California State Teachers Retirement System (CalSTRS)

May 3, 2023

Benchmarking Project

Introduction

→ At the Board's request, Meketa began a broad review of benchmarking in September 2021.

- Board survey

- Board interviews

→ Broad working group including HR Staff, Compensation Consultant, and Board representatives.

→ This presentation, based on feedback from the Board at the January 2023 meeting, provides the Board with potential benchmarking options.
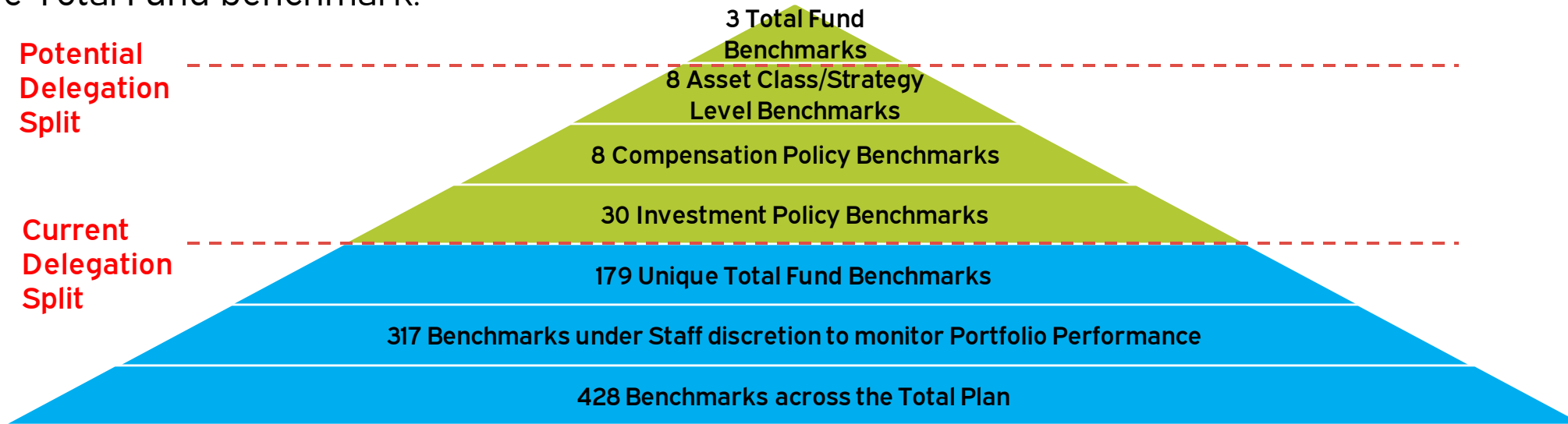
- The Board is addressing only Board-level benchmarks. There are many benchmarks that Staff has and will use for a variety of purposes that are not being addressed by this Project.

→ This presentation, and the Board's discussion, is exclusively on benchmarking CalSTRS' total fund.

- The role of benchmarks and how they impact incentive compensation will be addressed by the Board at a later date.

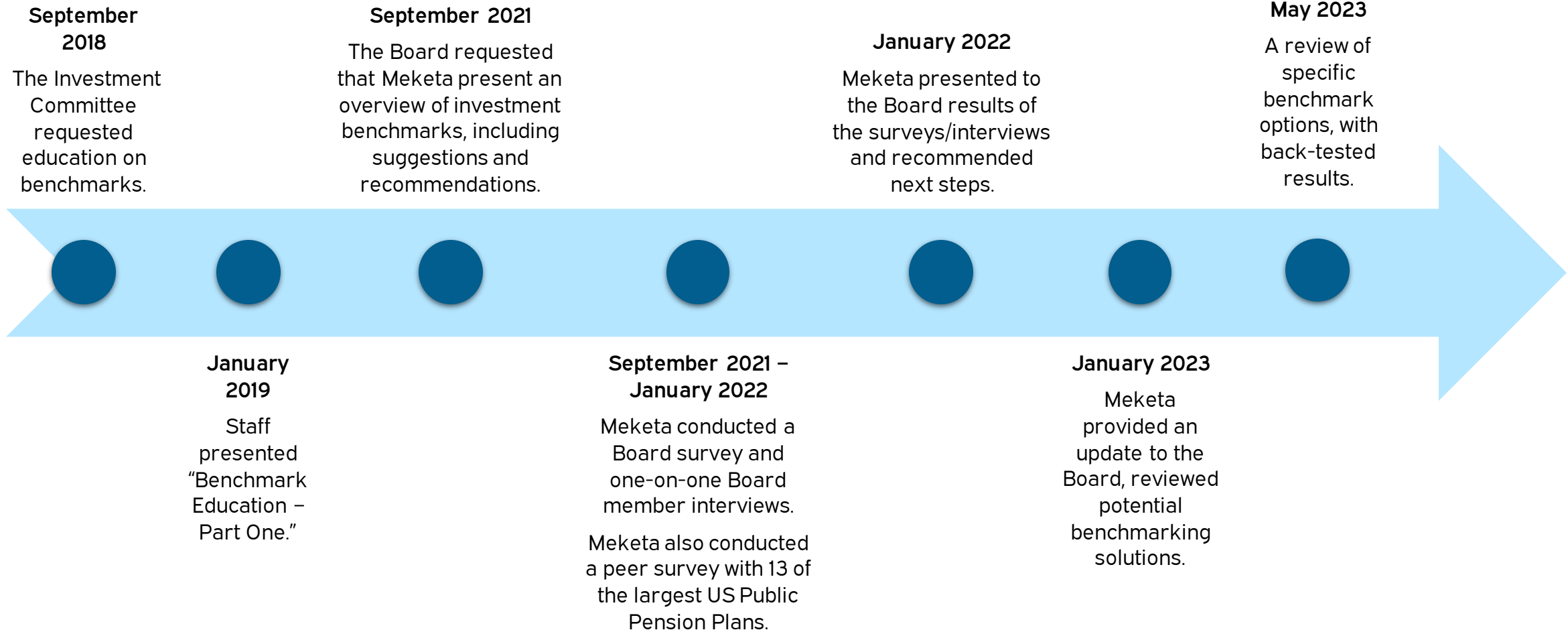## Why Is the Board Addressing Board-Level Investment Benchmarks?

→ The Board is currently responsible for approving 38 benchmarks at the Total Fund, Asset Class, and Sub-Asset Class levels. This project could result in the Board's involvement being limited to approving one Total Fund benchmark.

Potential Delegation Split

Current Delegation Split

3 Total Fund Benchmarks
8 Asset Class/Strategy Level Benchmarks
8 Compensation Policy Benchmarks
30 Investment Policy Benchmarks
179 Unique Total Fund Benchmarks
317 Benchmarks under Staff discretion to monitor Portfolio Performance
428 Benchmarks across the Total Plan

→ With time and increasing portfolio complexity, the existing benchmark structure at CalSTRS has grown in complexity. The Board has provided feedback that the growing complexity makes it challenging to understand the benchmarks, to approve benchmark changes, and to communicate benchmarks to stakeholders.

Timeline of the Benchmarking Project at CalSTRS

September 2018

The Investment Committee requested education on benchmarks.

September 2021

The Board requested that Meketa present an overview of investment benchmarks, including suggestions and recommendations.

January 2022

Meketa presented to the Board results of the surveys/interviews and recommended next steps.

May 2023

A review of specific benchmark options, with back-tested results.

January 2019

Staff presented "Benchmark Education – Part One."

September 2021 – January 2022

Meketa conducted a Board survey and one-on-one Board member interviews.

Meketa also conducted a peer survey with 13 of the largest US Public Pension Plans.

January 2023

Meketa provided an update to the Board, reviewed potential benchmarking solutions.

Complexity Scale

1. **Complex Policy Benchmark (CalSTRS Current Benchmark)**
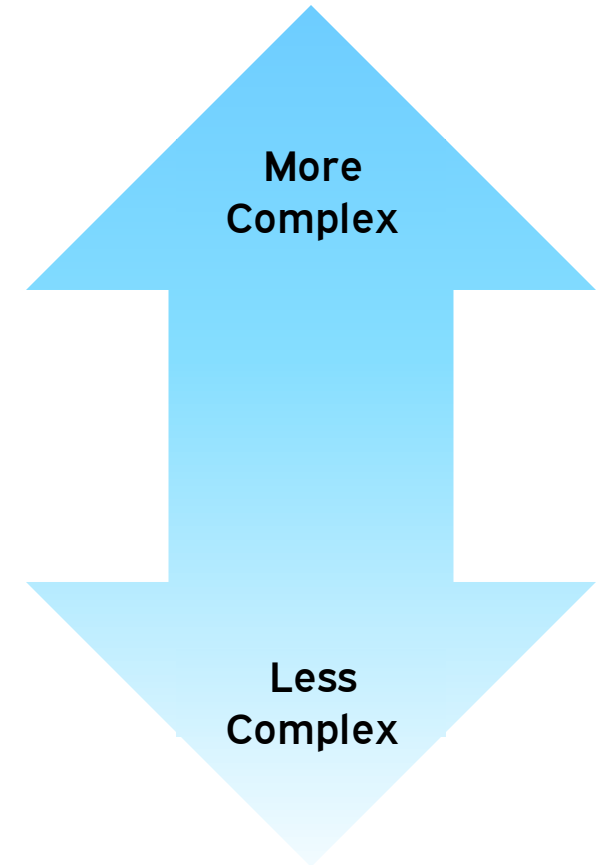
   - *8 Underlying Benchmark Components, Each Customized*

2. **Public & Private Equity / Bond Split**

   - *4 Underlying Benchmark Components*

3. **Simple Equity / Bond Split**

   - *2 Underlying Benchmark Components*

More Complex

Less Complex

→ At the last Board meeting, the Trustees provided feedback to focus on the least complex benchmarking options (numbers 2 and 3).

Potential Measurement Indexes

→ Public Global Equity – **MSCI ACWI IMI**

- The MSCI All Country World Index Investable Market Index ("ACWI IMI") is a broadly accepted global equity index, representing the universe of global publicly traded equities.

→ Public Fixed Income – **Bloomberg Aggregate**

- The Bloomberg Aggregate Bond Index is a broadly accepted US fixed income index, representing the universe of investment grade US fixed income securities.

→ Private Equity – **State Street Private Equity Index**

- The State Street Private Equity Index is one of a handful of industry accepted peer indexes, representing of a broad set of institutional quality private equity fund investments.

→ Real Estate – **NCREIF ODCE**

- The NCREIF ODCE Index is an industry accepted real estate peer index, representing of a broad set of institutional quality core real estate fund investments.

Potential Policy Benchmark Options

Legend:
- ■ MSCI ACWI IMI
- ■ Bloomberg Aggregate
- ■ State Street PE
- ■ NCREIF ODCE

→**Option 1:** 70% MSCI ACWI IMI / 30% Bloomberg Aggregate

MSCI ACWI IMI	Bloomberg Aggregate
70%	30%

→**Option 2:** 50% MSCI ACWI IMI / 20% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE

MSCI ACWI IMI	Bloomberg Aggregate	State Street PE	NCREIF ODCE
50%	20%	15%	15%

→**Option 3:** 40% MSCI ACWI IMI / 30% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE

MSCI ACWI IMI	Bloomberg Aggregate	State Street PE	NCREIF ODCE
40%	30%	15%	15%
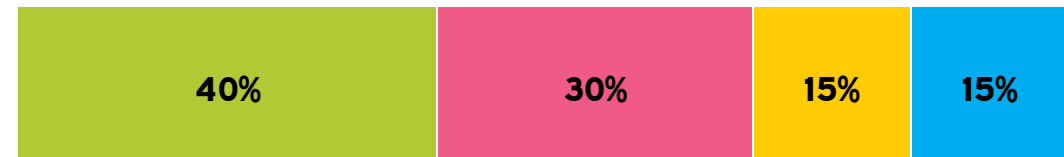
Policy Benchmark Options – Trailing Performance and Risk/Return Profiles

As of 12/31/2022	One Year (%)	Three Years (%)	Five Years (%)	10 Years (%)	20 Years (%)	Historical Risk[1] (%)		Expected Risk[1] (%)	Expected Return[1] (%)
CalSTRS Total Portfolio	**-6.7**	**7.2**	**7.2**	**8.8**	**8.1**	**8.6**		**10.4**	**7.4**
CalSTRS Benchmark	*-6.7*	*6.6*	*6.6*	*8.5*	*8.1*	*8.8*		*N/A*	*N/A*
Option 1	*-16.6*	*2.2*	*3.8*	*6.0*	*7.0*	*11.3*		*11.8*	*7.4*
Option 2	*-10.9*	*6.2*	*6.7*	*8.2*	*8.5*	*8.3*		*12.0*	*7.8*
Option 3	*-10.4*	*5.5*	*6.1*	*7.5*	*7.9*	*6.9*		*10.6*	*7.6*
Peer Universe Median	*-10.9*	*4.7*	*5.5*	*7.0*	*7.4*	*9.2*		*11.7*	*7.7*

Option 1: 70% MSCI ACWI IMI / 30% Bloomberg Aggregate

Option 2: 50% MSCI ACWI IMI / 20% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE

Option 3: 40% MSCI ACWI IMI / 30% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE

[1] Risk is defined/measured as standard deviation. Historical Risk data is measured as the standard deviation of returns over the prior 20-year time period. Expected risk & return metrics reflect CalSTRS' 20-year 2023 Capital Market Assumptions. Peer Group used for this analysis is the Investment Metrics All Defined Benefit Plans > $5 billion. Median asset allocation for peer group is: 50% Global Equity, 25% fixed income, 15% Private Equity, 10% Real Estate.

Summary of Back-Testing of Benchmark Options

→ The following two slides summarize the results of Meketa's back-testing of the various benchmark options.

→ As shown on the first chart, each of the benchmark options tracked the actual returns of CalSTRS reasonably closely over rolling three-year periods, indicating that all benchmark options reasonably match the broad investment exposures of CalSTRS over time.

→ As shown on the second chart, Option 1, which excludes private markets allocations, has the highest "tracking error" to the actual CalSTRS returns, meaning that CalSTRS' returns relative to Option 1 are likely to deviate much more than they do in relation to the current benchmark or to Options 2 or 3.

→ Over the last 10 years, Option 2 had a lower tracking error than the current benchmark, implying a stronger fit to actual investment exposures at CalSTRS.

Rolling Three-Year Historical Return Comparison
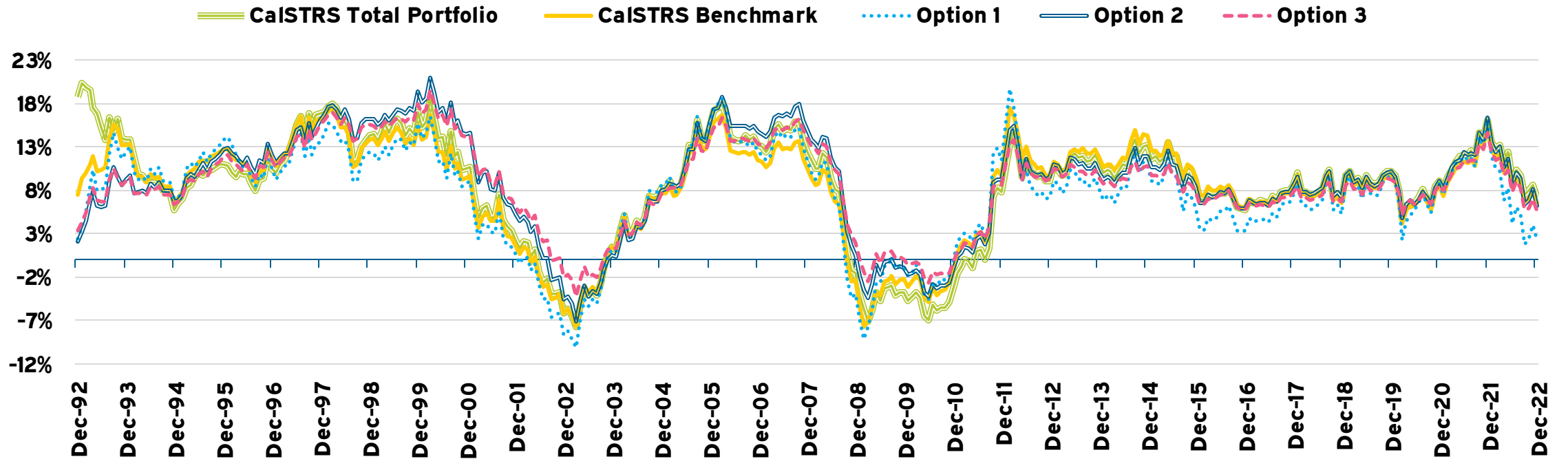
→The returns of CalSTRS and the various potential benchmarks have been highly correlated (greater than 0.91) over historical rolling 3-year periods.

Option 1: 70% MSCI ACWI IMI / 30% Bloomberg Aggregate
Option 2: 50% MSCI ACWI IMI / 20% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE
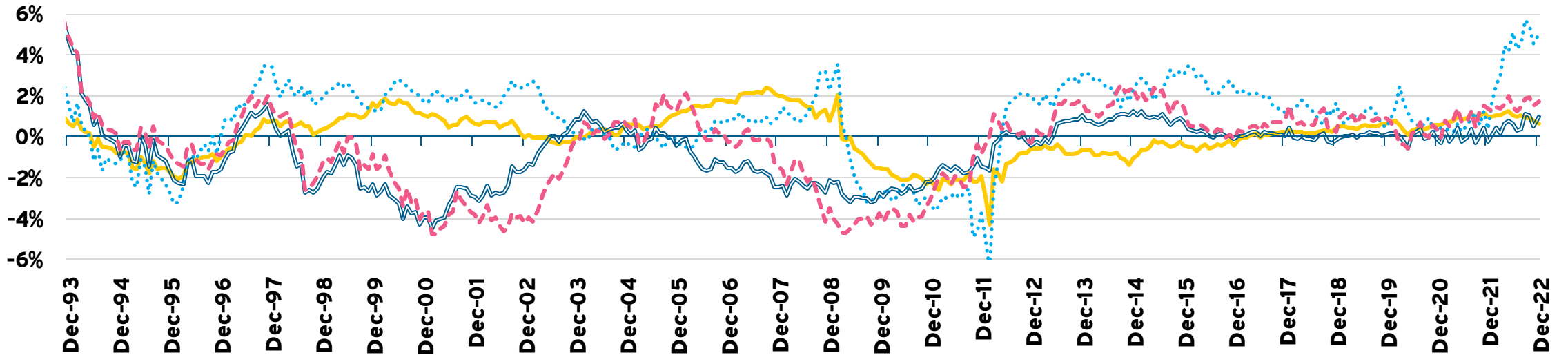Option 3: 40% MSCI ACWI IMI / 30% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE

Rolling Three-Year CalSTRS Return Versus Benchmarks
(Positive number means CalSTRS outperformed the benchmark)

→ Compared to the CalSTRS portfolio over the last ten years, the current policy benchmark had an annualized tracking error of 2.3%. Option 1 had an annualized tracking error of 8.0%, Option 2's tracking error was 1.8%, and Option 3's tracking error was 4.1%.

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Policy Benchmark Options – Historical Scenario Analysis

	Private Markets Boom (Jul 2021 – Jun 2022)	COVID-19 Market Shock (Feb – Mar 2020)	Taper Tantrum (May – Aug 2013)	Global Financial Crisis (Oct 2007 – Mar 2009)	Global Financial Crisis Recovery (Mar– Nov 2009)
CalSTRS Total Portfolio	**-1.3**	**-10.3**	**1.2**	**-25.3**	**17.5**
CalSTRS Benchmark	*-2.2*	*-10.3*	*1.7*	*-23.6*	*30.2*
Option 1	*-14.5*	*-14.9*	*-1.4*	*-25.5*	*43.9*
Option 2	*-3.5*	*-10.0*	*0.2*	*-21.8*	*21.6*
Option 3	*-2.8*	*-7.7*	*-0.2*	*-17.7*	*16.8*

→The returns achieved by the CalSTRS Total Portfolio and the CalSTRS Benchmark for periods beyond 10 years ago reflected a materially different asset allocation mix.

Option 1: 70% MSCI ACWI IMI / 30% Bloomberg Aggregate
Option 2: 50% MSCI ACWI IMI / 20% Bloomberg Aggregate / 15% State Street Private Equity Index / 15% NCREIF ODCE
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Next Steps

→ Consider benchmarking options provided in this presentation.

→ Once selected, modify Policy documents to reflect new Total Fund reference portfolio.

→ Benchmark would be reflected in Staff reports to the Investment Committee (e.g., CIO reports) and in Consultant Semi-Annual Reviews.