Mid-Cycle Public Employees' Retirement Fund Asset Liability Management Review March 2024

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Purpose

Recommend the CalPERS Board review and adopt the Capital Market Assumptions (CMAs). The Board is also asked to approve an updated Strategic Asset Allocation (SAA) for the PERF Policy Portfolio (Labeled Candidate Portfolio A in Exhibit 1).

Exhibit 1. The current and recommended Policy Portfolio allocations

	Current Policy		Candidate Portfolio A	
Asset Classes	Weights	Ranges	Weights	Ranges
Public Equity	42%	+/- 7%	37%	+/- 7%
Private Equity	13%	+/- 5%	17%	+/- 5%
Fixed Income	30%	+/- 6%	28%	+/- 6%
Private Debt	5%	+/- 5%	8%	+/- 5%
Real Assets	15%	+/- 5%	15%	+/- 5%
Leverage	-5%		-5%	
Geo Return [1]	6.9%		7.0%	
Survey Return Range	5.6%-7.7%		5.7%-7.7%	
CDaR [2]	21.5%		21.4%	
Volatility	11.2%		11.3%	

The recommended changes, shown as Candidate Portfolio A in Exhibit 1, maintain risk at the Board-approved level while projected returns increase by 10 basis points (bps). (Approximately $480M per year for the current portfolio).

Total equity target exposure declines slightly, from 55% to 54%, while fixed income increases slightly. Private asset target exposures increase from 33% to 40%.

The recommended portfolio has more than adequate short- and long-term liquidity to meet CalPERS obligations, and to support PERF strategies.

Finally, the CalPERS Actuarial Office has advised no revision to current actuarial assumptions are needed. As a result, the Actuarial Office has kept the discount rate at 6.8%. The Actuarial Office provided a risk assessment in November, which is included in the appendix.

Objective

The choice of PERF Policy Portfolio is the CalPERS Board's most important investment decision. This decision is guided by the Constitution of California, which requires the portfolio to be constructed to

[1] 20-Year geometric return net of 10bps admin expense.

[2] CDaR: Conditional Drawdown at Risk is an estimate of the average of the worst 10% potential loss that may transpire in any three-year period.

"minimize the risk of loss", "maximize the rate of return", and "assure prompt delivery of benefits", while "minimizing employer contributions". The actual choice of portfolio must strike a balance among these competing objectives.

Background

The mid-cycle review of the strategic asset allocation is part of the PERF asset liability management process (see appendix). This review involves CalPERS' Actuarial, Communications and Stakeholder Relations, Financial, and Investment Offices (see appendix).

The PERF Policy Portfolio is a benchmark asset mix designed to harvest scalable long-term risk premia while maintaining an acceptable risk of loss.

The SAA is designed with the following considerations in mind:

a) Having a reasonable expectation of PERF returns meeting or exceeding the actuarial discount rate over the long-term.
b) Minimizing the risk of loss needed to support the harvesting of risk premia.
c) Ensuring sufficient liquidity to meet our obligations now and in the future.

The Board approved the current Policy Portfolio in November 2021 by adopting CMAs, selecting a strategic asset allocation, a projected return, and a projected risk. To facilitate this mid-cycle review, we use the 2021 Policy Portfolio asset mix to represent the Board risk appetite.

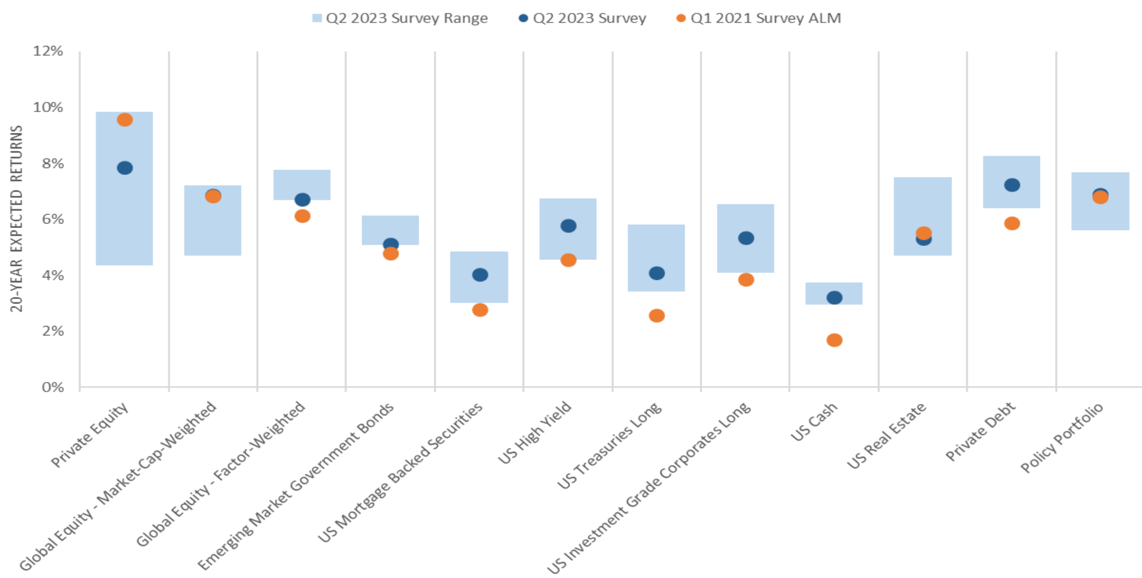
Our recommendation relaxes self-imposed constraints on private equity allocations used in 2021. The recommended portfolio also reflects the material change in the rate environment.

Capital Market Assumptions

Our most recent survey (end of Q2, 2023) of 20-year projected returns is presented in Exhibit 2. There were no material changes relative to the CMAs provided in Q3, 2023 (see appendix).

The light blue boxes represent the range of responses for asset class returns, and the blue dots represent the median value of the responses for the asset class. The orange dots represent the median values used in the 2021 ALM analysis. The size of the blue boxes represents the diversity of surveyed expert opinion and are indicative of the uncertainty associated with return projections.

Exhibit 2. Expected Returns: 20-Year CMA Survey Estimates



Projections for fixed income and private debt returns have increased, while projected private equity returns have decreased. These changes are attributed to the general increase in both short- and long-term rates, leading to increased bond returns. These same rate increases can lead to increased financing costs for private equity, reducing private equity returns.

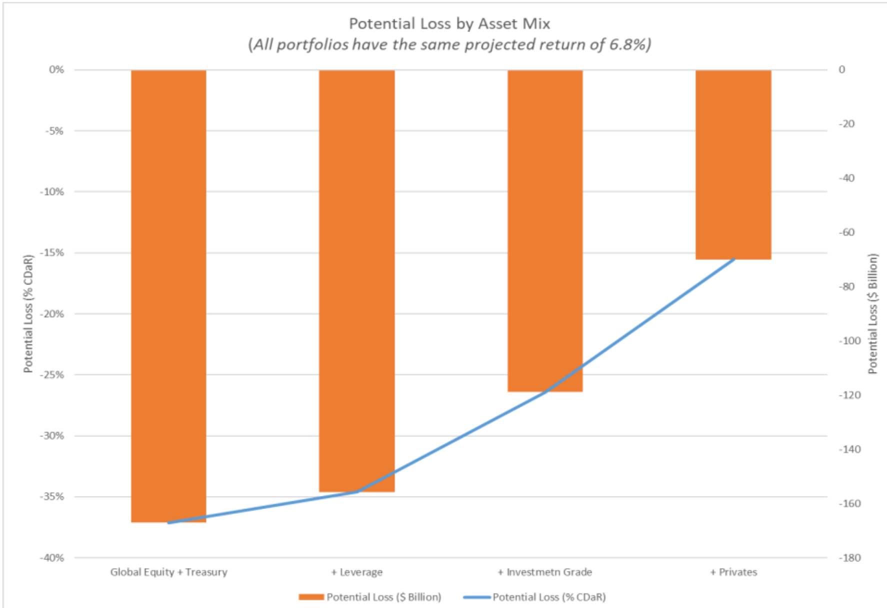
Diversification

Portfolio diversification is an integral part of asset management and is a critical component of managing the overall risk of a portfolio. The benefits of diversification can be illustrated through the sequential addition of new asset classes and leverage to a portfolio, starting from a basic asset class mix and gradually incorporating more complex assets.

The risk-reducing benefits of diversification are illustrated in Exhibit 3. Drawdown risk, as a percentage of total portfolio, is plotted on the left vertical axis. The right-hand axis measures drawdown risk in dollars. Four portfolios of increasing diversification are plotted along the horizontal axis. All the portfolios target the same projected return of 6.8%.

The simplest portfolio (labelled 'Global Equity & Treasury') is leftmost, constructed using public equities, long treasuries, and cash. This simple portfolio has a drawdown risk of roughly -37%. The sequential addition of new asset classes increases diversification and reduces risk. In order, the addition of leverage, then investment grade bonds, and finally, private assets, reduces drawdown risk to -35%, -26%, and finally -15%. Leverage is used to increase the exposure to lower risk assets (such as treasuries) and reduce the exposure to risky assets (equity). Private assets provide economic diversification and exhibit valuation characteristics that smooth and lag market value changes, thus moderating short-term fluctuations and contributing to overall portfolio stability.

Exhibit 3. Diversification and Portfolio Performance



Discussion

Two important factors have played out since the approval of our strategic asset allocation in 2021.

First projected-20-year fixed income returns have increased materially, rising from 2% to 4%. With markets returning to a more normal state, treasuries have a reasonable expectation of acting as diversifiers in the next equity downturn. As a result, there is a modest increase in fixed income products, primarily in private debt.

Second, since the 2021 approval of our current strategic asset allocation, our private equity strategy has done very well relative to the total portfolio. In under two years, our private equity position has exceeded our 4-year target of 13%, rising from 9% in September 2021 to 14% as of December 31, 2023. Three factors contributed to this positive outcome.

1. Private equity outperformance relative to total portfolio has been roughly two times higher than expected. This better-than-expected performance contributed to private equity as a percentage of total fund being higher than projected (denominator effect)
2. Private equity deployment under the new PE strategy has been faster than initially forecast.
3. Private equity distributions are slightly slower than forecast in 2021.

The second point is a consequence of the new private equity strategy, which significantly expanded the capacity to originate value-adding private equity assets. We expect this level of deployment to continue. With this current pacing of private equity commitments and coinvests we expect private equity to reach the upper bound of our target range in a few years.

Capital market assumptions have long favored a higher private equity allocation. Historically, private equity has been our top performer as shown below.

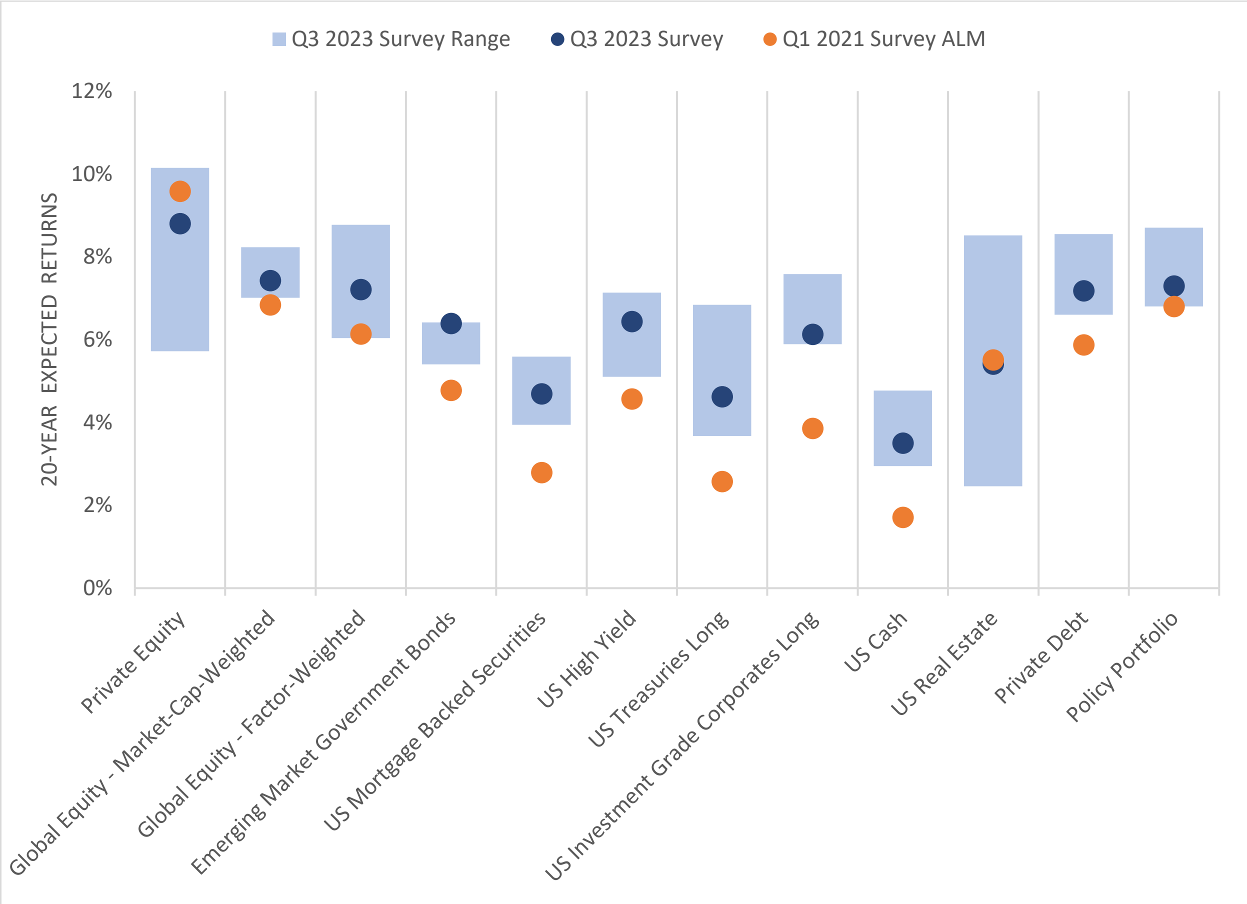
Exhibit 4: 10-Yr Annualized Returns as of June 30, 2023

Asset Classes	10-Yr Annualized Returns
Public Equity	8.9%
Private Equity	11.8%
Fixed Income	2.4%
Real Assets	7.7%
Total PERF	7.1%

The current PERF allocation was limited by our capacity as understood in 2021. Today, we believe our private equity strategy will add significant value to the PERF portfolio, and this strategy is best supported by increasing the target allocation weight from 13% to 17%. The range surrounding the target allocation remains +/-5%, meaning that as a proportion of the total portfolio, the target ranges for private equity would shift from [8%,18%] to [12%,22%].

We believe we have more than adequate liquidity. Our liquidity measures meet a higher standard than just paying benefits. Our liquidity analysis also assesses our ability to sustain all our investment strategies, each of which has its own unique demands on liquidity. As a result, we are meeting a very high liquidity standard.

Appendix: Q3 2023 Capital Market Assumptions



Appendix: Alternate Candidate Portfolios

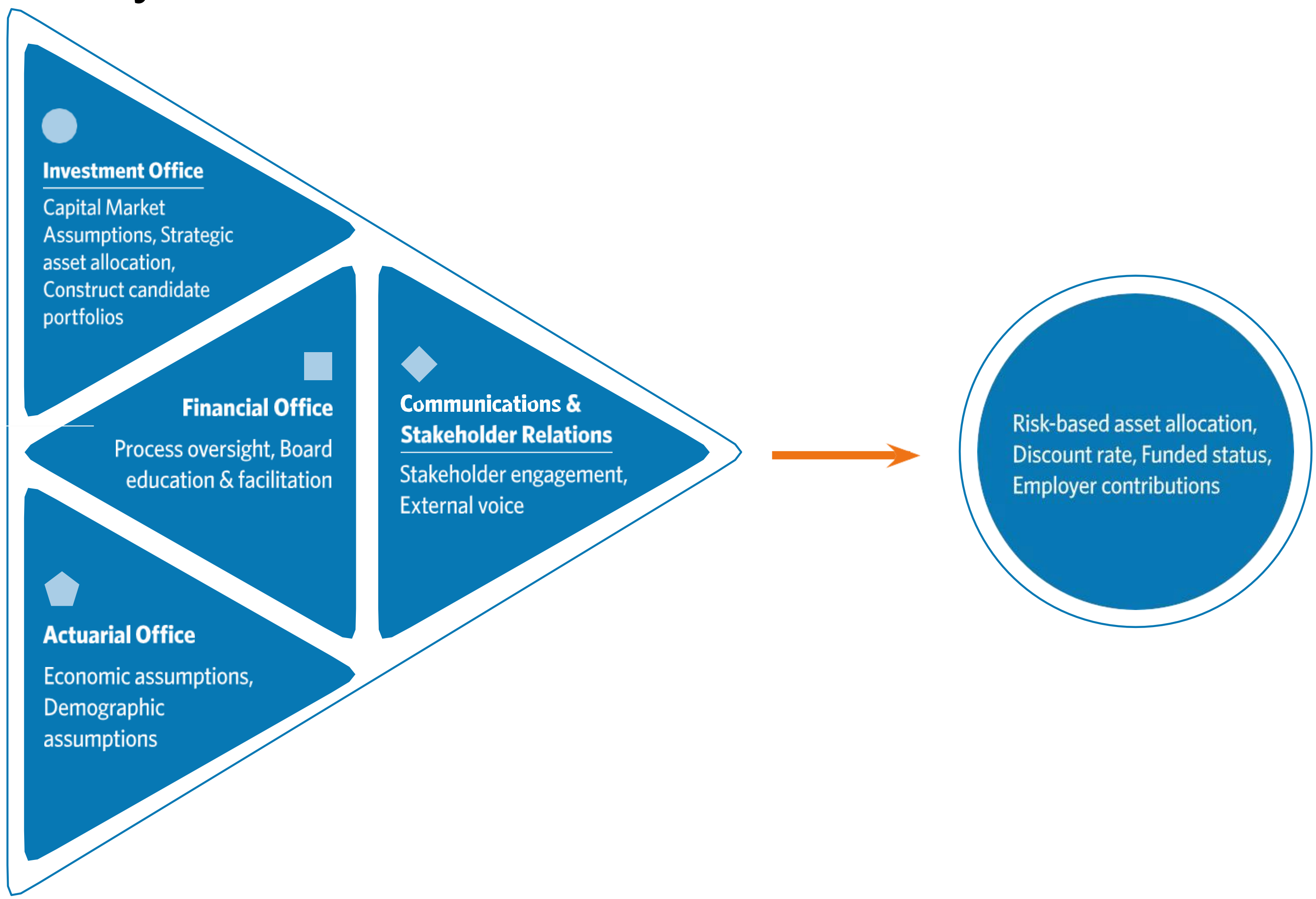
The recommended portfolio (Candidate A) was designed to match the risk of the current Board approved strategic asset allocation. Candidate B was designed to have the same target return as the current Board approved strategic asset allocation. Candidate C was designed to have target returns equal the current Board approved discount rate.

Asset Class	Current Policy	Policy Target Return: Simple	Candidate Portfolio		
			A	B	C
			Policy Target CDaR: 21.5%	Policy Target Return: 6.9%	Target Return: 6.8%
Public Equity	42%	89%	37%	33%	31%
Private Equity	13%		17%	17%	17%
Fixed Income	30%	48%	28%	32%	34%
Private Debt	5%		8%	8%	8%
Real Assets	15%		15%	15%	15%
Leverage	-5%	-37%	-5%	-5%	-5%
Geo Return	6.9%	6.9%	7.0%	6.9%	6.8%
Survey Return Range	5.6%-7.7%	5.0%-7.9%	5.7%-7.7%	5.7%-7.7%	5.6%-7.6%
CDaR	21.5%	34.6%	21.4%	20.1%	19.5%
Volatility	11.2%	16.4%	11.3%	10.9%	10.6%

Appendix: Asset Volatilities and Correlations

Assets	Volatility	Private Equity	Global Equity - Market-Cap-Weighted	Global Equity - Non-Cap-Weighted	Emerging Market Government Bonds	US Mortgage-backed Securities	US High Yield	US Treasuries Long	US Investment Grade Corporates Long	US Cash	US Real Estate	Private Debt
Private Equity	21.9%	1.0	0.6	0.6	0.2	0.1	0.3	0.1	0.2	0.1	0.3	0.4
Global Equity - Market-Cap-Weighted	16.7%	0.6	1.0	0.9	0.3	0.1	0.4	0.1	0.3	0.2	0.3	0.4
Global Equity - Non-Cap-Weighted	12.3%	0.6	0.9	1.0	0.4	0.2	0.4	0.2	0.3	0.2	0.3	0.5
Emerging Market Government Bonds	9.5%	0.2	0.3	0.4	1.0	0.4	0.6	0.6	0.8	0.2	0.3	0.2
US Mortgage-backed Securities	4.2%	0.1	0.1	0.2	0.4	1.0	0.2	0.6	0.5	0.4	0.1	0.2
US High Yield	9.5%	0.3	0.4	0.4	0.6	0.2	1.0	0.2	0.6	0.2	0.3	0.3
US Treasuries Long	11.6%	0.1	0.1	0.2	0.6	0.6	0.2	1.0	0.8	0.3	0.1	0.2
US Investment Grade Corporates Long	10.0%	0.2	0.3	0.3	0.8	0.5	0.6	0.8	1.0	0.3	0.2	0.2
US Cash	0.6%	0.1	0.2	0.2	0.2	0.4	0.2	0.3	0.3	1.0	0.2	0.3
US Real Estate	14.8%	0.3	0.3	0.3	0.3	0.1	0.3	0.1	0.2	0.2	1.0	0.2
Private Debt	12.2%	0.4	0.4	0.5	0.2	0.2	0.3	0.2	0.2	0.3	0.2	1.0

Appendix: Key Functions Within the ALM Process



Appendix: Asset Liability Management Process Timelines

2021

November

Experience study results

Discussion of candidate

portfolios with discount rates

Final approval of discount rate

Final approval of strategic asset allocation

2022

July*

Effective date for strategic asset allocation

2023

February

Educational sessions: concepts, framework, timeline

November

Discussion of mid-cycle review

2024

March

Final approval of mid-cycle review asset allocation

2025

February

Educational session: concepts, framework, timeline

June

Capital Market Assumptions

Economic Assumptions

July*

Educational sessions:

ALM

process & framework

Investment funds risk assessment

Gauging the funds' ability to tolerate market risk

September

Discussion of candidate

portfolios with proposed discount rates

November

Experience study results

Discussion of candidate

portfolios with discount rates

Final approval of discount rate

Final approval of strategic asset allocation

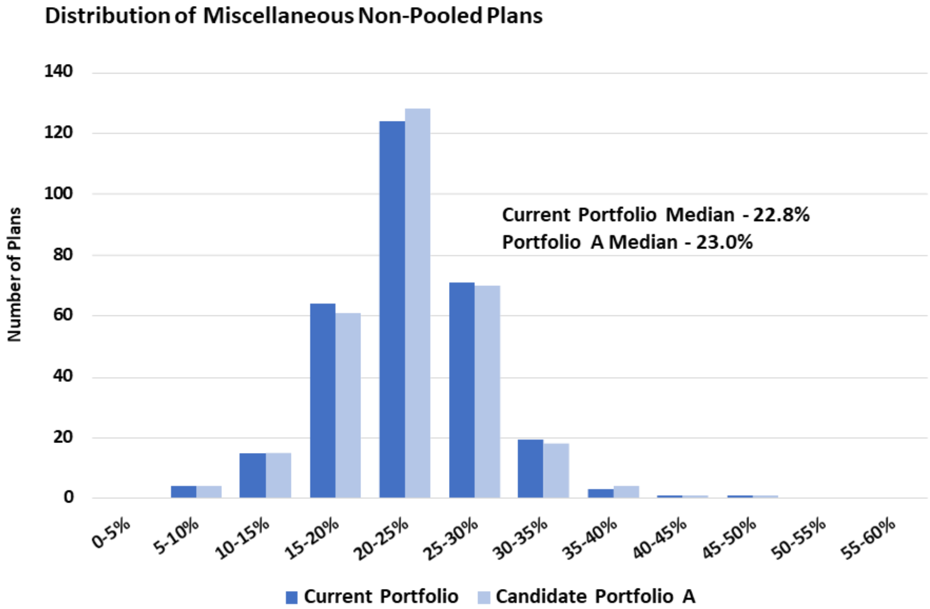
Appendix: Actuarial Assessments of Funding and Contribution Risks

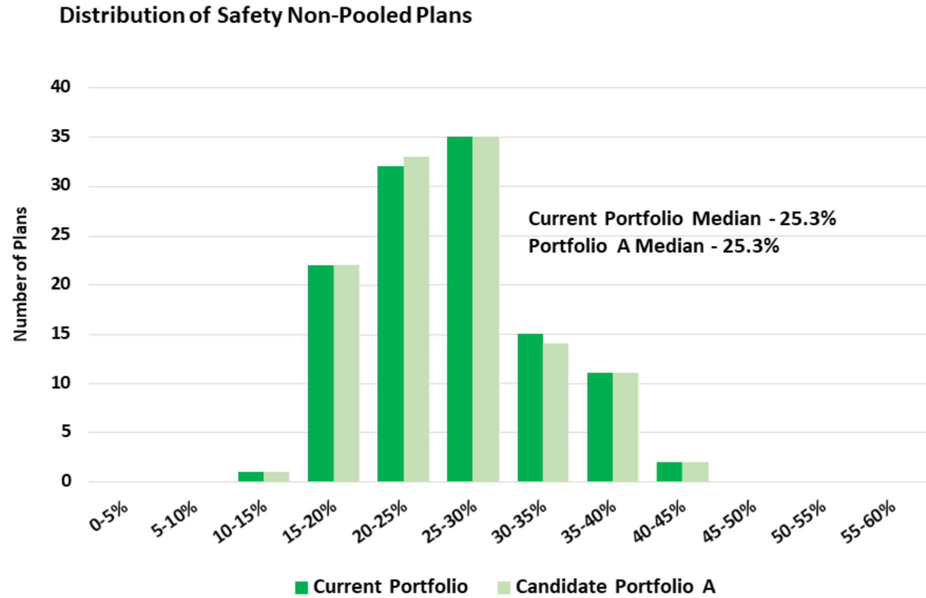
Comparison of current and Candidate portfolio A projected investments returns (after administrative costs). The right three columns on the right side of the panel provide actuarial estimates of the probability the long-term returns will exceed the specified values. As an example, the column headed by 6.8% gives a 49.7% probability the current portfolio long term returns will exceed 6.8%, and a 51.2.% probability Candidate Portfolio A long-term returns will exceed 6.8%.

	Estimated Long-Term Return*	Probability of Average Return Exceeding**		
		6.8%	6.9%	7.0%
Current Portfolio	6.9%	49.7%	48.0%	46.4%
Portfolio A	7.0%	51.2%	49.6%	47.9%

The probability of funding falling below 50% for Miscellaneous Non-Pooled and Safety Non-Pooled plans are given in the next two exhibits. The dark shaded bars are for the current portfolio, and light shaded for the Candidate Portfolio A.

Looking at the Miscellaneous Non-Pooled Plans exhibit, the horizontal axis indicates the probability of funding dropping below 50%. The vertical axis is the number of plans having that probability. The left most part of the exhibit shows there are 0 funds having a probability in the range of 0-5%. Second from the leftmost, there are roughly 3 plans having a probability of 5-10%. The two portfolios have similar funding ratio risk.





Distributions of employer contributions for Miscellaneous Non-Pooled and Safety Non-Pooled plans are presented in the next two exhibits. Again, we see the current and Candidate Portfolio A have very similar outcomes.