

Real Assets Annual Review - Supplemental Report

Period Ending June 30, 2018

Investment Objective

The role of Real Estate is to have ownership risk in real property with stable cash yield and act as an economic diversifier to equity risk. Capital appreciation is an added, but lower source of return.

The role of Forestland is to have ownership risk in forestland properties, enhance long-term inflation protection and provide moderate cash yield.

The role of Infrastructure is to have ownership risk in essential infrastructure assets and provide predictable returns with moderate long-term inflation protection. Infrastructure also acts as an economic diversifier to equity risk.

- CalPERS ALM Workshop (2013)

Asset Class Characteristics

Managing Investment Director: Paul Mouchakkaa

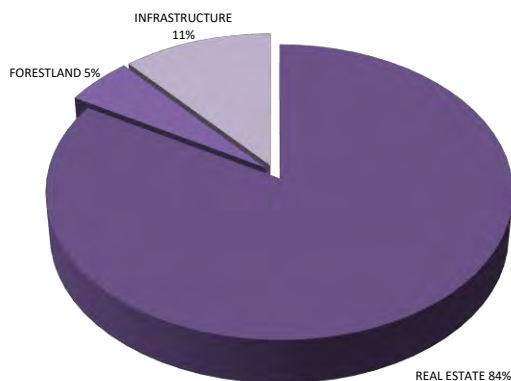
Assets: \$38.1 Billion

Benchmark: 84.6% Real Estate benchmark + 7.7% Infrastructure benchmark + 7.7% Forestland benchmark

- Real Estate Program
Benchmark: NCREIF ODCE
 - Stable cash yield with real property ownership
 - Acts as a partial inflation hedge
- Forestland Program
Benchmark: NCREIF Timberland
 - Forestland properties ownership
 - Inflation protection, illiquidity
- Infrastructure Program
Benchmark: CPI +4%, lagged one quarter
 - Predictable returns with essential infrastructure assets ownership
 - Economic diversifier
- *Partners - 37
- *Partnerships - 82

*Partner and partnership count includes active and inactive trailing partnerships

Real Assets Programs

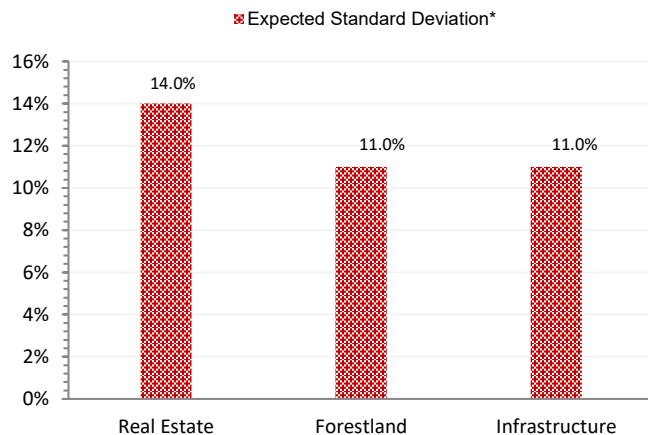
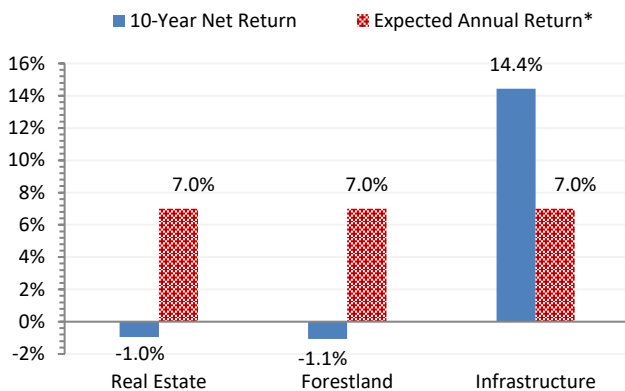


Class Allocation	Real Estate	Forestland	Infrastructure
Strategic Target Range %	6-16%	0-2%	0-2%
Interim Strategic Target %	10%	1%	1%
Actual Investment %	9%	1%	1%
Variance	-1%	-0.4%	0.2%
Interim Strategic Target \$	\$ 35.2 Billion	\$ 3.5 Billion	\$ 3.5 Billion
Actual Investment \$	\$ 31.8 Billion	\$ 2.0 Billion	\$ 4.3 Billion
Variance \$	\$(3.4 Billion)	\$(1.5 Billion)	\$ 0.8 Billion

Note: Interim Strategic Target effective April 1, 2018

Asset Liability Management Expectations

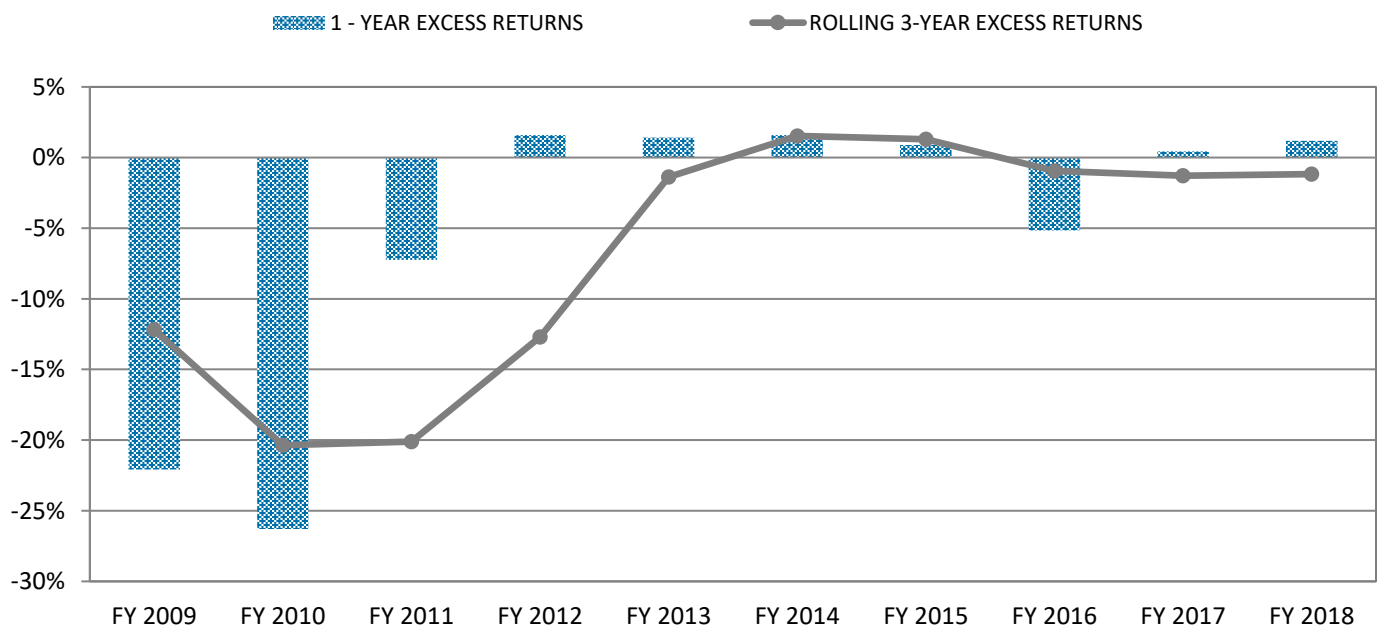
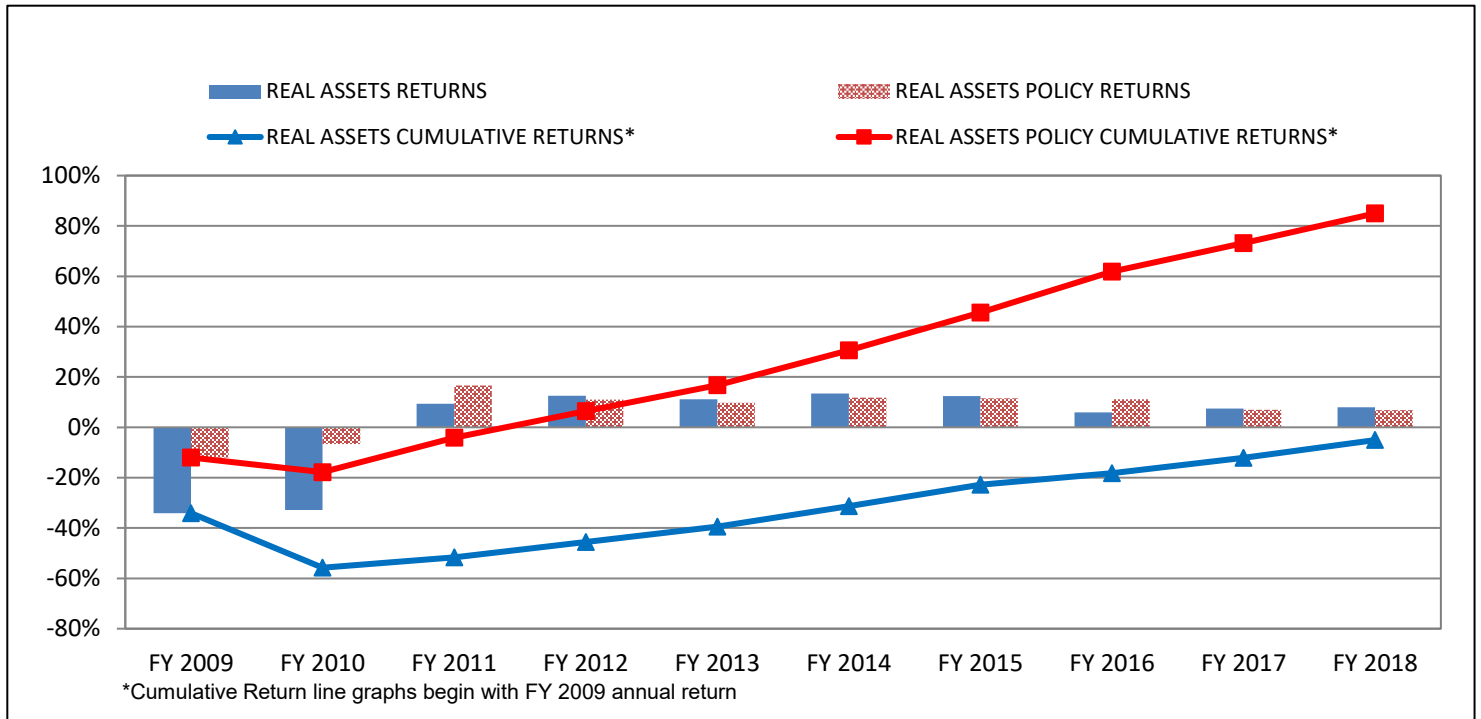
*Capital markets assumptions used in the 2013 ALM Workshop



REAL ASSETS PERFORMANCE

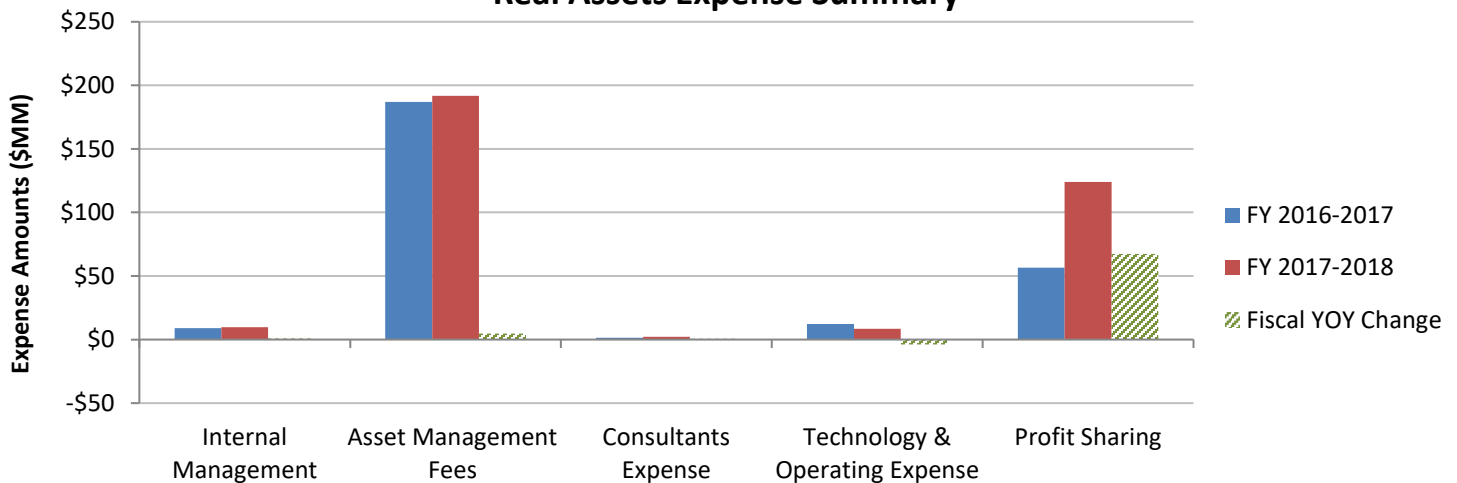
QUARTER ENDING JUNE 30, 2018			1-YR		3-YR		5-YR		10-YR	
Asset Class*	Ending Market Value	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	
REAL ASSETS	\$ 38.1 Billion	8.0%	119	7.1%	(117)	9.4%	(23)	(0.5%)	(686)	
REAL ESTATE	\$ 31.8 Billion	6.8%	(27)	7.2%	(184)	9.8%	(66)	(1.0%)	(808)	
FORESTLAND	\$ 2.0 Billion	1.9%	(187)	(2.4%)	(581)	(1.0%)	(709)	(1.1%)	(513)	
INFRASTRUCTURE	\$ 4.3 Billion	20.6%	1,414	13.0%	711	15.0%	952	14.4%	853	

* Performance for the total asset class and top 3 strategies based on ending market value



EXPENSES

Real Assets Expenses	FY 2016-2017 (\$millions)	FY 2017-2018 (\$millions)	Fiscal YOY Change (\$millions)
Internal Management	\$9	\$10	\$1
Asset Management Fees	\$187	\$192	\$5
Consultants Expense	\$1	\$2	\$1
Technology & Operating Expense	\$12	\$8	(\$4)
Profit Sharing	\$57	\$124	\$67

Real Assets Expense Summary**STAFFING (as of 6/30/2018)**

Senior Management Team	Years with CalPERS	Years Experience
Paul Mouchakkaa - MID	5	18
Ed Yrure - ID	11	27
Mike Inglett - ID	13	25
Jane Delfendahl - ID	14	26
Investment Team	Number of Members	
Investment Managers	11	
Associate Investment Managers	2	
Investment Officers	27	
Additional Resources	Number of Members	
Administrative Support Staff	11	

Real Assets Staffing Updates

- Appointed 1 Investment Director
- Appointed 1 Investment Manager
- Appointed 9 Investment Officers
- Appointed 1 Staff Services Manager I
- Appointed 1 Staff Services Analyst
- Appointed 2 Office Technicians
- Appointed 3 Seasonal Clerks
- Transferred 1 Associate Government Program Analyst to other INVO program area
- Current Vacancies
 - 1 Investment Officer I
 - 1 Investment Manager

POLICY

REVIEWED	AMEND	POLICY/DELEGATION NAME	ACTION
✓	NO	Real Assets Policy	None

CalPERS INVESTMENT BELIEFS**CalPERS Investment Beliefs****#1 Liabilities must influence the asset structure**

Real Assets role, according to the ALM, is to provide long term stable income, cash yield, and a partial hedge to inflation to match liabilities.

#2 A long time investment horizon is a responsibility and an advantage

Real Assets strategy is to invest in long term income producing properties.

#3 CalPERS investment decisions may reflect wider stakeholder views, provided they are consistent with its fiduciary duty to members and beneficiaries

Engagement with Global Governance

#4 Long-term value creation requires effective management of three forms of capital: financial, physical and human

Sustainability monitoring tools and portfolio policy compliance ensure portfolios are managed according to expectations. Have established leadership with regard to alignment of financial interests and responsible contracting.

#5 CalPERS must articulate its investment goals and performance measures and ensure clear accountability for their execution

Real Assets has clearly stated benchmarks and internal staff compensation is aligned using 5 year Real Assets returns.

#6 Strategic asset allocation is the dominant determinant of portfolio risk and return

The role of real assets, the strategic plan, and the benchmark are all consistent with the Strategic Asset Allocation.

#7 CalPERS will take risk only where we have a strong belief we will be rewarded for it

A majority of the program (75%) to be invested in high quality well located assets held long term with limits and governance on debt financing. Further, Staff actively measures risk in determining and underwriting its risk/reward profile.

#8 Costs matter and need to be effectively managed

Management of portfolio consistent with costs of the benchmark as well as external management fee reductions is a Real Assets priority.

#9 Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error

Staff has implemented detailed risk measurements for portfolio components.

#10 Strong processes and teamwork and deep resources are needed to achieve CalPERS goals and objectives

Enhanced training has taken team on path to be a world class investment management group. Existing need for enhancement of IT systems.