MEKETA | 45
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California State Teachers Retirement System (CalSTRS)

May 4, 2023

2023 ALM Study Discussion

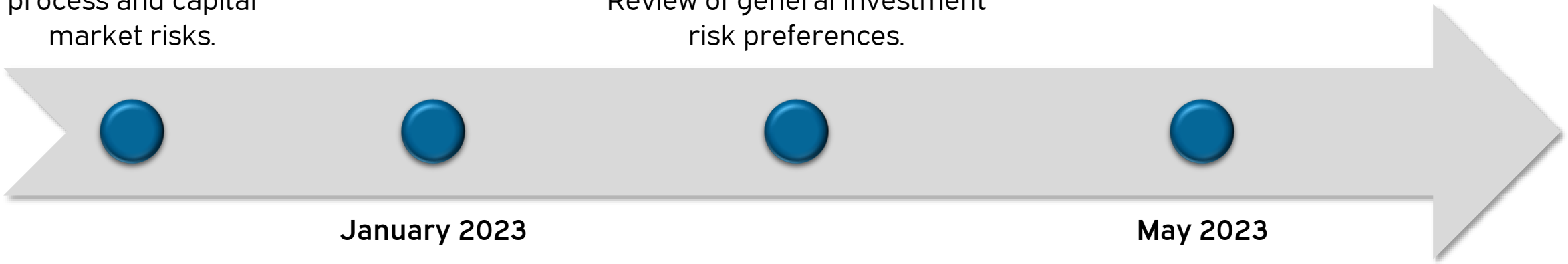
Introduction

→ Over the past nine months, Meketa has worked with Staff on the Asset Liability Management ("ALM") study process. In concert with Staff, the following has been presented:

1. A review of the ALM process and capital market risks (November 2022)
2. A review (and IC approval) of Capital Market Assumptions (January 2023)
3. A review of general investment risk preferences (March 2023)

→ This presentation outlines the results of the collaboration between Meketa and Staff on the asset allocation modeling process, a specific recommendation on an Asset Allocation policy, an analysis of the recommended policy compared to peers, and Meketa's geopolitical and climate simulation modeling for the asset classes & various policies presented.

Timeline of the ALM Study at CalSTRS



November 2022

Review of ALM process and capital market risks.

January 2023

Review and approval of Capital Market Assumptions.

March 2023

Review of general investment risk preferences.

May 2023

Asset allocation policy recommendations are presented to the Investment Committee.

Summary of Staff Modeling and Recommendation

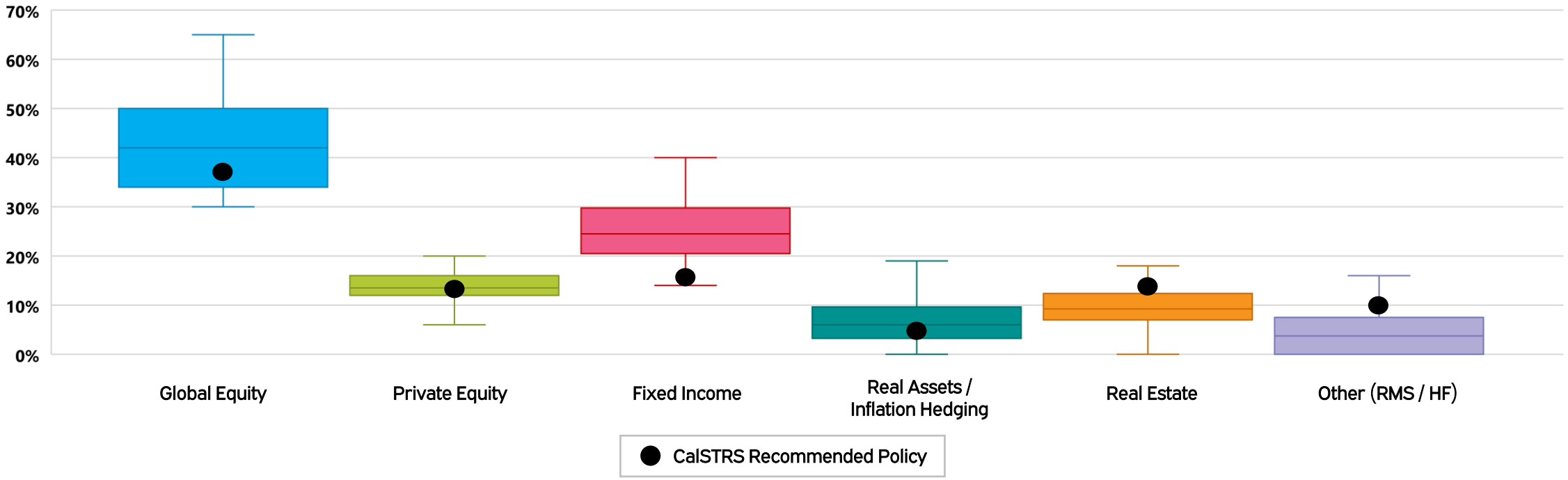
→ Staff's modeling process and analysis of potential asset allocation options were based on a few fundamental principles:

1. Asset allocation policy portfolios should reflect the risk-level preferences expressed by the Investment Committee at the March meeting.
2. Being a very large pool of assets, asset allocation policy changes at CalSTRS should generally be modest, as transition costs and frictions can be significant.
3. Risk should be viewed from a wide variety of perspectives, not just forward-looking market value/rate of return volatility expectations.
4. Asset allocation policies must be developed within a framework of CalSTRS' liabilities and cash flows.

→ Following the modeling exercise, Staff is offering five potential asset allocations options with expected returns ranging from 7.2% to 7.4% (current policy is 7.4%) and expected volatility ranging from 9.4% to 10.1% (current policy is 10.4%).

→ The recommended policy (Policy A) expresses a more efficient risk/return profile than the current policy, as the return expectation remains at 7.4%, while the expected volatility is 30 basis points lower.

Peer Comparison – Public Defined Benefit Plans > $50 billion



	Global Equity (%)	Private Equity (%)	Fixed Income (%)	Real Assets / Inflation Hedging (%)	Real Estate (%)	Other (RMS/HF) (%)	Strategic Leverage (%)
Average	42	14	26	8	10	4	-3
CalSTRS Policy	42	13	14	6	15	10	0
Recommended Policy	**38**	**14**	**16**	**7**	**15**	**10**	**0**

Meketa's Geopolitical & Climate Simulation Modeling

→ As part of the ALM process, Meketa was asked to independently model climate risk and two geopolitical risks (Stagflation and Deglobalization). These risks were identified by the Board at its October offsite meeting and directed to be part of the ALM process.

- The simulation modeling provides a "big picture" estimation of potential impacts to returns and risk that could confront the various policies in fundamentally uncertain situations.

→ On an absolute basis, a near-term, the prolonged stagflationary scenario appears to present the greatest risk to long terms returns among the various policies.

→ Among climate scenarios, scenarios which have later transitions (Current Policies, Delayed Transition) appear to benefit the proposed portfolios, while more ambitious mitigation efforts (Net Zero 2050, Divergent Net Zero) present greater transition risks and more scope for negative outcomes.

	Stagflation (%)	Deglobalization (%)
Current Policy	-1.8	-0.7
Recommended Policy	-1.7	-0.7
Policy 2	-1.7	-0.6
Policy 3	-1.7	-0.6
Policy 4	-1.6	-0.5

Legend
<-1%
-1% – 0%
0% - 1%
>1%

	Climate: Current Policies (%)	Climate: Delayed Transition (%)	Climate: NDCs (%)	Climate: Below 2° (%)	Climate: Net Zero 2050 (%)	Climate: Divergent Net Zero (%)
Current Policy	0.7	0.2	0.0	0.0	-0.3	-0.7
Recommended Policy	0.7	0.2	0.0	-0.1	-0.3	-0.7
Policy 2	0.6	0.2	-0.1	-0.1	-0.3	-0.7
Policy 3	0.6	0.2	-0.1	-0.1	-0.3	-0.7
Policy 4	0.6	0.1	-0.1	-0.1	-0.3	-0.7

Legend
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Summary and Next Steps

→ Approve target ranges around each asset class target.

→ Approve an implementation/transition plan.

→ Modify asset class policies.