CalPERS

Investment Committee

California Public Employees' Retirement System

Agenda Item 5a

June 17, 2013

ITEM NAME: Revision of the Total Fund Benchmarks Policy to Reflect Global Fixed Income Benchmark and Inflation Assets Benchmark Changes

PROGRAM: Total Fund

ITEM TYPE: Policy & Delegation – Action

RECOMMENDATION

Approve the revised Total Fund Benchmarks Policy, provided as Attachment 2, to reflect changes to the Global Fixed Income Benchmark and Inflation Assets Benchmark. The consultant opinion letter is provided as Attachment 3.

EXECUTIVE SUMMARY

The Total Fund Benchmarks Policy was presented to the Investment Committee for initial review on May 13, 2013. The Investment Committee did not request any changes to the proposed Policy at the time of the initial review. However, during the course of the initial review of these proposed policy changes, an administrative change was applied to the Total Fund Benchmarks Policy. This change was to specify the benchmark for the Public Employees' Health Care Fund to be the Barclay's Aggregate Index. The administrative change was in follow up to the adoption of a dedicated program policy for the Public Employees' Health Care Fund at the April 2013 Investment Committee meeting.

The administrative change does not impact the proposed Global Fixed Income and Inflation Assets benchmark changes, however, Attachment 2 has been updated to reflect the proposed changes on the most current version of the Benchmarks Policy.

Staff seeks approval of the revised Total Fund Benchmarks Policy to:

- Broaden the investment opportunity set,
- Reduce the concentration risks in the Global Fixed Income and Inflation Assets Program portfolios, and
- Increase CalPERS exposure to countries whose economies are expected to contribute a greater percentage of future global gross domestic product (GDP).

STRATEGIC PLAN

This item supports the CalPERS Strategic Plan Goal to improve long-term pension and health benefit sustainability.

Periodically evaluating and revising program benchmarks enhances staff's ability to achieve CalPERS investment objectives and increase returns.

BACKGROUND

Proposed Change to Global Fixed Income Benchmark

The Global Fixed Income benchmark (GFI Benchmark) has a 16% weight in the Total Fund Policy Benchmark and is comprised of two components:

1. 90% Barclays Long Liabilities (GFI Domestic Benchmark), and
2. 10% Barclays International Fixed Income (GFI International Benchmark)

The proposed change will only impact the GFI International Benchmark, and thus represents a 10% change in the GFI Benchmark and a 1.6% impact on the Policy as shown in Attachment 1, Page 2 of 11. The table below outlines key differences between the existing and proposed GFI International Benchmarks.

Existing GFI International Benchmark - Market capitalization weighted benchmark *Barclays International Fixed Income benchmark*	
Summary	A rules-based index in which countries with more index-eligible debt outstanding (on a market value basis) have a higher weight in the index.
Pros	• Historically perceived to better reflect the "market portfolio" or investable universe of securities.
Cons	• Tend to over allocate to the most indebted countries instead of the most creditworthy countries, which can incur large losses as demonstrated in the recent European sovereign debt crisis.
Proposed GFI International Benchmark - GDP weighted benchmark *Barclays International Fixed Income Index GDP weighted ex-U.S.*	
Summary	An alternative rules-based index which fixes country weights in a benchmark based on related GDP weights instead of total market value of outstanding debt.
Pros	• Broaden the opportunity set by including investment grade emerging markets, thereby increasing diversification • Avoid over allocation to the most indebted countries
Cons	• Potentially poses a concern of investability as there may not be sufficient debt issuance available in the countries with less debt as a percentage of their GDP. Staff has reviewed this issue.

Proposed GFI International Benchmark - GDP weighted benchmark *Barclays International Fixed Income Index GDP weighted ex-U.S.*	
Cons ***Continued***	• Based on the current size of the GFI International portfolio, and even if such portfolio tripled in size, the estimated portfolio market share of the proposed country bond markets is very small. Therefore, the adoption of the proposed GDP weighted benchmark would not impact staff's ability to prudently manage the portfolio.

Proposed Change to Inflation Assets Benchmark
The Inflation Assets (IA) benchmark has a 4% weight in the Total Fund Policy Benchmark and is comprised of two components:

1. 75% Inflation Linked Bond (ILB) benchmark, and
2. 25% Commodities benchmark

The proposed change will only impact the international component of the ILB benchmark. The current ILB benchmark is a custom Index blend of 67% Barclays Global Inflation-Linked U.S. (ILB U.S. Benchmark) and 33% Barclays Global Inflation linked United Kingdom, France, Italy, Germany, and Canada only, un-hedged (ILB International Benchmark).

Accordingly, 25% of the IA benchmark will be impacted by this proposed change, and 1% of the Total Fund Policy Benchmark will be impacted by this proposed change as shown in Attachment 1, Page 3 of 11.

Existing ILB International Benchmark - market capitalization weighted inflation linked index for five countries only *Barclays Global Inflation Linked U.K., France, Italy, Germany, and Canada*	
Summary	Custom benchmark of inflation linked bonds issued by selected countries in Barclays Capital Global Inflation Linked Index based on size and liquidity criteria. Currently only includes five countries.
Pros	• Simplicity
Cons	• Highly concentrated portfolio
Proposed ILB International Benchmark – market capitalization weighted inflation linked index for sixteen countries *Barclays Universal Government Inflation Linked Bond Index ex-U.S.*	
Summary	Includes sixteen developing and emerging market countries and excludes non-investment grade rated countries and other countries due to tax, regulatory, or other capital controls.
Pros	• Broaden the opportunity set by including investment grade emerging markets, thereby increasing diversification

Proposed ILB International Benchmark – market capitalization weighted inflation linked index for sixteen countries *Barclays Universal Government Inflation Linked Bond Index ex-U.S.*	
Pros *Continued*	• Better align the investment process with the proposed GFI International Benchmark
Cons	• Still a market capitalization weighted index. Staff does not argue for a GDP weighted variant of the inflation linked index as inflation linked bonds tend to be a smaller subset of total government indebtedness. As the issuance of inflation linked bonds grows, it may make sense to consider a GDP weighted inflation linked benchmark in the future.

ANALYSIS

The existing GFI International Benchmark was designed to best reflect the "market portfolio" or investable universe of sovereign securities from which to choose. The existing ILB International Benchmark limited the universe to only developed countries. The benchmarks have accomplished their goals. However, as was demonstrated in the European sovereign debt crisis beginning in 2009, market capitalization weighted sovereign benchmarks over allocate to the most indebted countries as opposed to the most creditworthy. The proposed changes address this issue by broadening the opportunity set to include countries whose economies are expected to contribute a greater percentage of future global GDP.

In contrast to market capitalization benchmarks for equities which reward success (i.e., higher equity market capitalizations are tied to higher economic growth), the opposite is potentially true for fixed income benchmarks (i.e. rewarding "profligacy") and especially true for those where the underlying debts are sovereigns rather than corporates. The reason this risk is higher for sovereigns issuing in their own currencies is their capacity to monetize, or "inflate away," their debts. In contrast, corporate issuers are subject to a different and stricter form of market discipline because they cannot similarly inflate away their debts. Moreover, sovereign benchmarks tend to be inherently more concentrated as there is a smaller universe of potential issuers (i.e., 35 in our proposed and 31 in the existing benchmark) versus corporate indices which usually have hundreds of issuers. For example, there are over 800 in CalPERS investment grade corporate benchmark.

BENEFIT/RISKS

Adopting the proposed benchmark changes would significantly reduce the concentration risks, and therefore reduce the potential impact to CalPERS if any one country were to default. The largest exposure to any one country falls from 42% exposure to Japan in the existing GFI International Benchmark to 18% in the proposed GFI International Benchmark.

Japan, in particular, has grown debt quickly and if it were to have trouble refinancing its debt, it could have a significant potential negative impact on the existing GFI International portfolio. This risk is reduced by moving to the proposed GFI International Benchmark. Similarly, the largest exposure to any one country falls from 51% in existing ILB International Benchmark to 39% in the proposed ILB International Benchmark.

The proposed benchmarks have historically had a higher return than the existing benchmarks (see Attachment 1). Based on current yields, the proposed benchmarks are expected to improve the cash flow yield and reduce the interest rate exposure of the Total Fund.

The risk of the proposed benchmark is that they have historically had higher volatility than the existing benchmarks (see Attachment 1). CalPERS risk model estimates that the Total Fund volatility will increase by four basis points. Correlation of the proposed benchmarks to the Total Fund has also been higher historically.

ATTACHMENTS

Attachment 1 – Current and Proposed GFI and IA Benchmarks, Returns, Volatility and Impact on the Total Fund Policy Benchmark
Attachment 2 – Total Fund Benchmarks Policy with Proposed Revisions
Attachment 3 – Consultant Opinion Letter

ERIC BAGGESEN
Interim Senior Investment Officer
Asset Allocation and Risk Management

JOSEPH A. DEAR
Chief Investment Officer

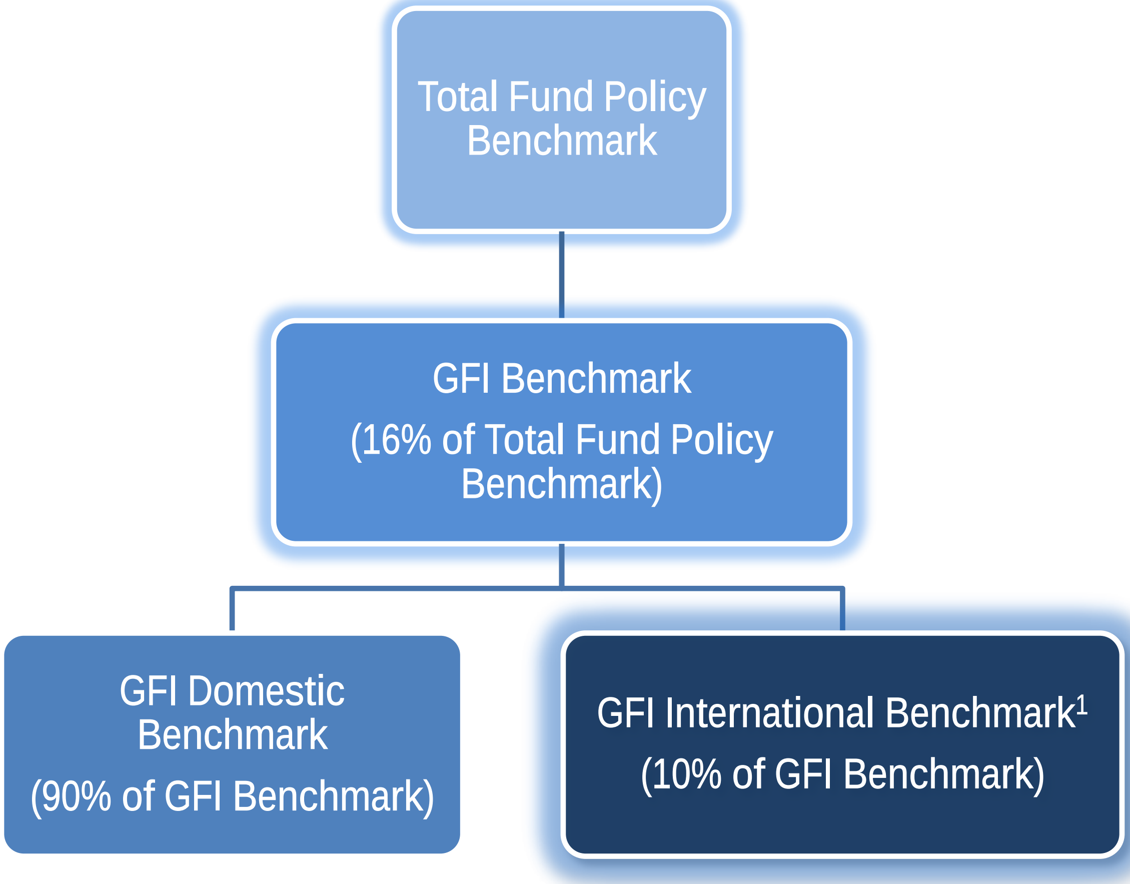
Revision of the Total Fund Benchmarks Policy

Asset Allocation

June 17, 2013

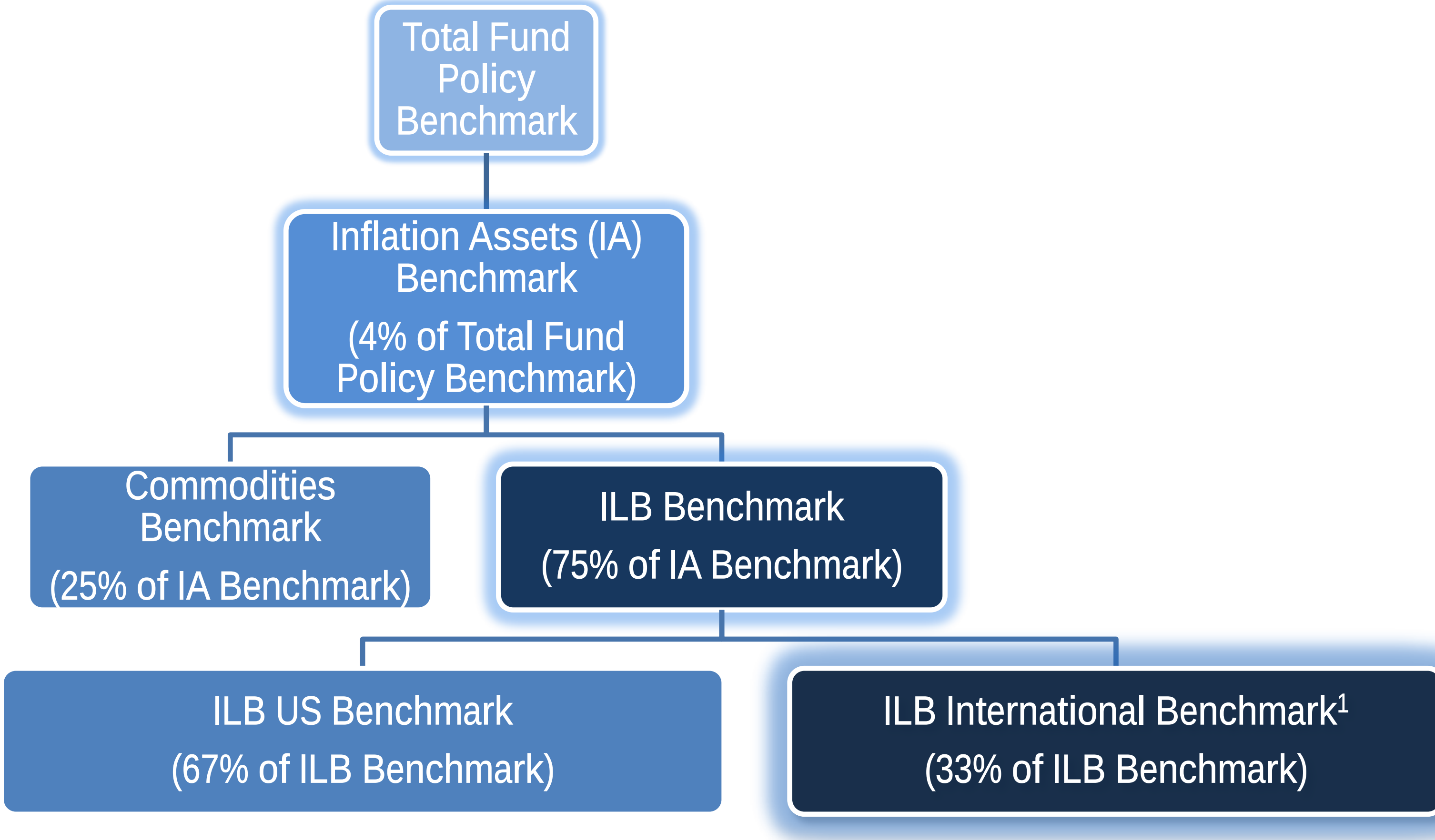
CalPERS | Investment Office
Asset Allocation

Proposed Global Fixed Income (GFI) International Benchmark Change has a 1.6% impact on the Total Fund Policy Benchmark Composition



[1] Proposed change from Barclays International Fixed Income Index to Barclays International Fixed Income Index GDP-Weighted ex-US.

Proposed Inflation Linked Bond (ILB) International Benchmark Change has a 1% impact on the Total Fund Policy Benchmark Composition



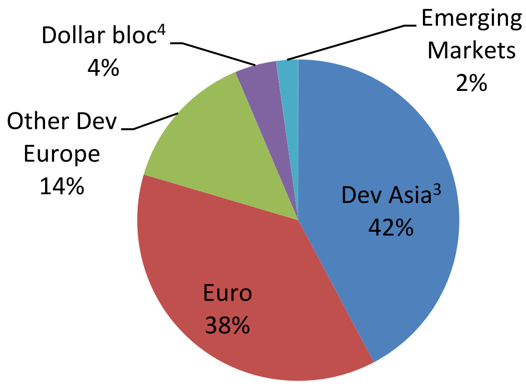
[1] Proposed change from Barclays Global Inflation Linked United Kingdom, France, Italy, Germany, and Canada only, un-hedged, to Barclays Universal Government Inflation Linked Bond Index ex-US.

GFI International Benchmark – Existing vs. Proposed

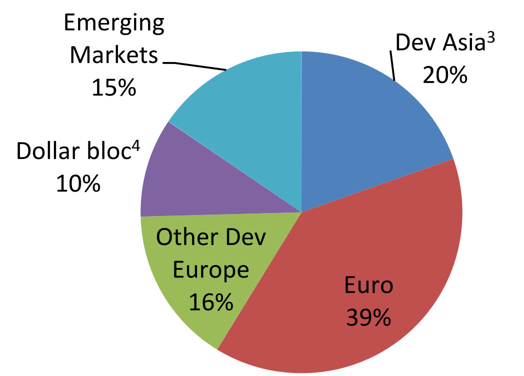
Country[1,2]	Existing GFI International Benchmark (%)	Proposed GFI International Benchmark (%)
Australia	1.37	4.27
Austria	1.57	1.29
Belgium	2.41	1.59
Canada	2.51	5.22
Chile	0.04	0.72
Croatia		0.20
Czech Rep	0.30	0.66
Denmark	0.73	1.03
Finland	0.56	0.81
France	8.85	8.67
Germany	8.02	11.17
Hong Kong	0.03	0.74
Ireland	0.69	0.70
Israel	0.31	0.73
Italy	8.55	6.91
Japan	41.81	18.08
Luxembourg	0.03	0.21
Malta	0.01	0.08
Mexico	0.77	3.45
Netherlands	2.45	2.63
New Zealand	0.31	0.47
Norway	0.25	1.44
Peru		0.52
Poland	0.70	1.57
Russia		5.24
S.Africa	0.57	1.20
Singapore	0.39	0.77
Slovakia	0.20	0.30
Slovenia	0.09	0.16
Spain	3.93	4.67
Sweden	0.57	1.60
Switzerland	0.61	1.93
Thailand	0.51	1.04
Turkey		2.37
United Kingdom	10.87	7.55
Total	100	100

Source: Barclays

Regional Weights: Current Benchmark



Regional Weights: Proposed Benchmark



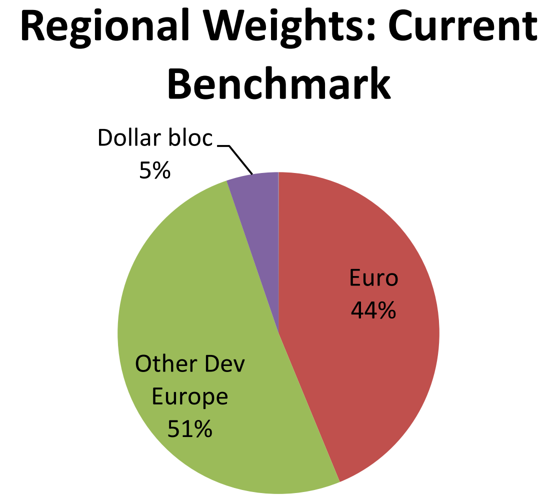
CalPERS Investment Office Asset Allocation

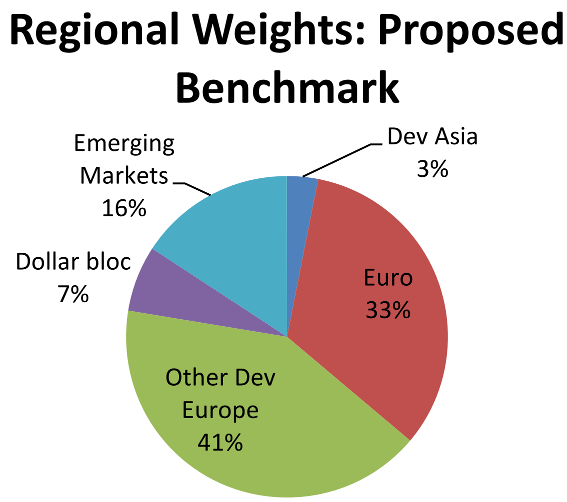
1. Following countries are excluded as they are below investment grade: Argentina, Egypt, Philippines, Hungary
2. Following countries are excluded due to tax and capital control restrictions: Brazil, China, Columbia, India, Indonesia, South Korea, Malaysia, Taiwan
3. Developed Asia includes Japan, Hong Kong and Singapore
4. Dollar Bloc includes Australia, New Zealand and Canada

ILB International Benchmark – Existing vs. Proposed

Country	Existing ILB International Benchmark (%)	Proposed ILB International Benchmark (%)
Japan		3.11
France	22.17	17.12
Germany	6.83	5.00
Italy	14.77	10.93
Sweden		2.59
UK	51.00	38.72
Denmark		0.13
Australia		1.94
Canada	5.23	4.67
Chile		1.00
Mexico		4.50
Poland		0.58
South Africa		2.49
Turkey		3.61
Israel		3.35
Thailand		0.24
Total	100	100

Source: Barclays





Impact of Adapting the Proposed GFI & ILB International Benchmarks using six years of historical data[1]

6 Year Annualized		With Existing GFI & ILB International Benchmarks	With Both Proposed GFI & ILB International Benchmarks
Total Fund Policy Benchmark[2]	Average Return	4.58%	4.60%
	Volatility	11.07%	11.10%
GFI Benchmark	Average Return	7.54%	7.62%
	Volatility	6.01%	5.98%
IA Benchmark	Average Return	6.55%	6.69%
	Volatility	7.98%	7.79%

- Increases the returns for GFI, IA and Total Fund Policy Benchmarks
- Reduces the volatility for GFI and IA Benchmarks, but increases it for the Total Fund Policy Benchmark[3].

[1] Historical Data for the Proposed ILB International Benchmark were only available for the past six years, due to unavailability of issues from Emerging Markets.
[2] The FTSE All World Total Market Index was used as a proxy for the Public Equity Return Series.
[3] While the historical volatility of the GFI and IA Benchmarks are lower with the Proposed Benchmarks, volatility at the Total Fund Policy Benchmark is higher because the historical correlations with the Total Fund Policy Benchmark are higher for the Proposed Benchmarks than the Existing Benchmarks. The Proposed Benchmarks' higher correlations with the Total Fund Policy Benchmark is due to their inclusion of emerging markets. In general, emerging markets have a higher factor exposure to growth risks, which drives much of the return of the Total Fund Policy Benchmark.

Impact of Adapting the Proposed GFI International Benchmark, using ten years of historical data

10 Year Annualized		With Existing GFI International Benchmark	With Proposed GFI International Benchmark only
Total Fund Policy Benchmark	Average Return	9.28%	9.29%
	Volatility	9.16%	9.18%
GFI Benchmark	Average Return	6.66%	6.77%
	Volatility	5.72%	5.70%

- Improves the historical return of GFI and Total Fund Policy Benchmarks but worsens the Total Fund Policy Benchmark Volatility over 10 year horizon[1].

[1] While the historical volatility of the GFI Benchmark is the same with the Proposed and Existing GFI International Benchmarks, volatility at the Total Fund Policy Benchmark is higher because the historical correlation with the Total Fund Policy Benchmark is higher for the Proposed GFI International Benchmark than the Existing GFI International Benchmark. The Proposed GFI Benchmark's higher correlation with the Total Fund Policy Benchmark is due to its inclusion of emerging markets. In general, emerging markets have a higher factor exposure to growth risks, which drives much of the return of the Total Fund Policy Benchmark.

Impact of Adapting the Proposed IA International Benchmark using six years of historical data[1]

6 Year Annualized		With Existing ILB International Benchmark	With Proposed ILB International Benchmark
Total Fund Policy Benchmark	Average Return	4.58%	4.59%
	Volatility	11.07%	11.07%
IA Benchmark	Average Return	6.55%	6.69%
	Volatility	7.98%	7.79%

- Improves the historical return of IA and Total Fund Policy Benchmarks horizon and improves the IA Benchmark Volatility over six year[2].

[1] Historical Data for the Proposed ILB International Benchmark were only available for the past six years, due to unavailability of issues from Emerging Markets.
[2] While the historical volatility of the IA Benchmark is lower with the Proposed ILB International Benchmark, volatility at the Total Fund Policy Benchmark is unchanged because the historical correlation with the Total Fund Policy Benchmark is higher for the Proposed ILB International Benchmark than the Existing ILB International Benchmark. The Proposed ILB Benchmark's higher correlation with the Total Fund Policy Benchmark is due to its inclusion of emerging markets. In general, emerging markets have a higher factor exposure to growth risks, which drives much of the return of the Total Fund Policy Benchmark.

Forecasted Risk Impact of Adapting Both Benchmarks

Total Risk	With Existing GFI & ILB International Benchmarks	With Both Proposed GFI & ILB International Benchmarks
Total Fund Policy Benchmark	12.16%	12.20%
GFI Benchmark	5.89%	5.84%
IA Benchmark	5.21%	5.07%

- Barra Risk Estimates are higher for the Total Fund Policy Benchmark and lower for GFI and IA Benchmarks. This is due to the higher projected correlation between the proposed benchmarks and the Total Fund Policy Benchmark compared to the existing benchmarks and the Total Fund Policy Benchmark.

Forecasted Risk Impact of Adapting the Proposed GFI International Benchmark Only

Total Risk	With Existing GFI International Benchmark	With Proposed GFI International Benchmark
Total Fund Policy Benchmark	12.16%	12.19%
GFI Benchmark	5.89%	5.84%

- Barra Risk Estimates are higher for the Total Fund Policy Benchmark and lower for GFI Benchmark. This is due to the higher projected correlation between the proposed benchmarks and the Total Fund Policy Benchmark compared to the existing benchmarks and the Total Fund Policy Benchmark.

Forecasted Risk Impact of Adapting the Proposed IA International Benchmark Only

Total Risk	With Existing ILB International Benchmark	With Proposed ILB International Benchmark
Total Fund Policy Benchmark	12.16%	12.16%
IA Benchmark	5.21%	5.07%

- Barra Risk Estimates are the same for the Total Fund Policy Benchmark and lower for IA Benchmark. This is due to the higher projected correlation between the proposed benchmarks and the Total Fund Policy Benchmark compared to the existing benchmarks and the Total Fund Policy Benchmark.

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
STATEMENT OF INVESTMENT POLICY

FOR
BENCHMARKS

June 17, 2013~~May 10, 2013~~

This policy is effective immediately upon adoption and supersedes all previous Benchmarks policies.

I. PURPOSE

The California Public Employees' Retirement System ("CalPERS") Total Fund Statement of Investment Policy, adopted by the CalPERS Investment Committee ("Committee"), sets forth CalPERS overarching investment purposes and objectives with respect to all its investment programs.

This document sets forth the investment policy ("Policy") for the selection and modification of program benchmarks ("Program"). The design of this Policy ensures that investors, managers, consultants, and other participants selected by CalPERS take prudent and careful action when selecting program benchmarks and managing the benchmark modification process. Additionally, use of this Policy assures sufficient flexibility in managing investment risks and returns associated with managing Program benchmarks.

II. STRATEGIC OBJECTIVE

The Program shall be managed to accomplish the following:

A. Manage total portfolio risk and return characteristics; and,

B. Establish controls for the selection and modification of benchmarks.

III. RESPONSIBILITIES

A. The Committee is responsible for approving total fund policy benchmarks.

B. CalPERS Investment Staff ("Staff") is responsible for the following:

1. All aspects of portfolio management including monitoring, analyzing, and evaluating performance relative to the appropriate benchmark.

2. Modifying benchmarks as applicable.

3. Providing a report to the Chief Operating Investment Officer ("COIO"), annually, in July, listing all new benchmark, benchmark replacement and modification requests submitted during the previous fiscal year.

4. Reporting to the Committee quarterly, and more often if needed, any benchmark changes.

5. Monitoring the implementation of, and compliance with, the Policy. Staff shall report concerns, problems, material changes, and all violations of Guidelines and Policies at the next Committee meeting, or sooner if deemed necessary. These reports shall include explanations of any violations and appropriate recommendations for corrective action.

C. The General Pension Consultant ("Consultant") is responsible for:

1. Monitoring, evaluating, and reporting quarterly, to the Committee, on the performance of the Program relative to the Policy.

2. Reviewing and approving all requests for benchmark replacements and modifications.

IV. PERFORMANCE OBJECTIVE AND BENCHMARK

A. The performance objective is for the various asset classes and programs to meet or exceed their respective benchmarks.

B. The benchmark for individual programs or strategies is listed in one of the following attachments:

1. Attachment A: Total Fund Policy

2. Attachment B: Asset Allocation Policies

3. Attachment C: Growth Policies

4. Attachment D: Income Policies

5. Attachment E: Inflation Assets Policies

6. Attachment F: Real Assets Policies

7. Attachment G: Liquidity Policies

8. Attachment H: Multi Asset Class Partners Policies

9. Attachment I: Absolute Return Strategies Policies

10. Attachment J: Other (Non-PERF) Investment Portfolio Policies

Policies included in the following categories do not have referenced benchmarks; therefore, they are not listed in the attachments: Investment and Risk Management, Ethics, Operations, and Shareowner Activities.

C. Benchmark Definitions – Please see the applicable attachments for a definition of each program's component (i.e., industry, sector, country, etc.) benchmark.

V. INVESTMENT APPROACHES AND PARAMETERS

The purpose of a benchmark is to establish target investment exposures, facilitate the periodic reporting to the Committee, and to provide a relative measure to gauge success.

A. Desirable Benchmark Characteristics

The desirable characteristics of a suitable program benchmark are set forth below.

1. Public Market Securities / Programs

   a. Investable – The securities contained in the benchmark should represent tradable positions. Ideally, the benchmark should be constructed with low turnover to minimize transactions costs.

   b. Measurable – The pricing of the benchmark should be transparent, making it possible to track benchmark performance.

   c. Unambiguous – The names and weights of the securities in the benchmark should be clearly defined.

2. Private Market Programs

   a. Measurable – The pricing of the benchmark should be transparent, making it possible to track benchmark performance.

   b. Predetermined – The names and weights of the components of the benchmark should be clearly defined.

c. Representative – The components of the benchmark should be suitably representative of the investments and their associated risk and return levels.

B. Benchmark Modification Indicators:

The following factors may indicate that modification of a benchmark should be considered:

1. When a more cost efficient alternative is available that captures the risk return characteristics of the asset class or program.

2. When a component (i.e., industry, sector, country, etc.) of the benchmark is exposed to economic risks that are of such a degree that the future economic viability of that industry or sector is in doubt. Examples of such indicators:

   a. The industry, not an individual company, shares common exposure to product liability judgments, settlements, and ongoing litigation that have the potential to exceed the industry's net worth.

   b. Significant threat of a specific component filing bankruptcy.

   c. Regulatory or legislative actions or both that have the potential to substantially impair specific component earnings.

   d. Policy actions in the institutional investor community that, in aggregate, have the potential to have a deleterious effect on specific component share prices.

3. In the event that these or other indicators are evidenced, Staff or a member of the Committee may bring the matter before the Committee for due diligence and consideration. This due diligence will include:

   a. Analysis by Staff, in consultation with third-party experts, that the indicators are evidenced and have the potential to adversely impact the benchmark performance.

   b. Analysis of the expected effect of the benchmark modification on the total portfolio risk/return characteristics.

   c. Analysis of the expected costs associated with implementation of the benchmark modification.

d. A timetable for review of the benchmark modification.

C. Benchmark Modification Process

1. Staff is responsible for completing the Benchmark Change Control Form, obtaining the appropriate Senior Investment Officer approval, and submitting the form to the Investment Servicing Division – Portfolio Analytics Unit (“ISD – PA”).

2. ISD – PA Staff is responsible for reviewing the proposed purpose of the benchmark replacement or benchmark component modification.

3. The Consultant is responsible for reviewing and approving the benchmark replacement or benchmark component modification.

4. The Chief Investment Officer (“CIO”) or the COIO must also approve the benchmark replacement or benchmark component modification.

5. Once the Consultant and the CIO or COIO has approved the benchmark modification, ISD – PA Staff will notify the Office of Enterprise Compliance, the Asset Allocation Unit and the Custodian.

VI. CALCULATIONS AND COMPUTATIONS

Investors, managers, consultants, and other participants selected by CalPERS shall make all calculations and computations on a market value basis as recorded by CalPERS Custodian.

VII. GLOSSARY OF TERMS

Key words used in the policy are defined in CalPERS Master Glossary of Terms.

Approved by the Policy Subcommittee: Adopted by the Investment Committee:	June 15, 2009 August 17, 2009
Revised by the Policy Subcommittee: Approved by the Investment Committee:	November 16, 2009 December 14, 2009
Revised by the Policy Subcommittee: Approved by the Investment Committee: Policy Effective:	April 11, 2011 May 16, 2011 July 1, 2011
Administrative Update to Attachment F – Real Asset Policies:	February 7, 2012
Administrative Update to Attachment B - Asset Allocation Policies Program Benchmark:	March 1, 2012
Administrative Update to change AIM to Private Equity (PE):	October 10, 2012
Administrative Update to add Multi Asset Class Partners Allocation and Program	December 10, 2012
Administrative Update to Attachment B – Asset Allocation Policies Program Benchmark:	February 20, 2013
Administrative Update to Attachment J – Other (Non-PERF) Investment Portfolio Policies Program Benchmark	May 10, 2013
Approved by the Investment Committee: Policy Effective:	June 17, 2013 July 1, 2013

ATTACHMENT A

TOTAL FUND POLICY BENCHMARKS

~~December 10, 2012~~June 17, 2013

The total fund policy benchmark is the average return of the asset class benchmark indices weighted by asset class benchmark allocations plus the benchmark return of the total fund currency overlay program and the benchmark return of the Multi Asset Class Partners allocation.. The fund benchmark return is the return attributable to the target asset class allocations. Staff employs active strategies in an effort to achieve a fund portfolio return that exceeds the fund benchmark return.

Asset Class	Benchmark	Weight
Growth	78% * Public Equity benchmark + 22% * Private Equity benchmark.	63.0%
Income	90% Barclays Long Liabilities + 10% Barclays International Fixed Income Index GDP weighted ex-US.	16.0%
Inflation Assets	75% * ILB benchmark + 25% * Commodities benchmark.	4.0%
Real Assets	77% * Real Estate benchmark + 15% * Infrastructure benchmark + 8% * Forestland benchmark.	13.0%
Liquidity	75% * Barclays Treas 2-10 yr. + 25% * 1 mo. T-bill	4.0%

The total fund policy benchmark return will be scaled to reflect the target asset class allocations along with the addition of the Multi Asset Class Partners allocation as per the following weights:

Asset Class	Benchmark	Weight
Total Fund	See details above for composition	99.50%
Multi Asset Class Partners	Absolute 7.5%	0.50%

The allocation above will become effective on February 1, 2013.

ATTACHMENT B

ASSET ALLOCATION POLICIES
PROGRAM BENCHMARKS

~~February 20, 2012~~June 17, 2013

Policy	Program	Benchmark
Asset Allocation Strategy		Policy Index.
California Employers' Retiree Benefit Trust (CERBT) Funds		The benchmark for each asset allocation fund is a weighted benchmark determined by weighting each asset class benchmark by its policy target.
	Global Equity	MSCI ACWI IMI (Net)
	U.S. Fixed Income	Barclays ~~Capital~~ Long Liability Index
	TIPS	Barclays ~~Capital~~ Global Real: U.S. TIPs Index
	Commodities	S&P GSCI Total Return Daily
	REITs	FTSE EPRA/NAREIT Developed Liquid (Net)
Judges' Retirement System II		The benchmark for each asset allocation fund is a weighted benchmark determined by weighting each asset class benchmark by its policy target.
	Global Equity	CalPERS Custom FTSE Global Composite
	U.S. Fixed Income	Barclays ~~Capital~~ Long Liability Index
	TIPS	Barclays ~~Capital~~ Global Real: U.S. TIPs Index
	Commodities	S&P GSCI Total Return Daily
	REITs	FTSE EPRA/NAREIT Developed Index
Legislators' Retirement System		The benchmark for each asset allocation fund is a weighted benchmark determined by weighting each asset class benchmark by its policy target.
	Global Equity	CalPERS Custom FTSE Global Composite
	U.S. Fixed Income	Barclays ~~Capital~~ Long Liability Index
	TIPS	Barclays ~~Capital~~ Global Real: U.S. TIPs Index
	Commodities	S&P GSCI Total Return Daily

	REITs	FTSE EPRA/NAREIT Developed Index
Long-Term Care Fund		The benchmark for each asset allocation fund is a weighted benchmark determined by weighting each asset class benchmark by its policy target.
	Global Equity	MSCI ACWI IMI (Net)
	U.S. Fixed Income	Barclays ~~Capital~~ Long Liability Index
	TIPS	Barclays ~~Capital~~ Global Real: U.S. TIPs Index
	Commodities	S&P GSCI Total Return Daily
	REITs	FTSE EPRA/NAREIT Developed Liquid (Net)
SIP CalPERS Risk-Based & Target Retirement Date Funds		The benchmark for each asset allocation fund is a weighted benchmark determined by weighting each asset class benchmark by its policy target.
	Global Equity	Individual Global Equity pool portfolio benchmarks.
	U.S. Fixed Income	Barclays ~~Capital~~ Aggregate Index.
	TIPS	Barclays ~~Capital~~ Global Real: U.S. TIPS Index.
	Commodities	Standard & Poor's GSCI Total Return Index.
	REITS	FTSE EPRA/NAREIT Developed.

ATTACHMENT C

GROWTH POLICIES
PROGRAM BENCHMARKS

October 10, 2012

Policy	Program	Benchmark
Growth	Total Growth	78% * Public Equity benchmark + 22% * Private Equity benchmark
Private Equity (PE)	Total Private Equity	(67% FTSE U.S. TMI + 33% FTSE AW ex U.S. TMI) +3% lagged one quarter.
Restricting Private Equity Investments in Public Sector Outsourcers		Not Applicable.
Public Equity	Total Public Equity	CalPERS Custom Global Equity.
Public Equity Sub Asset Class Allocation Ranges	Domestic Equity	CalPERS Custom Domestic All Cap.
	International Equity	CalPERS All-World Ex U.S. All Cap.
Public Equity Emerging Manager Fund of Funds		Custom weighted average benchmark.
Corporate Governance	Corporate Governance (Externally Managed) Funds	The benchmark shall be recommended by the fund manager with input from the due diligence consultant and input and approval from the Corporate Governance Senior Portfolio Manager and Portfolio Manager.
	Corporate Governance Co-Investment Strategy	The benchmark is the portfolio market value weighted total return for the benchmark for each external partner with whom an actual co-investment has been made.
Emerging Equity Markets Principles		Not Applicable.

Externally Managed Strategies	Domestic Active Equity	CalPERS Custom Domestic Large / Mid Cap.
	Domestic Enhanced Indexing Equity	CalPERS Custom Domestic Large / Mid Cap.
	Domestic Relaxed Long-Only Equity	CalPERS Custom Domestic Large / Mid Cap.
	International Active Equity	CalPERS Custom Developed International Large / Mid Cap.
	International Enhanced Indexing Equity	CalPERS Custom Developed International Large / Mid Cap.
Manager Development Program (MDP) I and II Policy and Manager Transition Policy		Custom weighted average benchmark.
Monitoring Externally Managed Portfolios		Specific performance objectives and benchmarks for each externally managed program are outlined in policy and External Manager guidelines.
Internally Managed Affiliate Equity Index Funds	Deferred Compensation Index (SIP Large Cap Equity Index)	Standard & Poor's 500.
	Pooled Index	Standard & Poor's 500Ex Tobacco.
	Deferred Compensation Small and Mid Cap Index (SIP Small and Mid Cap Equity Index)	Russell 2500 Index.
Internally Managed Public Enhanced Equity Strategies	Fundamental Factor Model – Domestic	CalPERS Custom Domestic Large / Mid Cap.
	Fundamental Factor Model – Developed Markets - International	CalPERS Custom Developed International Large / Mid Cap.
	Environmental Factor Model – HSBC	CalPERS /Custom Global Equity
	Fundamental Factor Model – Emerging Markets – International	CalPERS Custom Emerging Markets.
	Country-Tiered Emerging Markets	CalPERS Custom Emerging Markets
	Synthetic Enhanced Equity	Standard & Poor's 500 Index.

Internally Managed Public Equity Index Funds	Domestic Large / Mid Cap	CalPERS Custom Domestic Large / Mid Cap.
	Domestic Microcap	CalPERS Custom Domestic Microcap.
Internally Managed Public Equity Index Funds, cont.	International Large / Mid Cap	CalPERS Custom Developed International Large / Mid Cap.
	International Small/Microcap	CalPERS Custom Developed International Small Cap.
	Emerging Markets	CalPERS Custom Emerging Markets.
	Cash Equitization	CalPERS Custom Global Equity
	Dynamic Completion	CalPERS Custom DCF.

BENCHMARK DETAILS:

CalPERS Custom Global Equity
The CalPERS Custom Global Equity benchmark is a custom composite that comprises the CalPERS Custom Domestic All Cap and CalPERS Custom All-World ex US All Cap benchmarks on a capitalization weighted basis.

CalPERS Custom Domestic All Cap
The CalPERS Custom Domestic All Cap benchmark is a custom composite that comprises the CalPERS Custom Domestic Large / Mid Cap and CalPERS Custom Domestic Microcap benchmarks on a capitalization weighted basis.

CalPERS Custom All-World ex US All Cap
The CalPERS Custom All-World ex US Cap benchmark is a custom composite that comprises the CalPERS Custom Developed International Large / Mid Cap, CalPERS Custom Developed International Small Cap, CalPERS Custom emerging Markets Large/Mid Cap, and CalPERS Custom Emerging Markets Small Cap benchmarks on a capitalization weighted basis.

CalPERS Custom Developed International Large / Mid Cap
The CalPERS Custom Developed International Large / Mid Cap benchmark is a custom index constructed and maintained by FTSE. It is defined as the FTSE All World Developed benchmark excluding US domestic and tobacco (as defined by RiskMetrics) securities. It is based on market capitalization and is reconstituted quarterly.

CalPERS Custom Developed International Small Cap
The CalPERS Custom Developed International Small Cap benchmark is a custom index constructed and maintained by FTSE. It is defined as the FTSE GEIS (Global Equity Index Series) Developed Small Cap benchmark excluding US domestic and tobacco (as

defined by RiskMetrics) securities. It is based on market capitalization and is reconstituted quarterly.

CalPERS Custom Domestic Large / Mid Cap
The CalPERS Custom Domestic Large / Mid Cap benchmark is a custom index constructed and maintained by FTSE. It is defined as the top 3000 securities in the FTSE US Total Market Index (TMI), excluding tobacco securities (as defined by RiskMetrics), based on market capitalization and is reconstituted quarterly.

CalPERS Custom Domestic Microcap
The CalPERS Custom Domestic Microcap benchmark is a custom index constructed and maintained by FTSE. It is defined as the FTSE US TMI, excluding tobacco securities (as defined by RiskMetrics), less the securities included in the CalPERS Custom Domestic Large / Mid Cap benchmark. It is based on market capitalization and is reconstituted quarterly.

CalPERS Custom DCF
The CalPERS Custom DCF (Dynamic Completion Fund) benchmark is a custom index constructed and maintained by Nuveen Investment Solutions (formerly Richards and Tierney). Its construction is a function of the style and market cap biases generated by the composite of the benchmarks for all Global Equity portfolios in the aggregate. This custom index complements the above-mentioned biases, completing the benchmark exposure to CalPERS strategic, custom, Global Equity benchmark, and is reconstituted as needed based on changes in the Global Equity program.

CalPERS Custom Emerging Markets Large / Mid Cap
The CalPERS Custom Emerging Markets Large / Mid Cap benchmark is a custom index constructed and maintained by FTSE. It is defined as the FTSE All World Emerging markets Large / Mid Cap benchmark excluding tobacco (as defined by RiskMetrics) securities, KLD-restricted securities, and Argentine securities. It is based on market capitalization and is reconstituted quarterly.

CalPERS Custom Emerging Markets Small Cap
The CalPERS Custom Emerging markets Small Cap benchmark is a custom index constructed and maintained by FTSE. It is defined as the FTSE All World Emerging markets small cap benchmark excluding tobacco (as defined by RiskMetrics) securities, KLD-restricted securities, and Argentine securities. It is based on market capitalization and is reconstituted quarterly.

Russell 2500
The Russell 2500 benchmark is a capitalization weighted benchmark designed to measure the performance of the US domestic small and mid cap equity market. It is composed of the largest 3000 securities, based on market capitalization, in the United States minus the largest 500 securities, and is reconstituted annually.

Standard & Poor's 500
The Standard & Poor's 500 benchmark is a capitalization weighted benchmark designed to measure the performance of the US domestic large cap equity market. It is composed of the largest 500 securities, based on market capitalization, in the United States and is reconstituted quarterly.

Standard & Poor's 500 Ex Tobacco
The Standard & Poor's 500 Ex Tobacco benchmark is a capitalization weighted benchmark designed to measure the performance of the US domestic large cap equity market. It is composed of the largest 500 securities, excluding tobacco securities (as defined by RiskMetrics), based on market capitalization, in the United States and is reconstituted quarterly.

ATTACHMENT D

INCOME POLICIES
PROGRAM BENCHMARKS

~~March 1, 2012~~June 17, 2013

Policy	Program	Benchmark
Currency Overlay	Currency Overlay Program	Sum of benchmark foreign currency exposures of portfolios with international benchmarks plus actual foreign currency exposures of portfolios with domestic-only benchmarks fully hedged.
	Tactical Management Program	Sum of benchmark foreign currency exposures of portfolios with international benchmarks plus actual foreign currency exposures of portfolios with domestic-only benchmarks fully hedged.
	Externally Managed Currency Overlay Program	Sum of benchmark foreign currency exposures of portfolios with international benchmarks plus actual foreign currency exposures of portfolios with domestic-only benchmarks fully hedged.
	Internally Managed Passive Currency Overlay Program	Sum of benchmark foreign currency exposures of portfolios with international benchmarks plus actual foreign currency exposures of portfolios with domestic-only benchmarks fully hedged.
	Internally Managed Active Currency Overlay Program	Sum of benchmark foreign currency exposures of portfolios with international benchmarks plus actual foreign currency exposures of portfolios with domestic-only benchmarks fully hedged.
Global Fixed Income Program	Dollar-Denominated Fixed Income Program	Barclays ~~Capital~~ Long Liabilities Index.

Global Fixed Income Program, cont.	~~Externally Managed Active~~ International Fixed Income Program	Barclays ~~Capital~~ International Fixed Income Index GDP weighted ex-US.
	Foreign Debt Policy Program	Not Applicable.
Low Duration Fixed Income Program	Dollar-Denominated Fixed Income High Quality Libor (HQL) Program	Federal Funds based index.
	Dollar-Denominated Fixed Income Short Duration Program	Federal Funds based index.
	Internally Managed Dollar-Denominated Short-Term Program	Total rate of return of the State Street Bank Short-Term Investment Fund after investment management fees.
Treasury Inflation Protected Securities (TIPS)		Barclays ~~Capital~~ Group Real: U.S. TIPS Index.

ATTACHMENT E

INFLATION ASSETS POLICIES
PROGRAM BENCHMARKS

~~July 1, 2011~~**June 17, 2013**

Policy	Program	Benchmark
Inflation Assets	Overall Program	75% * ILB benchmark + 25% * Commodities benchmark.
	Commodities Program	Standard & Poor's GSCI Total Return Index.
	Inflation-Linked Bond Program	ILB Custom Index: Blend of 67% Barclays ~~Capital~~ Global Inflation-Linked U.S. and 33% Barclays Universal Government Inflation Linked Bond Index ex-US~~Capital Global Inflation-Linked United Kingdom, France, Italy, Germany and Canada only, unhedged~~.
	Foreign Debt Policy	Not Applicable.

ATTACHMENT F

REAL POLICIES
PROGRAM BENCHMARKS

October 10, 2012

Policy	Program	Benchmark
Real Assets	Total Real	77% Real Estate benchmark + 15% * Infrastructure benchmark + 8% * Forestland benchmark.
	Real Estate Program***	Exceed (net of fees) NCREIF ODCE lagged one quarter
	Infrastructure Program	Consumer Price Index +4%, lagged one quarter.
	Forestland Program	NCREIF Timberland lagged one quarter.

*** The interim Real Estate benchmark is a composite of the NCREIF ODCE and the previous global equity REIT index (FTSE EPRA NAREIT Global). Each quarter, the benchmark weight of the REIT index weight would equal the actual weight of the REIT portfolio at the end of the prior quarter. The portfolio REIT allocation is expected to decline to zero over the next one to three years. This transition plan is gradual and responsive to market conditions.

ATTACHMENT G

LIQUIDITY POLICIES
PROGRAM BENCHMARKS

July 1, 2011

Policy	Program	Benchmark
Liquidity Program	Total Liquidity Program	75% * Barclays Treas 2-10 yr. + 25% * 1 mo. T-bill

ATTACHMENT H

MULTI ASSET CLASS POLICIES
PROGRAM BENCHMARKS

December 10, 2012

Policy	Program	Benchmark
Multi Asset Class	Multi Asset Class Program	Absolute 7.5%

ATTACHMENT I

ABSOLUTE RETURN STRATEGIES POLICIES
PROGRAM BENCHMARKS

March 1, 2012

Policy	Program	Benchmark
Absolute Return Strategies	Absolute Return Strategies Program	1 yr Treasury Note + 5%

ATTACHMENT J

OTHER (NON-PERF) INVESTMENT PORTFOLIO POLICIES
PROGRAM BENCHMARKS

~~May 10, 2013~~June 17, 2013

Policy	Program	Benchmark
Barclays Aggregate Program		Barclays ~~Capital~~ Aggregate Index.
Public Employees' Health Care Fund		Barclays ~~Capital~~ Aggregate Index.
Supplemental Income Plans (SIP)		The performance of each individual investment fund within SIP will be evaluated against its appropriate asset class benchmark.

Asset Class Glossary: Investment & Risk Management Policy: Benchmarks

June 17, 2013

Capitalization Weighted
A weighting method based on the equity market capitalization of a stock. Market capitalization is calculated by multiplying the total outstanding shares of a stock by its price per share.

Wilshire

Andrew Junkin, CFA, CAIA
Managing Director & Principal

May 22, 2013

Mr. Henry Jones
Chair of the Investment Committee
California Public Employees' Retirement System
400 Q Street
Sacramento, CA 95814

Re: Proposed Changes to the Global Fixed Income and Inflation Assets Benchmarks

Dear Mr. Jones:

You requested Wilshire's opinion with respect to Staff's proposed changes to the Global Fixed Income and Inflation Assets benchmarks. We will discuss each proposed change in turn. This was originally presented to the Investment Committee for comment at the May Investment Committee meeting.

Recommendation

Wilshire recommends that the Investment Committee approve the proposed benchmarks. These were discussed at length in the May meeting no changes have been made to the proposal since then. Wilshire believes the changes are appropriate and match the strategic intent of the underlying programs.

We note that changing the benchmark to broadening the investible universe will likely increase the portfolio exposure to debt of emerging market countries. While currency and default risk are present for all non-U.S. fixed income investments, historically, emerging market countries have been more susceptible to currency and default risk. While we recognize the potential diversification benefits from expanding the investible set, the Investment Committee should note that such an expansion may change (for better or worse) some characteristics of the portfolio.

We provided the following comments for the May discussion as our rationale for supporting the proposed changes.

Wilshire Associates
370 Interlocken Boulevard Suite 620 Broomfield, CO 80021 **TEL** 303.626.7444 **FAX** 303.466.1537
www.wilshire.com

First, the proposed change to the Global Fixed Income (GFI) benchmark is driven by the international component of the GFI benchmark. Staff is proposing a change from the Barclays International Fixed Income index to a GDP weighted version of the same index. Dollar weighted benchmarks in fixed income, such as the current Barclays index, cause concentrations in the most highly indebted issuers, when measured by total debt outstanding. While this does represent the investible opportunity set, concentrating portfolios in highly indebted issuers could increase the size of the risk of default in the portfolio. The proposed GDP weighted index links country weights to the size of the economy of the country, rather than how sizeable the debt is. Under this scenario, certain countries will have higher weights as their economies are larger than their share of total outstanding debt and others will have lower weights where the relative size of the country's debt outstrips the relative size of the economy.

Liquidity in some of the debt of smaller issuers might compromise such a strategy. However, Staff has reviewed this and do not feel it would be a constraint on successfully implementing the new benchmark. Additionally, this change would cause a meaningful increase in the percentage of the benchmark that would be targeted to emerging market countries (3% to 20%) and a significant decrease in the size of Japanese debt in the benchmark (from 41.8% to 18.1%). As emerging markets have matured, both economically and as debt markets, this does not present the same risk that it once did in terms of credit quality and perceived ability to repay.

Second, the proposed change to the Inflation Assets (IA) benchmark is also driven by the international component of the combined benchmark. Currently, the 75% of the IA benchmark that is tied to inflation linked bonds is split 2/3rd to US TIPS and 1/3rd to global inflation linked bonds in the countries of Canada, France, Italy, German and the U.K. The proposed change in this case would move to a broader benchmark, the Barclays Universal Government Inflation Linked Bond Index, consisting of sixteen developed and emerging market countries.

Staff has analyzed the potential impacts on risk and Wilshire views the changes as trivial – well within the estimation error of any risk model used to forecast across asset classes.

Should you require anything further or have any questions, please do not hesitate to contact us.

Best regards,

Wilshire Associates
370 Interlocken Boulevard Suite 620 Broomfield, CO 80021 **TEL** 303.626.7444 **FAX** 303.466.1537
www.wilshire.com