	15%	10%
Fixed Income + Cash	29%	36%	42%	46%	53%	66%	73%	83%	90%
- Core	18%	25%	30%	35%	41%	54%	63%	76%	85%
- High Yield	10%	10%	10%	10%	10%	9%	7%	4%	0%
- Cash	1%	1%	2%	1%	2%	3%	3%	3%	5%
Real Assets	13%	11%	9%	10%	8%	6%	5%	0%	0%
- Liquid Real Assets	3%	3%	3%	3%	3%	2%	2%	0%	0%
- Private Real Estate	10%	8%	6%	7%	5%	4%	3%	0%	0%
Private Equity	12%	10%	8%	10%	4%	0%	0%	0%	0%
Absolute Return	<u>7%</u>	<u>9%</u>	<u>6%</u>	<u>9%</u>	<u>5%</u>	<u>4%</u>	<u>3%</u>	<u>2%</u>	<u>0%</u>
	100%	100%	100%	100%	100%	100%	100%	100%	100%
30-Year Expected Return	7.6%	7.4%	7.2%	7.1%	6.9%	6.4%	6.1%	5.8%	5.5%
10-Year Expected Return	7.5%	7.3%	7.1%	7.0%	6.8%	6.4%	6.1%	5.9%	5.5%
Actuarial Discount Rate *	6.8%	6.8%	6.8%	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%
Standard Deviation	12.2%	10.8%	10.3%	9.3%	8.5%	6.5%	5.6%	4.8%	4.2%
Public & Private Equity	51%	44%	43%	35%	34%	24%	19%	15%	10%
Illiquid Investments	29%	27%	20%	26%	14%	8%	6%	2%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

- Eight future alternative asset mixes are shown above
 - Arranged by level of risk taking – standard deviation decreases as you move right
 - Private equity target decreases quickly (by Mix 5) as it takes a long time to wind down
 - Cash is slightly increased in anticipation of higher liquidity needs
- In practice, future asset mix alternatives would be reassessed and optimized based on current liquidity needs and capital market assumptions

Return vs. Risk



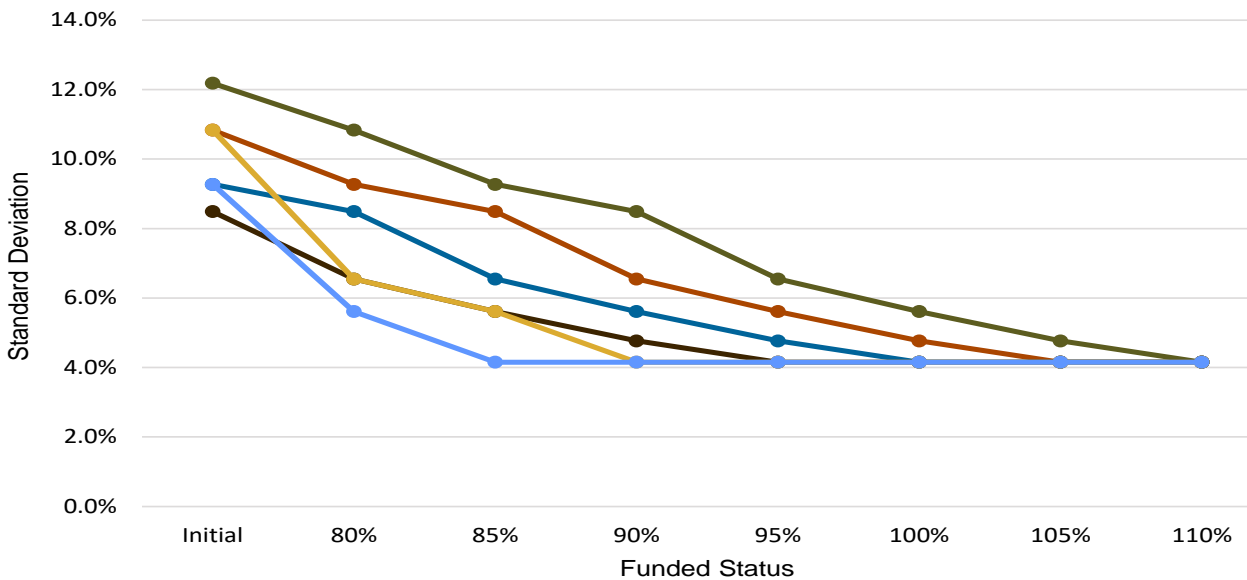
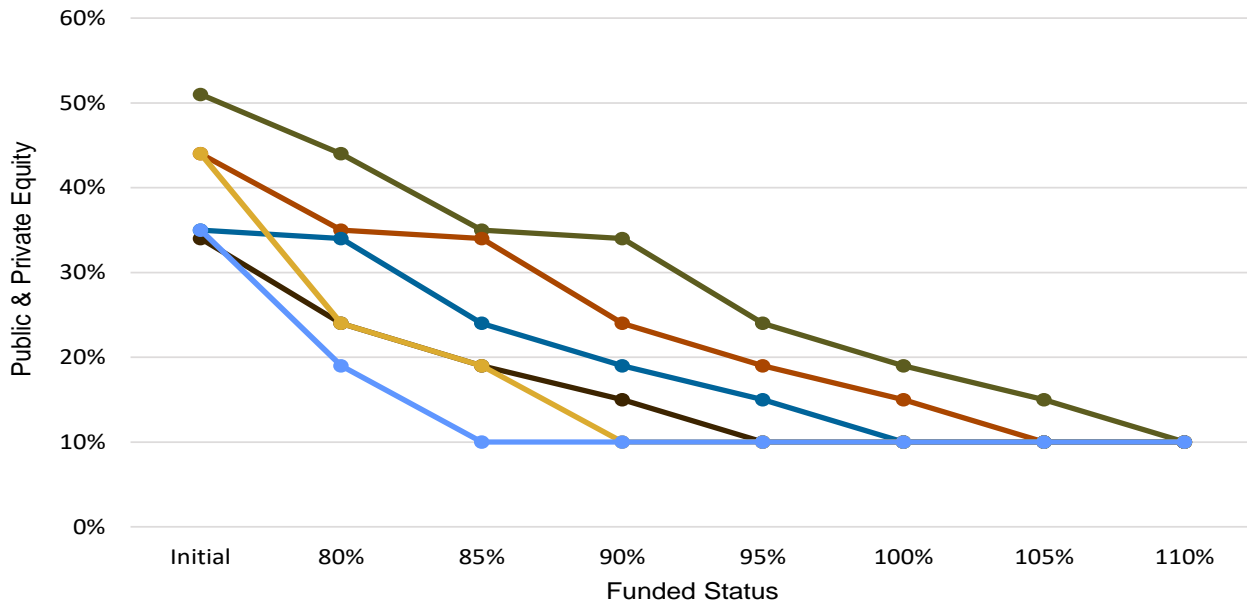
- Current Target Mix and Mixes 1-8 are graphed above
 - Percentage in equity includes public and private
 - Long-term expected return ranges from 5.5% to 7.6%
 - Risk ranges from 4% to 12%

Glide Paths Examined

	Initial	80%	85%	90%	95%	100%	105%	110%
GlidePath 1	Target	Mix 1	Mix 3	Mix 4	Mix 5	Mix 6	Mix 7	Mix 8
GlidePath 2	Mix 1	Mix 3	Mix 4	Mix 5	Mix 6	Mix 7	Mix 8	
GlidePath 3	Mix 3	Mix 4	Mix 5	Mix 6	Mix 7	Mix 8		
GlidePath 4	Mix 4	Mix 5	Mix 6	Mix 7	Mix 8			
GlidePath 5	Mix 1	Mix 5	Mix 6	Mix 8				
GlidePath 6	Mix 3	Mix 6	Mix 8					

- In general, Glide Paths gradually accelerate the pace of de-risking as you move from GP1 to GP6
- The Glide Path may continue to de-risk after 100% funded in order to minimize probability of falling back into deficit
- All Glide Paths eventually terminate at Mix 8
 - The speed of de-risking and when Mix 8 is reached varies by Glide Path

Glide Paths Gradually De-risk



- Graphs visually display the amount of equity exposure (top) and level of risk (bottom) at each funded status node
 - Equity exposure is a primary driver of the level of risk
 - Note, GP5 is more aggressive than GP4 and GP3 in early stages
 - Also note, GP6 is initially more aggressive than GP4



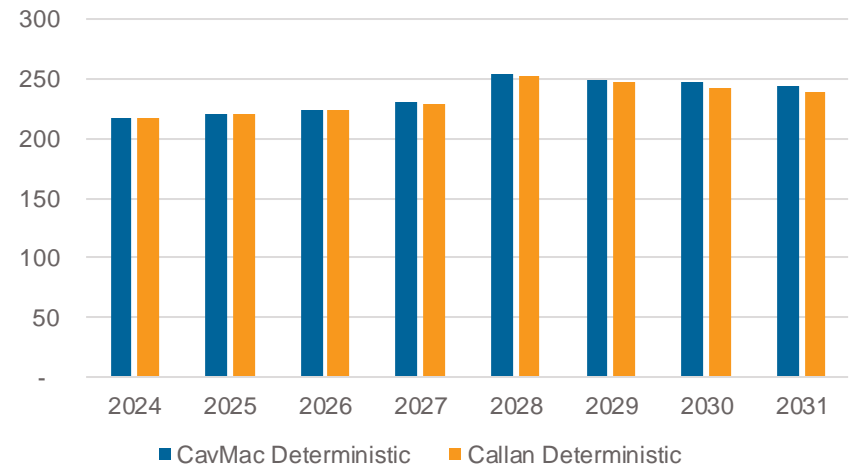
Contribution Simulations under Act 12 Funding Policy

Portfolio Targeting A 6.8% Return

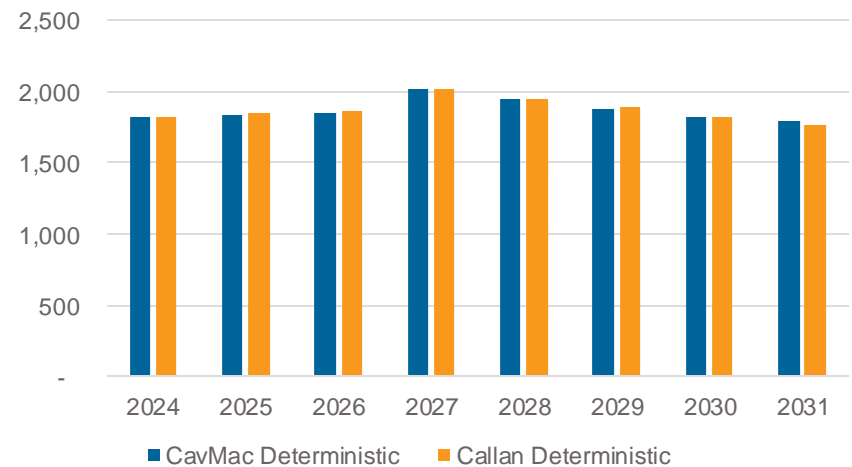
- A hypothetical portfolio that targets a 6.8% return is utilized as a reference point for the Glide Path Analysis
- Results of the 6.8% portfolio are consistent with the Plan actuary's (Cavanaugh McDonald) 6.8% deterministic forecast

	Target
Public Equity	18%
Fixed Income + Cash	59%
- Core	44%
- High Yield	15%
- Cash	1%
Real Assets	10%
- Liquid Real Assets	3%
- Private Real Estate	7%
Private Equity	6%
Absolute Return	7%
	100%
30-Year Expected Return	6.8%
10-Year Expected Return	6.8%
Actuarial Discount Rate *	6.8%
Standard Deviation	7.6%
Public & Private Equity	24%
Illiquid Investments	20%

Projected Employer Contributions for 6.8% Return Portfolio



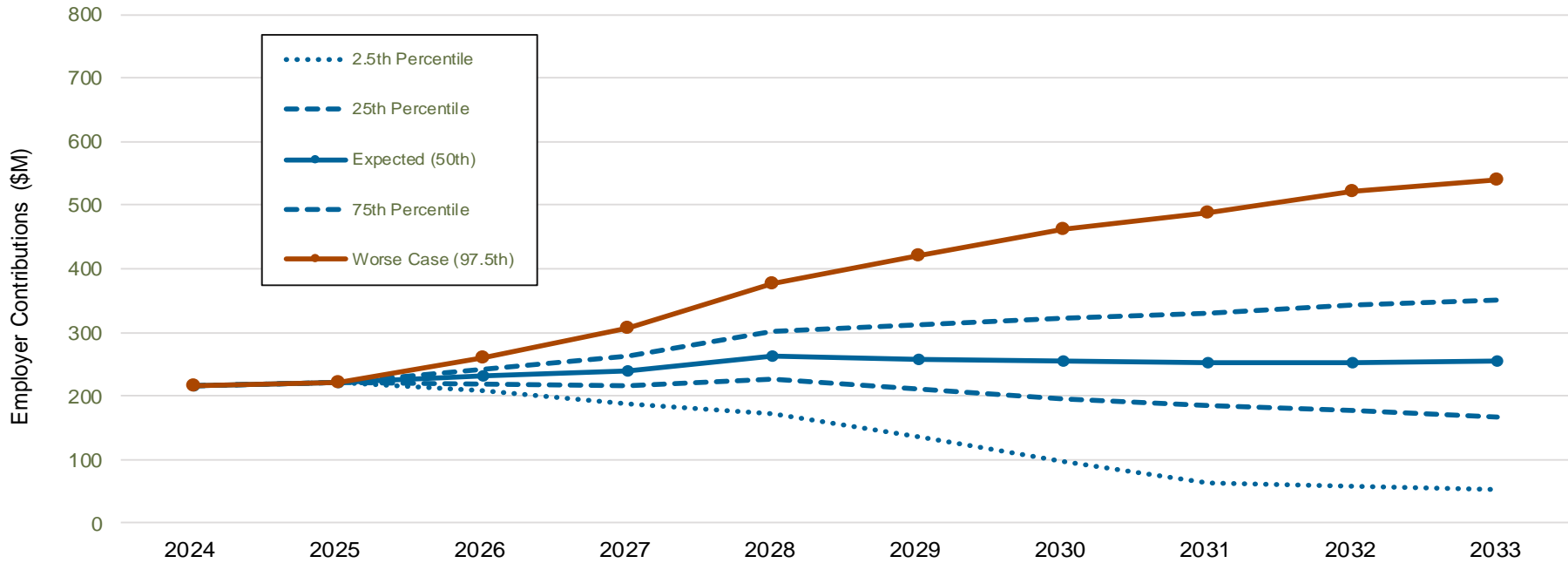
Projected UAAL for 6.8% Return Portfolio



Summary of Act 12 Changes

	Prior Framework	Act 12
Discount Rate	7.50%	6.80%
Plan Status	Open to new hires	Plan closed, effective 1.1.2024
Contribution Setting	5-year Employer Stable Contribution Policy	Contributions determined annually
Funding Policy	<ul style="list-style-type: none"> Effective 1/1/2019, 25-year closed amortization of UAAL After 2019, annual change in UAAL amortized over a closed 15-year period After 2019, changes in assumptions or benefits amortized over closed 25 years Amortization payments increase 2.0% per year 	<ul style="list-style-type: none"> 1/1/2024 UAAL is amortized over 30 years Future increases in the UAAL are amortized over 10 years Future decreases in the UAAL are amortized over the remaining amortization period for the 1/1/2024 UAAL, or 10 years if greater. The UAAL payments will be calculated as level-dollar amounts.
Lag	No Lag	One-year contribution lag
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Actuarial Value of Assets	5-year average	5-year average Return differential phased-in over 5 years

10-Year Contribution Outlook for 6.8% Mix



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Sum ¹	Average
Worse Case (97.5th)	217	220	261	308	377	420	463	488	523	541	3,730	373
75th Percentile	217	220	241	263	303	312	323	331	344	351	2,869	287
Expected (50th)	217	220	230	239	263	258	255	252	253	254	2,442	244
25th Percentile	217	220	220	216	226	210	196	184	176	167	2,064	206
2.5th Percentile	217	220	207	187	172	135	98	64	57	52	1,472	147
Range	0	0	53	121	206	285	365	424	466	489		

1 - Sum is based on distribution of 10-year cumulative contributions

- Expected contribution outlay over the next 10 years (2024 – 2033) is \$2.4B
- Calendar years are sorted independently
- In a worse case scenario, contributions may be much higher

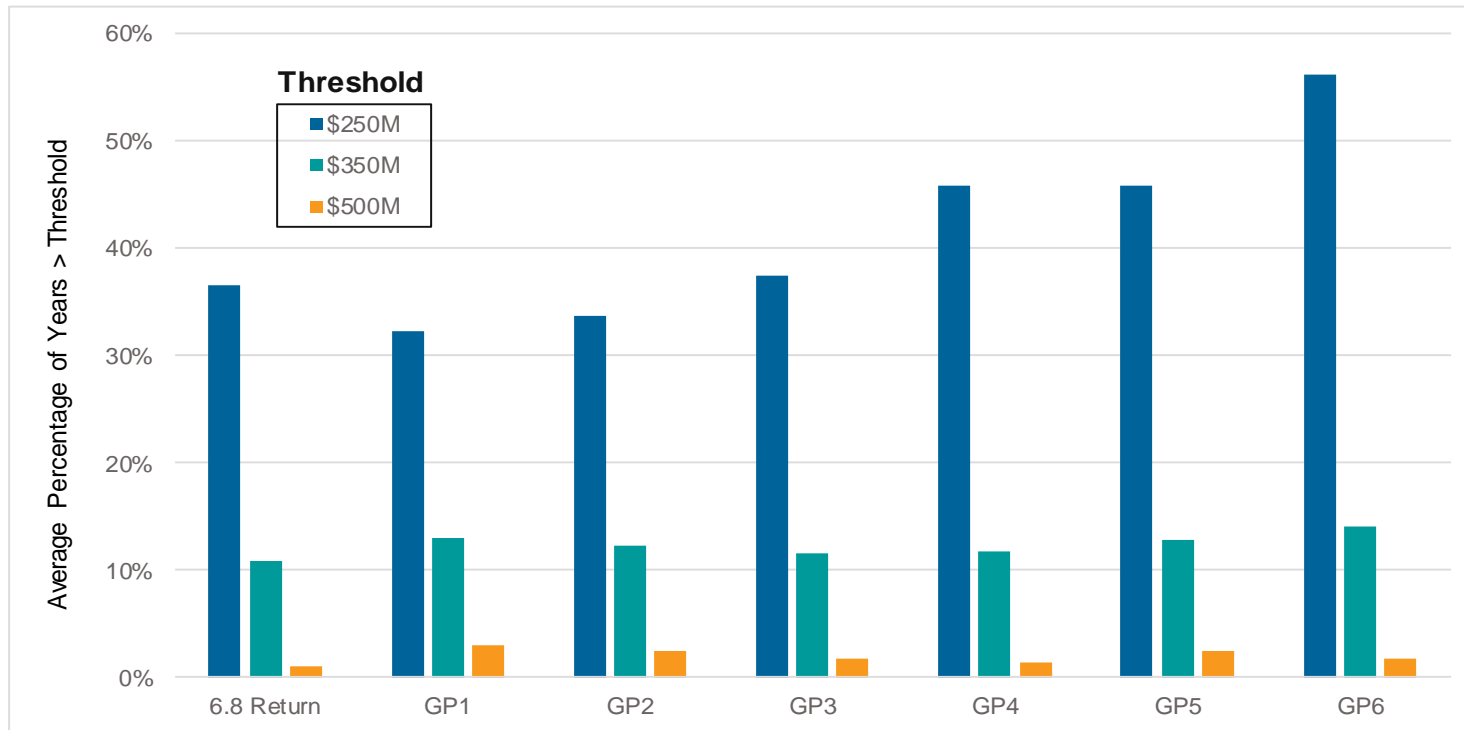
10-Year Cumulative Contributions

10-Year Cumulative Contributions (2024 - 2033)

	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
97.5%	3,730	4,266	4,113	3,922	3,851	4,113	3,922
75.0%	2,869	2,927	2,911	2,886	2,928	2,949	3,013
50%	2,442	2,289	2,357	2,457	2,581	2,560	2,711
25.0%	2,064	1,900	2,032	2,173	2,323	2,310	2,493
2.5%	1,472	1,511	1,678	1,842	1,991	2,030	2,215
Change from Target							
50%		-153	-85	15	138	117	269
97.5%		536	383	192	121	383	192

- 6.8% Return Mix presumes de-risking immediately, thus, has the best downside protection (as measured by the 97.5th percentile)
- GP1 and GP2 are expected to cost less than the 6.8% Mix as they de-risk slowly

Probability of Exceeding Thresholds



- For each Path and the Target, the probability of exceeding a threshold (\$250, \$350 or \$500M) from 2024 to 2033 is determined
- In general, the probability increases from GP1 to GP6 since \$250M is near the expected case
- Probability of exceeding \$350 decreases from GP1 to GP4
- Probability of exceeding \$500 decreases from GP1 to GP4
- Probability of exceeding \$500M, in any year, over the next 10 years is 1-3%



Glide Path Analysis

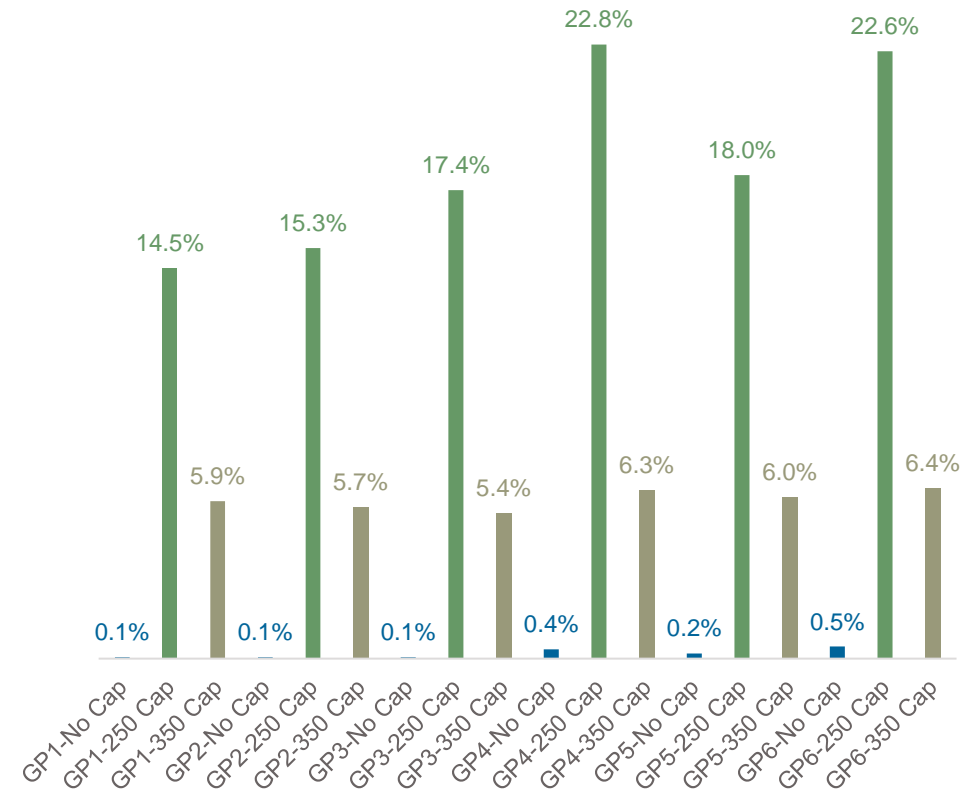
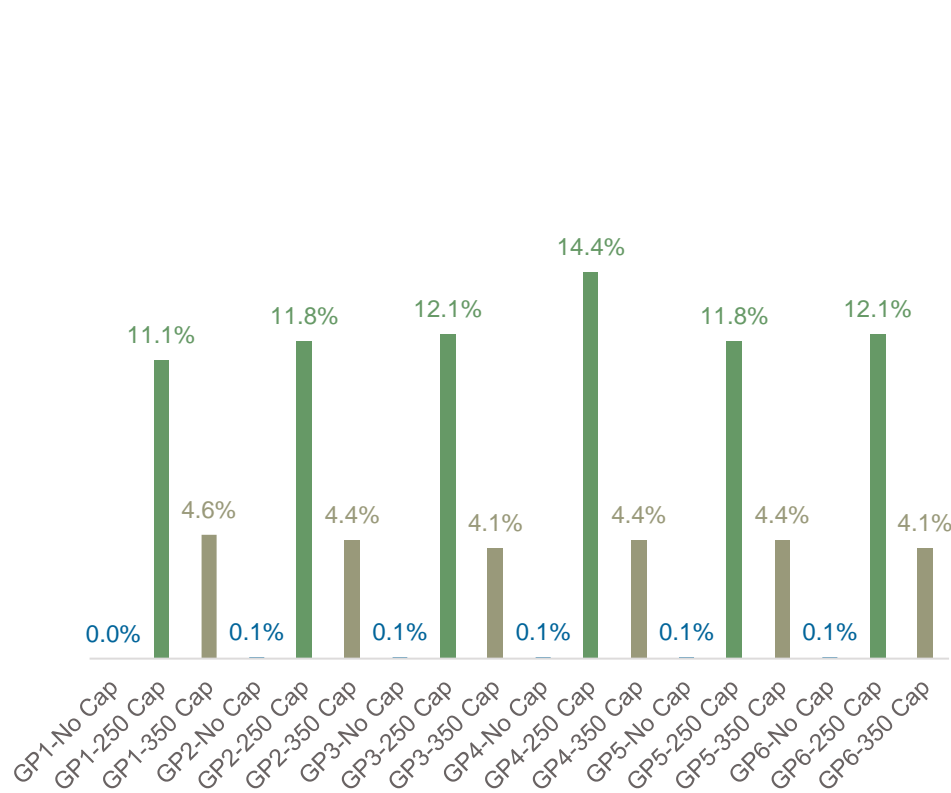
Introduction to Glide Path Analysis

- This section examines the 6.8% static mix and the six Glide Paths outlined earlier (GP1 => GP6)
- 30-year projections are examined
 - While the 6.8% Mix is illustrated, it may not be suitable over the full 30 years due to the amount of illiquid investments
 - The 6.8% Mix allocates 7% and 6% to Private Real Estate and Private Equity respectively
 - The 6.8% Mix is a reference point for the other glide paths since it achieves a median 30-year annualized return of 6.8%
- Probability of full funding
- Act 12 Funding policy is simulated under three scenarios:
 - Act 12 Funding Policy with no annual cap on employer contributions (current policy)
 - Act 12 Funding Policy with a hypothetical \$350M cap on employer contributions
 - Act 12 Funding Policy with a hypothetical \$250M cap on employer contributions

Probability of No or Little Derisking

No Derisking Through 2054

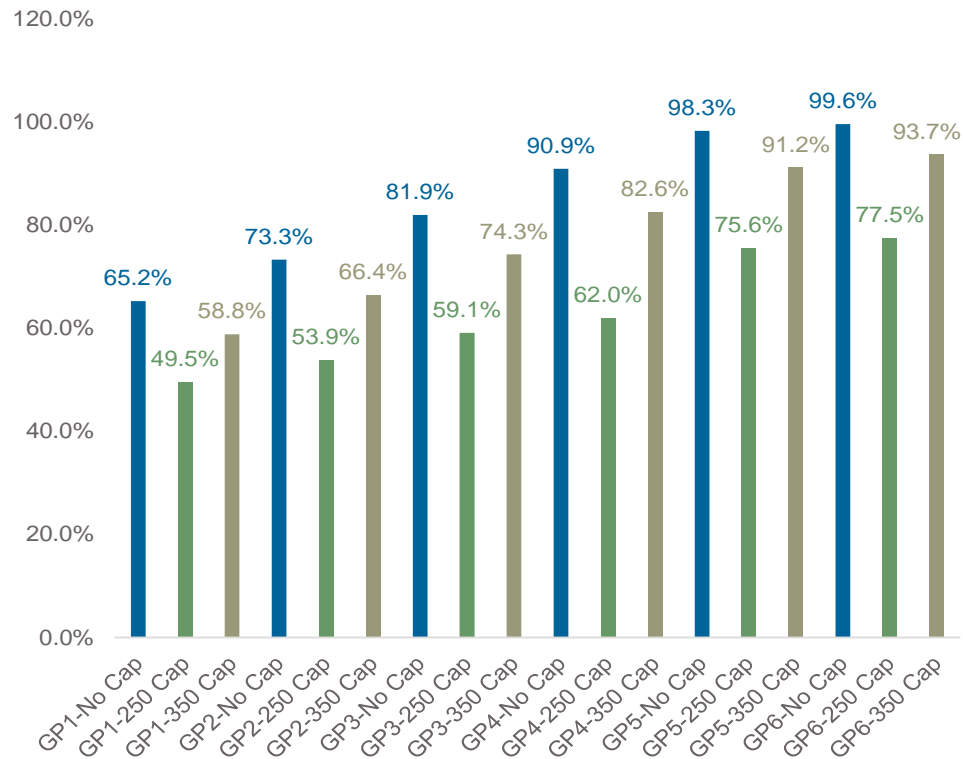
85% Funded or Less Through 2054



- The \$250M contribution cap (green bars) meaningfully increases the chances that the Glide Paths never derisk or only derisk one step (remain at 85% funded or less)
- The \$350M contribution cap (gray bars) is less impactful but modestly increases probabilities of no or little derisking

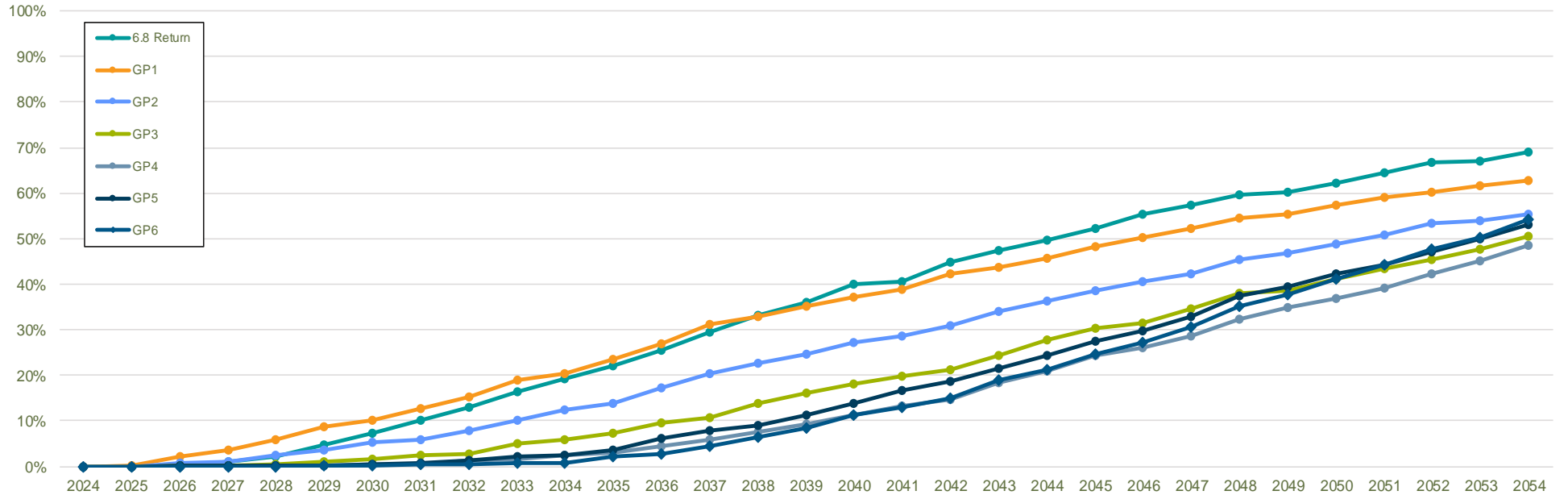
Probability of Reaching End State by 2054

Probability of Reaching End State by 2054



- A limitation on annual contributions will result in less de-risking
 - I.e. Glide Paths will be more aggressive in constrained contribution scenarios
 - Earlier funded status triggers may be suitable for annual contribution limitations
- As expected, faster de-risking Paths have higher probability of reaching end state
 - E.g. compare GP1 (slow) to GP4 (fast)

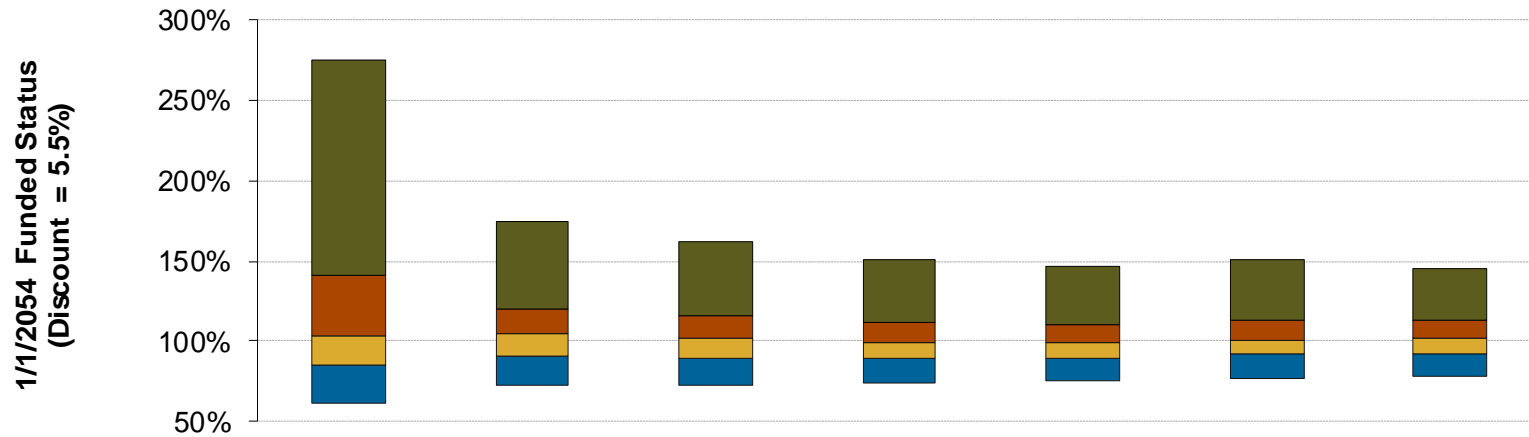
Probability of Full Funding



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
6.8 Return	0%	0%	0%	1%	2%	5%	7%	10%	13%	16%	19%	22%	26%	29%	33%	36%	40%	41%	45%	47%	50%	52%	55%	57%	60%	60%	62%	64%	67%	67%	69%
GP1	0%	0%	2%	4%	6%	9%	10%	13%	15%	19%	20%	24%	27%	31%	33%	35%	37%	39%	42%	44%	46%	48%	50%	52%	54%	55%	57%	59%	60%	62%	63%
GP2	0%	0%	1%	1%	2%	4%	5%	6%	8%	10%	12%	14%	17%	20%	23%	25%	27%	29%	31%	34%	36%	39%	41%	42%	45%	47%	49%	51%	53%	54%	55%
GP3	0%	0%	0%	0%	0%	1%	2%	3%	3%	5%	6%	7%	10%	11%	14%	16%	18%	20%	21%	24%	28%	30%	31%	34%	38%	39%	41%	43%	45%	48%	51%
GP4	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	3%	3%	4%	6%	8%	9%	11%	13%	15%	18%	21%	24%	26%	29%	32%	35%	37%	39%	42%	45%	49%
GP5	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	4%	6%	8%	9%	11%	14%	17%	19%	22%	24%	27%	30%	33%	37%	39%	42%	44%	47%	50%	53%
GP6	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	3%	5%	6%	8%	11%	13%	15%	19%	21%	25%	27%	31%	35%	38%	41%	44%	48%	50%	54%

- The above chart illustrates the probability of full funding (100% funded) across the Glide Paths
 - Probability above 50% is highlighted in green
- Full funding is expected to be more than 20 years away

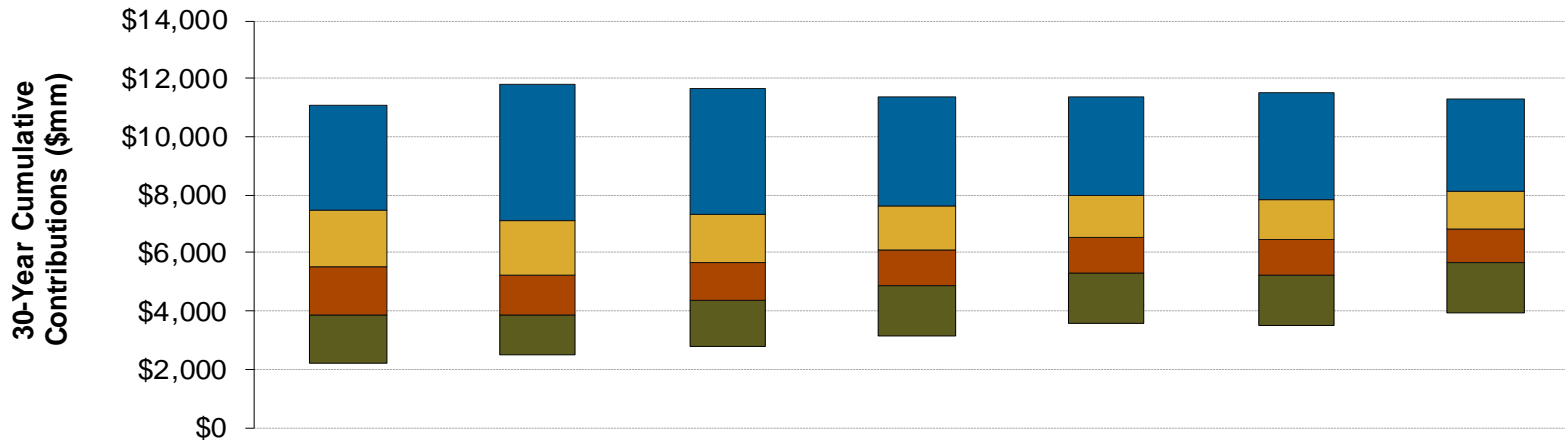
30-Year Projected Funded Status



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
2.5th	275%	175%	162%	151%	147%	151%	145%
25th	141%	120%	115%	112%	111%	113%	113%
50th	104%	104%	101%	100%	99%	101%	102%
75th	85%	91%	90%	89%	90%	92%	92%
97.5th	62%	72%	73%	74%	75%	77%	78%
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%
1/1/2054 Discount Rate	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%

- The above graphic depicts 30-Year Projected Funded Status for the Target Mix and Glide Path options
 - Actuarial liability is discounted at 5.5% in Year 30 to enable fair comparison
- GP5 and GP6 are appealing – expect to be fully funded with highest downside protection

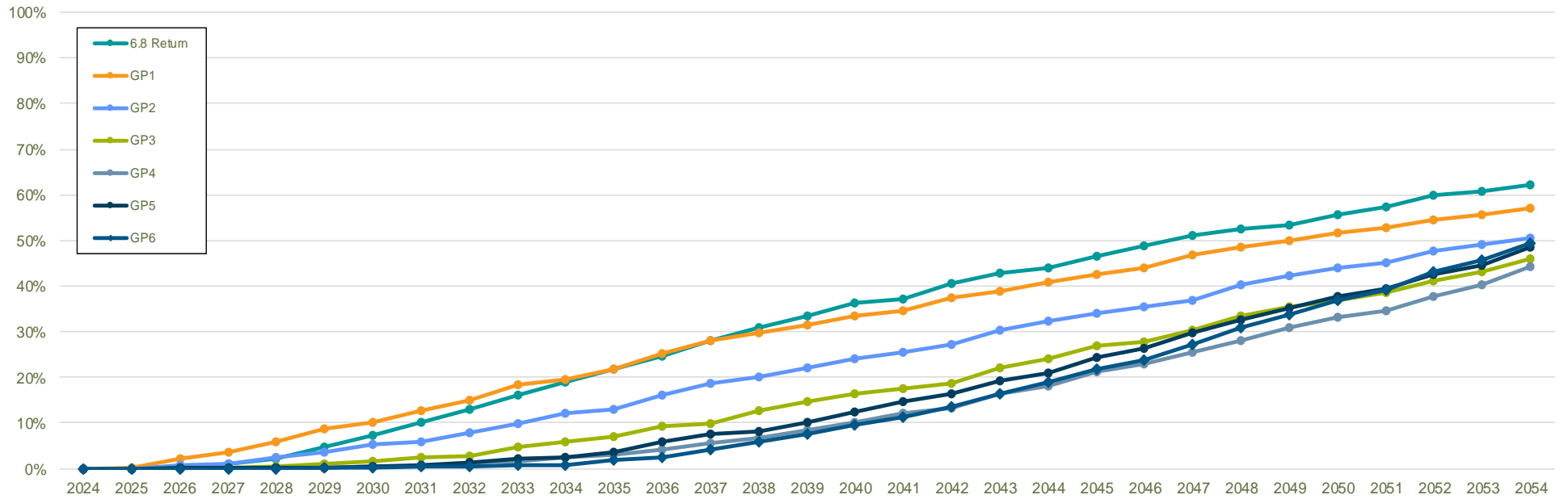
30-Year Cumulative Contributions



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
97.5th	\$11,078	\$11,782	\$11,644	\$11,385	\$11,348	\$11,509	\$11,327
75th	7,448	7,106	7,304	7,594	7,955	7,848	8,100
50th	5,537	5,267	5,672	6,102	6,563	6,457	6,836
25th	3,884	3,892	4,381	4,849	5,299	5,227	5,675
2.5th	2,175	2,520	2,788	3,175	3,578	3,536	3,962
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%

- 6.8% Return has the lowest contribution outlay in worse case scenario
- Speed of de-risking is evident in the expected and worse case scenario:
 - GP1 has lowest expected contribution and highest worse case contribution outlay
 - GP6 has the highest expected contribution and lowest worse case contribution outlay

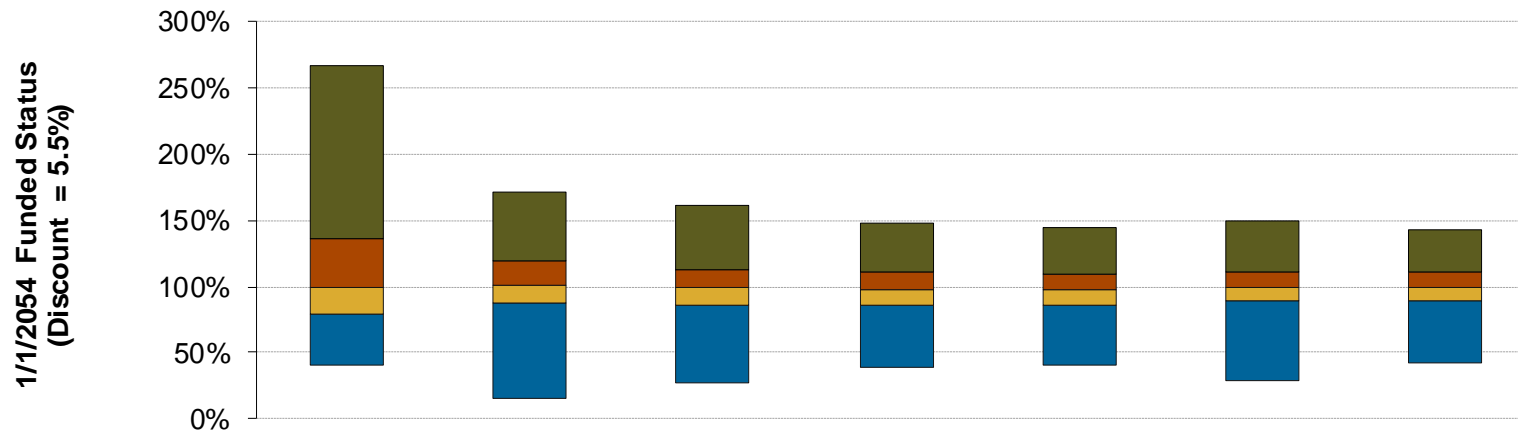
Probability of Full Funding



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
6.8 Return	0%	0%	0%	1%	2%	5%	7%	10%	13%	16%	19%	22%	25%	28%	31%	33%	36%	37%	41%	43%	44%	46%	49%	51%	53%	54%	56%	57%	60%	61%	62%
GP1	0%	0%	2%	4%	6%	9%	10%	13%	15%	18%	20%	22%	25%	28%	30%	32%	33%	35%	37%	39%	41%	43%	44%	47%	48%	50%	52%	53%	54%	56%	57%
GP2	0%	0%	1%	1%	2%	4%	5%	6%	8%	10%	12%	13%	16%	19%	20%	22%	24%	26%	27%	30%	32%	34%	35%	37%	40%	42%	44%	45%	48%	49%	51%
GP3	0%	0%	0%	0%	0%	1%	2%	2%	3%	5%	6%	7%	9%	10%	13%	15%	16%	18%	19%	22%	24%	27%	28%	30%	33%	35%	37%	39%	41%	43%	46%
GP4	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	3%	4%	6%	7%	8%	10%	12%	13%	16%	18%	21%	23%	26%	28%	31%	33%	35%	38%	40%	44%
GP5	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	4%	6%	7%	8%	10%	12%	15%	16%	19%	21%	24%	26%	30%	33%	35%	38%	39%	43%	45%	48%
GP6	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	4%	6%	7%	10%	11%	13%	17%	19%	22%	24%	27%	31%	34%	37%	39%	43%	46%	49%

- As expected, probability of full funding declines as contributions are constrained.

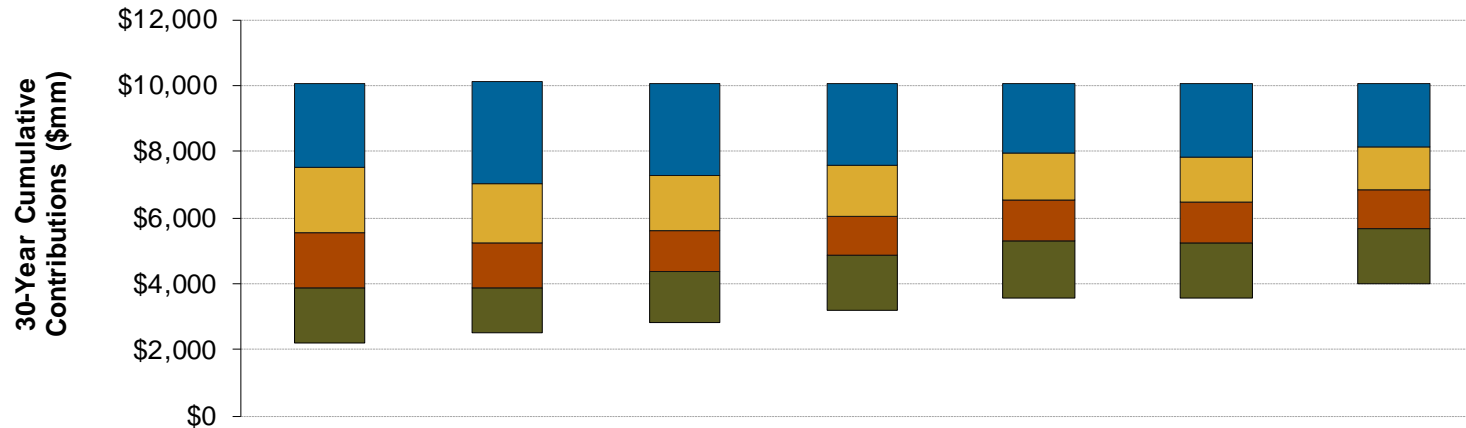
30-Year Projected Funded Status



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
2.5th	266%	171%	161%	148%	144%	150%	143%
25th	136%	119%	113%	110%	109%	111%	111%
50th	99%	101%	99%	98%	98%	99%	100%
75th	79%	87%	87%	86%	87%	89%	90%
97.5th	40%	15%	27%	38%	41%	29%	42%
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%
1/1/2054 Discount Rate	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%

- Under a \$350M cap, expected funded status is 2-5% lower
- In a worse case scenario, funded status would be significantly lower

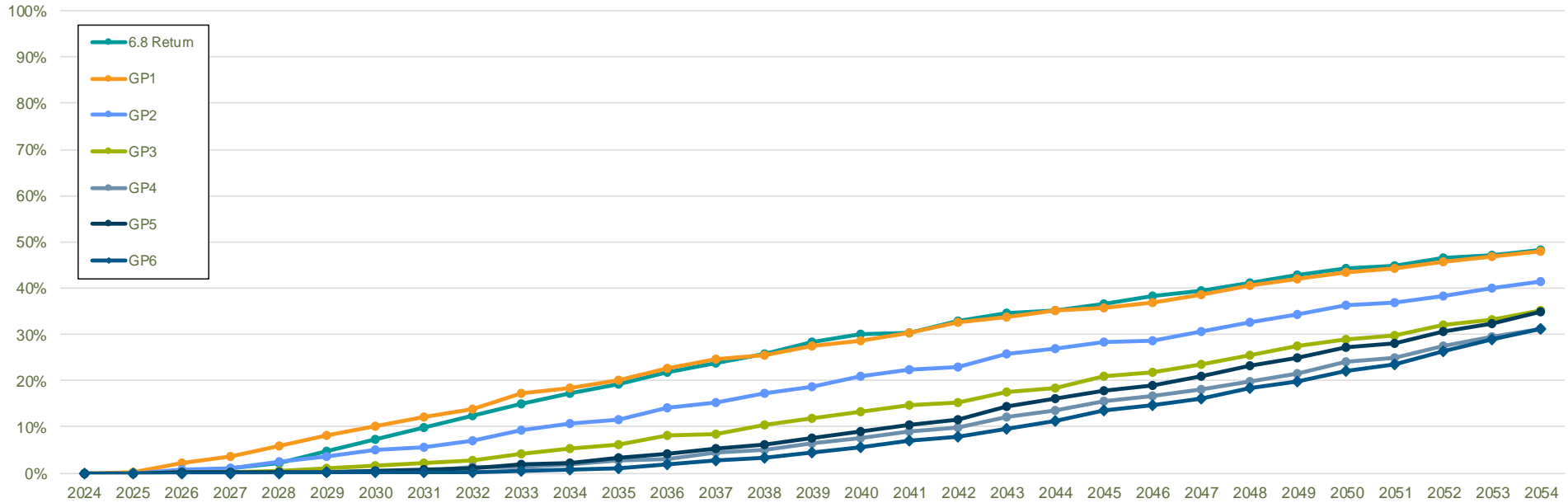
30-Year Cumulative Contributions



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
97.5th	\$10,024	\$10,099	\$10,070	\$10,057	\$10,055	\$10,070	\$10,061
75th	7,540	7,007	7,258	7,602	7,967	7,837	8,141
50th	5,518	5,223	5,620	6,054	6,544	6,437	6,851
25th	3,882	3,886	4,380	4,845	5,299	5,225	5,666
2.5th	2,175	2,520	2,788	3,175	3,578	3,536	3,962
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%

- Under a \$350M cap, expected contributions do not materially change
- In a worse case scenario, across the Glide Paths, contributions are significantly lower
 - Worse case contributions are \$1.2 - \$1.7B lower
 - Lower worse case contributions translates into a larger Plan deficit (prior slide)
 - Worse case contributions are similar across all Glide Paths due to the \$350M cap
 - Note that \$350M x 30 = \$10,500M

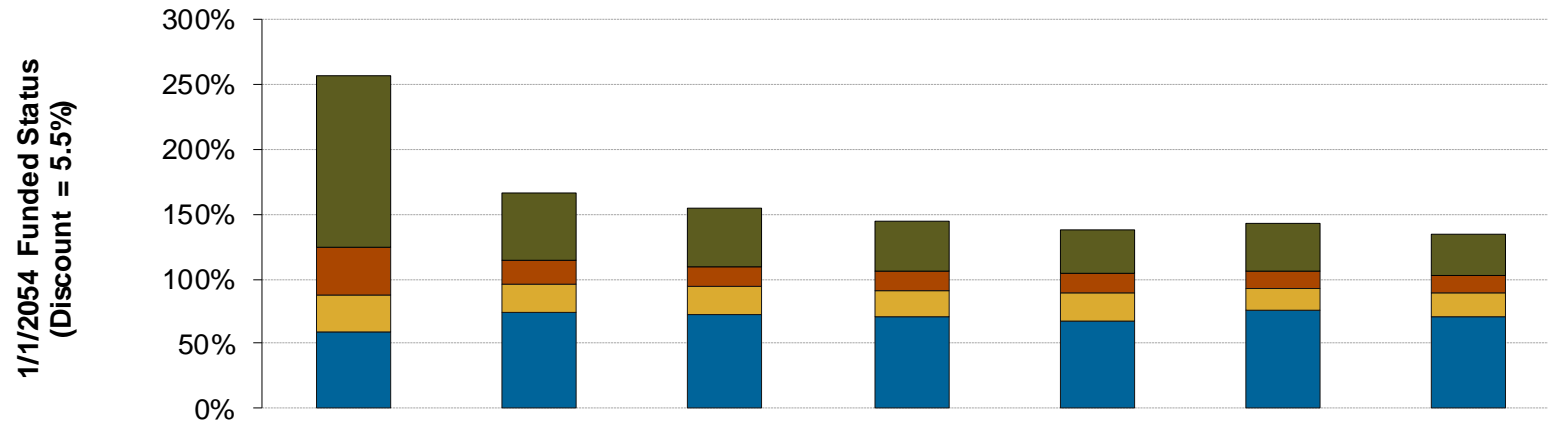
Probability of Full Funding: \$250M Cap



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
6.8 Return	0%	0%	0%	1%	2%	5%	7%	10%	12%	15%	17%	19%	22%	24%	26%	28%	30%	30%	33%	34%	35%	36%	38%	40%	41%	43%	44%	45%	46%	47%	48%
GP1	0%	0%	2%	4%	6%	8%	10%	12%	14%	17%	18%	20%	23%	25%	26%	28%	29%	30%	33%	34%	35%	36%	37%	39%	41%	42%	43%	44%	46%	47%	48%
GP2	0%	0%	1%	1%	2%	4%	5%	5%	7%	9%	11%	12%	14%	15%	17%	19%	21%	22%	23%	26%	27%	28%	29%	31%	33%	34%	36%	37%	38%	40%	41%
GP3	0%	0%	0%	0%	0%	1%	2%	2%	3%	4%	5%	6%	8%	8%	10%	12%	13%	15%	15%	17%	18%	21%	22%	23%	26%	27%	29%	30%	32%	33%	35%
GP4	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	3%	3%	5%	5%	7%	8%	9%	10%	12%	14%	16%	17%	18%	20%	22%	24%	25%	27%	29%	31%
GP5	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	3%	4%	5%	6%	8%	9%	10%	12%	14%	16%	18%	19%	21%	23%	25%	27%	28%	31%	32%	35%
GP6	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	3%	3%	4%	6%	7%	8%	9%	11%	13%	15%	16%	18%	20%	22%	23%	26%	29%	31%

- As expected, probability of full funding declines as contributions are constrained.

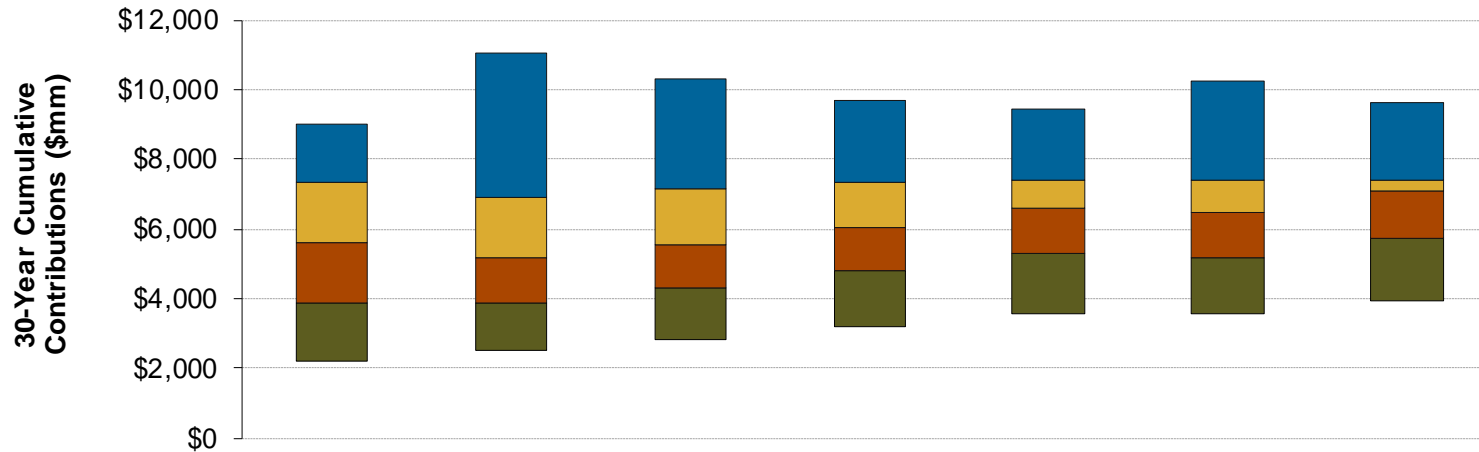
30-Year Projected Funded Status



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
2.5th	256%	166%	155%	145%	139%	143%	134%
25th	124%	114%	109%	106%	104%	106%	103%
50th	87%	96%	94%	91%	90%	92%	90%
75th	58%	74%	73%	71%	68%	75%	70%
97.5th	0%	0%	0%	0%	0%	0%	0%
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%
1/1/2054 Discount Rate	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%

- Under a \$250M cap, no Glide Paths are expected to reach full funding
 - Expected funded status is 8-12% lower than “no contribution cap” scenario
- In a worse case scenario, the Plan would run out of assets and become pay-as-you-go
 - Pay-as-you-go means paying benefit payments each year which are \$600M-775M in last 10 years (2044 to 2054)

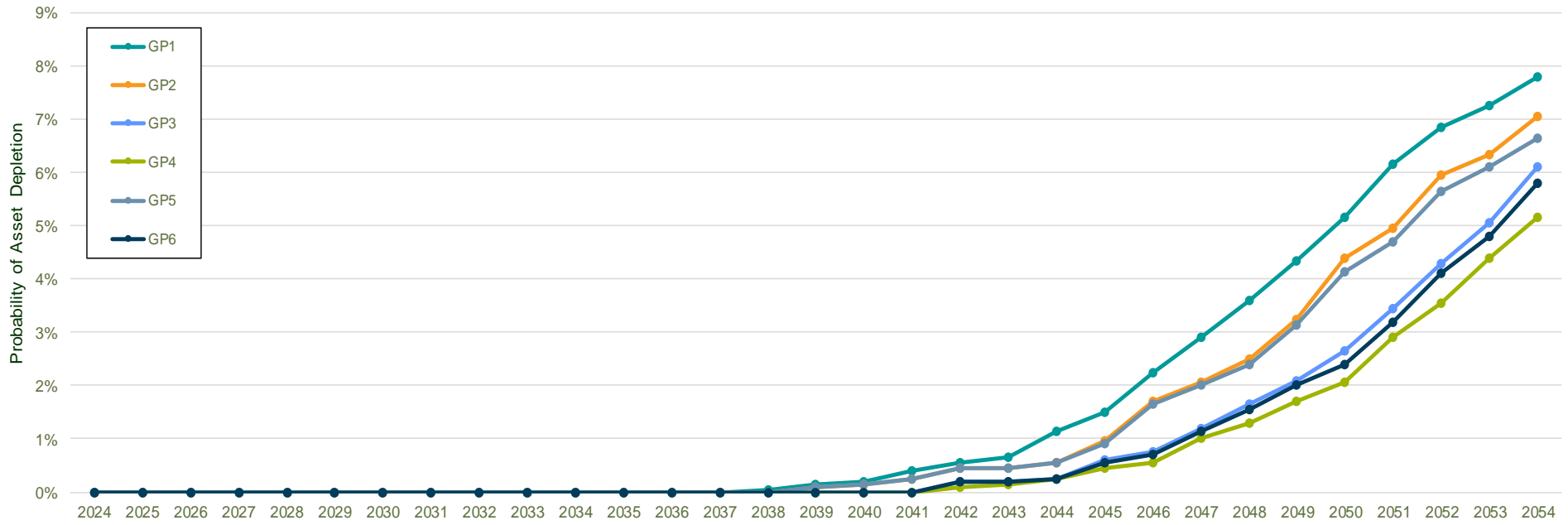
30-Year Cumulative Contributions



Percentile	6.8 Return	GP1	GP2	GP3	GP4	GP5	GP6
97.5th	\$9,025	\$11,035	\$10,301	\$9,655	\$9,435	\$10,218	\$9,649
75th	7,303	6,927	7,138	7,304	7,394	7,375	7,407
50th	5,623	5,138	5,553	6,045	6,593	6,463	7,060
25th	3,842	3,850	4,298	4,766	5,277	5,177	5,749
2.5th	2,175	2,520	2,788	3,175	3,578	3,528	3,915
30-Year Return	6.8%	6.6%	6.5%	6.3%	6.2%	6.2%	6.0%
30-Year Std Dev	7.5%	9.7%	8.8%	7.9%	7.1%	7.8%	7.0%

- Under a \$250M cap, expected contributions do not materially change
- In a worse case scenario, across the Glide Paths, contributions are significantly lower
 - Worse case contributions are \$0.75- \$1.7B lower
 - Lower worse case contributions translates into a larger Plan deficit (prior slide)
 - Note that \$250M x 30 = \$7,500M. Worse case is higher to pay benefit payments
 - Risky Glide Paths pay more in worse case as assets are depleted sooner

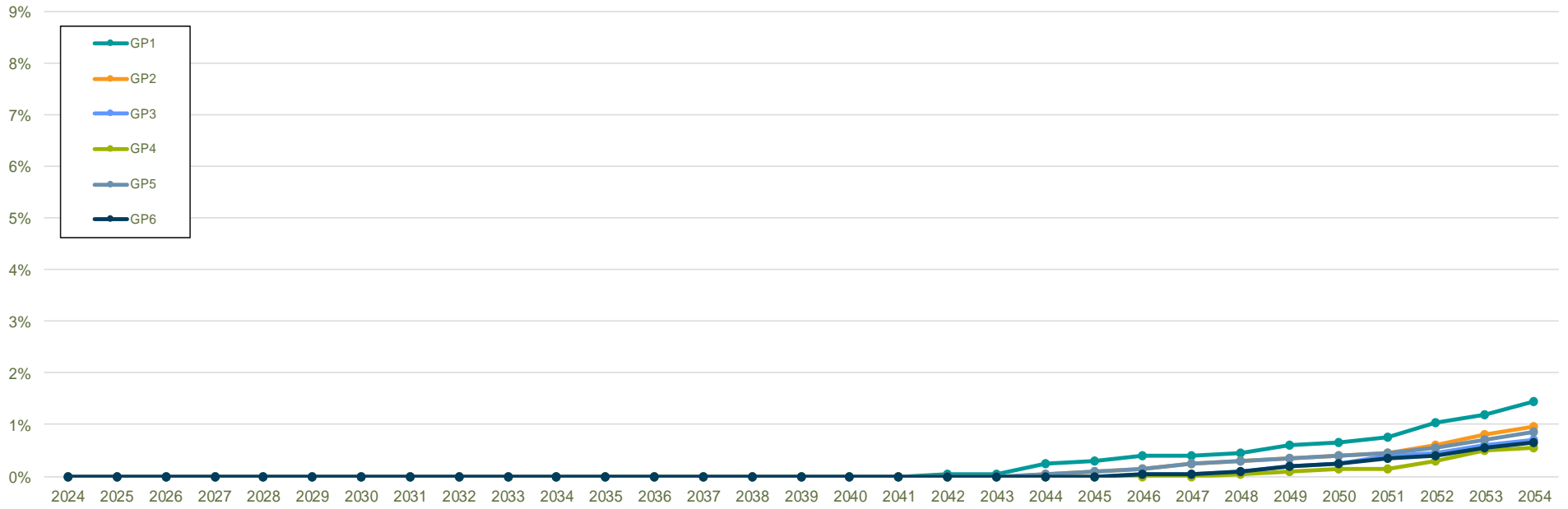
Probability of Asset Depletion



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	
GP1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	2%	3%	4%	4%	5%	6%	7%	7%	8%	
GP2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	3%	3%	4%	5%	6%	6%	7%	
GP3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	2%	3%	3%	4%	5%	6%	
GP4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	2%	2%	3%	4%	4%	5%
GP5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	3%	4%	5%	6%	6%	7%	7%	7%
GP6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	2%	2%	3%	4%	5%	6%	6%

- Under a \$250M cap, assets may run out in 15 years depending on the Glide Path

Probability of Asset Depletion



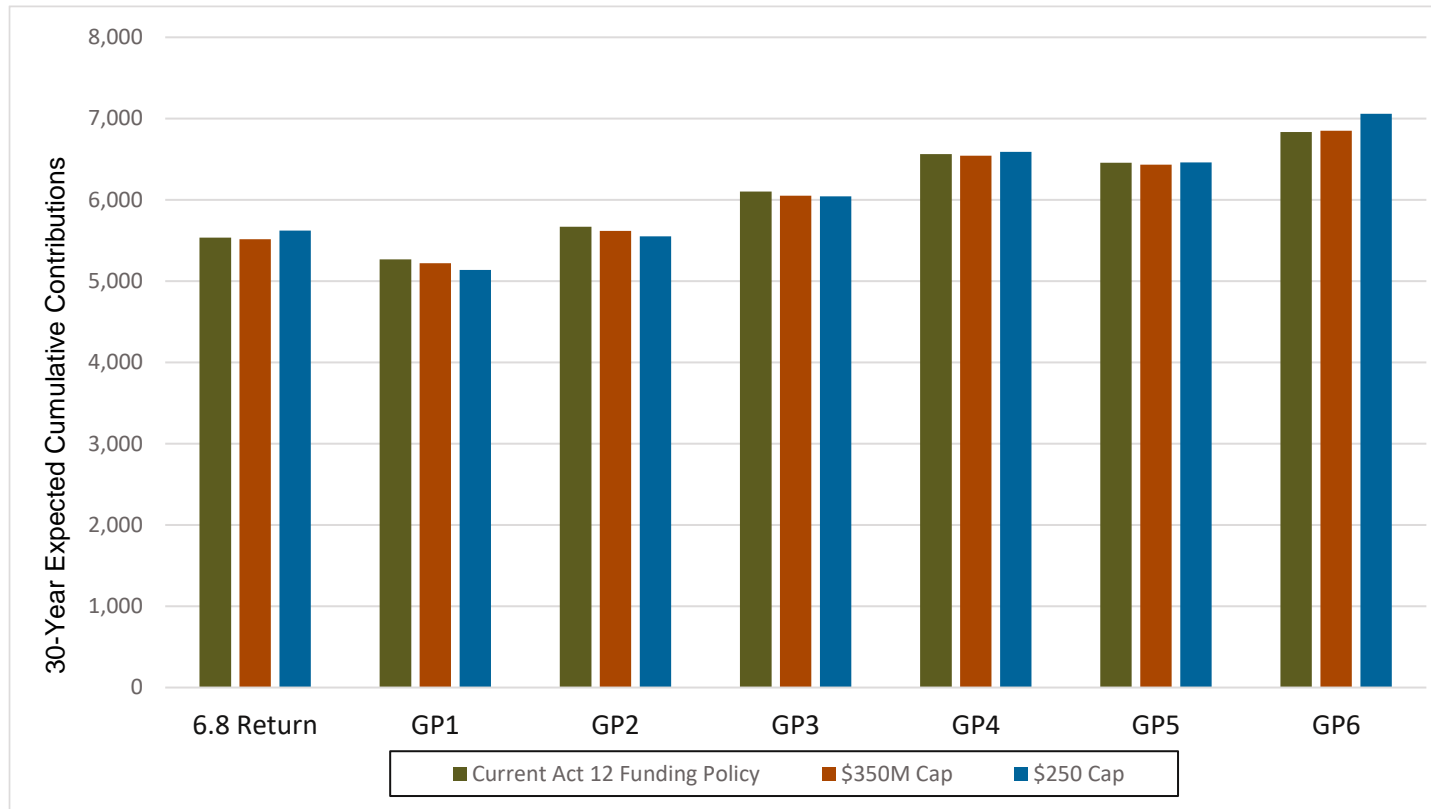
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	
GP1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
GP2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
GP3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
GP4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
GP5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
GP6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%

- Under a \$350M cap, the probability of asset depletion is very low

Glide Path Analysis Findings

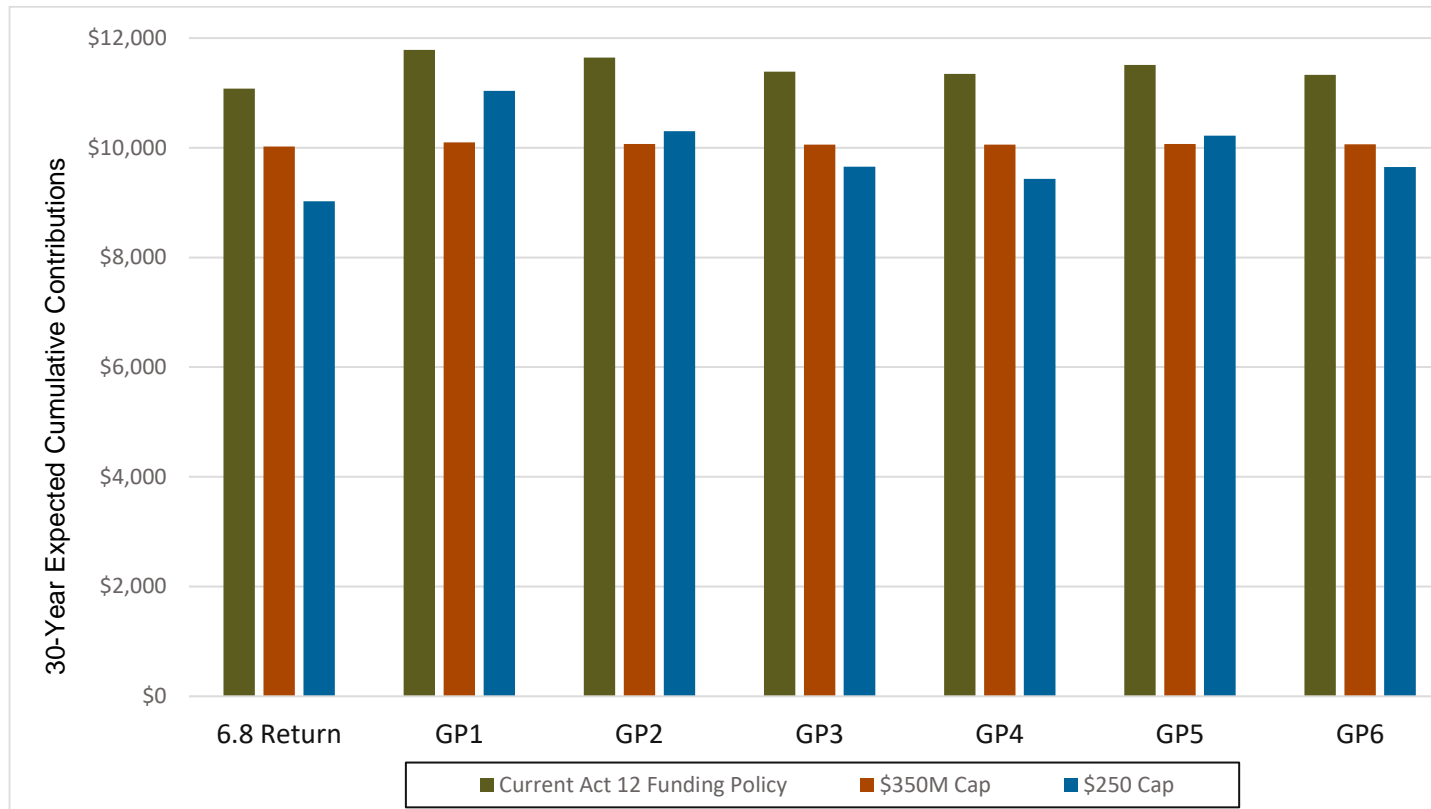
- Probability of full funding
 - Sales tax proceeds cease upon reaching full funding
 - Under current Act 12 funding policy, all the Glide Paths (except GP4) are expected to be fully funded within 30 years
 - A more aggressive Glide Path (e.g. GP1) is expected to reach full funding sooner
 - As expected, a limitation on annual employer contributions (i.e. a cap) will lower the probability of reaching full funding
- 30-year Projected Funded Status Under current Act 12 Funding Policy:
 - Slower de-risking results in higher expected funded status but less downside protection
 - GP5 and GP6 are appealing – expect to be fully funded with highest downside protection
- 30-year Projected Funded Status Under \$350M Cap:
 - Fast or immediate de-risking (6.8% Mix) offer compelling downside protection over the other alternatives
- 30-year Projected Funded Status Under \$250M Cap:
 - May not be sustainable over the very long term
 - Assets may run out in 15 years depending on the Glide Path

Findings: Expected Contributions



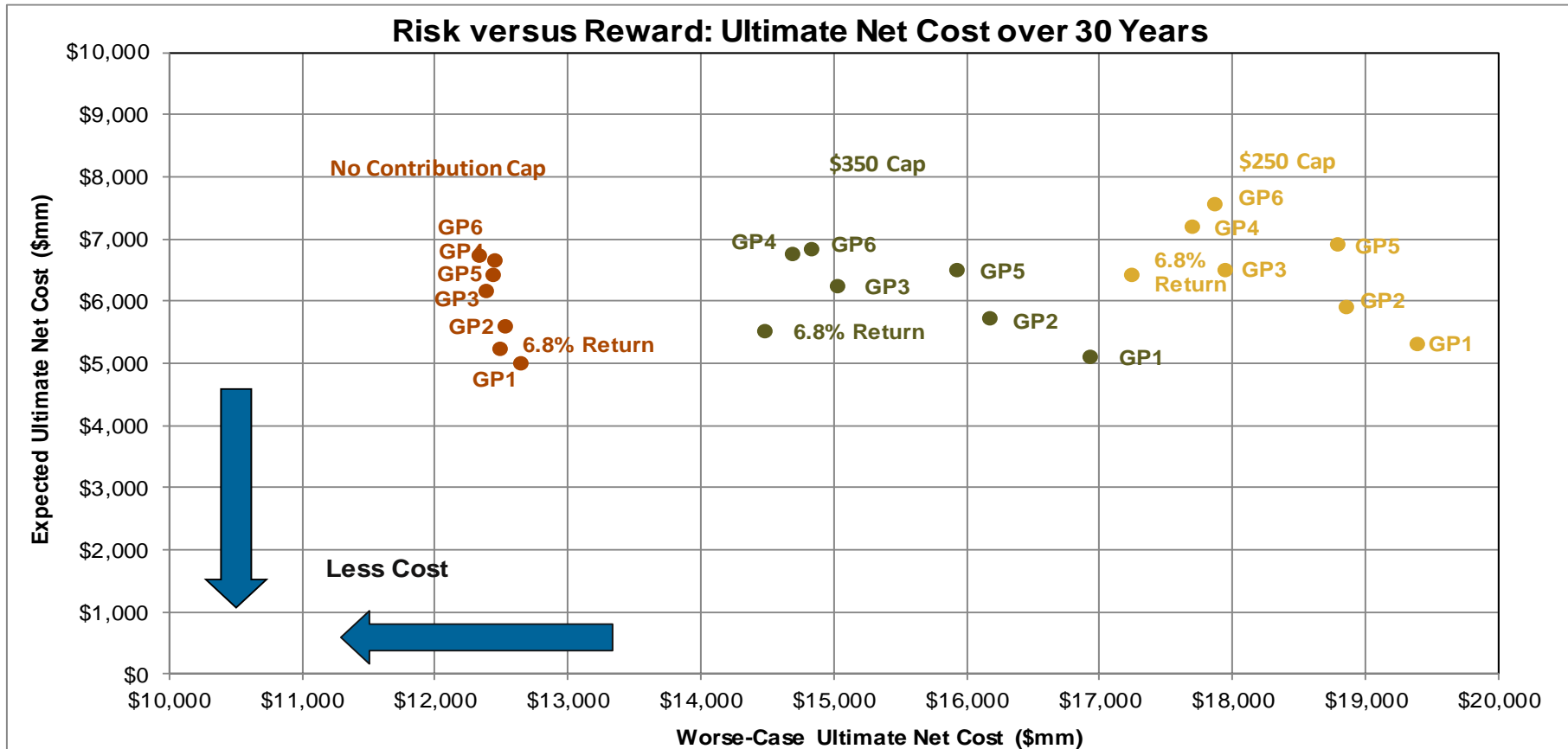
- Slower de-risking lowers expected contributions under the current Act 12 Funding Policy
- Annual contribution cap does not have a material impact on expected contributions (in a normal market environment)

Findings: Worse Case Contributions



- For current Act 12 Funding Policy
 - 6.8% Return minimizes worse case contributions as it de-risks immediately
 - Faster de-risking (GP1) results in higher worse case contributions
- In general, a contribution cap reduces worse case contributions - funding shortfall results in much larger Plan deficit

Findings: Reward-Risk Ultimate Net Cost



- **UNC = 30-Year Cumulative Contributions + 1/1/2054 Unfunded Actuarial Liability**
 - UNC captures what is expected to be paid over 30 years plus what is owed at the end of the 30-year period
- Contribution cap of \$350M does not significantly affect expected cost. Expected cost begins to rise at \$250 cap
- Faster de-risking generally leads to higher expected cost
- In a worse case scenario, a contribution cap could exacerbate long-term cost

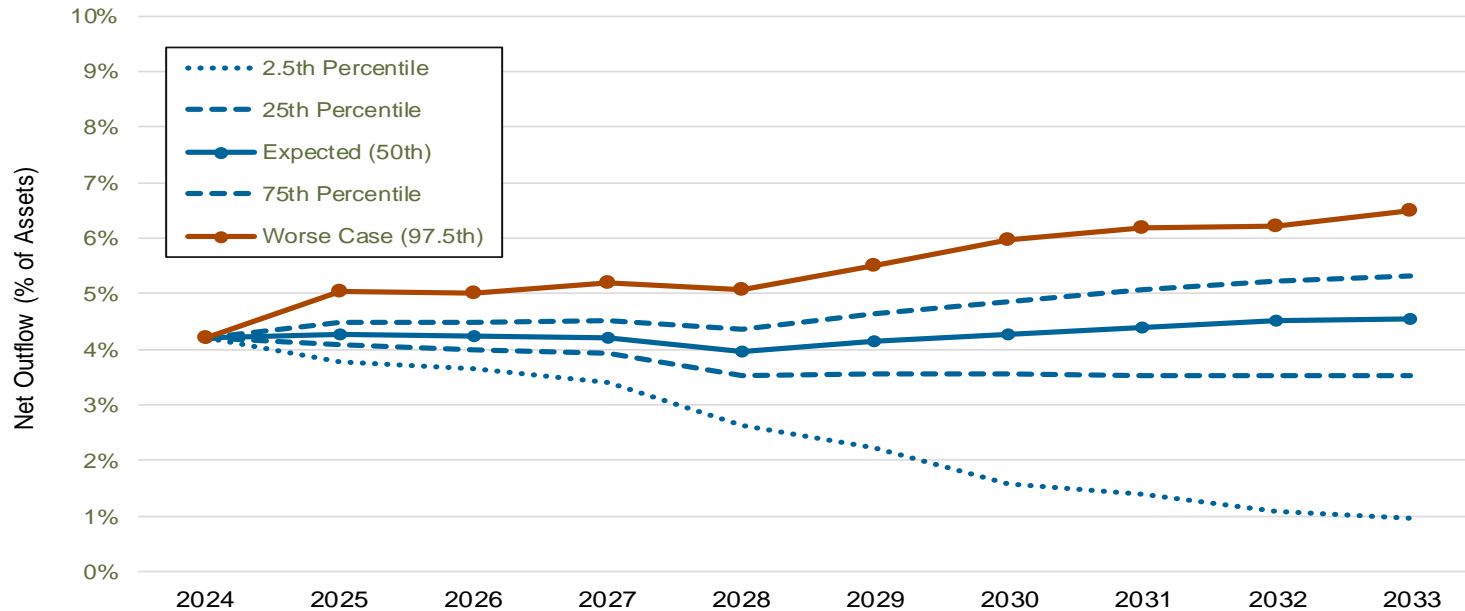


Examine Liquidity Needs

Liquidity Needs Summary

- This section explores liquidity needs over the next 10-30 years
- First, the 6.8% Mix is examined over the next 10 years under the three funding scenarios
 - Act 12 Funding Policy with no annual cap on employer contributions (current policy)
 - Act 12 Funding Policy with a hypothetical \$350M cap on employer contributions
 - Act 12 Funding Policy with a hypothetical \$250M cap on employer contributions
 - An annual contribution cap increases liquidity needs in a worse case scenario
- The 6.8% Mix has much less risk than the current Target Mix
 - 7.6% standard deviation (6.8% Mix) vs. 12% (Current Target)
 - A more volatile asset mix will have higher liquidity needs in a worse case scenario
- Second, the liquidity needs of the Glide Paths are examined over 30 years in a worse case scenario
 - De-risking the portfolio (more downside protection) and phasing-out illiquid investments assists with meeting liquidity needs which will rise overtime
 - A contribution cap can increase liquidity needs significantly overtime
 - In a worse case scenario, a slow de-risking Path (more aggressive) has higher liquidity needs than a fast de-risking Path

Net Outflow (% of Assets) for 6.8% Return Mix

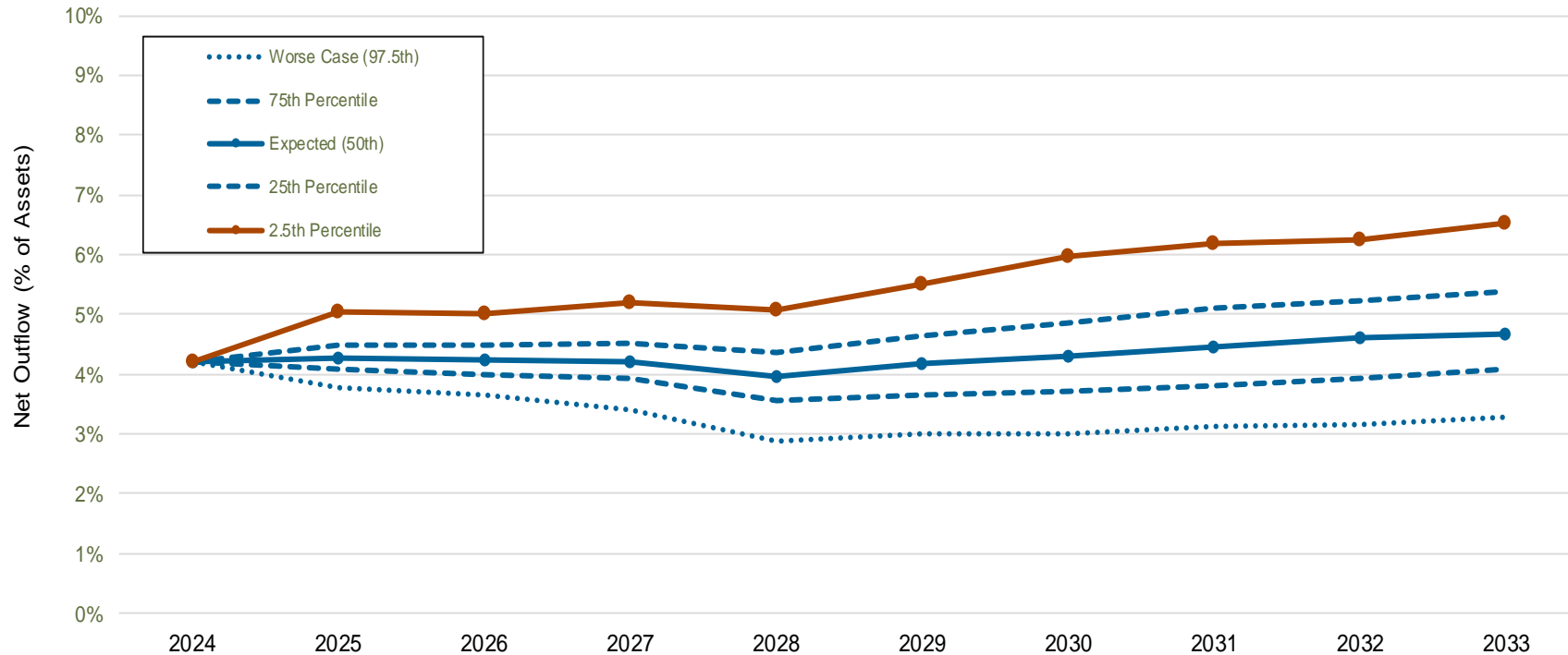


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Worse Case (97.5th)	4.2%	5.0%	5.0%	5.2%	5.1%	5.5%	6.0%	6.2%	6.2%	6.5%
75th Percentile	4.2%	4.5%	4.5%	4.5%	4.4%	4.7%	4.9%	5.1%	5.2%	5.3%
Expected (50th)	4.2%	4.3%	4.2%	4.2%	4.0%	4.1%	4.3%	4.4%	4.5%	4.5%
25th Percentile	4.2%	4.1%	4.0%	3.9%	3.5%	3.6%	3.6%	3.5%	3.5%	3.5%
2.5th Percentile	4.2%	3.8%	3.6%	3.4%	2.6%	2.2%	1.6%	1.4%	1.1%	0.9%
Prob (NOF > 5.0%)	5%	8%	8%	10%	8%	16%	24%	31%	34%	38%

< 5%
5 - 7%
7 - 10%
> 10%

- Net Outflow (NOF) = Benefit Payments + Admin Expenses – Employer and Employee Contributions
- Liquidity needs are expected to be manageable for the next 10 years – NOF is under 7.0%
- Contributions may exceed Benefit Payments (negative net outflow)
- **Cash flow analysis assumes strict adherence to current funding policy (No Cap)**

Net Outflow (% of Assets) for 6.8% Return Mix

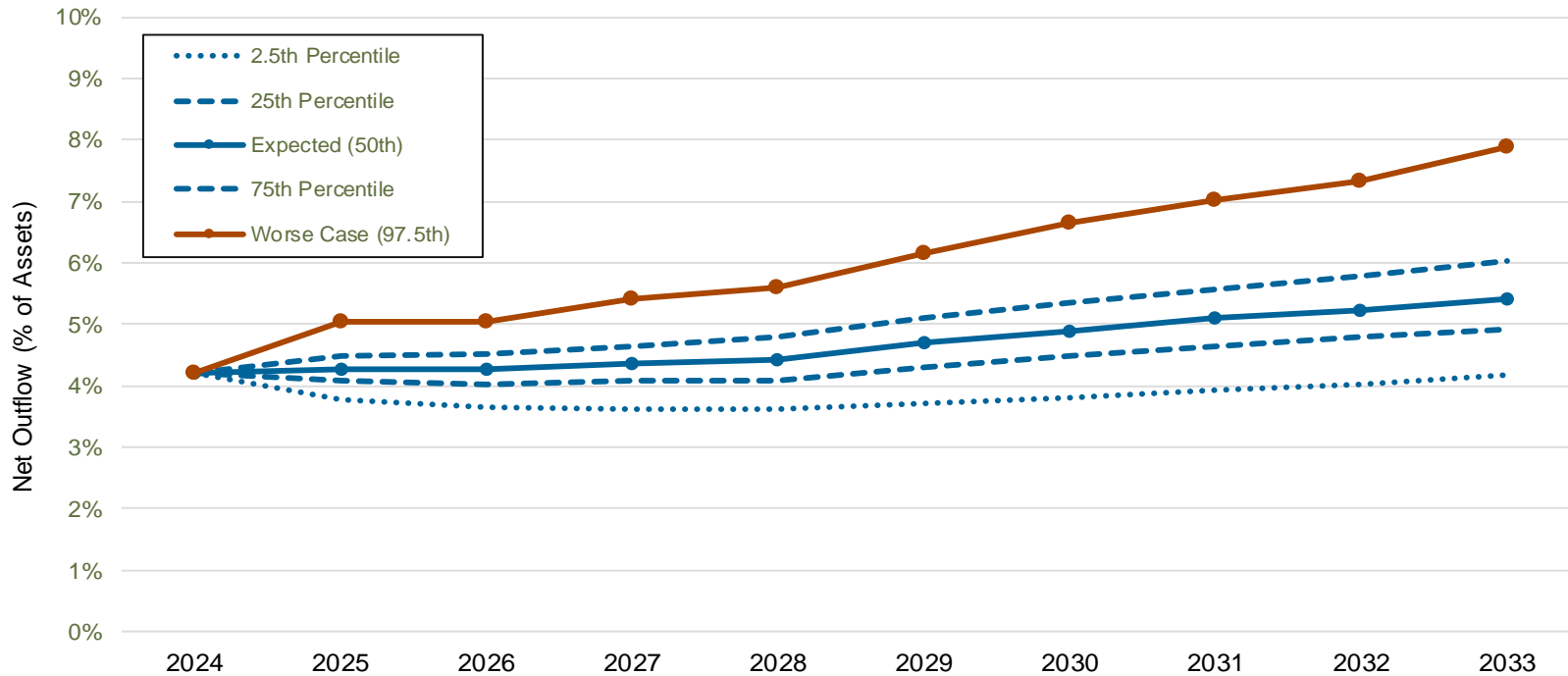


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Worse Case (97.5th)	4.2%	5.0%	5.0%	5.2%	5.1%	5.5%	6.0%	6.2%	6.3%	6.5%
75th Percentile	4.2%	4.5%	4.5%	4.5%	4.4%	4.7%	4.9%	5.1%	5.2%	5.4%
Expected (50th)	4.2%	4.3%	4.2%	4.2%	4.0%	4.2%	4.3%	4.5%	4.6%	4.7%
25th Percentile	4.2%	4.1%	4.0%	3.9%	3.6%	3.6%	3.7%	3.8%	3.9%	4.1%
2.5th Percentile	4.2%	3.8%	3.6%	3.4%	2.9%	3.0%	3.0%	3.1%	3.1%	3.3%
Prob (NOF > 5.0%)	0%	3%	3%	5%	4%	13%	21%	29%	33%	39%



- Liquidity needs are similar in expected and worse case

Net Outflow (% of Assets) for 6.8% Return Mix

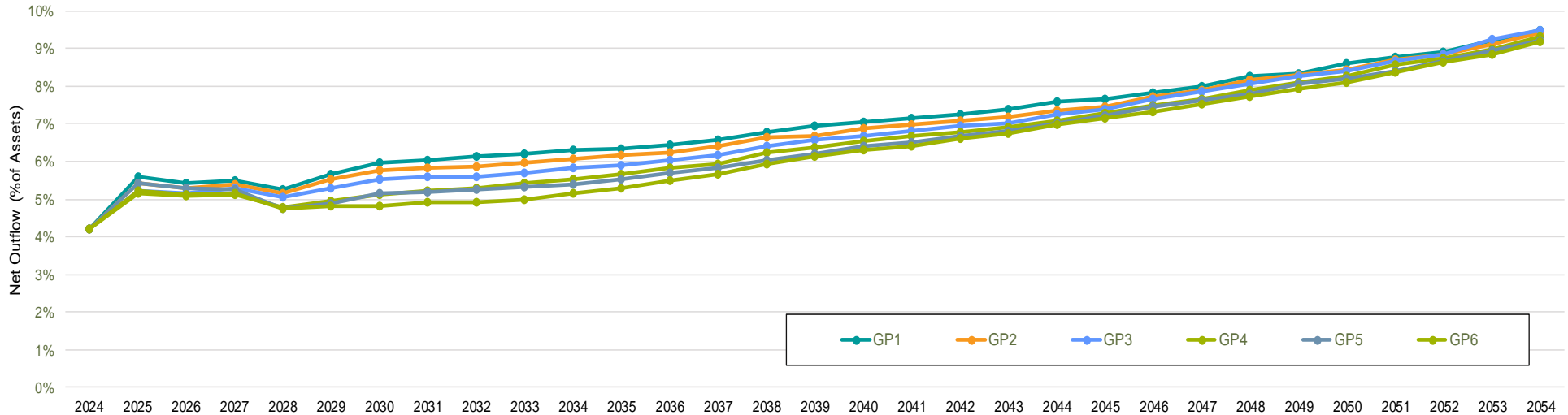


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Worse Case (97.5th)	4.2%	5.0%	5.0%	5.4%	5.6%	6.2%	6.7%	7.0%	7.3%	8%
75th Percentile	4.2%	4.5%	4.5%	4.6%	4.8%	5.1%	5.4%	5.6%	5.8%	6.0%
Expected (50th)	4.2%	4.3%	4.3%	4.4%	4.4%	4.7%	4.9%	5.1%	5.2%	5.4%
25th Percentile	4.2%	4.1%	4.0%	4.1%	4.1%	4.3%	4.5%	4.7%	4.8%	4.9%
2.5th Percentile	4.2%	3.8%	3.6%	3.6%	3.6%	3.7%	3.8%	3.9%	4.0%	4.2%
Prob (NOF > 5.0%)	0%	3%	3%	9%	15%	30%	43%	55%	64%	70%

< 5%
5 - 7%
7 - 10%
> 10%

- Liquidity needs steadily increase in worse case scenario

Worse Case Net Outflow (% of Assets)

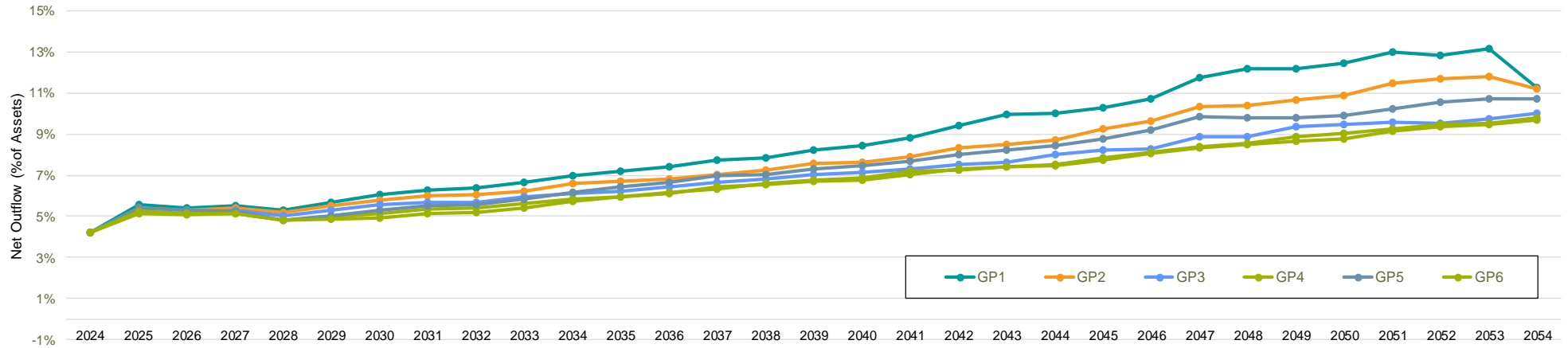


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
GP1	4.2%	5.6%	5.4%	5.5%	5.3%	5.7%	6.0%	6.1%	6.1%	6.2%	6.3%	6.3%	6.5%	6.6%	6.8%	7.0%	7.1%	7.1%	7.3%	7.4%	7.6%	7.7%	7.8%	8.0%	8.3%	8.4%	8.6%	8.8%	8.9%	9.2%	9.5%
GP2	4.2%	5.4%	5.3%	5.4%	5.2%	5.5%	5.8%	5.8%	5.9%	6.0%	6.1%	6.2%	6.3%	6.4%	6.7%	6.7%	6.9%	7.0%	7.1%	7.2%	7.3%	7.5%	7.7%	7.9%	8.2%	8.3%	8.4%	8.7%	8.8%	9.1%	9.4%
GP3	4.2%	5.2%	5.1%	5.3%	5.1%	5.3%	5.5%	5.6%	5.6%	5.7%	5.8%	5.9%	6.1%	6.2%	6.4%	6.6%	6.7%	6.8%	7.0%	7.0%	7.2%	7.4%	7.7%	7.9%	8.1%	8.3%	8.4%	8.7%	8.9%	9.2%	9.5%
GP4	4.2%	5.1%	5.1%	5.1%	4.8%	5.0%	5.1%	5.2%	5.3%	5.4%	5.5%	5.7%	5.8%	5.9%	6.2%	6.4%	6.5%	6.7%	6.8%	6.9%	7.1%	7.3%	7.5%	7.7%	7.9%	8.1%	8.3%	8.6%	8.8%	9.0%	9.3%
GP5	4.2%	5.4%	5.3%	5.2%	4.8%	4.9%	5.2%	5.2%	5.3%	5.3%	5.4%	5.5%	5.7%	5.8%	6.1%	6.2%	6.4%	6.5%	6.7%	6.8%	7.0%	7.2%	7.5%	7.6%	7.8%	8.1%	8.2%	8.4%	8.7%	9.0%	9.2%
GP6	4.2%	5.2%	5.1%	5.1%	4.8%	4.8%	4.8%	4.9%	4.9%	5.0%	5.2%	5.3%	5.5%	5.7%	5.9%	6.1%	6.3%	6.4%	6.6%	6.8%	7.0%	7.1%	7.3%	7.5%	7.7%	7.9%	8.1%	8.4%	8.7%	8.9%	9.2%

- Liquidity needs gradually increase across all Glide Paths but stay under 10% per year
- Cash flow analysis assumes strict adherence to Act 12 funding policy (No Cap)

< 5%
5 - 7%
7 - 10%
> 10%

Net Outflow (% of Assets) for Target Mix

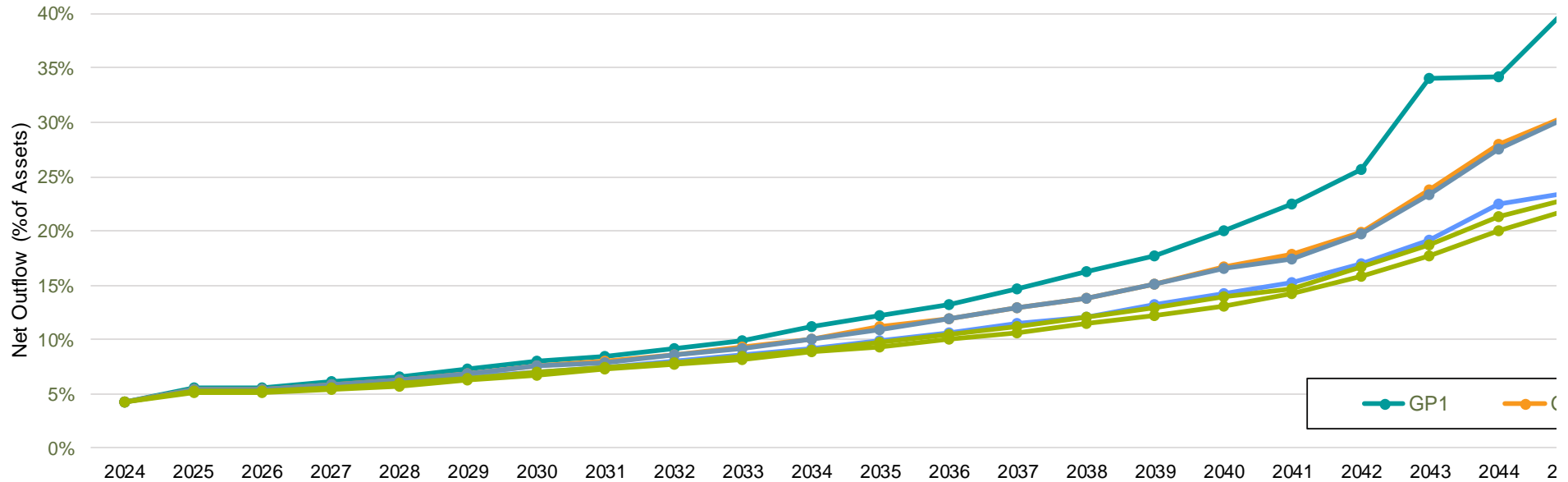


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
GP1	4.2%	5.6%	5.4%	5.5%	5.3%	5.7%	6.0%	6.3%	6.4%	6.6%	7.0%	7.2%	7.4%	7.7%	7.9%	8.2%	8.4%	8.8%	9.4%	10.0%	10.0%	10.3%	10.7%	11.7%	12.2%	12.2%	12.5%	13.0%	12.8%	13.2%	11.2%
GP2	4.2%	5.4%	5.3%	5.4%	5.2%	5.5%	5.8%	6.0%	6.1%	6.2%	6.6%	6.7%	6.8%	7.1%	7.3%	7.6%	7.6%	7.9%	8.3%	8.5%	8.7%	9.3%	9.6%	10.4%	10.4%	10.7%	10.9%	11.5%	11.7%	11.8%	11.2%
GP3	4.2%	5.2%	5.1%	5.3%	5.1%	5.3%	5.6%	5.7%	5.7%	5.9%	6.1%	6.2%	6.4%	6.7%	6.8%	7.0%	7.2%	7.3%	7.5%	7.7%	8.0%	8.2%	8.3%	8.9%	8.9%	9.4%	9.5%	9.6%	9.5%	9.8%	10.0%
GP4	4.2%	5.1%	5.1%	5.1%	4.8%	5.0%	5.2%	5.4%	5.4%	5.6%	5.8%	5.9%	6.2%	6.3%	6.6%	6.8%	6.9%	7.2%	7.3%	7.4%	7.5%	7.9%	8.1%	8.4%	8.5%	8.9%	9.0%	9.2%	9.5%	9.5%	9.8%
GP5	4.2%	5.4%	5.3%	5.2%	4.8%	5.0%	5.3%	5.5%	5.6%	5.8%	6.2%	6.4%	6.6%	7.0%	7.0%	7.3%	7.5%	7.7%	8.0%	8.2%	8.4%	8.8%	9.2%	9.8%	9.8%	9.8%	9.9%	10.2%	10.5%	10.7%	10.7%
GP6	4.2%	5.2%	5.1%	5.1%	4.8%	4.9%	4.9%	5.2%	5.2%	5.4%	5.7%	5.9%	6.1%	6.4%	6.5%	6.7%	6.8%	7.0%	7.3%	7.4%	7.5%	7.8%	8.1%	8.3%	8.5%	8.7%	8.8%	9.2%	9.4%	9.5%	9.7%

- Liquidity needs are manageable in first 10 years
- Liquidity needs begin to exceed 10% in the last 10 years (2044 to 2054)

< 5%
5 - 7%
7 - 10%
> 10%

Net Outflow (% of Assets) for Target Mix



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
GP1	4.2%	5.6%	5.6%	6.1%	6.5%	7.3%	8.0%	8.5%	9.2%	9.9%	11.1%	12%	13%	15%	16%	18%	20%	22%	26%	34%	34%
GP2	4.2%	5.4%	5.4%	5.8%	6.2%	6.9%	7.5%	8.0%	8.6%	9.3%	10.1%	11%	12%	13%	14%	15%	17%	18%	20%	24%	28%
GP3	4.2%	5.2%	5.2%	5.6%	5.9%	6.5%	7.0%	7.5%	8.0%	8.5%	9.2%	10%	11%	11%	12%	13%	14%	15%	17%	19%	23%
GP4	4.2%	5.1%	5.1%	5.5%	5.8%	6.3%	6.7%	7.3%	7.7%	8.1%	8.9%	9%	10%	11%	11%	12%	13%	14%	16%	18%	20%
GP5	4.2%	5.4%	5.4%	5.8%	6.2%	6.9%	7.5%	7.9%	8.5%	9.2%	10.0%	11%	12%	13%	14%	15%	17%	17%	20%	23%	28%
GP6	4.2%	5.2%	5.2%	5.6%	5.9%	6.5%	7.0%	7.5%	7.9%	8.4%	9.1%	10%	11%	11%	12%	13%	14%	15%	17%	19%	21%

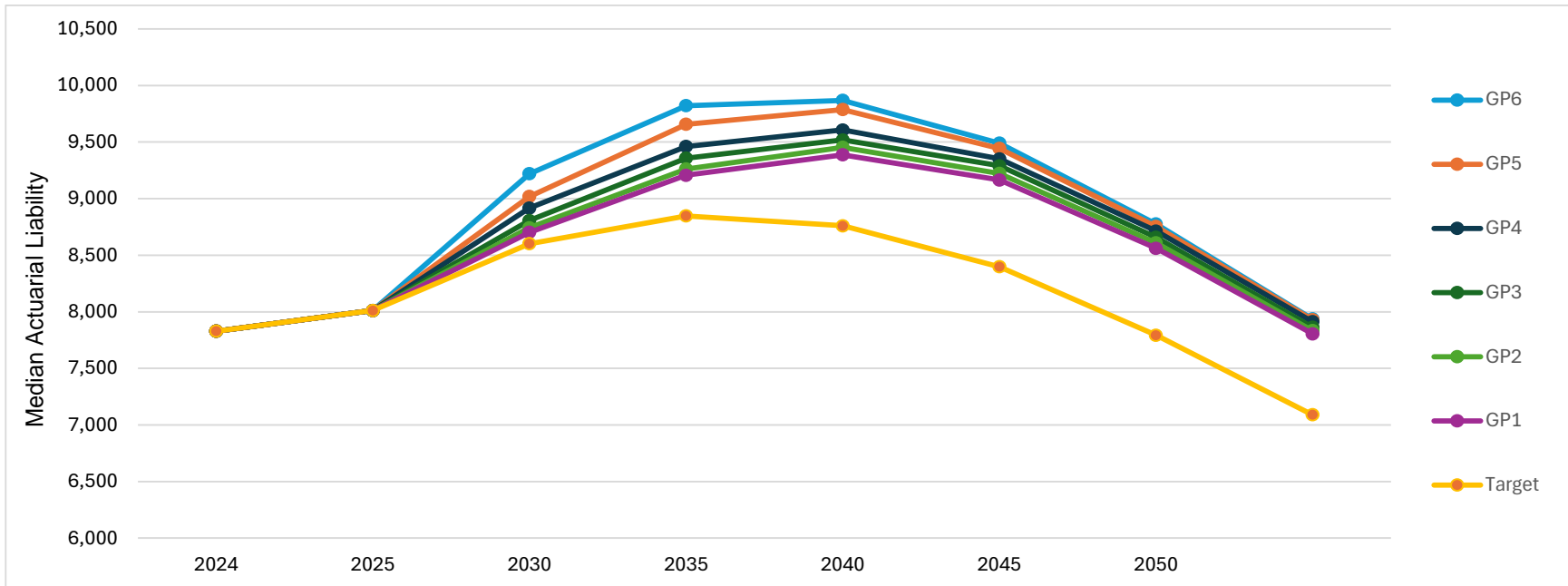
- Only shown for 20 years since probability of running out of assets approaches 2.5% in 20 years

< 5%
5 - 7%
7 - 10%
> 10%



Appendix

Median Actuarial Liability: No Contribution Cap

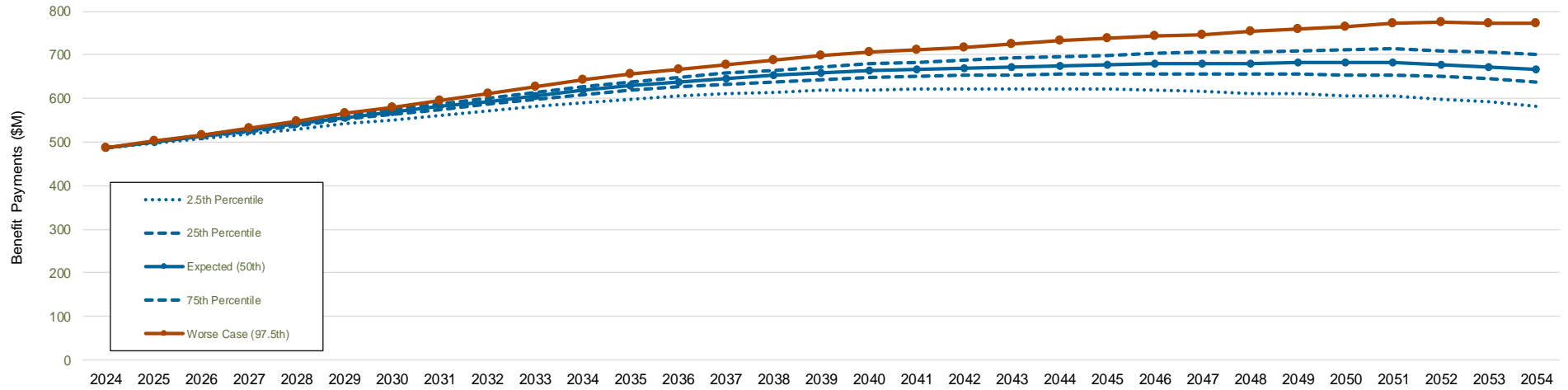


	Median Actuarial Liability							
	2024	2025	2030	2035	2040	2045	2050	2054
GP6	7,829	8,011	9,220	9,821	9,868	9,490	8,776	7,936
GP5	7,829	8,011	9,019	9,657	9,787	9,443	8,754	7,929
GP4	7,829	8,011	8,917	9,460	9,607	9,351	8,714	7,912
GP3	7,829	8,011	8,807	9,357	9,519	9,291	8,658	7,863
GP2	7,829	8,011	8,743	9,263	9,454	9,222	8,609	7,834
GP1	7,829	8,011	8,702	9,207	9,388	9,165	8,561	7,806
Target	7,829	8,011	8,602	8,847	8,760	8,398	7,793	7,090

	Median Discount Rate							
	2024	2025	2030	2035	2040	2045	2050	2054
GP6	6.8%	6.8%	6.1%	5.5%	5.5%	5.5%	5.5%	5.5%
GP5	6.8%	6.8%	6.4%	6.1%	5.5%	5.5%	5.5%	5.5%
GP4	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%	5.5%	5.5%
GP3	6.8%	6.8%	6.8%	6.4%	5.9%	5.5%	5.5%	5.5%
GP2	6.8%	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%	5.5%
GP1	6.8%	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%	5.5%
Target	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%

- Actuarial liability forecast vary by Glide Path due to possible change in the discount rate
- A decrease in the discount rate results in a higher liability which may trigger higher contributions
- Actuarial Liability projections are slightly lower under contribution cap policies as de-risking is triggered with less frequency

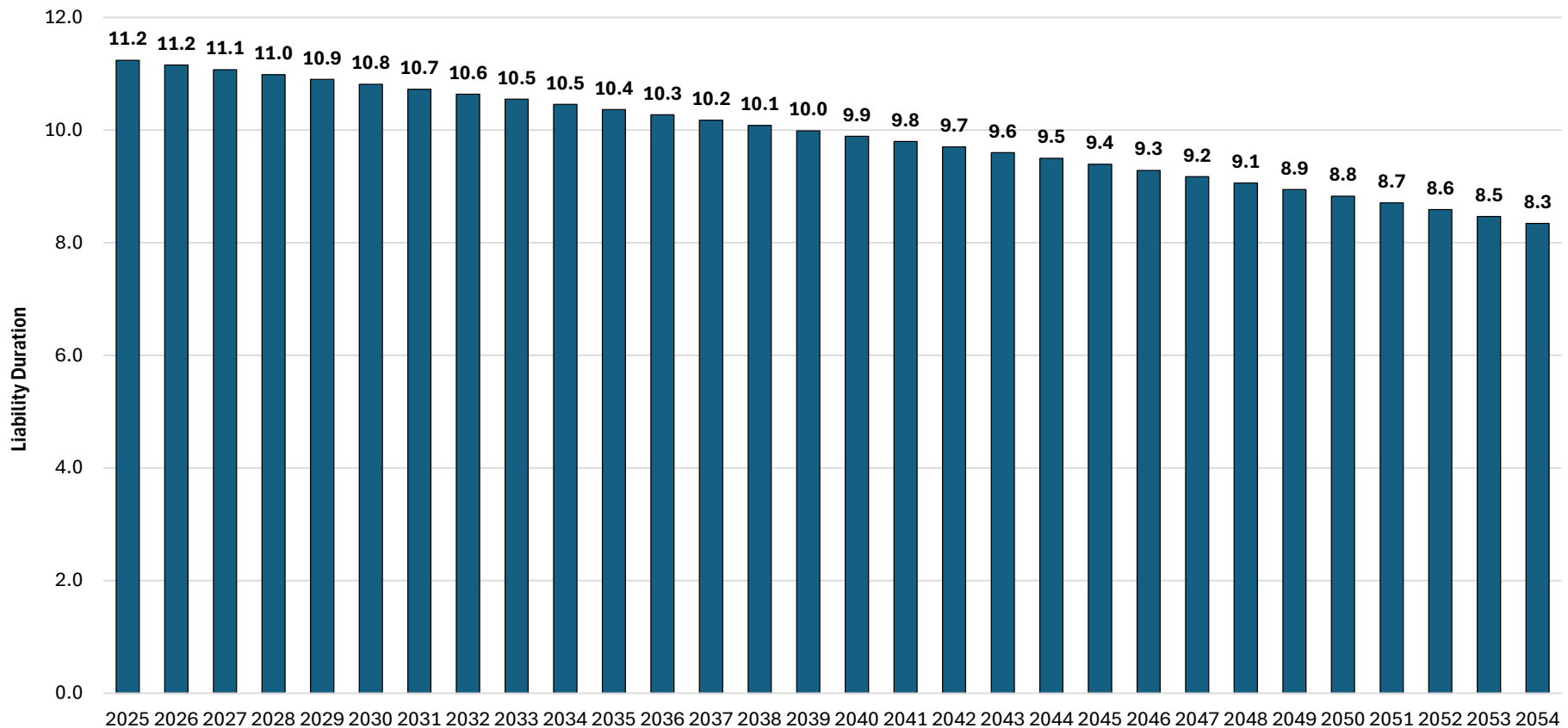
All Mixes: Benefit Payments



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	
Worse Case (97.5th)	486	502	517	532	549	566	581	596	610	627	642	655	667	678	688	697	705	711	718	725	732	739	743	747	753	760	764	772	774	773	772	
75th Percentile	486	501	515	530	545	560	573	587	600	614	627	638	648	657	665	672	679	683	688	692	695	699	703	705	707	710	711	713	710	706	701	
Expected (50th)	486	500	514	528	542	556	569	581	593	607	619	629	638	646	653	658	663	667	670	673	676	678	680	681	681	682	682	682	678	673	667	
25th Percentile	486	499	512	525	538	552	564	575	586	599	609	618	626	633	639	644	647	650	652	654	656	657	657	657	657	655	655	654	654	651	645	638
2.5th Percentile	486	497	508	519	530	542	551	561	571	581	591	599	605	610	615	618	619	621	622	622	622	621	619	616	612	610	606	605	598	591	582	
Range	0	5	9	14	19	24	29	34	39	46	51	56	63	68	73	79	86	91	96	103	111	118	124	131	141	149	158	168	177	181	191	

- Benefit payments vary by inflation not by de-risking alternative
- Benefit payments are expected to peak in 20 – 28 years (outlined in table)

Liability Duration



- Liability Duration measures how sensitive the liability is to a change in the discount rate, i.e., it is the approximate percentage change in value for a 1.0% change in the discount rate
- Future de-risking to a more conservative asset allocation may result in a drop in the discount rate which will cause the liability to increase (funded status to fall)
- CMERS liability duration is long but it will gradually decline as the Plan winds down

Glide Path #1 (GP1)

	Initial	80%	85%	90%	95%	100%	105%	110%
Public Equity	39%	34%	25%	30%	24%	19%	15%	10%
Fixed Income + Cash	29%	36%	46%	53%	66%	73%	83%	90%
- Core	18%	25%	35%	41%	54%	63%	76%	85%
- High Yield	10%	10%	10%	10%	9%	7%	4%	0%
- Cash	1%	1%	1%	2%	3%	3%	3%	5%
Real Assets	13%	11%	10%	8%	6%	5%	0%	0%
- Liquid Real Assets	3%	3%	3%	3%	2%	2%	0%	0%
- Private Real Estate	10%	8%	7%	5%	4%	3%	0%	0%
Private Equity	12%	10%	10%	4%	0%	0%	0%	0%
Absolute Return	7%	9%	9%	5%	4%	3%	2%	0%
	100%	100%	100%	100%	100%	100%	100%	100%
30-Year Expected Return	7.6%	7.4%	7.1%	6.9%	6.4%	6.1%	5.8%	5.5%
10-Year Expected Return	7.5%	7.3%	7.0%	6.8%	6.4%	6.1%	5.9%	5.5%
Actuarial Discount Rate *	6.8%	6.8%	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%
Standard Deviation	12.2%	10.8%	9.3%	8.5%	6.5%	5.6%	4.8%	4.2%
Public & Private Equity	51%	44%	35%	34%	24%	19%	15%	10%
Illiquid Investments	29%	27%	26%	14%	8%	6%	2%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

- What is a glide path

Glide Path #2 (GP2)

	Initial	80%	85%	90%	95%	100%	105%
Public Equity	34%	25%	30%	24%	19%	15%	10%
Fixed Income + Cash	36%	46%	53%	66%	73%	83%	90%
- Core	25%	35%	41%	54%	63%	76%	85%
- High Yield	10%	10%	10%	9%	7%	4%	0%
- Cash	1%	1%	2%	3%	3%	3%	5%
Real Assets	11%	10%	8%	6%	5%	0%	0%
- Liquid Real Assets	3%	3%	3%	2%	2%	0%	0%
- Private Real Estate	8%	7%	5%	4%	3%	0%	0%
Private Equity	10%	10%	4%	0%	0%	0%	0%
Absolute Return	<u>9%</u>	<u>9%</u>	<u>5%</u>	<u>4%</u>	<u>3%</u>	<u>2%</u>	<u>0%</u>
	100%	100%	100%	100%	100%	100%	100%
30-Year Expected Return	7.4%	7.1%	6.9%	6.4%	6.1%	5.8%	5.5%
10-Year Expected Return	7.3%	7.0%	6.8%	6.4%	6.1%	5.9%	5.5%
Actuarial Discount Rate *	6.8%	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%
Standard Deviation	10.8%	9.3%	8.5%	6.5%	5.6%	4.8%	4.2%
Public & Private Equity	44%	35%	34%	24%	19%	15%	10%
Illiquid Investments	27%	26%	14%	8%	6%	2%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

Glide Path #3 (GP3)

	Initial	80%	85%	90%	95%	100%
Public Equity	25%	30%	24%	19%	15%	10%
Fixed Income + Cash	46%	53%	66%	73%	83%	90%
- Core	35%	41%	54%	63%	76%	85%
- High Yield	10%	10%	9%	7%	4%	0%
- Cash	1%	2%	3%	3%	3%	5%
Real Assets	10%	8%	6%	5%	0%	0%
- Liquid Real Assets	3%	3%	2%	2%	0%	0%
- Private Real Estate	7%	5%	4%	3%	0%	0%
Private Equity	10%	4%	0%	0%	0%	0%
Absolute Return	<u>9%</u>	<u>5%</u>	<u>4%</u>	<u>3%</u>	<u>2%</u>	<u>0%</u>
	100%	100%	100%	100%	100%	100%
30-Year Expected Return	7.1%	6.9%	6.4%	6.1%	5.8%	5.5%
10-Year Expected Return	7.0%	6.8%	6.4%	6.1%	5.9%	5.5%
Actuarial Discount Rate *	6.8%	6.8%	6.4%	6.1%	5.9%	5.5%
Standard Deviation	9.3%	8.5%	6.5%	5.6%	4.8%	4.2%
Public & Private Equity	35%	34%	24%	19%	15%	10%
Illiquid Investments	26%	14%	8%	6%	2%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

Glide Path #4 (GP4)

	Initial	80%	85%	90%	95%
Public Equity	30%	24%	19%	15%	10%
Fixed Income + Cash	53%	66%	73%	83%	90%
- Core	41%	54%	63%	76%	85%
- High Yield	10%	9%	7%	4%	0%
- Cash	2%	3%	3%	3%	5%
Real Assets	8%	6%	5%	0%	0%
- Liquid Real Assets	3%	2%	2%	0%	0%
- Private Real Estate	5%	4%	3%	0%	0%
Private Equity	4%	0%	0%	0%	0%
Absolute Return	<u>5%</u>	<u>4%</u>	<u>3%</u>	<u>2%</u>	<u>0%</u>
	100%	100%	100%	100%	100%
30-Year Expected Return	6.9%	6.4%	6.1%	5.8%	5.5%
10-Year Expected Return	6.8%	6.4%	6.1%	5.9%	5.5%
Actuarial Discount Rate *	6.8%	6.4%	6.1%	5.9%	5.5%
Standard Deviation	8.5%	6.5%	5.6%	4.8%	4.2%
Public & Private Equity	34%	24%	19%	15%	10%
Illiquid Investments	14%	8%	6%	2%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

Glide Path #5 (GP5)

	Initial	80%	85%	90%
Public Equity	34%	24%	19%	10%
Fixed Income + Cash	36%	66%	73%	90%
- Core	25%	54%	63%	85%
- High Yield	10%	9%	7%	0%
- Cash	1%	3%	3%	5%
Real Assets	11%	6%	5%	0%
- Liquid Real Assets	3%	2%	2%	0%
- Private Real Estate	8%	4%	3%	0%
Private Equity	10%	0%	0%	0%
Absolute Return	9%	4%	3%	0%
	100%	100%	100%	100%
30-Year Expected Return	7.4%	6.4%	6.1%	5.5%
10-Year Expected Return	7.3%	6.4%	6.1%	5.5%
Actuarial Discount Rate *	6.8%	6.4%	6.1%	5.5%
Standard Deviation	10.8%	6.5%	5.6%	4.2%
Public & Private Equity	44%	24%	19%	10%
Illiquid Investments	27%	8%	6%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

Glide Path #6 (GP6)

	Initial	80%	85%
Public Equity	25%	19%	10%
Fixed Income + Cash	46%	73%	90%
- Core	35%	63%	85%
- High Yield	10%	7%	0%
- Cash	1%	3%	5%
Real Assets	10%	5%	0%
- Liquid Real Assets	3%	2%	0%
- Private Real Estate	7%	3%	0%
Private Equity	10%	0%	0%
Absolute Return	9%	3%	0%
	100%	100%	100%
30-Year Expected Return	7.1%	6.1%	5.5%
10-Year Expected Return	7.0%	6.1%	5.5%
Actuarial Discount Rate *	6.8%	6.1%	5.5%
Standard Deviation	9.3%	5.6%	4.2%
Public & Private Equity	35%	19%	10%
Illiquid Investments	26%	6%	0%

* Discount rate employed if de-risk to corresponding asset mix. Discount rate calculated as lesser of 6.8% and Callan 10-Year Expected Return

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September 30, 2024



City of Milwaukee Employees' Retirement System

Investment Measurement Service
Quarterly Review

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September 30, 2024

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U.S. EQUITIES

U.S. market reaches record high after spike in volatility

- The U.S. equity market had a disappointing start to 3Q24 as the S&P 500 Index dropped in July.
- But the market rallied in the last months of 3Q to end the quarter at a record high.
- All sectors within the S&P 500 posted positive returns over the quarter except for the Energy sector. As a result of the Fed’s rate cut decision, the bond proxy sectors (Real Estate and Utilities) performed the best.
- During 3Q, value outperformed growth across the market cap spectrum. Small cap stocks outperformed large cap stocks.
- Narrow leadership continues to be an issue for U.S. stocks. YTD, the “Magnificent Seven” stock returns accounted for 45% of the returns of the S&P 500 Index.

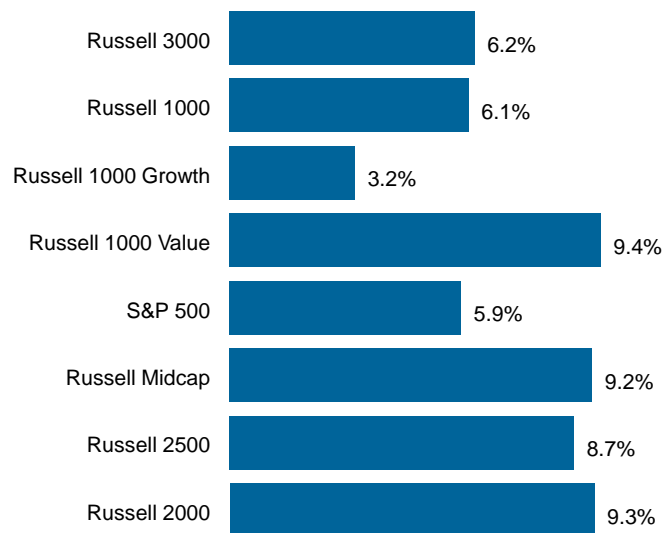
Top performers have broadened out

- The “Magnificent Seven” stocks experienced increased volatility and mixed results in 3Q. Four of these stocks underperformed the S&P 500 Index.
- Better earnings growth expectations for the market relative to the “Magnificent Seven” could result in broader market leadership.
- Although the long-term trend may have reversed in the last quarter, a large percentage of S&P 500 Index returns since 2021 are attributable to the “Magnificent Seven.”

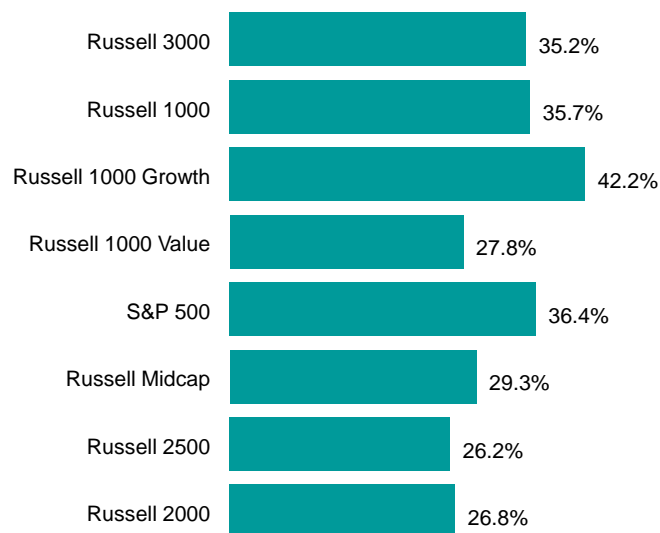
Small cap valuations

- Small cap relative valuations are historically low across numerous forward and trailing valuation multiples.
- Small cap continues to trade at large discounts relative to large cap.
- This may be indicative of an attractive entry point for increased allocation.

U.S. Equity: Quarterly Returns

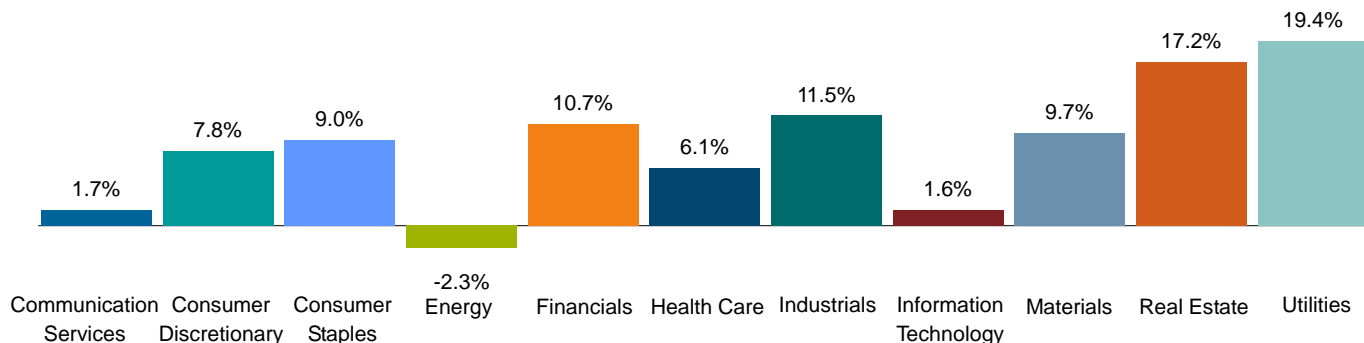


U.S. Equity: One-Year Returns



Sources: FTSE Russell, S&P Dow Jones Indices

S&P Sector Returns, Quarter Ended 9/30/24



Source: S&P Dow Jones Indices

GLOBAL EQUITIES

Global ex-U.S. markets outpace U.S. as technology lags

- Global equity markets rose while central banks began easing monetary policy and cutting interest rates.
- Market gains broadened to include more value stocks and previously underperforming sectors.
- Global ex-U.S. markets outpaced U.S. markets as the technology sector, a large portion of the U.S. market, faced pressure from AI spending scrutiny.
- Emerging markets outperformed developed markets with Asia being the strongest region within emerging markets.

Emerging markets

- China led a sharp rally higher in emerging markets after the Chinese government announced extensive stimulus measures aimed at tackling weakening economic activity, deflation, and its deteriorating property market.

Growth vs. value

- Generally, value-oriented sectors led markets higher as the technology sector hindered growth concerns. One exception was China, as stimulus announcements boosted beaten-down Chinese tech companies.

U.S. dollar strength

- The U.S. Dollar Index (DXY), declined over 3Q amid a much-anticipated rate cut by the U.S. Federal Reserve.

Quality growth managers struggle

- While outperforming in 2022, global quality growth managers have struggled since 2023, as high-growth names, often viewed as low-quality, have driven much of the market.

High growth rewarded last 18 months

- While high-growth managers were punished in 2022, they performed exceptionally well in 2023 and 2024.
- Still, on a three-year basis, quality growth managers have tended to outperform high-growth managers but still struggle against the ACWI index.

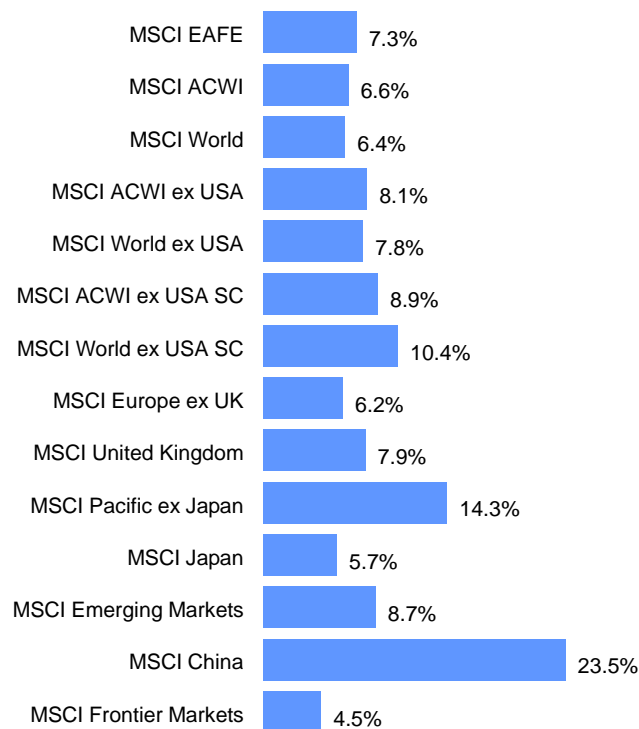
China’s stimulus: what and why

- On Sept. 24, 2024, China announced a broad economic stimulus package. This is likely due to declining consumer sentiment and investor pressure.

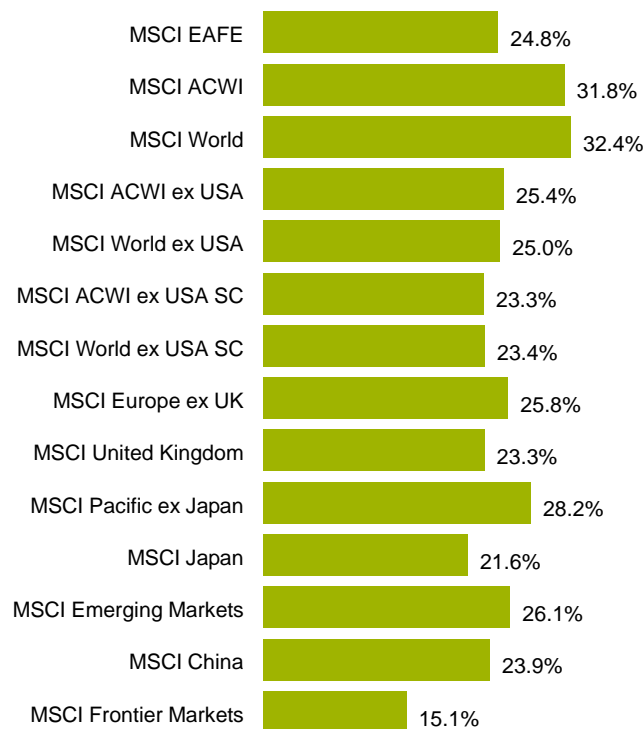
Results

- Stock markets initially rallied between 10%-30%, moving into YTD gain territory. Valuations are still at 10-year lows.
- China has the worst pass-through from GDP growth to earnings and investor returns since 2010. While the stimulus may assist with GDP growth, it may not correlate to better stock performance.

Global Equity: Quarterly Returns



Global Equity: One-Year Returns



Source: MSCI

U.S. FIXED INCOME

Rate cut spurs market rally

- The Fed lowered rates for the first time since 2020, reducing its overnight target by 50 bps; Fed “dot plot” indicates two more cuts by year-end.
- U.S. Treasuries fell across the curve; 10-year Treasury yield declined to 3.81% from 4.36% at the beginning of the quarter.
- The yield curve took a step toward normalization with the 2s/10s ending positive, though rates at the front-end remain elevated vs. intermediate- and long-term.

Performance and drivers

- The Bloomberg US Aggregate Index gained 5.2%, the second-best quarter in nearly 30 years, led by the rally in rates.
- Investment grade corporates and all securitized sectors outperformed U.S. Treasuries on a duration-adjusted basis.
- High yield corporate excess returns (+1.7%) outpaced investment grade corporates excess returns (+0.8%).

Valuations

- Despite significant widening in late July, both IG and HY spreads ended tighter over the quarter.
- HY defaults declined to 1.8%, while bank loans rose to 3.1%, widening the gap between them to the highest since 2014.
- New issuance continued to be strong, adding \$424 billion in IG and \$78 billion in HY debt.

Munis posted gains but underperformed U.S. Treasuries

- Bloomberg Municipal Bond Index (+2.7%) vs Bloomberg US Treasury Index (+4.7%)

AAA-rated muni yield curve normalized

- 2-year and 10-year AAA rates fell by 77 bps and 23 bps, respectively; spread now +24 bps
- Maximum inversion of -50 bps was April 2024
- Followed path of U.S. Treasury yield curve, which also normalized during the quarter (2-year vs 10-year)

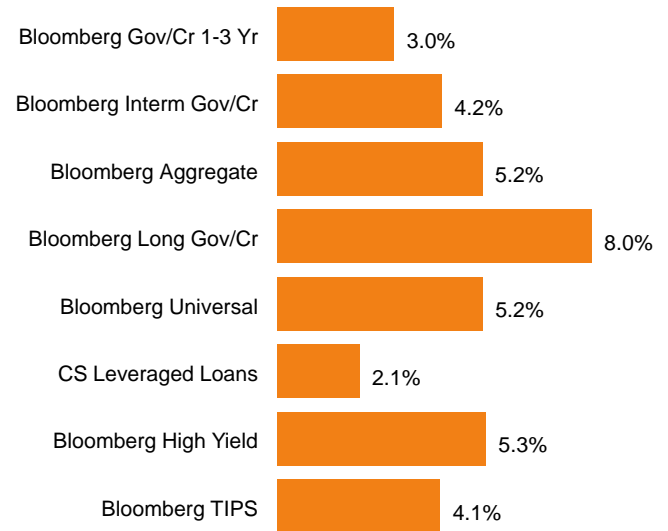
Quality was not a major differentiator in 3Q

- AAA: 2.8%
- AA: 2.7%
- A: 2.7%
- BBB: 2.9%

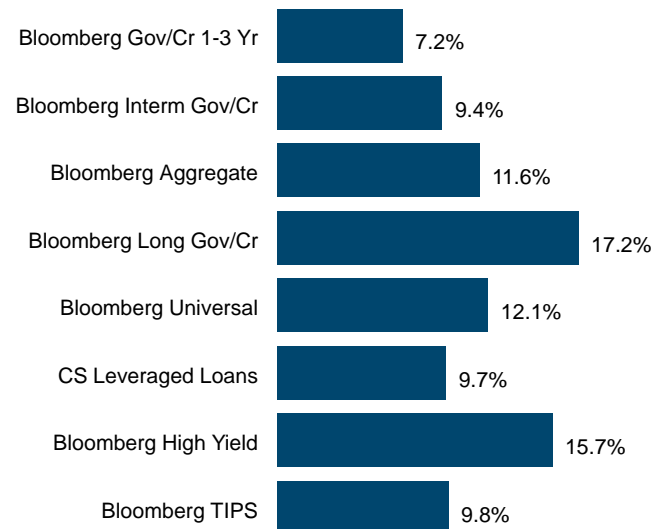
Muni valuations vs. U.S. Treasuries remain rich

- 10-year AAA Muni/10-year U.S. Treasury yield ratio rich relative to 10-year median (69% now vs. 85% historical)
- Need for increased infrastructure spending could benefit municipal bond issuance in years to come

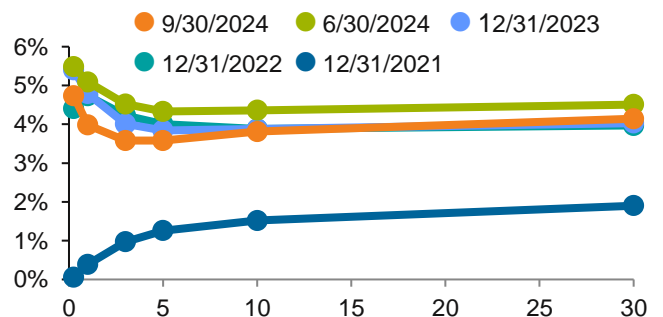
U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: One-Year Returns



U.S. Treasury Yield Curves



Sources: Bloomberg, Credit Suisse

U.S. FIXED INCOME (continued)

Fed makes first cut, and markets anticipate more

- The Fed cut rates in September with a 50 bps decrease, citing a slowdown in job gains, higher unemployment, and inflation nearing its target of 2%. The move marked the first reduction since March 2020.
- Fed Funds futures now imply three additional rate cuts by year end and seven more over the coming year.
- Yields fell across the curve by no less than 37 bps, and the spread between 2-year and 10-year rates became positive for the first time since July 5, 2022, ending the quarter at +15 bps. However, the front end remains well above intermediate- and long-term rates.

Corporate new debt issuance remains robust

- Investment-grade corporate issuers continued the surge of new debt, issuing \$424 billion in 3Q, bringing the total YTD to more than \$1.3 trillion, already more than 7 of the last 10 years. At the current pace, new issuance will surpass \$1.7 trillion by year-end, the second-highest total on record.
- High yield new issuance was also robust, with approximately \$78 billion issued over the quarter. This brings the total issuance YTD to nearly \$250 billion, more than each of the last two calendar years.
- Concerning labor reports in late July initially led to a pullback in the market.
- But spreads narrowed once again with both IG and HY ending the quarter tighter than they began.

GLOBAL FIXED INCOME

Macro environment

- Developed market rates declined as growth and inflation expectations moved lower.
- Several central banks cut rates over the quarter while the Bank of Japan unexpectedly raised its target to 0.25%, its highest rate since 2008.

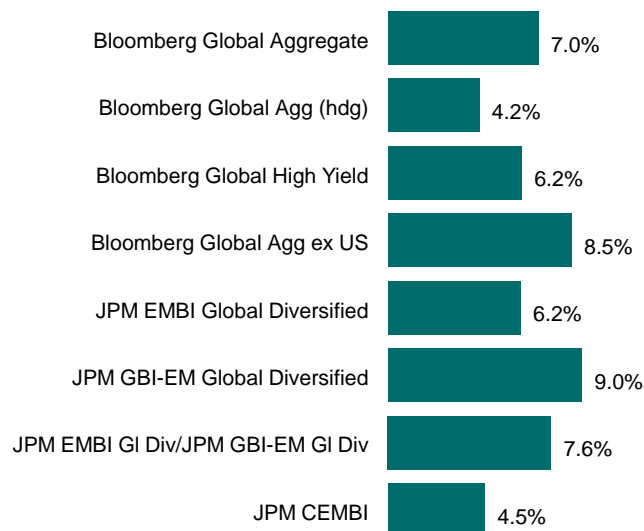
U.S. dollar weakens

- The U.S. dollar weakened relative to major currencies, reversing the trend from the first half of the year and enhancing returns for unhedged investors.
- Within the U.S. Dollar Index (DXY), Japanese yen saw the largest relative gain, rising 12% vs. the U.S dollar.

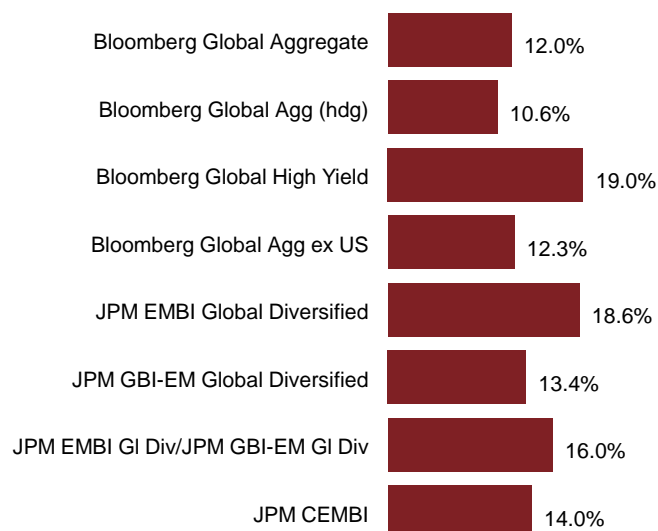
Emerging market debt posts strong quarter

- EM central banks broadly continued their easing policies, though Brazil raised its rate and signaled future hikes.
- The rally in EM currencies enhanced returns for EM debt, with the JPM GBI-EM Global Diversified Index gaining 9.0%.

Global Fixed Income: Quarterly Returns

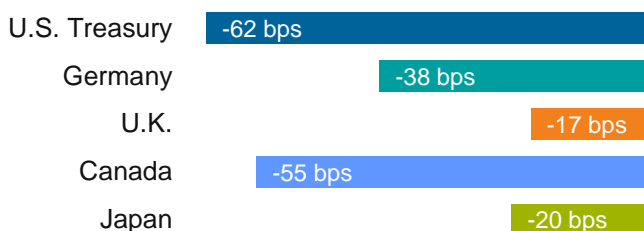


Global Fixed Income: One-Year Returns



Change in 10-Year Global Government Bond Yields

2Q24 to 3Q24



Sources: Bloomberg, JP Morgan

Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of September 30, 2024, with the distribution as of June 30, 2024. The change in asset distribution is broken down into the dollar change due to Net New Investment and the dollar change due to Investment Return.

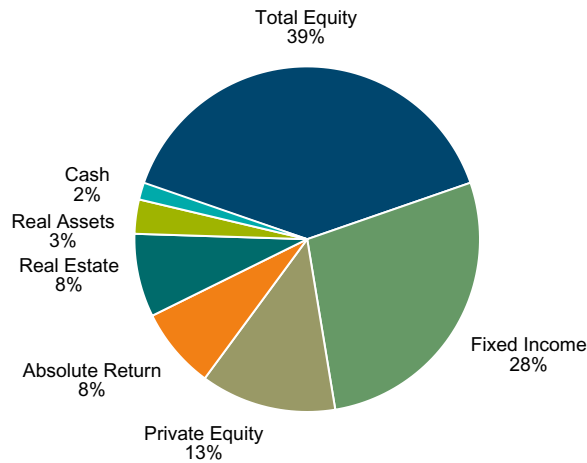
Asset Distribution Across Investment Managers

	September 30, 2024			Inv. Return	June 30, 2024	
	Market Value	Weight	Net New Inv.		Market Value	Weight
Total Domestic Equity	\$1,067,085,622	17.60%	\$(42,100,000)	\$73,958,041	\$1,035,227,582	17.56%
BlackRock Russell 1000 Value	207,391,160	3.42%	(16,900,000)	18,742,537	205,548,622	3.49%
DFA Large Cap Value	151,270,256	2.49%	(3,800,000)	10,667,009	144,403,247	2.45%
Northern Trust Global	208,265,735	3.44%	(12,700,000)	11,847,974	209,117,761	3.55%
Polen Capital Management	120,262,849	1.98%	(8,700,000)	4,294,694	124,668,155	2.11%
Earnest Partners LLC	180,781,290	2.98%	0	14,068,011	166,713,279	2.83%
DFA Small Cap Value	199,114,333	3.28%	0	14,337,816	184,776,517	3.13%
Total Global Equity	\$476,906,041	7.87%	\$(21,100,000)	\$28,482,354	\$469,523,687	7.96%
BlackRock Global Alpha Tilts	262,608,446	4.33%	(15,900,000)	13,700,841	264,807,605	4.49%
MFS Investment Management	214,297,595	3.53%	(5,200,000)	14,781,513	204,716,082	3.47%
Total International Equity	\$849,551,195	14.01%	\$(61,096,711)	\$67,233,244	\$843,414,662	14.31%
AQR Emerging Markets	109,292,433	1.80%	(8,200,738)	2,905,063	114,588,108	1.94%
Brandes Investment Partners	329,879,038	5.44%	(35,300,000)	38,545,642	326,633,396	5.54%
William Blair & Company	238,782,997	3.94%	(8,711,142)	11,768,779	235,725,360	4.00%
DFA International Small Cap	171,596,727	2.83%	(8,884,831)	14,013,760	166,467,798	2.82%
Total Fixed Income	\$1,682,326,175	27.75%	\$0	\$84,329,898	\$1,597,996,277	27.11%
BlackRock US Govt Bond	429,870,009	7.09%	0	19,405,152	410,464,856	6.96%
Reams Asset Management	764,096,160	12.60%	0	37,116,899	726,979,261	12.33%
Loomis, Sayles & Company, L.P.	488,360,007	8.05%	0	27,807,847	460,552,159	7.81%
Total Private Equity	\$768,983,740	12.68%	\$(16,362,347)	\$3,773,432	\$781,572,655	13.26%
Abbott Capital Management 2010	15,779,656	0.26%	(350,000)	(199,499)	16,329,155	0.28%
Abbott Capital Management 2011	32,241,690	0.53%	(2,475,000)	(493,925)	35,210,615	0.60%
Abbott Capital Management 2012	29,376,981	0.48%	(2,400,000)	(623,335)	32,400,316	0.55%
Abbott Capital Management 2013	29,599,336	0.49%	(1,400,000)	(402,489)	31,401,825	0.53%
Abbott Capital Management 2014	33,263,320	0.55%	(875,000)	(498,475)	34,636,795	0.59%
Abbott Capital Management 2015	28,185,871	0.46%	(1,162,500)	(108,358)	29,456,729	0.50%
Abbott Capital Management 2016	25,877,825	0.43%	(1,740,000)	299,572	27,318,253	0.46%
Abbott Capital Management 2018	24,662,711	0.41%	0	395,324	24,267,387	0.41%
Abbott Capital Management 2019	22,471,958	0.37%	0	321,658	22,150,300	0.38%
Abbott Capital Management 2020	30,624,334	0.51%	0	327,964	30,296,370	0.51%
Abbott Capital Management 2021	10,576,917	0.17%	0	95,935	10,480,982	0.18%
Abbott Capital Management 2022	12,107,658	0.20%	557,812	(178,942)	11,728,787	0.20%
Abbott Capital Management 2023	3,431,410	0.06%	0	(106,708)	3,538,118	0.06%
Abbott Capital Management 2024	3,568,169	0.06%	2,400,000	(31,831)	1,200,000	0.02%
Mesirow V	32,241,789	0.53%	(1,650,000)	(929,907)	34,821,696	0.59%
Mesirow VI	55,895,421	0.92%	(2,820,000)	(373,304)	59,088,725	1.00%
Mesirow VII	126,051,351	2.08%	(3,700,000)	1,435,867	128,315,484	2.18%
Mesirow VIII	75,793,561	1.25%	3,600,000	543,487	71,650,074	1.22%
NB Secondary Opp Fund III	6,775,070	0.11%	0	150,722	6,624,348	0.11%
NB Secondary Opp Fund IV	16,774,457	0.28%	(664,484)	(46,223)	17,485,164	0.30%
NB Secondary Opp Fund V	50,188,293	0.83%	960,543	1,507,256	47,720,494	0.81%
Private Advisors VI	18,688,027	0.31%	(2,565,292)	424,161	20,829,158	0.35%
Private Advisors VII	12,820,318	0.21%	(1,021,066)	207,657	13,633,727	0.23%
Private Advisors VIII	20,355,991	0.34%	(568,277)	1,114,496	19,809,772	0.34%
Private Advisors IX	37,513,618	0.62%	(613,484)	708,794	37,418,308	0.63%
Apogem Capital X	14,118,008	0.23%	124,400	233,535	13,760,073	0.23%
Absolute Return	\$457,774,165	7.55%	\$(12,000,000)	\$11,193,467	\$458,580,698	7.78%
Aptitude	186,960,878	3.08%	(12,000,000)	4,211,070	194,749,808	3.30%
UBS A & Q	270,813,287	4.47%	0	6,982,397	263,830,890	4.48%
Real Assets	\$191,727,963	3.16%	\$(287,927)	\$14,110,771	\$177,905,119	3.02%
Principal DRA	191,727,963	3.16%	(287,927)	14,110,771	177,905,119	3.02%
Total Real Estate	\$471,728,582	7.78%	\$8,001,789	\$2,356,179	\$461,370,614	7.83%
Real Estate	471,728,582	7.78%	8,001,789	2,356,179	461,370,614	7.83%
Total Cash	\$96,943,034	1.60%	\$25,581,859	\$1,388,442	\$69,972,732	1.19%
Cash	96,943,034	1.60%	25,581,859	1,388,442	69,972,732	1.19%
Total Fund	\$6,063,026,517	100.0%	\$(119,363,336)	\$286,825,828	\$5,895,564,025	100.0%

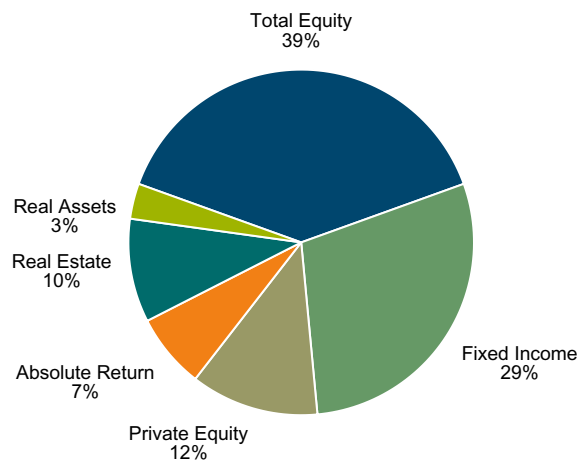
Actual vs Target Asset Allocation As of September 30, 2024

The first chart below shows the Fund's asset allocation as of September 30, 2024. The second chart shows the Fund's target asset allocation as outlined in the investment policy statement.

Actual Asset Allocation



Target Asset Allocation



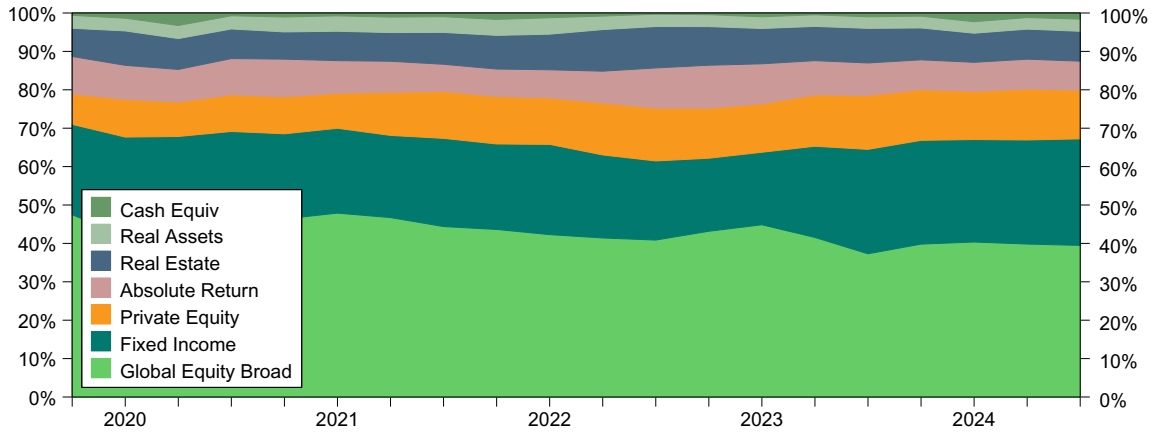
Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Total Equity	2,393,543	39.5%	39.0%	0.5%	28,963
Fixed Income	1,682,326	27.7%	29.0%	(1.3%)	(75,951)
Private Equity	768,984	12.7%	12.0%	0.7%	41,421
Absolute Return	457,774	7.6%	7.0%	0.6%	33,362
Real Estate	471,729	7.8%	9.7%	(1.9%)	(116,385)
Real Assets	191,728	3.2%	3.3%	(0.1%)	(8,352)
Cash	96,943	1.6%	0.0%	1.6%	96,943
Total	6,063,027	100.0%	100.0%		

* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

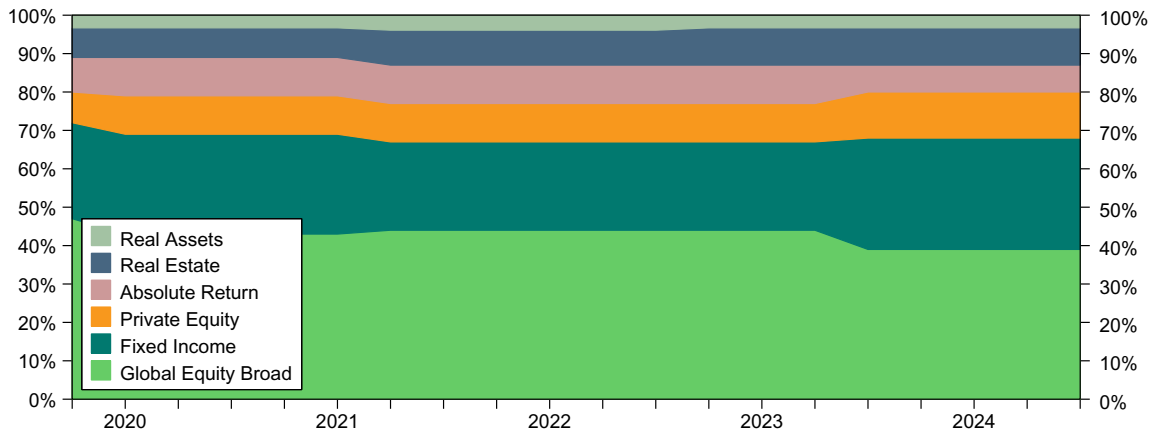
Actual vs Target Historical Asset Allocation

The Historical asset allocation for a fund is by far the largest factor explaining its performance. The charts below show the fund's historical actual asset allocation, the fund's historical target asset allocation, and the historical asset allocation of the average fund in the Callan Public Fund Sponsor Database.

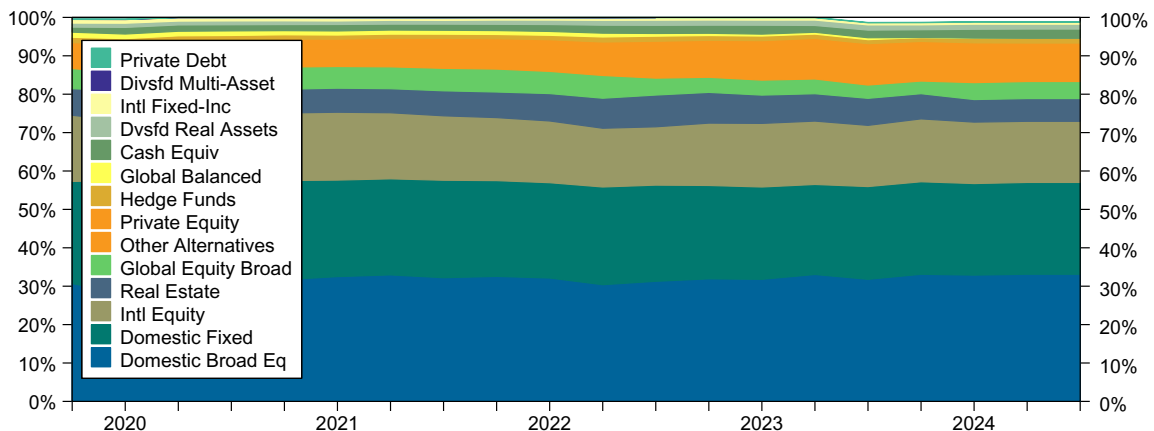
Actual Historical Asset Allocation



Target Historical Asset Allocation



Average Callan Public Fund Sponsor Database Historical Asset Allocation



* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

Total Fund

Period Ended September 30, 2024

Investment Philosophy

The Public Fund Sponsor Database consists of public employee pension total funds including both Callan Associates client and surveyed non-client funds. Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 7.0% 3-month Treasury Bill+3.0%, 9.7% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.3% Principal Blended Benchmark.

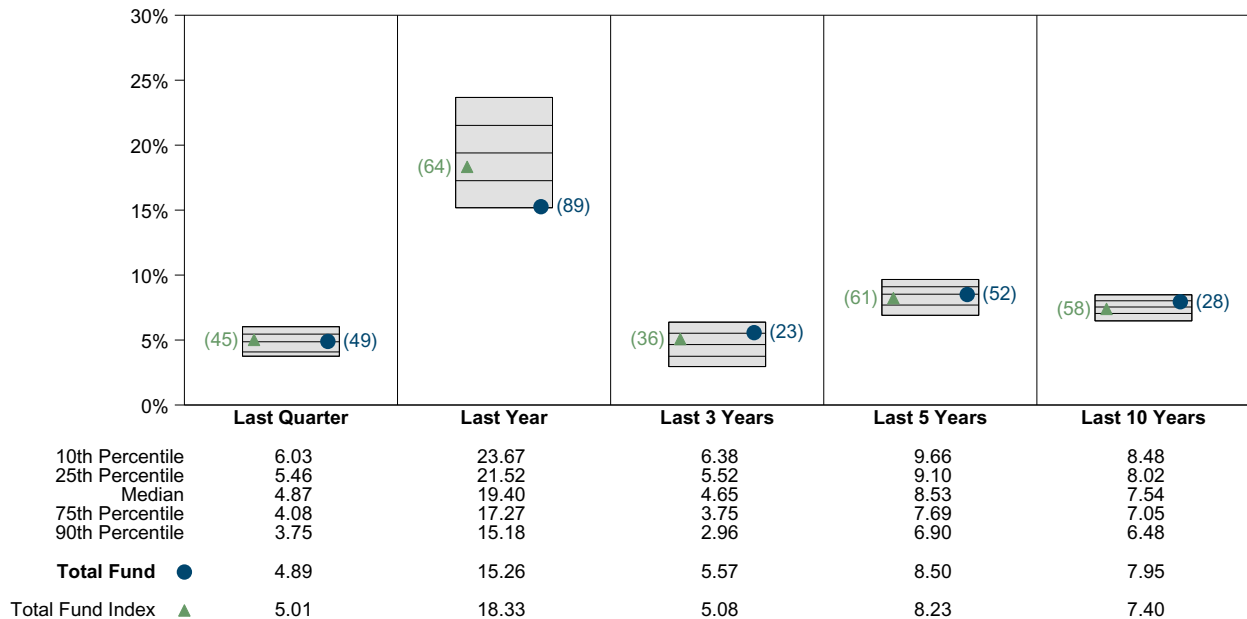
Quarterly Summary and Highlights

- Total Fund's portfolio posted a 4.89% return for the quarter placing it in the 49 percentile of the Callan Public Fund Sponsor Database group for the quarter and in the 89 percentile for the last year.
- Total Fund's portfolio underperformed the Total Fund Index by 0.12% for the quarter and underperformed the Total Fund Index for the year by 3.07%.

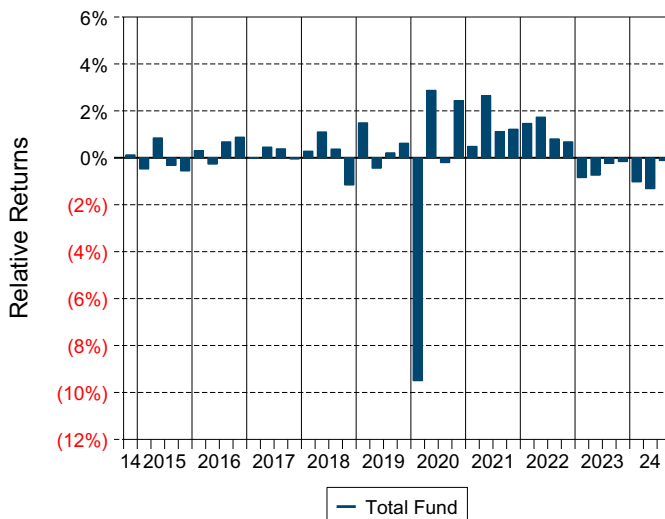
Quarterly Asset Growth

Beginning Market Value	\$5,895,564,025
Net New Investment	\$-119,363,336
Investment Gains/(Losses)	\$286,825,828
Ending Market Value	\$6,063,026,517

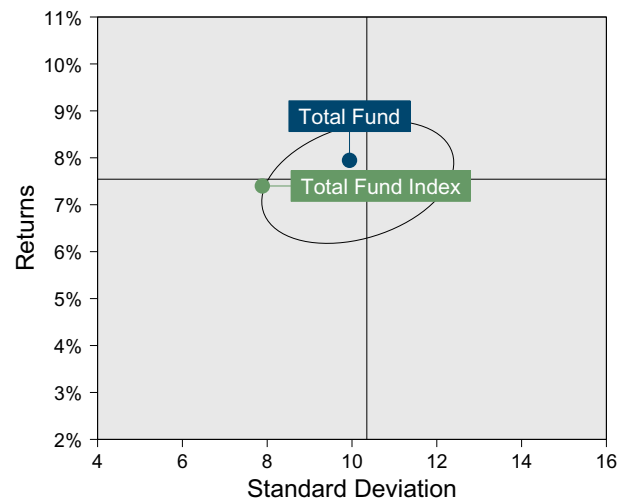
Performance vs Callan Public Fund Sponsor Database (Gross)



Relative Return vs Total Fund Index



Callan Public Fund Sponsor Database (Gross) Annualized Ten Year Risk vs Return

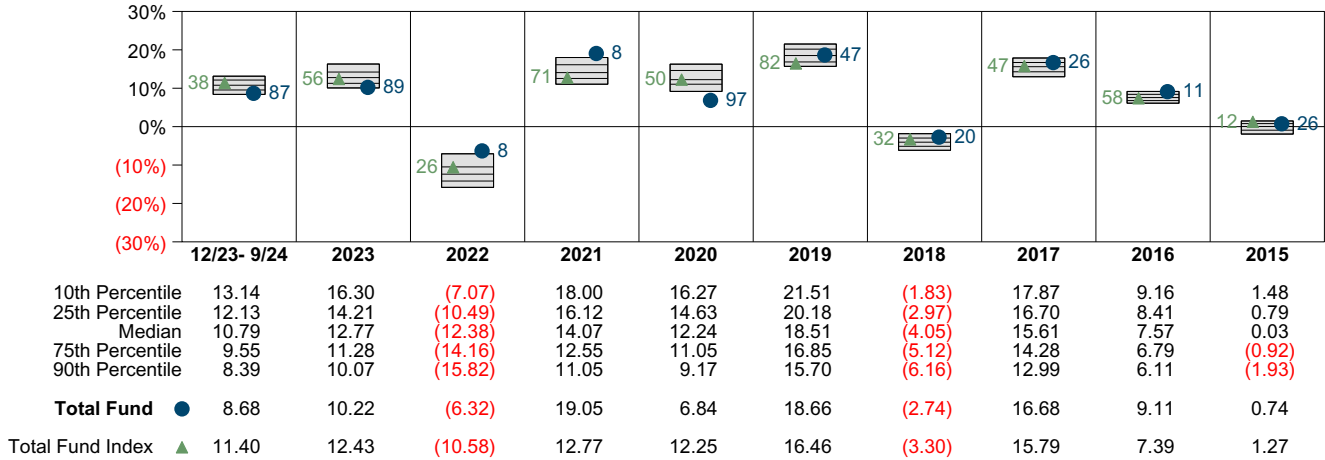


Total Fund Return Analysis Summary

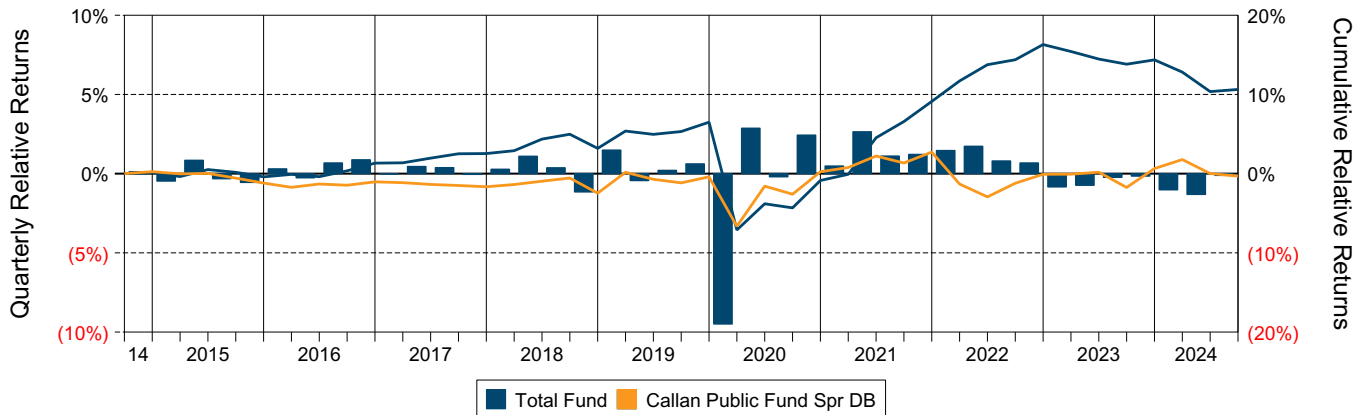
Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

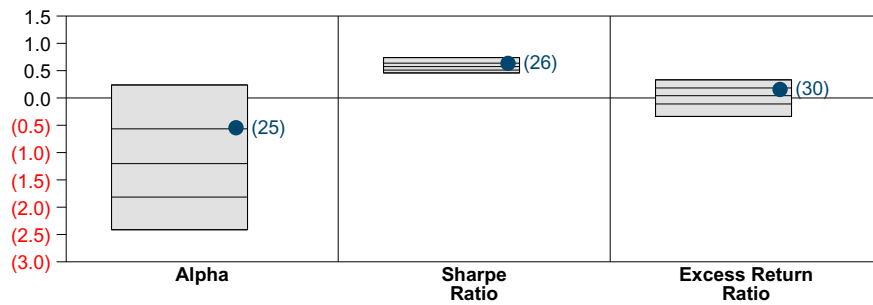
Performance vs Callan Public Fund Sponsor Database (Gross)



Cumulative and Quarterly Relative Returns vs Total Fund Index



Risk Adjusted Return Measures vs Total Fund Index Rankings Against Callan Public Fund Sponsor Database (Gross) Ten Years Ended September 30, 2024



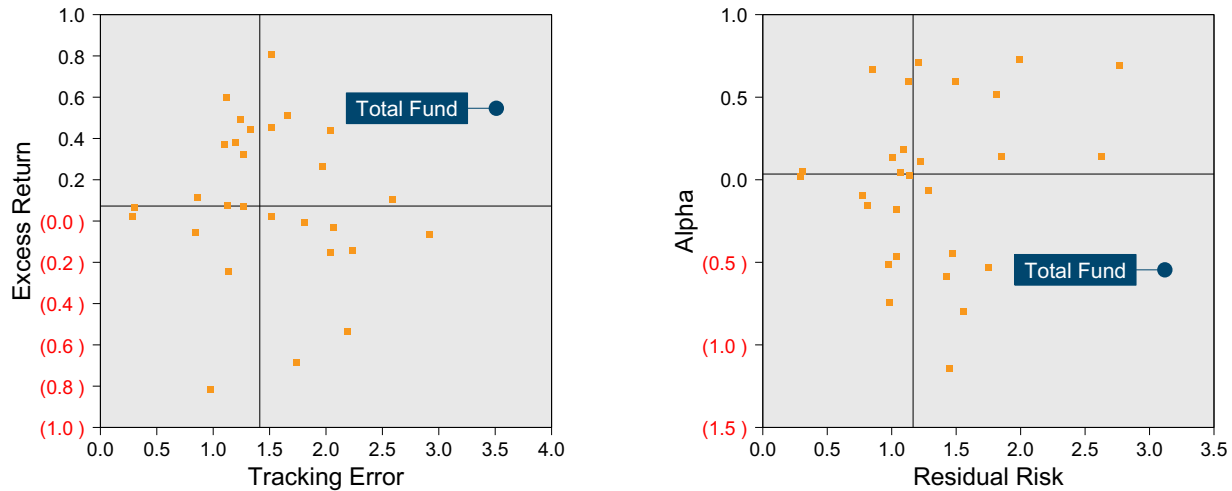
Total Fund

Total Fund vs Target Risk Analysis

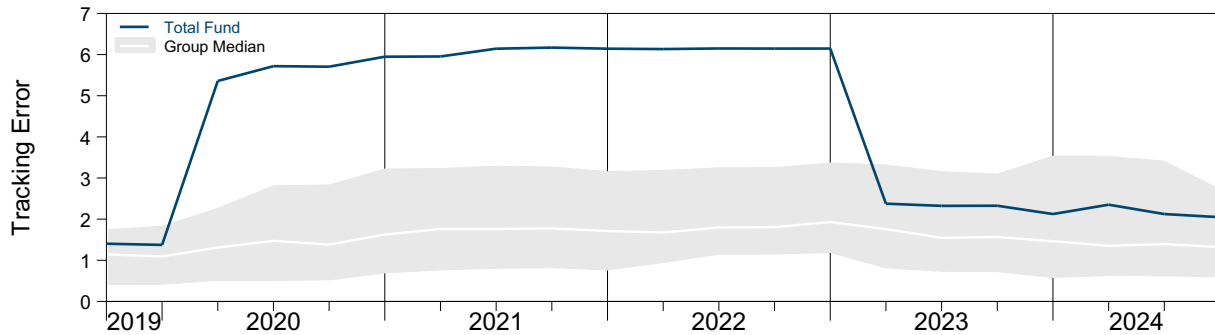
Risk Analysis

The graphs below analyze the performance and risk of the fund relative to the appropriate target mix. This relative performance is compared to a peer group of funds wherein each member fund is measured against its own target mix. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the target. The second scatter chart displays the relationship, sometimes called Information Ratio, between alpha (market-risk or "beta" adjusted return) and residual risk (non-market or "unsystematic" risk). The third chart shows tracking error patterns over time compared to the range of tracking error patterns for the peer group. The last two charts show the ranking of the fund's risk statistics versus the peer group.

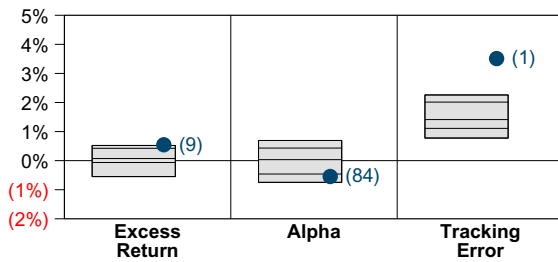
Risk Analysis vs Callan Public Fund Sponsor Database Ten Years Ended September 30, 2024



Rolling 12 Quarter Tracking Error vs Targets Compared to Callan Public Fund Sponsor Database



Risk Statistics Rankings vs Targets Rankings Against Callan Public Fund Sponsor Database Ten Years Ended September 30, 2024



10th Percentile 0.52
25th Percentile 0.42
Median 0.07
75th Percentile (0.06)
90th Percentile (0.55)

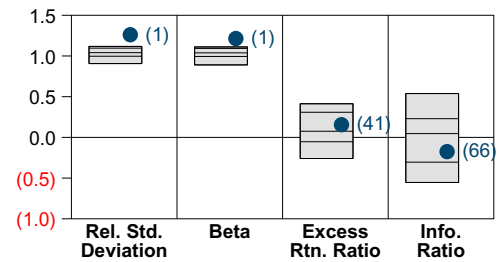
10th Percentile 0.69
25th Percentile 0.43
Median 0.03
75th Percentile (0.46)
90th Percentile (0.75)

10th Percentile 2.26
25th Percentile 2.01
Median 1.41
75th Percentile 1.11
90th Percentile 0.78

Total Fund ● 0.55

(9) (84) (0.55)

3.51



10th Percentile 1.12
25th Percentile 1.10
Median 1.04
75th Percentile 1.00
90th Percentile 0.91

10th Percentile 1.11
25th Percentile 1.09
Median 1.04
75th Percentile 0.99
90th Percentile 0.89

10th Percentile 0.41
25th Percentile 0.31
Median 0.08
75th Percentile (0.05)
90th Percentile (0.26)

10th Percentile 0.54
25th Percentile 0.23
Median 0.05
75th Percentile (0.30)
90th Percentile (0.55)

Total Fund ● 1.26

(1) (1) (41) (66)

0.16

(0.17)

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended September 30, 2024. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended September 30, 2024

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception	
Total Public Equity	7.42%		28.96%		7.68%		12.40%		11.39%	(1/16)
MSCI ACWI IMI	6.84%		30.96%		7.44%		11.87%		10.79%	(1/16)
Total Domestic Equity	7.25%	14	28.51%	91	7.87%	82	13.45%	76	8.42%	(7/98)
Russell 3000 Index	6.23%	74	35.19%	17	10.29%	31	15.26%	24	8.44%	(7/98)
Pub Pln- Dom Equity	6.59%		33.63%		9.74%		14.46%		-	
BlackRock Russell 1000 Value	9.45%	16	27.79%	53	9.04%	74	10.81%	85	9.65%	(4/17)
Russell 1000 Value Index	9.43%	16	27.76%	54	9.03%	74	10.69%	86	9.51%	(4/17)
Callan Large Cap Value	7.79%		28.20%		10.61%		12.41%		-	
DFA Large Cap Value	7.44%	63	26.65%	67	9.82%	60	11.18%	79	9.28%	(11/17)
Russell 1000 Value Index	9.43%	16	27.76%	54	9.03%	74	10.69%	86	9.54%	(11/17)
Callan Large Cap Value	7.79%		28.20%		10.61%		12.41%		-	
Northern Trust Global	5.88%	28	36.33%	54	11.93%	55	15.99%	51	11.17%	(8/88)
S&P 500 Index	5.89%	28	36.35%	54	11.91%	55	15.98%	51	11.13%	(8/88)
Callan Large Cap Core	5.09%		36.59%		12.16%		16.01%		-	
Polen Capital Management	3.59%	34	26.95%	93	0.20%	95	12.26%	94	15.01%	(7/12)
S&P 500 Index	5.89%	8	36.35%	73	11.91%	18	15.98%	70	14.64%	(7/12)
Callan Large Cap Growth	2.90%		40.79%		9.35%		17.29%		-	
Earnest Partners LLC	8.44%	38	25.78%	54	7.42%	44	12.90%	19	11.44%	(5/05)
Russell MidCap Index	9.21%	25	29.33%	22	5.75%	57	11.30%	53	10.06%	(5/05)
Callan Mid Capitalization	7.89%		26.05%		6.71%		11.48%		-	
DFA Small Cap Value	7.76%	72	24.60%	54	11.31%	10	15.45%	7	11.96%	(11/96)
Russell 2000 Value Index	10.15%	24	25.88%	41	3.77%	89	9.29%	79	9.13%	(11/96)
Callan Small Cap Value	8.37%		24.70%		7.04%		11.07%		-	
Total Global Equity	6.27%	39	31.44%	47	8.68%	38	12.94%	40	10.18%	(4/10)
MSCI World	6.36%	38	32.43%	36	9.08%	35	13.04%	38	10.17%	(4/10)
Callan Global Equity	5.74%		31.23%		7.75%		12.40%		-	
BlackRock Global Alpha Tilts	5.45%	58	33.76%	27	9.65%	27	13.10%	36	13.14%	(3/16)
MSCI ACWI Gross	6.72%	33	32.35%	36	8.60%	39	12.72%	42	12.74%	(3/16)
Callan Global Equity	5.74%		31.23%		7.75%		12.40%		-	
MFS Investment Management	7.29%	26	28.50%	60	7.46%	53	12.84%	41	12.74%	(12/12)
MSCI ACWI Gross	6.72%	33	32.35%	36	8.60%	39	12.72%	42	10.88%	(12/12)
Callan Global Equity	5.74%		31.23%		7.75%		12.40%		-	
Total International Equity	8.28%	13	28.05%	6	6.64%	5	10.61%	3	7.42%	(5/96)
MSCI EAFE	7.26%	77	24.77%	63	5.48%	21	8.20%	57	5.08%	(5/96)
Pub Pln- Intl Equity	7.62%		25.11%		4.14%		8.42%		-	
AQR Emerging Markets	2.78%	95	27.05%	33	2.55%	34	8.22%	24	7.26%	(8/16)
MSCI EM Gross	8.88%	23	26.54%	40	0.82%	44	6.15%	56	6.60%	(8/16)
Callan Emerging Broad	6.98%		24.82%		0.14%		6.50%		-	
Brandes Investment Partners	12.29%	1	30.80%	5	13.17%	1	12.07%	4	8.50%	(2/98)
MSCI EAFE	7.26%	51	24.77%	62	5.48%	42	8.20%	71	5.17%	(2/98)
Callan NonUS Eq	7.32%		25.64%		4.95%		8.93%		-	
William Blair & Company	5.15%	92	25.51%	52	(1.91%)	95	8.66%	56	7.72%	(12/03)
MSCI ACWIxUS Gross	8.17%	36	25.96%	47	4.67%	55	8.10%	72	6.99%	(12/03)
Callan NonUS Eq	7.32%		25.64%		4.95%		8.93%		-	
DFA International Small Cap	8.59%	61	26.68%	27	8.10%	8	10.37%	20	5.75%	(5/06)
MSCI EAFE Small	10.54%	20	23.48%	62	(0.36%)	58	6.40%	66	4.64%	(5/06)
Callan Intl Small Cap	9.02%		24.75%		0.19%		8.12%		-	

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended September 30, 2024. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended September 30, 2024

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception	
Total Fixed Income	5.28%	22	12.60%	26	1.51%	6	0.65%	87	6.60%	(12/87)
Bimbg Aggregate	5.20%	24	11.57%	65	(1.39%)	88	0.33%	95	5.47%	(12/87)
Pub Pln- Dom Fixed	4.84%		12.04%		(0.32%)		1.49%		-	
BlackRock US Govt Bond	4.73%	97	9.74%	100	-	-	-		(1.93%)	(12/21)
Bimbg Government	4.71%	97	9.68%	100	(1.72%)	97	(0.16%)	99	(2.05%)	(12/21)
Callan Core Bond FI	5.29%		12.34%		(0.97%)		0.91%		-	
Reams Asset Management	5.11%	86	12.62%	80	(0.11%)	16	2.84%	7	5.07%	(1/01)
Bimbg Aggregate	5.20%	76	11.57%	95	(1.39%)	90	0.33%	98	3.80%	(1/01)
Callan Core Plus FI	5.38%		13.17%		(0.68%)		1.50%		-	
Loomis, Sayles & Company, L.P.	6.04%	4	15.19%	2	0.65%	6	2.61%	9	8.14%	(12/87)
Bimbg Aggregate	5.20%	76	11.57%	95	(1.39%)	90	0.33%	98	5.47%	(12/87)
Callan Core Plus FI	5.38%		13.17%		(0.68%)		1.50%		-	
Total Private Equity	0.49%		1.85%		4.04%		16.42%		12.26%	(6/10)
Private Equity Benchmark (3)	3.72%		25.39%		10.48%		16.70%		-	
Abbott Capital Management 2010	(1.23%)		(10.38%)		(4.50%)		9.49%		0.77%	(6/10)
Abbott Capital Management 2011	(1.51%)		(10.27%)		(5.73%)		11.15%		3.70%	(6/11)
Abbott Capital Management 2012	(2.04%)		(8.79%)		(2.67%)		13.10%		10.14%	(7/12)
Abbott Capital Management 2013	(1.34%)		(7.34%)		(1.90%)		13.53%		10.90%	(5/13)
Abbott Capital Management 2014	(1.45%)		(7.69%)		(0.63%)		14.08%		10.26%	(4/14)
Abbott Capital Management 2015	(0.38%)		0.72%		5.26%		17.02%		12.92%	(4/15)
Abbott Capital Management 2016	1.16%		5.79%		8.51%		19.03%		12.65%	(3/16)
Abbott Capital Management 2018	1.63%		3.41%		9.03%		17.34%		13.41%	(7/18)
Abbott Capital Management 2019	1.45%		4.94%		8.12%		-		16.09%	(1/20)
Abbott Capital Management 2020	1.08%		5.96%		2.84%		-		16.87%	(1/21)
Abbott Capital Management 2021	0.92%		3.67%		4.92%		-		5.09%	(2/21)
Abbott Capital Management 2022	(1.51%)		(3.88%)		-		-		(1.82%)	(2/22)
Abbott Capital Management 2023	(3.02%)		3.05%		-		-		2.43%	(7/23)
Abbott Capital Management 2024	(1.22%)		-		-		-		(1.22%)	(6/24)
Mesirow V	(2.73%)		(4.31%)		(5.39%)		12.17%		13.54%	(6/10)
Mesirow VI	(0.65%)		(2.52%)		(1.35%)		17.69%		12.42%	(7/13)
Mesirow VII	1.13%		5.63%		7.31%		15.66%		4.08%	(6/17)
Mesirow VIII	0.72%		3.04%		1.52%		-		(0.40%)	(9/20)
NB Secondary Opp Fund III	2.28%		7.74%		7.43%		11.31%		11.86%	(12/13)
NB Secondary Opp Fund IV	(0.26%)		5.52%		6.24%		14.34%		18.11%	(4/17)
NB Secondary Opp Fund V	3.22%		17.61%		-		-		58.29%	(3/22)
Private Advisors VI	2.34%		13.07%		13.96%		23.98%		14.00%	(4/15)
Private Advisors VII	1.65%		7.47%		15.22%		17.05%		14.26%	(1/17)
Private Advisors VIII	5.80%		14.41%		19.95%		20.28%		19.05%	(8/18)
Private Advisors IX	1.93%		7.13%		17.44%		-		22.00%	(2/20)
Apogem Capital X	1.68%		5.77%		-		-		22.86%	(5/23)
Absolute Return	2.49%		10.35%		14.04%		6.94%		6.27%	(6/14)
90 Day T-Bill + 3%	2.08%		8.46%		6.49%		5.32%		4.60%	(6/14)
Aptitude	2.29%	56	10.97%	1	-	-	-		8.15%	(9/22)
1-month LIBOR + 4%	2.29%	56	9.63%	52	7.78%	9	6.49%	31	9.18%	(9/22)
Callan Abs Rtn Hedge FoF	2.43%		9.63%		5.43%		6.13%		-	
UBS A & Q	2.65%	23	9.94%	33	8.42%	5	9.34%	12	6.64%	(12/14)
1-month LIBOR + 4%	2.29%	56	9.63%	52	7.78%	9	6.49%	31	5.84%	(12/14)
Callan Abs Rtn Hedge FoF	2.43%		9.63%		5.43%		6.13%		-	
Real Assets	7.93%		17.65%		4.23%		6.96%		6.13%	(1/16)
Principal DRA	7.93%	5	17.65%	22	4.23%	69	6.96%	68	6.13%	(1/16)
Principal DRA Blend Index (1)	9.14%	3	18.64%	17	4.34%	68	6.08%	73	5.68%	(1/16)
Callan Alternative Inv DB	2.05%		8.67%		6.08%		8.35%		-	
Total Real Estate	0.50%		(6.78%)		2.64%		4.74%		6.42%	(7/86)
Real Estate	0.50%	41	(6.78%)	66	2.64%	35	4.74%	32	6.42%	(7/86)
Blended Benchmark (2)	(0.82%)	84	(10.32%)	88	1.14%	52	2.58%	54	-	
Callan Tot Real Est DB	0.30%		(4.45%)		1.29%		2.84%		-	
Total Fund	4.89%	49	15.26%	89	5.57%	23	8.50%	52	-	
Total Fund Index*	5.01%	45	18.33%	64	5.08%	36	8.23%	61	-	
Callan Public Fund Spr DB	4.87%		19.40%		4.65%		8.53%		-	

* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Bimbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

(1) Current Principal DRA Blend Index = 15% Bloomberg US TIPS Idx, 15% Bloomberg Commodity Idx, 30% S&P Global Infrastructure Idx, 15% S&P Global Natural Resources Idx and 25% FTSE EPRA/NAREIT Developed Market Idx.

(2) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.

(3) Private Equity Benchmark = Russell 3000 Index lagged 3 months+3.0% through 12/31/19, Russell 3000 Index lagged 3 months+2.0% thereafter.

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	12/2023- 9/2024		2023		2022		2021		2020	
Total Public Equity	15.68%		21.40%		(15.78%)		20.92%		14.78%	
MSCI ACWI IMI	17.83%		21.58%		(18.40%)		18.22%		16.25%	
Total Domestic Equity	14.90%	94	19.73%	89	(15.68%)	12	28.12%	16	16.35%	72
Russell 3000 Index	20.63%	23	25.96%	17	(19.21%)	79	25.66%	55	20.89%	24
Pub Pln- Dom Equity	19.33%		23.70%		(17.91%)		25.88%		18.58%	
BlackRock Russell 1000 Value	16.70%	50	11.47%	63	(7.54%)	80	25.18%	79	3.28%	47
Russell 1000 Value Index	16.68%	52	11.46%	63	(7.54%)	80	25.16%	79	2.80%	52
Callan Large Cap Value	16.70%		12.85%		(4.93%)		28.35%		3.04%	
DFA Large Cap Value	16.03%	61	12.33%	53	(4.95%)	50	27.52%	64	(1.56%)	90
Russell 1000 Value Index	16.68%	52	11.46%	63	(7.54%)	80	25.16%	79	2.80%	52
Callan Large Cap Value	16.70%		12.85%		(4.93%)		28.35%		3.04%	
Northern Trust Global	22.07%	53	26.30%	48	(18.08%)	58	28.69%	54	18.42%	52
S&P 500 Index	22.08%	53	26.29%	48	(18.11%)	58	28.71%	54	18.40%	52
Callan Large Cap Core	22.76%		26.16%		(17.42%)		29.05%		18.84%	
Polen Capital Management	11.01%	95	38.20%	61	(37.72%)	89	24.84%	43	35.13%	56
S&P 500 Index	22.08%	56	26.29%	89	(18.11%)	6	28.71%	21	18.40%	98
Callan Large Cap Growth	23.31%		40.56%		(30.21%)		24.28%		35.61%	
Earnest Partners LLC	11.35%	66	17.57%	52	(15.13%)	52	26.09%	48	21.61%	41
Russell MidCap Index	14.63%	36	17.23%	53	(17.32%)	58	22.58%	58	17.10%	48
Callan Mid Capitalization	13.13%		17.82%		(14.34%)		25.38%		16.17%	
DFA Small Cap Value	7.92%	72	21.85%	13	(1.69%)	10	40.61%	16	3.85%	45
Russell 2000 Value Index	9.22%	57	14.65%	65	(14.48%)	84	28.27%	64	4.63%	37
Callan Small Cap Value	10.30%		16.41%		(10.51%)		31.82%		2.88%	
Total Global Equity	18.00%	45	22.29%	47	(17.35%)	47	19.03%	53	18.78%	43
MSCI World	18.86%	36	23.79%	35	(18.14%)	52	21.82%	28	15.90%	55
Callan Global Equity	17.25%		21.74%		(17.81%)		19.42%		17.13%	
BlackRock Global Alpha Tilts	19.99%	27	23.27%	40	(16.80%)	43	18.73%	56	16.53%	52
MSCI ACWI Gross	19.08%	35	22.81%	43	(17.96%)	51	19.04%	53	16.82%	51
Callan Global Equity	17.25%		21.74%		(17.81%)		19.42%		17.13%	
MFS Investment Management	15.47%	62	21.00%	53	(18.14%)	52	19.56%	49	22.42%	32
MSCI ACWI Gross	19.08%	35	22.81%	43	(17.96%)	51	19.04%	53	16.82%	51
Callan Global Equity	17.25%		21.74%		(17.81%)		19.42%		17.13%	
Total International Equity	15.27%	14	22.82%	3	(15.36%)	23	13.08%	14	10.84%	70
MSCI EAFE	12.99%	77	18.24%	20	(14.45%)	18	11.26%	24	7.82%	90
Pub Pln- Intl Equity	13.70%		16.66%		(16.86%)		8.95%		12.71%	
AQR Emerging Markets	15.09%	54	18.78%	12	(20.29%)	38	1.23%	36	18.26%	49
MSCI EM Gross	17.24%	36	10.27%	59	(19.74%)	35	(2.22%)	55	18.69%	44
Callan Emerging Broad	15.71%		11.91%		(21.94%)		(0.59%)		18.17%	
Brandes Investment Partners	18.12%	8	31.34%	1	(6.79%)	5	14.42%	18	(1.30%)	96
MSCI EAFE	12.99%	63	18.24%	47	(14.45%)	43	11.26%	53	7.82%	65
Callan NonUS Eq	14.01%		18.09%		(15.29%)		11.54%		11.47%	
William Blair & Company	10.92%	82	16.06%	75	(28.57%)	95	13.27%	30	31.44%	6
MSCI ACWIxUS Gross	14.70%	40	16.21%	73	(15.57%)	51	8.29%	72	11.13%	51
Callan NonUS Eq	14.01%		18.09%		(15.29%)		11.54%		11.47%	
DFA International Small Cap	15.74%	22	18.04%	22	(9.42%)	5	16.47%	14	1.47%	91
MSCI EAFE Small	11.11%	56	13.16%	66	(21.39%)	52	10.10%	72	12.34%	46
Callan Intl Small Cap	12.81%		15.18%		(20.63%)		12.78%		11.29%	

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	12/2023- 9/2024		2023		2022		2021		2020	
Total Fixed Income	5.25%	39	6.63%	43	(6.83%)	9	(0.36%)	45	(1.82%)	98
Blmbg Aggregate	4.45%	81	5.53%	82	(13.01%)	71	(1.54%)	91	7.51%	67
Pub Plin- Dom Fixed	5.03%		6.40%		(12.26%)		(0.57%)		8.53%	
BlackRock US Govt Bond	3.98%	98	4.24%	99	(12.43%)	22	-		-	
Blmbg Government	3.85%	98	4.09%	99	(12.32%)	17	(2.28%)	100	7.94%	85
Callan Core Bond FI	4.99%		6.17%		(12.91%)		(1.03%)		8.71%	
Reams Asset Management	4.93%	89	6.76%	57	(11.39%)	13	(1.23%)	91	17.28%	2
Blmbg Aggregate	4.45%	96	5.53%	96	(13.01%)	41	(1.54%)	97	7.51%	93
Callan Core Plus FI	5.64%		6.90%		(13.27%)		(0.27%)		9.27%	
Loomis, Sayles & Company, L.P.	6.96%	3	8.56%	2	(12.12%)	18	2.13%	5	7.14%	94
Blmbg Aggregate	4.45%	96	5.53%	96	(13.01%)	41	(1.54%)	97	7.51%	93
Callan Core Plus FI	5.64%		6.90%		(13.27%)		(0.27%)		9.27%	
Total Private Equity	3.86%		2.89%		(4.88%)		67.66%		22.14%	
Private Equity Benchmark (3)	28.82%		22.76%		(15.10%)		34.08%		17.99%	
Abbott Capital Management 2010	(2.75%)		(6.70%)		(16.87%)		65.55%		24.43%	
Abbott Capital Management 2011	(2.91%)		(7.55%)		(18.97%)		76.29%		29.13%	
Abbott Capital Management 2012	(3.59%)		(3.85%)		(13.14%)		72.85%		29.04%	
Abbott Capital Management 2013	(2.31%)		(2.85%)		(12.51%)		70.21%		28.65%	
Abbott Capital Management 2014	(2.60%)		(3.96%)		(9.41%)		75.52%		26.51%	
Abbott Capital Management 2015	2.06%		3.60%		(0.79%)		75.81%		16.62%	
Abbott Capital Management 2016	6.12%		5.24%		2.90%		71.04%		20.02%	
Abbott Capital Management 2018	4.05%		3.96%		7.44%		47.06%		22.73%	
Abbott Capital Management 2019	5.58%		3.43%		7.54%		57.22%		10.04%	
Abbott Capital Management 2020	5.83%		1.70%		0.81%		65.36%		-	
Abbott Capital Management 2021	3.84%		2.00%		1.72%		-		-	
Abbott Capital Management 2022	(2.55%)		4.87%		-		-		-	
Abbott Capital Management 2023	3.34%		-		-		-		-	
Mesirow V	1.11%		(0.80%)		(19.60%)		78.52%		21.39%	
Mesirow VI	2.08%		(0.52%)		(13.41%)		88.26%		29.10%	
Mesirow VII	5.21%		5.78%		(0.68%)		60.27%		16.43%	
Mesirow VIII	4.47%		0.22%		(2.15%)		10.14%		-	
NB Secondary Opp Fund III	5.72%		17.34%		(2.34%)		30.34%		4.23%	
NB Secondary Opp Fund IV	6.14%		4.64%		0.29%		48.73%		14.80%	
NB Secondary Opp Fund V	16.00%		21.41%		-		-		-	
Private Advisors VI	11.45%		4.68%		9.97%		83.78%		16.54%	
Private Advisors VII	6.06%		7.32%		21.61%		52.55%		3.97%	
Private Advisors VIII	12.51%		9.80%		27.61%		47.25%		15.78%	
Private Advisors IX	6.12%		13.33%		24.00%		37.25%		-	
Apogem Capital X	3.63%		-		-		-		-	
Absolute Return	7.81%		6.09%		26.46%		8.87%		(14.04%)	
90 Day T-Bill + 3%	6.25%		8.01%		4.46%		3.05%		3.67%	
Aptitude	8.72%	12	5.24%	59	-		-		-	
1-month LIBOR + 4%	7.11%	62	9.38%	1	5.80%	21	4.11%	77	4.63%	45
Callan Abs Rtn Hedge FoF	7.42%		5.87%		3.34%		6.76%		4.03%	
UBS A & Q	7.23%	59	6.48%	30	8.85%	13	8.08%	45	12.18%	14
1-month LIBOR + 4%	7.11%	62	9.38%	1	5.80%	21	4.11%	77	4.63%	45
Callan Abs Rtn Hedge FoF	7.42%		5.87%		3.34%		6.76%		4.03%	
Real Assets	9.69%		3.95%		(5.29%)		18.24%		4.69%	
Principal DRA	9.69%	37	3.95%	47	(5.29%)	85	18.24%	44	4.69%	23
Principal DRA Blend Index (1)	10.31%	36	4.31%	46	(5.07%)	85	15.87%	46	2.08%	32
Callan Alternative Inv DB	8.48%		2.97%		9.02%		13.64%		(0.22%)	
Total Real Estate	(3.29%)		(10.23%)		13.88%		23.85%		0.76%	
Real Estate	(3.29%)	72	(10.23%)	70	13.88%	29	23.85%	38	0.76%	56
Blended Benchmark (2)	(8.38%)	95	(13.08%)	79	21.68%	19	14.83%	61	0.89%	55
Callan Tot Real Est DB	(0.85%)		(3.04%)		8.51%		19.66%		1.50%	
Total Fund	8.68%	87	10.22%	89	(6.32%)	8	19.05%	8	6.84%	97
Total Fund Index*	11.40%	38	12.43%	56	(10.58%)	26	12.77%	71	12.25%	50
Callan Public Fund Spr DB	10.79%		12.77%		(12.38%)		14.07%		12.24%	

* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

(1) Current Principal DRA Blend Index = 15% Bloomberg US TIPS Idx, 15% Bloomberg Commodity Idx, 30% S&P Global Infrastructure Idx, 15% S&P Global Natural Resources Idx and 25% FTSE EPRA/NAREIT Developed Market Idx.

(2) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.

(3) Private Equity Benchmark = Russell 3000 Index lagged 3 months+3.0% through 12/31/19, Russell 3000 Index lagged 3 months+2.0% thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods ended September 30, 2024. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended September 30, 2024

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Net of Fee Returns					
Total Domestic Equity	7.18%	28.13%	7.58%	13.18%	11.62%
Russell 3000 Index	6.23%	35.19%	10.29%	15.26%	12.83%
BlackRock Russell 1000 Value	9.44%	27.78%	9.03%	10.79%	-
Russell 1000 Value Index	9.43%	27.76%	9.03%	10.69%	9.23%
DFA Large Cap Value	7.40%	26.42%	9.63%	10.98%	-
Russell 1000 Value Index	9.43%	27.76%	9.03%	10.69%	9.23%
Northern Trust Global	5.88%	36.32%	11.91%	15.98%	13.40%
S&P 500 Index	5.89%	36.35%	11.91%	15.98%	13.38%
Polen Capital Management	3.49%	26.45%	(0.18%)	11.82%	14.47%
S&P 500 Index	5.89%	36.35%	11.91%	15.98%	13.38%
Earnest Partners LLC	8.29%	25.11%	6.90%	12.33%	12.19%
Russell MidCap Index	9.21%	29.33%	5.75%	11.30%	10.19%
DFA Small Cap Value	7.59%	23.81%	10.70%	15.02%	10.00%
Russell 2000 Value Index	10.15%	25.88%	3.77%	9.29%	8.22%
Total Global Equity	6.16%	30.92%	8.34%	12.61%	10.82%
MSCI World	6.36%	32.43%	9.08%	13.04%	10.07%
BlackRock Global Alpha Tilts	5.34%	33.25%	9.39%	12.89%	-
MSCI ACWI Gross	6.72%	32.35%	8.60%	12.72%	9.94%
MFS Investment Management	7.18%	27.96%	7.00%	12.36%	11.99%
MSCI ACWI Gross	6.72%	32.35%	8.60%	12.72%	9.94%
Total International Equity	8.16%	27.46%	6.15%	10.09%	6.48%
MSCI EAFE Index	7.26%	24.77%	5.48%	8.20%	5.71%
AQR Emerging Markets	2.59%	26.18%	1.79%	7.42%	-
MSCI EM Gross	8.88%	26.54%	0.82%	6.15%	4.42%
Brandes Investment Partners	12.18%	30.29%	12.73%	11.64%	6.91%
MSCI EAFE Index	7.26%	24.77%	5.48%	8.20%	5.71%
William Blair & Company	5.02%	24.91%	(2.38%)	8.16%	6.27%
MSCI ACWI ex-US Index	8.17%	25.96%	4.67%	8.10%	5.72%
DFA International Small Cap	8.48%	26.15%	7.63%	9.82%	6.23%
MSCI EAFE Small	10.54%	23.48%	(0.36%)	6.40%	6.21%

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods ended September 30, 2024. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended September 30, 2024

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Net of Fee Returns					
Total Fixed Income	5.27%	12.50%	1.41%	0.55%	2.22%
Bimbg Aggregate	5.20%	11.57%	(1.39%)	0.33%	1.84%
BlackRock US Govt Bond	4.72%	9.72%	-	-	-
Bimbg Government	4.71%	9.68%	(1.72%)	(0.16%)	1.36%
Reams Asset Management	5.11%	12.52%	(0.23%)	2.72%	3.28%
Bimbg Aggregate	5.20%	11.57%	(1.39%)	0.33%	1.84%
Loomis, Sayles & Company, L.P.	6.00%	15.03%	0.50%	2.47%	3.68%
Bimbg Aggregate	5.20%	11.57%	(1.39%)	0.33%	1.84%
Total Private Equity	0.49%	1.85%	4.04%	16.42%	15.70%
Private Equity Benchmark	3.72%	25.39%	10.48%	16.70%	-
Abbott Capital Management 2010	(1.23%)	(10.38%)	(4.50%)	9.49%	13.30%
Abbott Capital Management 2011	(1.51%)	(10.27%)	(5.73%)	11.15%	13.83%
Abbott Capital Management 2012	(2.04%)	(8.79%)	(2.67%)	13.10%	13.29%
Abbott Capital Management 2013	(1.34%)	(7.34%)	(1.90%)	13.53%	13.47%
Abbott Capital Management 2014	(1.45%)	(7.69%)	(0.63%)	14.08%	12.00%
Abbott Capital Management 2015	(0.38%)	0.72%	5.26%	17.02%	-
Abbott Capital Management 2016	1.16%	5.79%	8.51%	19.03%	-
Abbott Capital Management 2018	1.63%	3.41%	9.03%	17.34%	-
Abbott Capital Management 2019	1.45%	4.94%	8.12%	-	-
Abbott Capital Management 2020	1.08%	5.96%	2.84%	-	-
Abbott Capital Management 2021	0.92%	3.67%	4.92%	-	-
Abbott Capital Management 2022	(1.51%)	(3.88%)	-	-	-
Abbott Capital Management 2023	(3.02%)	3.05%	-	-	-
Abbott Capital Management 2024	(1.22%)	-	-	-	-
Mesirow V	(2.73%)	(4.31%)	(5.39%)	12.17%	14.75%
Mesirow IV	(0.65%)	(2.52%)	(1.35%)	17.69%	13.57%
Mesirow VII	1.13%	5.63%	7.31%	15.66%	-
Mesirow VIII	0.72%	3.04%	1.52%	-	-
NB Secondary Opp Fund III	2.28%	7.74%	7.43%	11.31%	15.38%
NB Secondary Opp Fund IV	(0.26%)	5.52%	6.24%	14.34%	-
NB Secondary Opp Fund V	3.22%	17.61%	-	-	-
Private Advisors VI	2.34%	13.07%	13.96%	23.98%	-
Private Advisors VII	1.65%	7.47%	15.22%	17.05%	-
Private Advisors VIII	5.80%	14.41%	19.95%	20.28%	-
Private Advisors IX	1.93%	7.13%	17.44%	-	-
Apogem Capital X	1.68%	5.77%	-	-	-
Absolute Return	2.49%	10.35%	14.04%	6.88%	6.27%
90 Day T-Bill + 3%	2.08%	8.46%	6.49%	5.32%	4.65%
Aptitude	2.29%	10.97%	-	-	-
1-month LIBOR + 4%	2.29%	9.63%	7.78%	6.49%	5.81%
UBS A & Q	2.65%	9.94%	8.42%	9.34%	-
1-month LIBOR + 4%	2.29%	9.63%	7.78%	6.49%	5.81%
Real Assets	7.77%	16.94%	3.57%	6.28%	-
Principal DRA	7.77%	16.94%	3.57%	6.28%	-
Principal DRA Blend Index	9.14%	18.64%	4.34%	6.08%	-
Total Real Estate	0.46%	(7.04%)	2.33%	4.40%	7.00%
Real Estate	0.46%	(7.04%)	2.33%	4.40%	7.00%
Blended Benchmark	(0.82%)	(10.32%)	1.14%	2.58%	5.74%
Total Fund	4.84%	15.02%	5.34%	8.27%	7.68%
Total Fund Index	5.01%	18.33%	5.08%	8.23%	7.40%

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	12/2023- 9/2024	2023	2022	2021	2020
Net of Fee Returns					
Total Domestic Equity	14.65%	19.38%	(15.89%)	27.88%	16.09%
Russell 3000 Index	20.63%	25.96%	(19.21%)	25.66%	20.89%
BlackRock Russell 1000 Value	16.69%	11.46%	(7.55%)	25.17%	3.27%
Russell 1000 Value Index	16.68%	11.46%	(7.54%)	25.16%	2.80%
DFA Large Cap Value	15.88%	12.12%	(5.12%)	27.35%	(1.78%)
Russell 1000 Value Index	16.68%	11.46%	(7.54%)	25.16%	2.80%
Northern Trust Global	22.05%	26.29%	(18.09%)	28.68%	18.41%
S&P 500 Index	22.08%	26.29%	(18.11%)	28.71%	18.40%
Polen Capital Management	10.68%	37.75%	(37.97%)	24.34%	34.59%
S&P 500 Index	22.08%	26.29%	(18.11%)	28.71%	18.40%
Earnest Partners LLC	10.91%	16.95%	(15.58%)	25.59%	20.96%
Russell MidCap Index	14.63%	17.23%	(17.32%)	22.58%	17.10%
DFA Small Cap Value	7.41%	21.04%	(2.12%)	40.38%	3.74%
Russell 2000 Value Index	9.22%	14.65%	(14.48%)	28.27%	4.63%
Total Global Equity	17.64%	21.88%	(17.55%)	18.80%	18.48%
MSCI World	18.86%	23.79%	(18.14%)	21.82%	15.90%
BlackRock Global Alpha Tilts	19.63%	22.93%	(16.89%)	18.67%	16.39%
MSCI ACWI Gross	19.08%	22.81%	(17.96%)	19.04%	16.82%
MFS Investment Management	15.11%	20.50%	(18.50%)	19.05%	21.88%
MSCI ACWI Gross	19.08%	22.81%	(17.96%)	19.04%	16.82%
Total International Equity	14.87%	22.25%	(15.75%)	12.57%	10.28%
MSCI EAFE Index	12.99%	18.24%	(14.45%)	11.26%	7.82%
AQR Emerging Markets	14.50%	17.92%	(20.93%)	0.47%	17.38%
MSCI EM Gross	17.24%	10.27%	(19.74%)	(2.22%)	18.69%
Brandes Investment Partners	17.77%	30.84%	(7.15%)	14.00%	(1.69%)
MSCI EAFE Index	12.99%	18.24%	(14.45%)	11.26%	7.82%
William Blair & Company	10.52%	15.50%	(28.91%)	12.77%	30.84%
MSCI ACWI ex-US Index	14.70%	16.21%	(15.57%)	8.29%	11.13%
DFA International Small Cap	15.37%	17.52%	(9.80%)	15.89%	0.81%
MSCI EAFE Small	11.11%	13.16%	(21.39%)	10.10%	12.34%

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

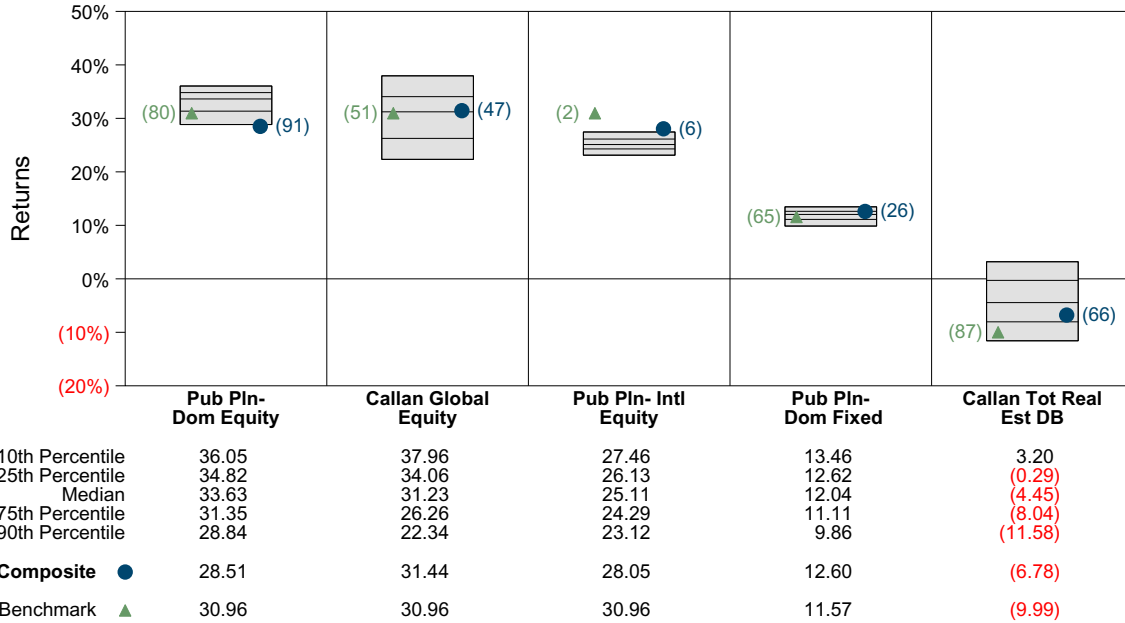
	12/2023- 9/2024	2023	2022	2021	2020
Net of Fee Returns					
Total Fixed Income	5.19%	6.52%	(6.93%)	(0.45%)	(1.91%)
Bimbg Aggregate	4.45%	5.53%	(13.01%)	(1.54%)	7.51%
BlackRock US Govt Bond	3.97%	4.22%	(12.44%)	-	-
Bimbg Government	3.85%	4.09%	(12.32%)	(2.28%)	7.94%
Reams Asset Management	4.87%	6.62%	(11.50%)	(1.36%)	17.11%
Bimbg Aggregate	4.45%	5.53%	(13.01%)	(1.54%)	7.51%
Loomis, Sayles & Company, L.P.	6.85%	8.41%	(12.26%)	1.98%	6.99%
Bimbg Aggregate	4.45%	5.53%	(13.01%)	(1.54%)	7.51%
Total Private Equity	3.86%	2.89%	(4.88%)	67.66%	22.14%
Private Equity Benchmark	28.82%	22.76%	(15.10%)	34.08%	17.99%
Abbott Capital Management 2010	(2.75%)	(6.70%)	(16.87%)	65.55%	24.43%
Abbott Capital Management 2011	(2.91%)	(7.55%)	(18.97%)	76.29%	29.13%
Abbott Capital Management 2012	(3.59%)	(3.85%)	(13.14%)	72.85%	29.04%
Abbott Capital Management 2013	(2.31%)	(2.85%)	(12.51%)	70.21%	28.65%
Abbott Capital Management 2014	(2.60%)	(3.96%)	(9.41%)	75.52%	26.51%
Abbott Capital Management 2015	2.06%	3.60%	(0.79%)	75.81%	16.62%
Abbott Capital Management 2016	6.12%	5.24%	2.90%	71.04%	20.02%
Abbott Capital Management 2018	4.05%	3.96%	7.44%	47.06%	22.73%
Abbott Capital Management 2019	5.58%	3.43%	7.54%	57.22%	10.04%
Abbott Capital Management 2020	5.83%	1.70%	0.81%	65.36%	-
Abbott Capital Management 2021	3.84%	2.00%	1.72%	-	-
Abbott Capital Management 2022	(2.55%)	4.87%	-	-	-
Abbott Capital Management 2023	3.34%	-	-	-	-
Mesirow V	1.11%	(0.80%)	(19.60%)	78.52%	21.39%
Mesirow IV	2.08%	(0.52%)	(13.41%)	88.26%	29.10%
Mesirow VII	5.21%	5.78%	(0.68%)	60.27%	16.43%
Mesirow VIII	4.47%	0.22%	(2.15%)	10.14%	-
NB Secondary Opp Fund III	5.72%	17.34%	(2.34%)	30.34%	4.23%
NB Secondary Opp Fund IV	6.14%	4.64%	0.29%	48.73%	14.80%
NB Secondary Opp Fund V	16.00%	21.41%	-	-	-
Private Advisors VI	11.45%	4.68%	9.97%	83.78%	16.54%
Private Advisors VII	6.06%	7.32%	21.61%	52.55%	3.97%
Private Advisors VIII	12.51%	9.80%	27.61%	47.25%	15.78%
Private Advisors IX	6.12%	13.33%	24.00%	37.25%	-
Apogem Capital X	3.63%	-	-	-	-
Absolute Return	7.81%	6.09%	26.46%	8.77%	(14.21%)
90 Day T-Bill + 3%	6.25%	8.01%	4.46%	3.05%	3.67%
Aptitude	8.72%	5.24%	-	-	-
1-month LIBOR + 4%	7.11%	9.38%	5.80%	4.11%	4.63%
UBS A & Q	7.23%	6.48%	8.85%	8.08%	12.18%
1-month LIBOR + 4%	7.11%	9.38%	5.80%	4.11%	4.63%
Real Assets	9.18%	3.31%	(5.91%)	17.51%	4.02%
Principal DRA	9.18%	3.31%	(5.91%)	17.51%	4.02%
Principal DRA Blend Index	10.31%	4.31%	(5.07%)	15.87%	2.08%
Total Real Estate	(3.51%)	(10.54%)	13.58%	23.45%	0.39%
Real Estate	(3.51%)	(10.54%)	13.58%	23.45%	0.39%
Blended Benchmark	(8.38%)	(13.08%)	21.68%	14.83%	0.89%
Total Fund	8.50%	9.97%	(6.51%)	18.80%	6.59%
Total Fund Index	11.40%	12.43%	(10.58%)	12.77%	12.25%

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

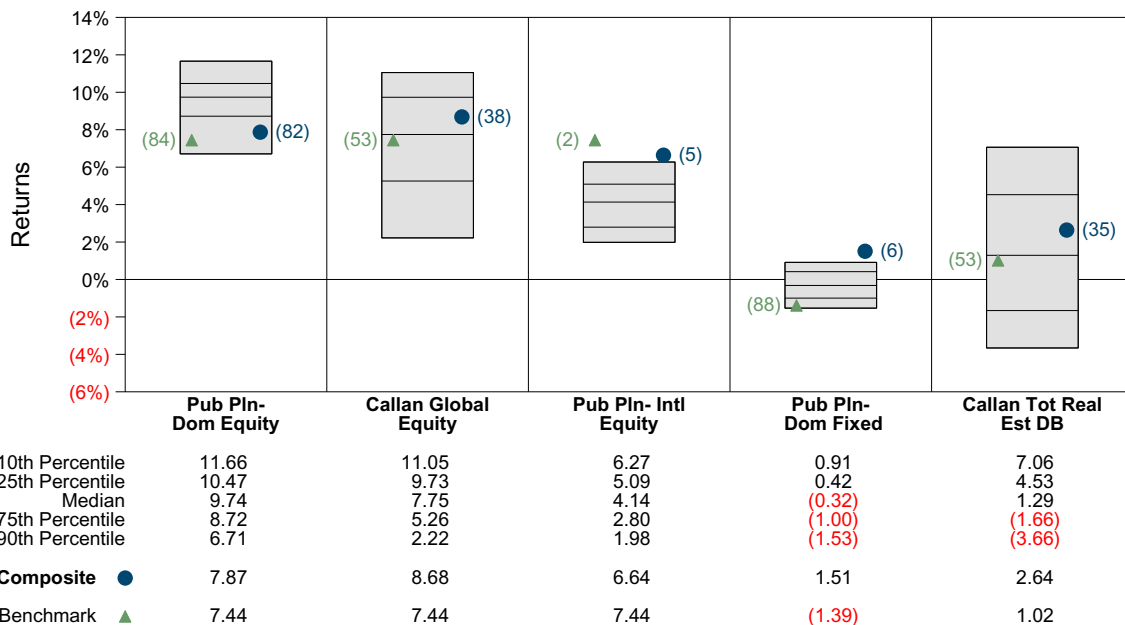
Asset Class Rankings

The charts below show the rankings of each asset class component of the Total Fund relative to appropriate comparative databases.

Total Asset Class Performance One Year Ended September 30, 2024



Total Asset Class Performance Three Years Ended September 30, 2024

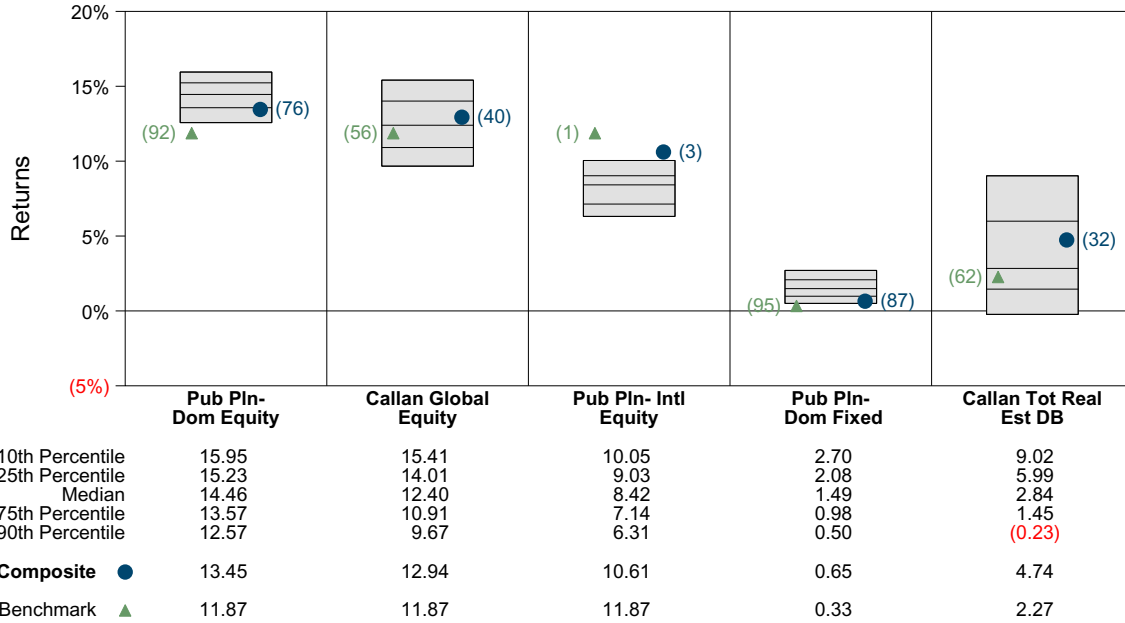


* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

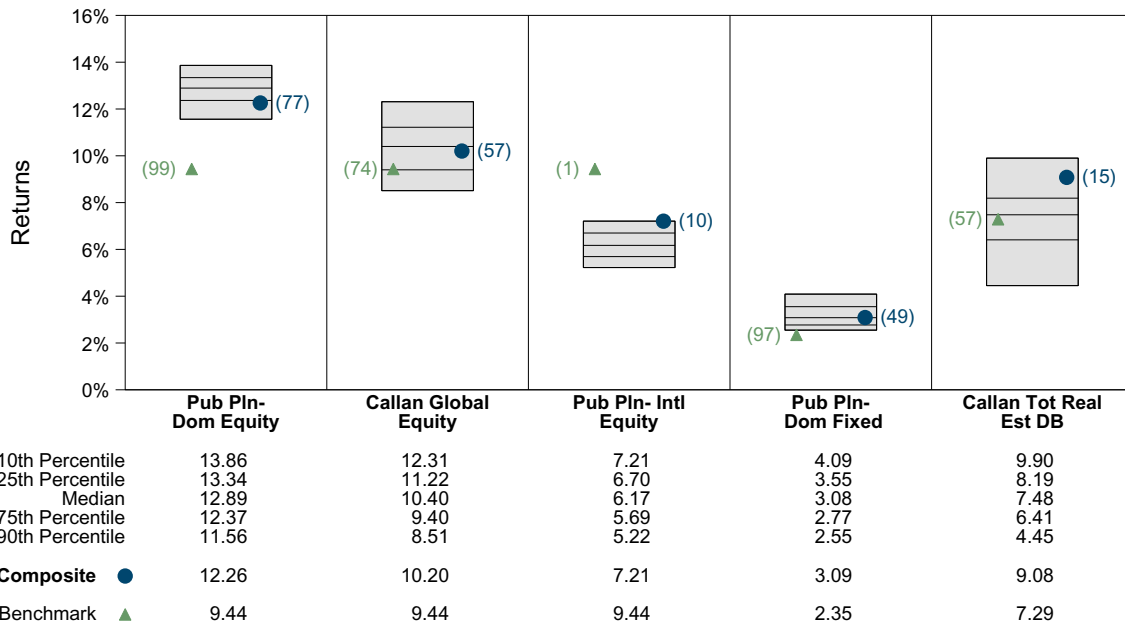
Asset Class Rankings

The charts below show the rankings of each asset class component of the Total Fund relative to appropriate comparative databases.

Total Asset Class Performance Five Years Ended September 30, 2024



Total Asset Class Performance Thirteen and Three-Quarter Years Ended September 30, 2024

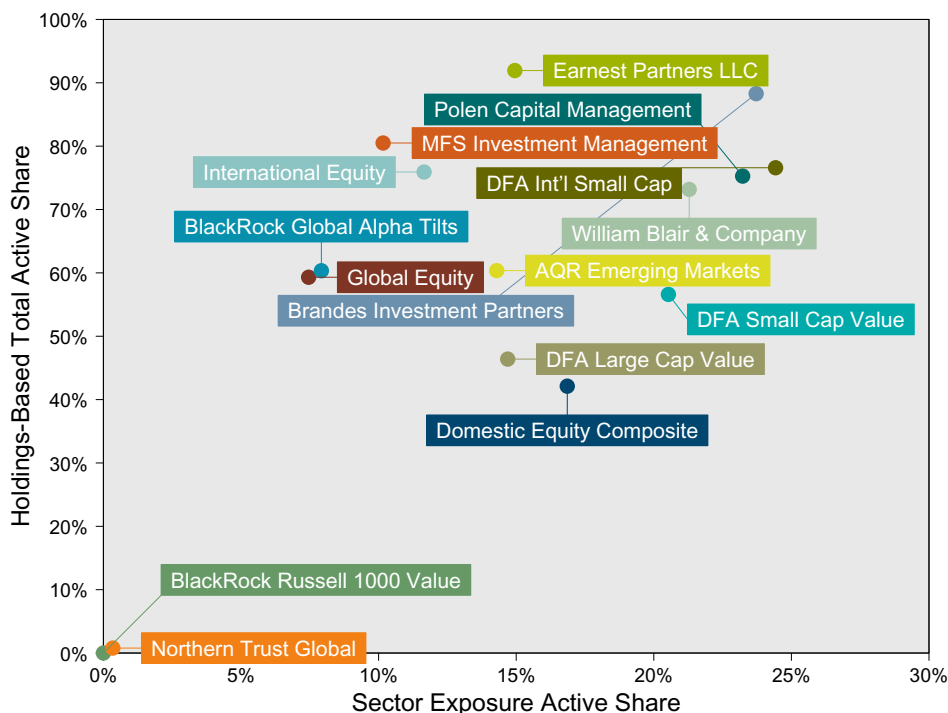


* Current Quarter Target = 39.0% MSCI ACWI IMI, 29.0% Blmbg:Aggregate, 12.0% Russell 3000 Index lagged 3 months+2.0%, 9.7% NCREIF NFI-ODCE Val Wt Nt lagged 3 months, 7.0% 3-month Treasury Bill+3.0% and 3.3% Principal DRA Blend Index.

Active Share Structure Analysis For One Quarter Ended September 30, 2024

This analysis compares multiple portfolios and composites in an active share context, illustrating the varying degrees of active risk taken by individual portfolios, and how they combine into active risk profiles for composites and the equity structure. Two sources of active share (active risk) are shown: 1) Total Holdings-Based Active Share based on individual position comparisons to the index (and the subcomponent from holding non-index securities), and 2) Sector Exposure Active Share that quantifies the more macro-level sector differences from the index.

Active Share Analysis Ended September 30, 2024



	Index	Total Act Share	Non-Idx Act Share	Sector Act Share	Number Securities	Security Diverse
Domestic Equity Composite	Russell 3000	42.12%	0.92%	16.86%	1763	101.35
BlackRock Russell 1000 Value	Russell 1000 Value	0.00%	0.00%	0.00%	872	74.91
DFA Large Cap Value	Russell 1000 Value	46.39%	0.61%	14.69%	338	53.09
Northern Trust Global	S&P 500	0.78%	0.02%	0.34%	501	28.41
Polen Capital Management	S&P 500	75.27%	4.61%	23.23%	23	7.92
Earnest Partners LLC	Russell MidCap	91.93%	9.50%	14.95%	58	22.26
DFA Small Cap Value	Russell 2000 Value	56.60%	19.40%	20.53%	931	127.08
Global Equity	MSCI World	59.31%	6.92%	7.46%	400	42.92
BlackRock Global Alpha Tilts	MSCI ACWI GD	60.34%	4.20%	7.92%	351	33.92
MFS Investment Management	MSCI ACWI GD	80.50%	1.90%	10.16%	72	20.64
International Equity	MSCI EAFE	75.92%	27.23%	11.65%	2332	71.66
AQR Emerging Markets	MSCI EM GD	60.36%	2.59%	14.29%	326	33.71
Brandes Investment Partners	MSCI EAFE	88.28%	15.84%	23.72%	69	24.13
William Blair & Company	MSCI ACWI xUS GD	73.17%	9.25%	21.29%	270	46.59
DFA Int'l Small Cap	MSCI EAFE Small	76.59%	17.54%	24.43%	1826	139.89

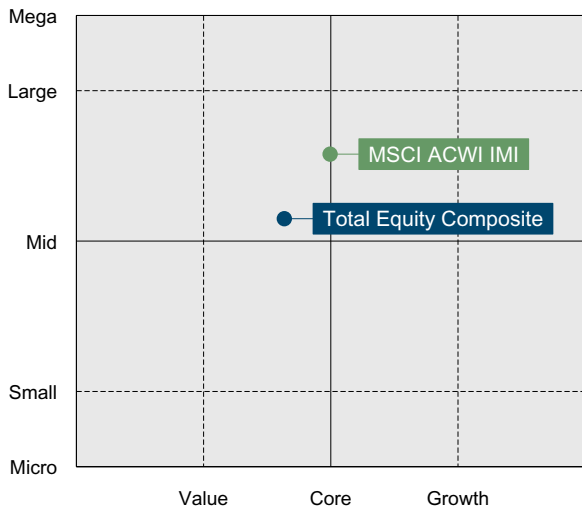
Current Holdings Based Style Analysis

Total Equity Composite

As of September 30, 2024

This page analyzes the current investment style of a portfolio utilizing a detailed holdings-based style analysis to determine actual exposures to various regional and style segments of the international/global equity market. The market is segmented quarterly by region and style. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the current market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the current portfolio and index weights and stock counts (in parentheses) in each region/style segment of the market. The middle chart illustrates the total exposures and stock counts in the three style segments, with a legend showing the total growth, value, and "combined Z" (growth - value) scores. The bottom chart exhibits the sector weights as well as the style weights within each sector.

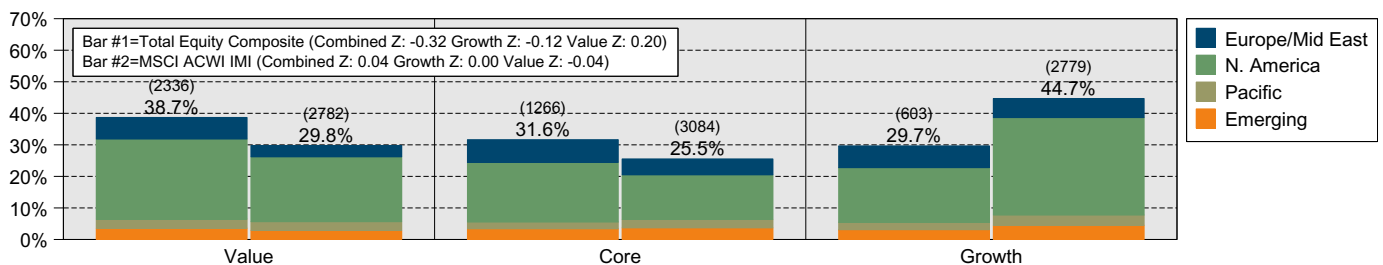
Style Map vs Callan Public Fund Spr DB Holdings as of September 30, 2024



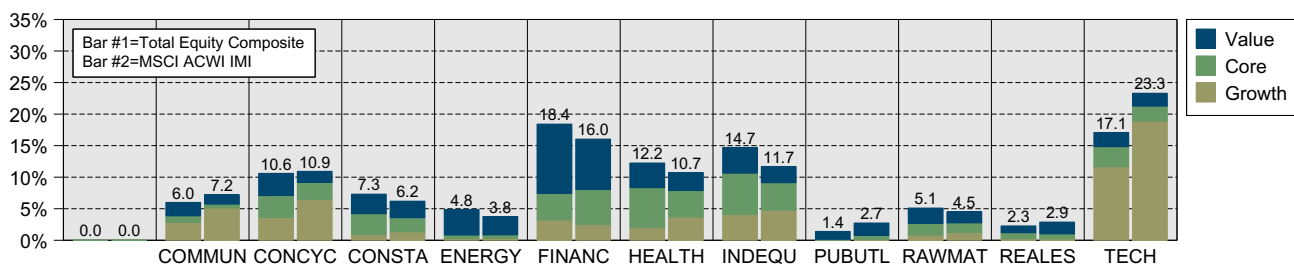
Style Exposure Matrix Holdings as of September 30, 2024

	Value	Core	Growth	Total
Europe/ Mid East	6.8% (403)	7.2% (265)	6.9% (116)	20.9% (784)
	3.6% (414)	5.0% (501)	6.1% (455)	14.7% (1370)
N. America	25.4% (992)	18.9% (597)	17.4% (287)	61.7% (1876)
	20.6% (895)	14.1% (968)	30.9% (711)	65.6% (2574)
Pacific	2.9% (778)	2.1% (260)	2.3% (94)	7.3% (1132)
	2.7% (483)	2.7% (500)	3.2% (467)	8.6% (1450)
Emerging	3.6% (163)	3.4% (144)	3.1% (106)	10.1% (413)
	2.9% (990)	3.7% (1115)	4.5% (1146)	11.1% (3251)
Total	38.7% (2336)	31.6% (1266)	29.7% (603)	100.0% (4205)
	29.8% (2782)	25.5% (3084)	44.7% (2779)	100.0% (8645)

Combined Z-Score Style Distribution Holdings as of September 30, 2024



Sector Weights Distribution Holdings as of September 30, 2024



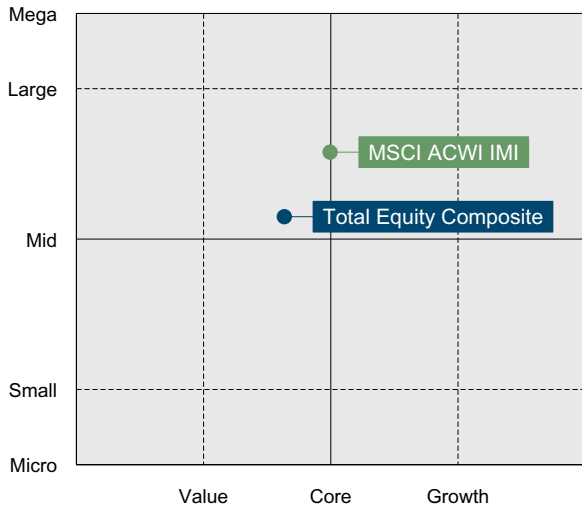
Current Holdings Based Style Analysis

Total Equity Composite

As of September 30, 2024

This page analyzes the current investment style of a portfolio utilizing a detailed holdings-based style analysis to determine actual exposures to various regional and style segments of the international/global equity market. The market is segmented quarterly by region and style. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the current market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the current portfolio and index weights and stock counts (in parentheses) in each capitalization/style segment of the market. The middle chart illustrates the total exposures and stock counts in the three style segments, with a legend showing the total growth, value, and "combined Z" (growth - value) scores. The bottom chart exhibits the sector weights as well as the style weights within each sector.

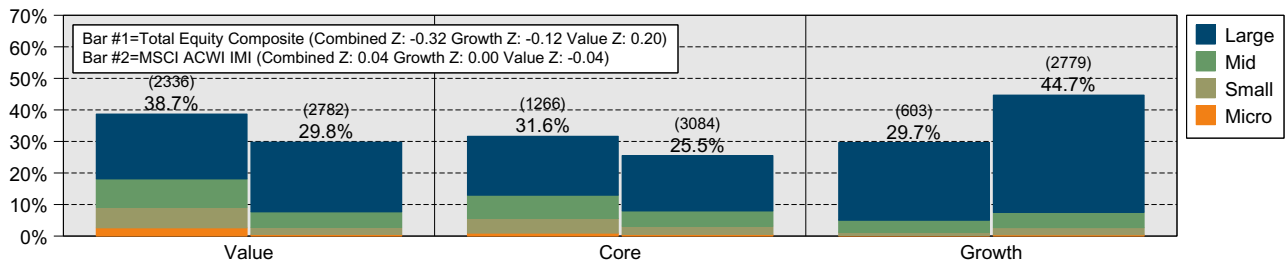
Style Map vs Callan Public Fund Spr DB Holdings as of September 30, 2024



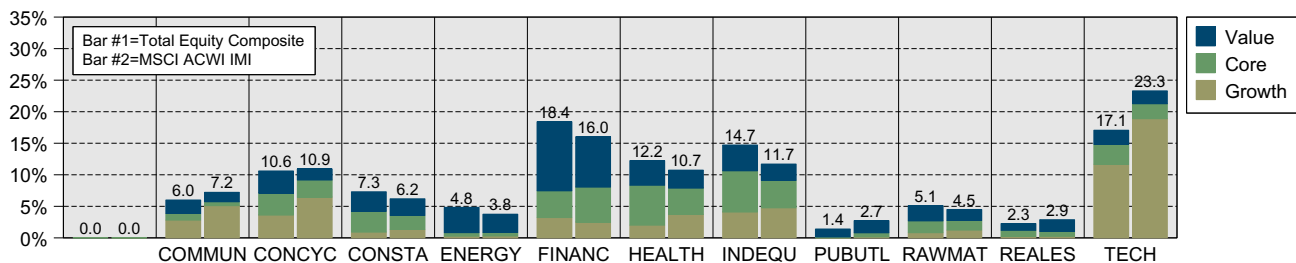
Style Exposure Matrix Holdings as of September 30, 2024

	Value	Core	Growth	Total
Large	20.6% (232)	18.7% (171)	24.7% (172)	63.9% (575)
	22.1% (312)	17.6% (262)	37.1% (289)	76.8% (863)
Mid	9.0% (295)	7.4% (269)	3.8% (202)	20.2% (766)
	4.9% (521)	4.8% (565)	4.9% (644)	14.6% (1730)
Small	6.5% (448)	4.6% (420)	1.0% (131)	12.2% (999)
	2.3% (1038)	2.6% (1283)	2.3% (1138)	7.1% (3459)
Micro	2.6% (1361)	0.9% (406)	0.2% (98)	3.7% (1865)
	0.5% (911)	0.6% (974)	0.4% (708)	1.5% (2593)
Total	38.7% (2336)	31.6% (1266)	29.7% (603)	100.0% (4205)
	29.8% (2782)	25.5% (3084)	44.7% (2779)	100.0% (8645)

Combined Z-Score Style Distribution Holdings as of September 30, 2024



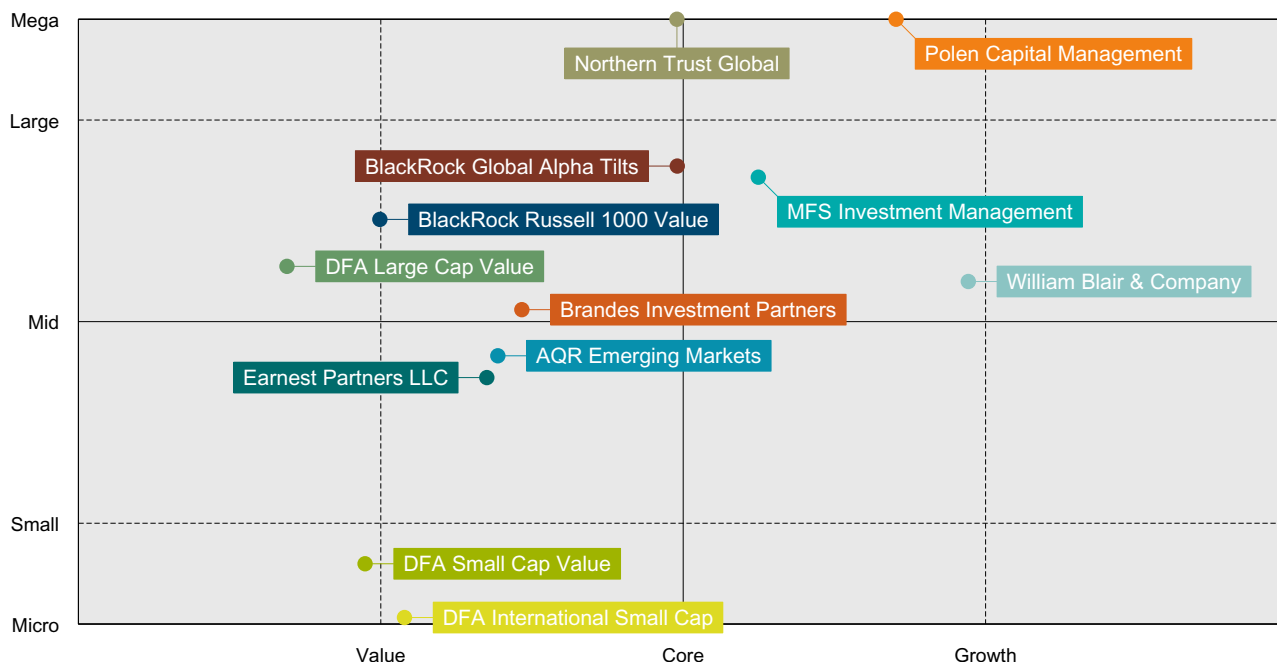
Sector Weights Distribution Holdings as of September 30, 2024



Global Holdings Based Style Analysis For One Quarter Ended September 30, 2024

This page analyzes and compares the investment styles of multiple portfolios using a detailed holdings-based style analysis methodology. The size component of style is measured by the weighted median market capitalization of the holdings. The value/core/growth style dimension is captured by the "Combined Z-Score" of the portfolio. This score is based on eight fundamental factors used in the MSCI stock style scoring system. The table below gives a more detailed breakdown of several relevant style metrics on the portfolios.

Style Map Holdings for One Quarter Ended September 30, 2024



	Weight %	Wtd Median Mkt Cap	Combined Z-Score	Growth Z-Score	Value Z-Score	Number of Securities	Security Diversification
BlackRock Russell 1000 Value	8.66%	84.65	(0.97)	(0.45)	0.52	872	74.91
DFA Large Cap Value	6.32%	57.29	(1.28)	(0.42)	0.86	338	53.09
Northern Trust Global	8.70%	267.56	0.03	(0.01)	(0.03)	501	28.41
Polen Capital Management	5.02%	422.32	0.72	0.20	(0.52)	23	7.92
Earnest Partners LLC	7.55%	19.30	(0.61)	(0.32)	0.30	58	22.26
DFA Small Cap Value	8.32%	3.34	(1.02)	(0.24)	0.78	931	127.08
MFS Investment Management	8.95%	109.23	0.29	(0.06)	(0.35)	72	20.64
BlackRock Global Alpha Tilts	10.97%	115.72	0.03	0.02	(0.01)	351	33.92
AQR Emerging Markets	4.57%	21.56	(0.57)	(0.07)	0.51	326	33.71
Brandes Investment Partners	13.78%	32.08	(0.49)	(0.16)	0.33	69	24.13
William Blair & Company	9.98%	48.47	0.95	0.32	(0.63)	270	46.59
DFA International Small Cap	7.17%	2.23	(0.89)	(0.21)	0.68	1826	139.89

List of Callan’s Investment Manager Clients

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The list below is an important component of our conflicts management and disclosure process. It identifies those investment managers that pay Callan fees for educational, consulting, software, database, or reporting products and services. We update the list quarterly because we believe that our fund sponsor clients should know the investment managers that do business with Callan, particularly those investment manager clients that the fund sponsor clients may be using or considering using. Please note that if an investment manager receives a product or service on a complimentary basis (e.g., attending an educational event), they are not included in the list below. Callan is committed to ensuring that we do not consider an investment manager’s business relationship with Callan, or lack thereof, in performing evaluations for or making suggestions or recommendations to its other clients. Please refer to Callan’s ADV Part 2A for a more detailed description of the services and products that Callan makes available to investment manager clients through our Institutional Consulting Group, Independent Adviser Group, and Fund Sponsor Consulting Group. Due to the complex corporate and organizational ownership structures of many investment management firms, parent and affiliate firm relationships are not indicated on our list.

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Manager Name
abrdn
Acadian Asset Management LLC
ACR Alpine Capital Research
Adams Street Partners, LLC
Aegon Asset Management
AEW Capital Management, L.P.
AllianceBernstein
Allspring Global Investments, LLC
Altrinsic Global Advisors, LLC
American Century Investments
Amundi US, Inc.
Antares Capital LP
Apollo Global Management, Inc.
AQR Capital Management
Ares Management LLC
ARGA Investment Management, LP
Ariel Investments, LLC
Aristotle Capital Management, LLC

Manager Name
Atlanta Capital Management Co., LLC
Audax Private Debt
AXA Investment Managers
Baillie Gifford International, LLC
Baird Advisors
Barings LLC
Baron Capital Management, Inc.
Barrow, Hanley, Mewhinney & Strauss, LLC
BentallGreenOak
Beutel, Goodman & Company Ltd.
BlackRock
Blackstone Group (The)
Blue Owl Capital, Inc.
BNY Mellon Asset Management
Boston Partners
Brandes Investment Partners, L.P.
Brandywine Global Investment Management, LLC
Brookfield Asset Management Inc.

Manager Name

Brown Brothers Harriman & Company
Brown Investment Advisory & Trust Company
Capital Group
CastleArk Management, LLC
Cercano Management LLC
Champlain Investment Partners, LLC
CIBC Asset Management Inc.
CIM Group, LP
ClearBridge Investments, LLC
Cohen & Steers Capital Management, Inc.
Columbia Threadneedle Investments
Comvest Partners
Cooke & Bieler, L.P.
Crescent Capital Group LP
Dana Investment Advisors, Inc.
D.E. Shaw Investment Management, LLC
DePrince, Race & Zollo, Inc.
Dimensional Fund Advisors L.P.
Doubleline
DWS
EARNEST Partners, LLC
Fayez Sarofim & Company
Federated Hermes, Inc.
Fidelity Institutional Asset Management
Fiera Capital Corporation
First Eagle Investment Management, LLC
First Hawaiian Bank Wealth Management Division
Fisher Investments
Franklin Templeton
Fred Alger Management, LLC
GAMCO Investors, Inc.
Glenmeade Investment Management, LP
GlobeFlex Capital, L.P.
Goldman Sachs
Golub Capital
GW&K Investment Management
Harbor Capital Group Trust
HarbourVest Partners, LLC
Hardman Johnston Global Advisors LLC
Heitman LLC

Manager Name

Hotchkis & Wiley Capital Management, LLC
HPS Investment Partners, LLC
IFM Investors
Impax Asset Management LLC
Income Research + Management
Insight Investment
Intercontinental Real Estate Corporation
Invesco
J.P. Morgan
Janus
Jennison Associates LLC
Jobs Peak Advisors
Kayne Anderson Rudnick Investment Management, LLC
King Street Capital Management, L.P.
Kohlberg Kravis Roberts & Co. L.P. (KKR)
Lazard Asset Management
LGIM America
Lincoln National Corporation
Longview Partners
Loomis, Sayles & Company, L.P.
Lord, Abbett & Company
LSV Asset Management
MackKay Shields LLC
Macquarie Asset Management
Manulife Investment Management
Manulife | CQS Investment Management
Marathon Asset Management, L.P.
Maverick Real Estate Partners
Mawer Investment Management Ltd.
MetLife Investment Management
MFS Investment Management
Mondrian Investment Partners Limited
Montag & Caldwell, LLC
Morgan Stanley Investment Management
Mount Lucas Management LP
MUFG Bank, Ltd.
Natixis Investment Managers
Neuberger Berman
Newmarket Capital
Newton Investment Management

Manager Name

Nipun Capital, L.P.

NISA Investment Advisors LLC

Northern Trust Asset Management

Nuveen

Oaktree Capital Management, L.P.

Orbis Investment Management Limited

P/E Investments

Pacific Investment Management Company

Parametric Portfolio Associates LLC

Partners Group (USA) Inc.

Pathway Capital Management, LP

Peavine Capital

Peregrine Capital Management, LLC

PGIM DC Solutions

PGIM Fixed Income

PGIM Quantitative Solutions LLC

Pictet Asset Management

PineBridge Investments

Polen Capital Management, LLC

PPM America, Inc.

Pretium Partners, LLC

Principal Asset Management

Raymond James Investment Management

RBC Global Asset Management

Red Cedar Investment Management

Regions Financial Corporation

S&P Dow Jones Indices

Sands Capital Management

Manager Name

Schroder Investment Management North America Inc.

Segall Bryant & Hamill

SLC Management

Star Mountain Capital, LLC

State Street Global Advisors

Strategic Global Advisors, LLC

T. Rowe Price Associates, Inc.

TD Global Investment Solutions – TD Epoch

The TCW Group, Inc.

Thompson, Siegel & Walmsley LLC

TPG Angelo Gordon

Tweedy, Browne Company LLC

UBS Asset Management

VanEck

Vaughan Nelson Investment Management

Versus Capital Group

Victory Capital Management Inc.

Virtus Investment Partners, Inc.

Vontobel Asset Management

Voya

Walter Scott & Partners Limited

WCM Investment Management

Wellington Management Company LLP

Western Asset Management Company LLC

Westfield Capital Management Company, LP

William Blair & Company LLC

Xponance, Inc.

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