Investment Cost Effectiveness Analysis (for the 5 years ending December 31, 2015)

CalPERS



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Key takeaways

Returns

- CalPERS 5-year net total return was 7.1%. This was slightly below the U.S. median of 7.3% and above the peer median of 4.3%.
- CalPERS 5-year policy return was 7.1%. This was slightly below the U.S. median of 7.3% and above the peer median of 4.6%.

Value added

• CalPERS 5-year net value added was 0.0%. This was close to the U.S. median of 0.1% and close to the peer median of 0.1%.

Cost and cost effectiveness

- CalPERS' investment cost of 32.5 bps was below its benchmark cost of 41.6 bps. This suggests that CalPERS was low cost compared to its peers. CalPERS is low cost primarily because its external private asset costs are lower. These savings may not be comparable to peers due to differences in methodology for reporting private asset fees between CEM and CalPERS.
- CalPERS 5-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.

This benchmarking report compares CalPERS cost and return performance to CEM's extensive pension database.

• 172 U.S. pension funds participate. The median U.S. fund had assets of \$7.5 billion and the average U.S. fund had assets of \$20.8 billion. Total participating U.S. assets were \$3.6 trillion.

80 Canadian funds participate with assets totaling \$1,228 billion.

• 57 European funds participate with aggregate assets of \$2.8 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, Switzerland and the U.K.

• 10 Asia-Pacific funds participate with aggregate assets of \$985 billion. Included are funds from Australia, New Zealand, China and South Korea.

The most meaningful comparisons for CalPERS returns and value added are to the U.S. universe.

Participating assets (\$ trillions)



The most valuable comparisons for cost performance are to CalPERS custom peer group because size impacts costs.

Peer group for CalPERS

- 14 global sponsors from \$130 billion to \$1,029 billion
- Median size of \$205 billion versus CalPERS \$290 billion
- 6 U.S. sponsors, 3 Canadian, 3 European, 2 Asia-Pacific



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document.

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What gets measured gets managed, so it is critical that you measure and compare the right things:

1. Returns	Why do total returns differ from other funds? What was the impact of CalPERS policy mix decisions versus implementation decisions?
2. Net value added	Are CalPERS implementation decisions (i.e., the amount of active versus passive management) adding value?
3. Costs	Are CalPERS costs reasonable? Costs matter and can be managed.
4. Cost effectiveness	Net implementation value added versus excess cost. Does paying more get you more?

CalPERS 5-year net total return of 7.1% was slightly below the U.S. median of 7.3% and above the peer median of 4.3%

Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	CalPERS 5-year
Net total fund return	7.1%
- Policy return	7.1%
= Net value added	0.0%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).



CalPERS 5-year policy return of 7.1% was slightly below the U.S. median of 7.3% and above the peer median of 4.6%.

CalPERS policy return is the return it could have earned passively by indexing its investments according to its policy mix.

Having a higher or lower relative policy return is not necessarily good or bad. CalPERS policy return reflects its investment policy, which should reflect its:

- Long term capital market expectations
- Liabilities
- Appetite for risk

Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.



To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 7.2%, 0.1% higher than your actual 5-year policy return of 7.1%. Mirroring this, your 5-year total fund net value added would be 0.1% lower. Refer to the Research section pages 6-7 for details.

CalPERS 5-year policy return was slightly below the U.S. median primarily because of:

Small differences in CalPERS policy mix relative to the average U.S. fund had a net negative impact over 5 years.

The negative impact of CalPERS higher weight in:

- Inflation Indexed Bonds (CalPERS 4% 5-year average weight versus a U.S. average of 1%).
- EAFE bonds (CalPERS 1% 5-year average weight versus a U.S. average of 0%).

The negative impact of your lower weight in:

 Long Bonds (your 0% 5-year average weight versus a U.S. average of 15%). In 2014 and 2011 long bonds were one of the best performing asset classes.

Partially offsetting the above was the positive impact of CalPERS higher weight in real estate (CalPERS 9% 5-year average versus the U.S. average of 5%).

5-year average policy mix

		Peer	U.S.
	CalPERS	Avg.	Avg.
Stock	50%	45%	47%
Fixed Income - EAFE	1%	3%	0%
U.S. Bonds	17%	7%	15%
Long Bonds	0%	2%	15%
Inflation Indexed Bonds	4%	4%	1%
Global Bonds	0%	5%	1%
Cash	1%	-1%	0%
Other Fixed Income ¹	2%	11%	3%
Total Fixed Income	25%	31%	36%
Hedge Funds	0%	3%	5%
Commodities	1%	1%	1%
Natural Resources	1%	1%	0%
Infrastructure	1%	2%	0%
Real Estate incl. REITS	9%	8%	5%
Private Equity	12%	8%	6%
Total	100%	100%	100%

1. Other fixed income includes mortgages, Canada and High Yield bonds.

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CalPERS policy asset mix has changed over the past 5 years. At the end of 2015 CalPERS policy mix compared to its peers and the U.S. universe as follows:

			Peer	U.S.
	CalP	ERS	avg.	avg.
Asset class	2011	2015	2015	2015
Stock	50%	51%	45%	45%
Fixed Income - EAFE	1%	0%	3%	0%
U.S. Bonds	17%	20%	7%	14%
Long Bonds	0%	0%	2%	17%
Inflation Indexed Bonds	3%	6%	3%	1%
Global Bonds	0%	0%	5%	1%
Cash	1%	1%	-1%	0%
Other Fixed Income ¹	3%	0%	10%	4%
Total Fixed Income	25%	27%	29%	36%
Hedge Funds	0%	0%	3%	5%
Commodities	1%	0%	1%	1%
Natural Resources	1%	1%	2%	0%
Infrastructure	1%	1%	2%	0%
Real Estate incl. REITS	8%	10%	9%	6%
Private Equity	14%	10%	9%	6%
Total	100%	100%	100%	100%

Policy asset mix

1. Other fixed income includes mortgages, Canada and High Yield bonds.

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Net value added is the component of total return from active management. CalPERS 5-year net value added was 0.0%.

Net value added equals total net return minus policy return.

Value added for CalPERS

	Net	Policy	Net value
Year	Return	Return	Added
2015	(0.1%)	(0.6%)	0.5%
2014	6.5%	6.8%	(0.3%)
2013	16.2%	14.8%	1.4%
2012	13.2%	14.4%	(1.2%)
2011	0.8%	0.9%	(0.1%)
5-year	7.1%	7.1%	0.0%

CalPERS 5-year net value added of 0.0% compares to a median of 0.1% for its peers and 0.1% for the U.S. universe.



CalPERS had positive 5-year net value added in U.S. Stock, EAFE Stock, Fixed Income, Real Estate and Private Equity.

5-year average net value added by major asset class

Asset Category	CalPERS	U.S. Average
U.S. Stock	0.03%	-0.29%
EAFE Stock	0.15%	0.52%
Fixed Income	0.11%	0.05%
Real Estate	0.00%	-0.23%
Private Equity ¹	0.21%	-2.36%

1. To enable fairer comparisons, the private equity benchmarks of all participants, except your fund, were adjusted to reflect lagged, investable, public-market indices. If your fund used the private equity benchmark suggested by CEM, your fund's 5-year private equity net value added would have been -1.0%. Refer to the Research section, pages 6-7, for details as to why this adjustment makes for better comparisons. It is also useful to compare total returns. CalPERS 5-year total return of 12.7% for private equity was above the U.S. average of 12.6%.

Agenda Item 7a, Attachment 2, Page 13 of 28 CalPERS investment costs were \$951.2 million or 32.5 basis points in 2015.

Asset management costs by asset	Internal Management			Externa	l Mgmt		
class and style (\$000s)	Passive	Active	Overseeing	Active	Perform.		
			of external	base fees	fees ³	To	tal
Public Market Equities	12,507	16,375	2,628	107,519	72,119	211,148	
Fixed Income	35	29,344	375	9,354	2,446	41,554	
Global TAA			1,260	8,102	4,745	14,107	
Hedge Funds - Direct			2,331	37,067	46,582	85,980	
Hedge Funds - Fund of Funds			170	5,644 ²	1,341 ^{1 2}	7,154	
Commodities		1,184				1,184	
Real Estate - LPs			24,540	177,071	431,941 ³	201,611	
Infrastructure		2,951				2,951	
Infrastructure - LPs			1,340	14,580	40,748 ³	15,920	
Natural Resources - LPs			811	7,629		8,440	
Diversified Private Equity			17,953	242,152		260,105	
Diversified Priv.Eq Fund of Funds			4,123	66,107		70,230	
Diversified Priv. Eq Co-investments			165	948		1,113	
Overlay Programs		1				1	
Total excluding private asset performa	nce fees					921,500	31.5bp
Oversight, custodial and other costs ⁴							
Oversight & consulting						15,436	
Trustee & custodial						6,757	
Audit						1,074	
Other						6,478	
Total oversight, custodial & other costs	5					29,745	1.0bp
Total investment costs (excl. transaction costs & private asset performance fees)							32.5bp

Footnotes ¹ Default performance fees were added. ² Default underlying costs were added to fund of funds. The defaults added were: Hedge Funds 151 bps base fees, 81 bps performance fees; refer to Appendix A for full details. ³ Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds. ⁴ Excludes non-investment costs, such as PBGC premiums and preparing checks for retirees.

CEM believes CalPERS' private asset fees are lower than its peers, however, due to differences in methodology, the difference may not be as much as shown.

The private asset management fees reported by CalPERS are exceptionally low. For example, its fee for direct private equity limited partnerships (LPs) of 84 bps compares to a peer median of 157 bps. (This comparison excludes CalPERS' mature LPs where the management fee is zero. It includes only CalPERS' active fee-bearing partnerships.)

At this time, CEM's methodology involves collecting gross management fees based on the LP's contract terms because survey participants have not been able to provide actual fees on a consistent, comparable basis. To alleviate this problem, in January 2016, the ILPA released a reporting template for fees, expenses and carried interest and CEM is encouraging all survey participants to use this template. Once CEM is comfortable that survey participants are reporting actual fees in a consistent manner based on the ILPA template, CEM will revisit its methodology. Since this has been an issue in the industry for a long time, CEM believes it could be several years before participants are reporting on a consistent basis.

In contrast to CEM's current methodology, CalPERS uses a transaction-based data capture methodology. In this report, your fees are used as reported, however, due to differences in methodology, CEM will use defaults for your fees in other participant's reports.

Diversified private equity fees as a % of the amount fees are based on¹



1. The amount fees are based on is usually the committed amount during the commitment period, and unreturned invested capital afterwards. For CalPERS, this base excludes mature partnerships where fees are no longer being paid.

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CalPERS total investment cost of 32.5 bps was below the peer median of 42.4 bps.

Differences in total investment cost are often caused by two factors that are often outside of management's control:

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 20% of your fund's assets at the end of 2015 versus a peer average of 23%.
- Fund size. Bigger funds have advantages of scale.

Therefore, to assess whether CalPERS costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for CalPERS fund. This analysis is shown on the following page.



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Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, CalPERS fund was low cost by 9.1 basis points in 2015.

CalPERS benchmark cost is an estimate of what CalPERS cost would be given its actual asset mix and the median costs that its peers pay for similar services. It represents the cost CalPERS peers would incur if they had its actual asset mix.

CalPERS total cost of 32.5 bp was below its benchmark cost of 41.6 bp. Thus, its cost savings was 9.1 bp.

CalPERS' cost savings are almost entirely due to lower private asset fees. These savings may not be comparable to peers due to differences in methodology for reporting private asset fees between CEM and CalPERS.

Your cost versus benchmark

	\$000s	basis points
CalPERS total investment cost	951,245	32.5 bp
CalPERS benchmark cost ¹	1,216,480	41.6 bp
CalPERS excess cost	(265,235)	(9.1) bp

CalPERS fund was low cost primarily because it paid less for external private asset management. These savings may not be comparable to peers due to differences in methodology for reporting private asset fees between CEM and CalPERS.

	Excess Cos (Savings)	t/
	\$000s	bps
1. Lower cost implementation style		
 Less fund of funds 	(35,470)	(1.2)
 Use of external active management (vs. lower cost passive and internal) 	84,385	2.9
Less overlays	(57,604)	(2.0)
Other style differences	(1,386)	(0.0)
	(10,075)	(0.3)
2. Paying less than peers for similar services		
 External investment management costs 		
 Public asset management costs 	121,225	4.1
 Private asset management costs 	(368,677)	(12.6)
 Internal investment management costs 	8,563	0.3
 Oversight, custodial & other costs 	(16,271)	(0.6)
	(502,613)	(8.7)
Total savings	(265,235)	(9.1)

Reasons for CalPERS low cost status

(265,235) (9.1)

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Differences in cost performance are often caused by differences in implementation style.

Implementation style is defined as the way in which your fund implements asset allocation. It includes internal, external, active, passive and fund of funds styles.

The greatest cost impact is usually caused by differences in the use of:

- External active management because it tends to be much more expensive than internal or passive management. CalPERS used less external active management than its peers (its 31% versus 35% for its peers).
- Within external active holdings, fund of funds usage because it is more expensive than direct fund investment. CalPERS had less in fund of funds. CalPERS 6% of hedge funds, real estate and private equity in fund of funds compared to 11% for your peers.

Implementation style¹



1. The graph above does not take into consideration the impact of derivatives.

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Differences in implementation style saved you 0.3 bp relative to your peers.

	CalPERS avg	<u>% External active</u>			Premium	Cos	st/
	holdings in		Peer	More/	vs passive &	(savi	ngs)
Asset class	\$mils	You	average	(less)	internal ¹	\$000s	bps
	(A)			(B)	(C)	(A X B X C)	
Public Market Equities	155,733	16.8%	31.9%	(15.1%)	41.8 bp	(98,610)	
Fixed Income	71,642	5.4%	17.3%	(11.9%)	29.8 bp	(25,442)	
Global TAA	1,173	100.0%	72.8%	27.2%	N/A ²	0	
Commodities	2,800	0.0%	1.7%	(1.7%)	223.6 bp	(1,078)	
Infrastructure	1,678	64.1%	23.0%	41.1%	79.6 bp	5,489	
Partnerships, as a proportion of external:	1,075	100.0%	66.3%	33.7%	41.8 bp	1,515	
Real Estate ex-REITs	32,325	100.0%	62.8%	37.2%	63.7 bp	76,531	
Partnerships, as a proportion of external:	32,325	100.0%	75.7%	24.3%	27.2 bp	21,337	
Natural Resources	2,621	100.0%	57.1%	42.9%	94.9 bp	10,680	
Partnerships, as a proportion of external:	2,621	100.0%	83.1%	16.9%	19.1 bp	845	
Diversified Private Equity	35,321	100.0%	81.5%	18.5%	142.5 bp	93,119	
Impact of less/more external act	ive vs. lower c	ost styles	6			84,385	2.9 bp
		Fund	of funds %	6 of LPs	vs. direct LP ¹		
Hedge Funds	1,605	10.1%	16.4%	(6.3%)	50.8 bp	(513)	
Infrastructure - LPs	1,075	0.0%	0.0%	0.0%		0	
Performance Fee Impact (on NAV):	1,599	0.0%	0.0%	0.0%		0	
Real Estate ex-REITs - LPs	32,325	0.0%	6.7%	(6.7%)	83.3 bp	(18,146)	
Natural Resources - LPs	2,621	0.0%	8.5%	(8.5%)	N/A ²	0	
Diversified Private Equity - LPs	35,321	11.9%	19.1%	(7.2%)	66.0 bp	(16,811)	
Impact of less/more fund of fund	ds vs. direct LP	S				(35,470)	(1.2) bp
		<u>Ove</u>	rlays and	<u>other</u>			
Impact of lower use of portfolio	level overlays					(57 <i>,</i> 604)	(2.0) bp
Impact of mix of internal passive	, internal activ	e, and ex	ternal pass	Sive ³		(1,386)	(0.0) bp
Total impact of differences in im	plementation	style				(10,075)	(0.3) bp

Calculation of the cost impact of differences in implementation style

1. The cost premium is the additional cost of external active management relative to the average of other lower cost implementation styles - internal passive, internal active and external passive.

2. A cost premium listed as 'N/A' indicates that there was not enough peer data in one or both styles to calculate the premium.

3. The 'Impact of mix of internal passive, internal active and external passive' quantifies the net cost impact of differences in cost between, and your relative use of, these 'low-cost' styles.

The net impact of paying more/less for external asset management costs saved 8.5 bps.

	CalPERS avg	Cost in bps			Cost/	
	holdings	Peer More/		More/	(savi	ngs)
	in \$mils	CalPERS	median	(less)	in \$000s	in bps
	(A)			(B)	(A X B)	
Public Assets						
Public Market Equities - Active	26,162	69.7 ¹	44.5	25.1	65 <i>,</i> 733	2.2 bp
Fixed Income - Active	3,835	31.8 ¹	32.2	(0.4)	(165)	(0.0) bp
Global TAA - Active	1,173	120.3 ¹	104.2	16.1	1,891	0.1 bp
Hedge Funds - Active	1,443	595.8 ¹	240.2	355.7	51,325	1.8 bp
Hedge Funds - Fund of Fund	162	441.6 ¹	291.0	150.6	<u>2,440</u>	<u>0.1 bp</u>
Total Public Assets					121,225	4.1 bp
Private Assets						
Infrastructure - Limited Partnership	1,075	148.0²	132.1	15.9	1,714	0.1 bp
Real Estate ex-REITs - Limited Partnership	32,325	62.4²	83.7	(21.3)	(68,819)	(2.4) bp
Natural Resources - Limited Partnership	2,621	32.2 ²	117.8	(85.6)	(22,439)	(0.8) bp
Diversified Private Equity - Active	31,112	84.0 ^{2 3}	165.0	(81.0)	(252,122)	(8.6) bp
Diversified Private Equity - Fund of Fund	4,209	166.9³	231.0	(64.2)	<u>(27,011)</u>	<u>(0.9) bp</u>
Total Private Assets					(368,677)	(12.6) bp
Total impact of paying more/less for extern	al manageme	nt			(247,452)	
Total in bps					(8.5) bp	

Cost impact of paying more/(less) for external asset management

¹ You paid performance fees in these asset classes.

² As indicated previously, due to differences in methodology these savings may be overstated.

³ Private asset holdings are the amount fees are based on (i.e., usually the committed amount during the commitment period, and unreturned invested capital afterwards). For CalPERS, this base excludes mature partnerships where fees are no longer being paid. Specifically, the base excludes \$9,019.3M from diversified private equity and \$1,283.8M from fund-of-fund diversified private equity. Excluding these assets allows us to provide a benchmark that reflects program maturity and focuses excess cost or savings on the difference in management fees on partnerships for which base fees are being collected. Without these adjustments, your cost for external active would have been about 74.0 bps and for fund of funds would have been 114.1 bps.

The net impact of paying more/less for internal asset management costs added 0.3 bps.

	CalPERS avg		Cost in bps	S	Cost/	
	holdings		Peer	More/	(savings)	
	in \$mils	CalPERS	median	(less)	in \$000s	
	(A)			(B)	(A X B)	
Public Market Equities - Passive	99,601	1.3	1.5	(0.2)	(2,004)	
Public Market Equities - Active	29,971	5.5	4.3	1.1	3,354	
Fixed Income - Passive	21	17.1	1.2	15.9	33	
Fixed Income - Active	67,787	4.3	3.3	1.0	6,764	
Commodities - Active	2,800	4.2	5.0	(0.8)	(222)	
Infrastructure - Active	603	49.0	38.4	10.6	638	
Total impact of paying more/less for internal management						
Total in bps					0.3 bp	

Cost impact of paying more/(less) for internal asset management

The net impact of differences in oversight, custodial & other costs saved 0.6 bps.

	CalPERS avg		Cost in bps			
	holdings		Peer	More/	(savings)	
	in \$mils	CalPERS	median	(less)	in \$000s	
	(A)			(B)	(A X B)	
Oversight & consulting	292,427	0.5	0.9	(0.3)	(9,551)	
Custodial	292,427	0.2	0.4	(0.2)	(5,950)	
Audit	292,427	0.0	0.0	(0.0)	(111)	
Other	292,427	0.2	0.2	(0.0)	(660)	
Total					(16,271)	
Total in bps					(0.6) bp	

Cost impact of differences in oversight, custodial & other costs

CalPERS fund was low cost primarily because it paid less for external private asset management. These savings may not be comparable to peers due to differences in methodology for reporting private asset fees between CEM and CalPERS.

	Excess C (Savin)	cost/ gs)
	\$000s	bps
1. Lower cost implementation style		
 Less fund of funds 	(35,470)	(1.2)
 Use of external active management (vs. lower cost passive and internal) 	84,385	2.9
Less overlays	(57 <i>,</i> 604)	(2.0)
Other style differences	(1,386)	(0.0)
	(10,075)	(0.3)
2. Paying less than peers for similar services		
External investment management costs		
 Public asset management costs 	121,225	4.1
 Private asset management costs 	(368,677)	(12.6)
 Internal investment management costs 	8,563	0.3
 Oversight, custodial & other costs 	(16,271)	(0.6)
	(502,613)	(8.7)
Total savings	(265,235)	(9.1)

Reasons for CalPERS low cost status

CalPERS 2015 performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



2015 net value added versus excess cost

(Your 2015: net value added 49.8bps, cost savings 9.1 bps)

Excess Cost

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CalPERS 3-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



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CalPERS 5-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



CalPERS net value added and excess cost for the past 5 years.



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