



Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 15

MEETING DATE: March 20, 2019

SUBJECT: Quarterly Investment Performance Report –
Alternative Assets

SUBMITTED FOR: ___ Consent ___ **Deliberation**
 and Action **X** **Receive**
 and File

RECOMMENDATION

Staff recommends the Board receive and file the Cliffwater Quarterly Performance Review presentation for the period ending December 31, 2018 for the Absolute Return portfolio, and the period ending September 30, 2018 for the Private Equity, Private Credit, Real Assets, and Opportunities portfolios.

PURPOSE

This agenda item does not specifically support the 2018-19 Strategic Management Plan but complies with SCERS' investment policy statement reporting requirements and contributes to the effective management and oversight of investment activities.

SCERS ALTERNATIVE ASSETS PORTFOLIO RETURNS

This memorandum provides a summarized table of SCERS' Alternative Assets period returns, which complements Cliffwater's Quarterly Performance Review and it highlights notable manager performance, along with any recent alternative investments made by SCERS.

SCERS' alternative asset class period returns are as follows:

SCERS ALTERNATIVE ASSETS PERFORMANCE SUMMARY
Quarter Reporting Periods Ending December 31, 2018

SCERS ASSET CLASS	Quarter*	1-Year*	3-Year*	5-Year*	Since Inception*	Since Inception Date*
SCERS Absolute Return	-4.8%	-4.2%	1.7%	1.4%	3.8%	Sep-04
HFRI FoF Conservative	-2.0%	0.4%	2.1%	2.0%	3.0%	
HFRI FoF Composite + 1%	-4.1%	-5.8%	1.3%	1.8%	3.6%	
SCERS Private Equity	7.1%	26.0%	18.2%	17.1%	14.6%	Feb-08
Cambridge Private Equity/Venture Capi	3.6%	18.0%	15.2%	15.2%	13.0%	
SCERS Private Credit	2.0%	7.6%	9.4%	8.5%	8.7%	Oct-11
Credit Suisse Leveraged Loan + 2%	2.4%	7.6%	7.4%	6.4%	7.5%	
SCERS Real Assets	4.5%	15.9%	16.1%	15.9%	15.7%	Jan-13
(45%) Cambridge Private Infrastructure; (35%) Cambridge Private Energy; (20%) NCREIF Agriculture/Timber	2.0%	9.1%	9.3%	7.0%	7.2%	
SCERS Opportunities	2.0%	3.6%	6.5%	7.6%	18.4%	Jan-08
SCERS Portfolio Actuarial Rate of Return	1.8%	7.0%	7.0%	7.0%	7.0%	
<i>*Note: Periods ending 9/30/18 for Private Equity, Private Credit, Real Assets, and Opportunities Periods ending 12/31/18 for Absolute Return All returns are net IRR, except Absolute Return which is time-weighted</i>						

SCERS PORTFOLIO RESULTS

For the quarter ended December 31, 2018, SCERS' Private Equity portfolio significantly outperformed its benchmark, 7.1% versus 3.6%, primarily due to the outperformance of the buyout investment strategies, with significant return contribution from the venture capital strategies. Also outperforming its benchmark was SCERS' Real Assets portfolio, 4.5% versus 2.0%, driven primarily by SCERS' energy investment strategies. Although outperforming, SCERS' Real Assets portfolio continues to mature, with several funds still in the early j-curve period, the period in which capital has not been fully invested enough to generate positive returns.

Underperforming its benchmark during the quarter was SCERS' Absolute Return portfolio, -4.8% versus -2.0%, where the growth-orientated funds, primarily the event-driven strategies (-13.6%), greatly hindered overall portfolio returns.

Below are notable top and bottom performing funds among SCERS' Alternative Assets during the quarter ended December 31, 2018:

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- Top performing funds:
 - Absolute Return:
 - Brevan Howard (macro discretionary): +1.9%
 - Laurion Capital (market neutral): +0.9%
 - Private Equity portfolio:
 - Accel-KKR Capital Partners IV (buyout): +52.2%
 - Summit Partners Europe Growth Equity Fund II (buyout): +32.3%
 - WPEF IV Feeder (buyout): +29.9%
 - Private Credit portfolio:
 - Athyrium Opportunities Fund II (opportunistic credit): +5.2%
 - Summit Partners Credit Fund (direct lending): +3.4%
 - Real Assets portfolio:
 - Quantum Energy Partners VI (energy): +18.3%
 - ArcLight Energy Partners VI (energy): +9.6%
 - Quantum Energy Partners VII (energy): +8.9%
 - Bottom performing funds:
 - Absolute Return portfolio:
 - JANA Partners Qualified, LP (event driven): -15.8%
 - Graham Global Investment Fund II, SPC Ltd (macro systematic): -11.8%
 - Third Point Partners Qualified (event driven): -11.5%
 - Private Equity portfolio:
 - Trinity Ventures XII (venture capital): -7.6%
 - Dyal Capital Partners II (buyout): -4.8%
 - HarbourVest Partners VIII (distressed debt): -3.1%
 - Private Credit portfolio:
 - Athyrium Opportunities III (opportunistic credit): +0.7%
 - Real Assets portfolio:

-
- EnCap Flatrock Midstream IV (midstream energy): -6.1%
 - Wastewater Opportunity Fund (water): -1.5%
 - Brookfield Infrastructure Fund III (infrastructure): -1.5%

NEW INVESTMENTS

During the quarter ended December 31, 2018, SCERS made the following new investments:

- RCP Direct III, LP (Private Equity - Buyout Co-Investments) - \$25 million
- RCP Fund XIII, LP (Private Equity - Fund-of-Funds) - \$50 million
- Thoma Bravo Fund XIII, LP (Private Equity - Buyout) - \$35 million
- TSG8, LP (Private Equity - Buyout) - \$45 million
- KLS Diversified Fund, LP (Absolute Return – Diversifying) - \$40 million
- MW Global Opportunities Fund (Absolute Return – Diversifying) - \$40 million
- The TAP Fund Ltd. (Real Assets – Commodities) - \$25.7 million

New investments made after the quarter:

- EQT Infrastructure Fund IV, SCSp (Real Assets - Infrastructure) - \$35 million

ATTACHMENT

Cliffwater's Quarterly Performance Report for Alternative Assets for the Quarter ended December 31, 2018

Prepared by:

/S/

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Investment Officer

Reviewed by:

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Chief Investment Officer

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INVESTMENT ADVISORY SERVICES

Los Angeles • New York

Sacramento County Employees' Retirement System Quarterly Performance Review

March 20, 2019



Executive Summary

Absolute Return Portfolio Performance Summary – as of December 31, 2018

Growth Oriented Strategies

- The Growth Oriented Portfolio returned -8.54% in Q4 and -5.99% for the 1 year period ending December 31, 2018
 - Underperforming the HFRI FoF Index + 1% benchmark by 387 bps in Q4 and 290 bps for the 1 year period
 - Underperforming the T-bills + 5% long term objective by 355 bps (annualized) over the trailing 5 year period
- The portfolio's equity orientation drove the sharply negative performance in the fourth quarter

Diversifying Strategies

- The Diversifying Portfolio returned -2.64% in Q4 and -3.32% for the 1 year period ending December 31, 2018
 - Outperforming the HFRI Conservative FoF Index benchmark by 51 bps in Q4; trailing by 254 bps for the 1 year period
 - Underperforming the T-bills + 2% long term objective by 202 bps (annualized) over the trailing 5 year period
- Performance was primarily hurt by Graham and AQR DELTA in 2018

Portfolio risk and market sensitivity has been within expectations for the Growth Oriented and Diversifying portfolios

- Growth Oriented
 - Portfolio standard deviation of 5.13% compared to the ACWI standard deviation of 11.04% since December 2011
 - Portfolio equity beta of 0.38 with an equity correlation of 0.83
 - Target standard deviation < 50% of global equities, with an equity beta < 0.5 and equity correlation < 0.8
- Diversifying
 - Portfolio standard deviation of 2.58% compared to the ACWI standard deviation of 11.04% since December 2011
 - Portfolio equity beta of 0.04 with an equity correlation of 0.19
 - Target standard deviation < 25% of global equities, with an equity beta < 0.1 and equity correlation < 0.1

Relative differences between the Growth Oriented and Diversifying portfolios reflect objectives and design

- Expect higher returns over the long-term from the Growth Oriented portfolio, though with more volatility
 - Both portfolios expected to provide diversification and risk reduction benefits for the overall SCERS portfolio
 - However, risk and correlations certainly increased with the broad market downturn seen in the fourth quarter

Growth Oriented Absolute Return Portfolio Performance – as of December 31, 2018

Fund	Market Value	Actual %	Returns								Std Dev	Sharpe Ratio	Incep Date
			Dec	QTD	YTD	FYTD	1 Year	3 Year	5 Year	Incep			
Growth-Oriented Portfolio													
Event Driven													
JANA Partners Qualified, L.P.	37,739,657	4.5%	-9.96%	-15.81%	-7.92%	-11.89%	-7.92%	0.25%	-0.22%	1.38%	9.09%	0.09	Jul-13
Third Point Partners Qualified L.P.	44,024,072	5.3%	-6.20%	-11.52%	-10.70%	-11.57%	-10.70%	3.81%	3.36%	7.91%	7.92%	0.89	May-12
Event Driven - HF Total	81,763,730	9.8%	-7.98%	-13.55%	-9.44%	-11.72%	-9.44%	2.10%	1.59%	6.35%	8.08%	0.70	May-12
Equity Long/Short													
Lakewood Capital Partners, LP	38,980,522	4.7%	-7.59%	-9.95%	-14.29%	-10.19%	-14.29%	1.08%	2.60%	3.46%	7.92%	0.35	Jul-13
Equity Long/Short - HF Total	38,980,522	4.7%	-7.59%	-9.95%	-14.29%	-10.19%	-14.29%	1.08%	2.60%	3.46%	7.92%	0.35	Jul-13
Multi-Strategy													
OZ Domestic Partners II, L.P.	45,828,628	5.5%	-2.13%	-4.96%	-2.01%	-5.98%	-2.01%	4.38%	3.50%	6.24%	4.81%	1.11	Jan-12
Multi-Strategy - HF Total	45,828,628	5.5%	-2.13%	-4.96%	-2.01%	-5.98%	-2.01%	4.38%	3.50%	6.24%	4.81%	1.11	Jan-12
Fund of Funds													
Grosvenor SC Absolute Return Fund LLC (Growth)	131,868,495	15.9%	-2.63%	-5.98%	-2.48%	-5.33%	-2.48%	4.32%	2.39%	5.35%	4.61%	0.97	Dec-11
Fund of Funds - HF Total	131,868,495	15.9%	-2.63%	-5.98%	-2.52%	-5.32%	-2.52%	3.99%	2.35%	4.26%	6.04%	0.44	Sep-04
Growth-Oriented Portfolio Total	298,441,375	35.9%	-4.74%	-8.54%	-5.99%	-7.92%	-5.99%	3.00%	2.08%	4.30%	6.30%	0.43	Sep-04
HFRI FoF Composite + 1%			-1.60%	-4.67%	-3.09%	-4.23%	-3.09%	2.28%	2.38%	3.77%	5.00%	0.43	Sep-04
3 Month T-Bills+5%			0.59%	1.78%	6.87%	3.50%	6.87%	6.02%	5.63%	6.34%	0.49%	-	Sep-04
Market Indices													
Libor3Month			0.24%	0.67%	2.36%	1.27%	2.36%	1.47%	0.99%	1.71%	0.50%	-	Sep-04
Bloomberg Barclays US Aggregate Bond Index			1.84%	1.64%	0.02%	1.66%	0.02%	2.06%	2.52%	3.84%	3.12%	0.67	Sep-04
Bloomberg Barclays US High Yield Bond Index			-2.14%	-4.53%	-2.08%	-2.23%	-2.08%	7.24%	3.84%	6.99%	9.19%	0.59	Sep-04
S&P 500 TR			-9.03%	-13.52%	-4.38%	-6.85%	-4.38%	9.26%	8.50%	8.11%	13.71%	0.51	Sep-04
MSCI AC World Index Free - Net			-7.04%	-12.75%	-9.42%	-9.02%	-9.42%	6.60%	4.26%	6.44%	15.13%	0.38	Sep-04
MSCI EAFE - Net			-4.85%	-12.54%	-13.79%	-11.35%	-13.79%	2.87%	0.53%	4.85%	16.62%	0.27	Sep-04
MSCI EMF (Emerging Markets Free) - Net			-2.66%	-7.48%	-14.58%	-8.49%	-14.58%	9.25%	1.65%	8.19%	21.65%	0.40	Sep-04

Diversifying Absolute Return Portfolio Performance – as of December 31, 2018

Fund	Market Value	Actual %	Returns								Std Dev	Sharpe Ratio	Incep Date
			Dec	QTD	YTD	FYTD	1 Year	3 Year	5 Year	Incep			
Diversifying Portfolio													
Market Neutral													
Laurion Capital, Ltd.	46,274,102	5.6%	0.20%	0.86%	7.59%	0.94%	7.59%	3.99%	-	5.95%	5.03%	0.97	Mar-14
Market Neutral - HF Total	46,274,102	5.6%	0.20%	0.86%	7.59%	0.94%	7.59%	3.99%	-	5.95%	5.03%	0.97	Mar-14
Event Driven													
Elliott International Limited	54,211,045	6.5%	0.10%	0.00%	2.29%	-0.74%	2.29%	7.64%	6.25%	7.19%	3.37%	1.82	Apr-12
Event Driven - HF Total	54,211,045	6.5%	0.10%	0.00%	2.29%	-0.74%	2.29%	7.64%	6.25%	7.19%	3.37%	1.82	Apr-12
Macro-Discretionary													
Brevan Howard LP	9,848,902	1.2%	0.39%	1.92%	12.23%	3.59%	12.23%	3.03%	-	1.77%	6.19%	0.15	Mar-14
Macro-Discretionary - HF Total	9,848,902	1.2%	0.39%	1.92%	12.23%	3.59%	12.23%	3.04%	1.32%	1.23%	5.11%	0.10	May-12
Macro-Systematic													
Graham Global Investment Fund II SPC Ltd. - Tactical Tren	30,362,495	3.7%	-4.78%	-11.80%	-14.00%	-6.83%	-14.00%	-	-	-7.15%	11.57%	-0.74	Feb-17
Winton Diversified Futures Fund L.P.	36,892,554	4.4%	-3.04%	-2.50%	-0.87%	-1.54%	-0.87%	-	-	2.67%	7.74%	0.14	Jan-17
Macro-Systematic - HF Total	67,255,049	8.1%	-3.83%	-6.93%	-7.26%	-4.00%	-7.26%	-	-	-2.17%	8.88%	-0.41	Jan-17
Multi-Strategy													
AQR DELTA Fund II, LP	61,142,504	7.4%	1.18%	-4.68%	-15.69%	-6.70%	-15.69%	-3.49%	1.37%	1.50%	5.92%	0.13	May-13
Multi-Strategy - HF Total	61,142,504	7.4%	1.18%	-4.68%	-15.69%	-6.70%	-15.69%	-3.49%	1.37%	1.50%	5.92%	0.13	May-13
Fund of Funds													
Grosvenor SC Absolute Return Fund LLC (Diversifying)	128,929,074	15.5%	-1.17%	-2.51%	-2.45%	-2.32%	-2.45%	-1.45%	-1.25%	1.16%	3.11%	0.13	Dec-11
Grosvenor SC Absolute Return Fund LLC Series B	165,349,976	19.9%	-1.35%	-2.39%	-3.51%	-2.73%	-3.51%	-3.37%	-1.66%	-0.05%	2.69%	-0.32	Feb-13
Fund of Funds - HF Total	294,279,050	35.4%	-1.27%	-2.44%	-3.17%	-2.56%	-3.17%	-2.27%	-1.42%	0.94%	2.86%	0.06	Dec-11
Diversifying Portfolio Total													
	533,010,652	64.1%	-1.02%	-2.64%	-3.32%	-2.54%	-3.32%	0.03%	0.61%	1.75%	2.58%	0.37	Dec-11
HFRI FOF: Conservative Index			-0.78%	-3.15%	-0.78%	-2.39%	-0.78%	1.72%	1.73%	2.83%	2.25%	0.88	Dec-11
3 Month T-Bills+2%			0.35%	1.05%	3.87%	2.04%	3.87%	3.02%	2.63%	2.47%	0.19%	-	Dec-11
SCERS Absolute Return Portfolio													
	831,452,027	100.0%	-2.38%	-4.83%	-4.15%	-4.52%	-4.15%	1.70%	1.44%	3.75%	5.74%	0.37	Sep-04
3 Month T-Bills+5%			0.59%	1.78%	6.87%	3.50%	6.87%	6.02%	5.63%	6.34%	0.49%	-	Sep-04
HFRI Fund of Funds Composite Index			-1.63%	-4.92%	-4.00%	-4.70%	-4.00%	1.31%	1.40%	2.77%	5.05%	0.23	Sep-04

* Included the SCERS Total Absolute Return Portfolio performance for reference

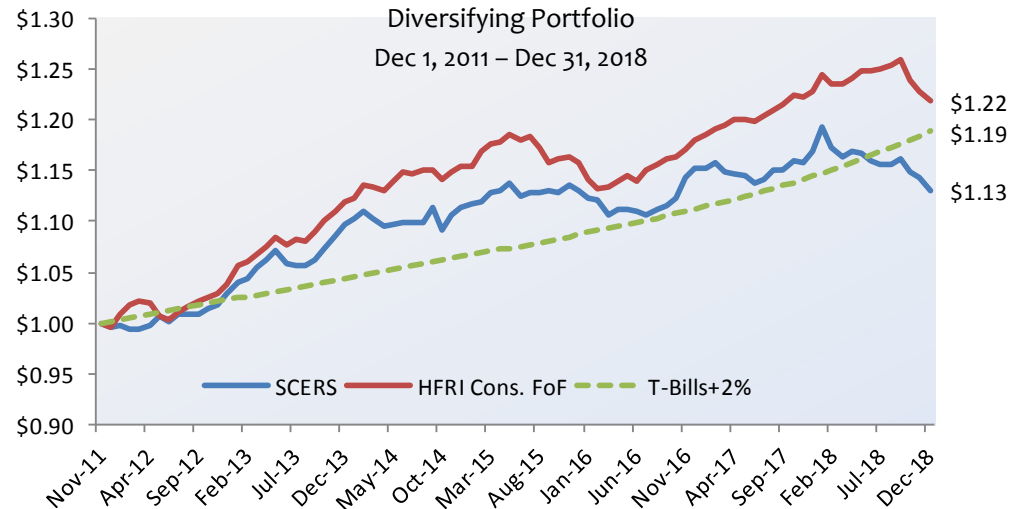
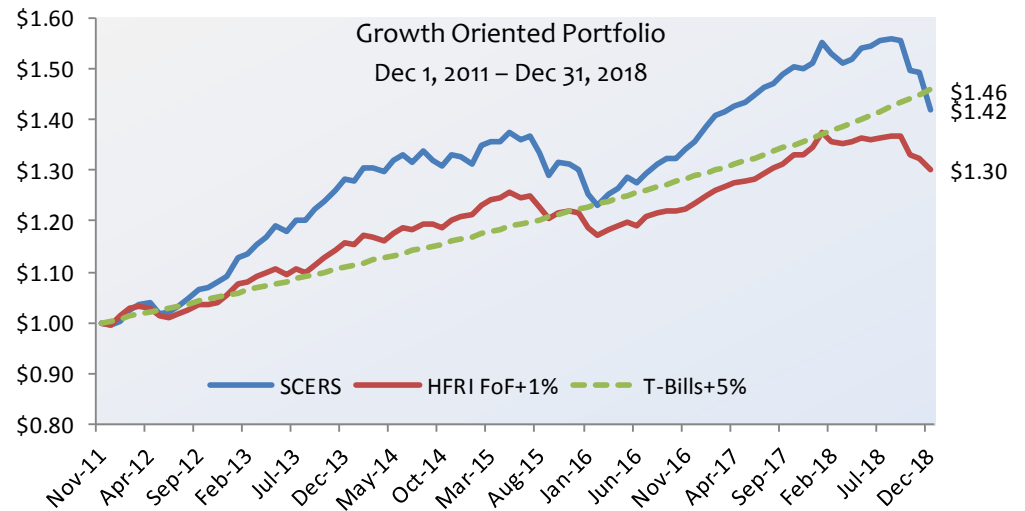
Absolute Return Portfolios Cumulative Performance – Dec 2011 to December 2018

The Growth Oriented portfolio has outperformed the Fund of Funds Index + 1% benchmark, although the Q4 downturn drove performance below the T-bills + 5% long term objective

The Diversifying portfolio was tracking the T-bills + 2% long term objective until the Q4 downturn; the portfolio has underperformed the HFRI Fund of Funds Conservative Index over this period

Showing cumulative performance (growth of \$1) for each portfolio since the initial restructuring of the Absolute Return portfolio in December 2011

- The prior exposure of the Absolute Return portfolio was only Equity Long/Short fund of funds investments



Private Equity Portfolio – as of September 30, 2018

The Private Equity portfolio's net IRR since inception is 14.59%, versus the Cambridge Associates benchmark IRR of 13.02%

- The long-term Policy objective (Russell 3000 + 3%) has a 16.71% IRR over this period

The private equity portfolio saw another quarter of impressive gains exceeding the performance of global equities

- Most of the funds once again generated strong quarterly returns, with several greater than 20%
 - AKKR IV, Summit Europe Growth II, Waterland V and VI, and Spectrum VII reported the largest gains in Q3
- Continued meaningful distributions among the direct fund investments (\$33.6 million) and fund of funds (\$14.3 million)
 - Marlin IV, Thoma Bravo XI, Linden III, AKKR IV, Trinity Ventures XI, and TOP III led distributions within direct

Continued strong longer-term performance across most of the private equity funds

- Double-digit net IRRs for all vintage years prior to 2017
- Summit VC IV (42.2%), AKKR IV (37.6%), Waterland V (37.4%), and Spectrum VII (37.0%) are leading performance

The legacy fund of funds also reported gains during the quarter

- Aggregate since inception net IRR increased to 11.80% from 11.76% during the quarter
 - The aggregate total value (TVPI) improved to 1.65x from 1.63x
- The legacy fund of funds comprise only 17% of the current fair value of the Private Equity portfolio

Changes during the quarter

- SCERS committed \$118.3 million across three funds (distressed, growth capital, and small buyout FoF) during Q3
 - SCERS also committed \$115 million across three funds (specialty buyouts and small buyout co-invest) in Q4 2018
- \$36.9 million in new contributions, \$47.9 million in distributions
- Total portfolio gain increased by \$55.9 million while the total portfolio IRR increased 0.73%

Private Equity Portfolio Characteristics as of September 30, 2018

The SCERS Private Equity portfolio is diversified by strategy and geography

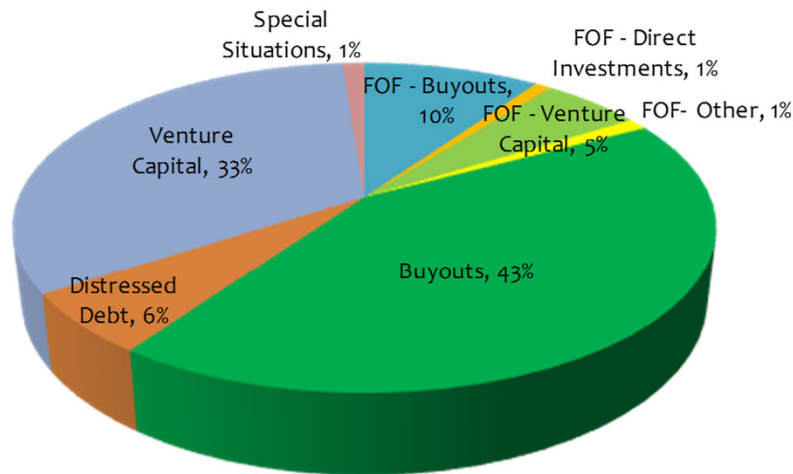
- Investments remain focused in North America, with meaningful exposure to Europe

The fund of funds exposure remains relatively small as a percentage of the total portfolio's value

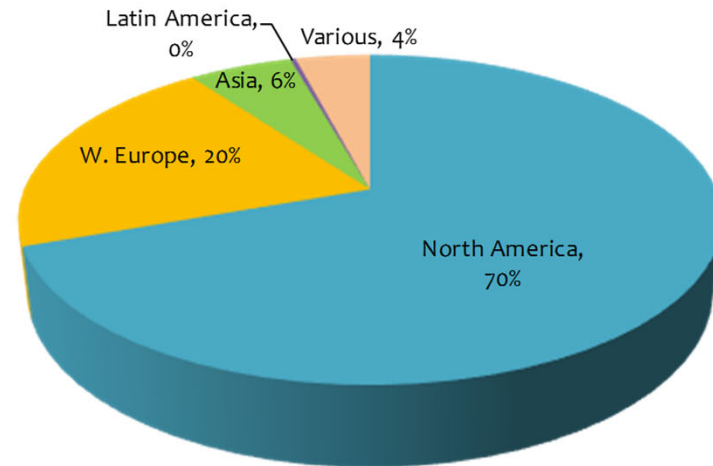
- Investments from direct private equity funds represent 83% of the total portfolio's value as of September 30, 2018

Portfolio strategy and geographic allocations, based on fair market value of invested capital, shown below

Market Value Strategy Exposure*



Market Value Geographic Exposure*



* Exposures are based on the market values of investments as of 9/30/18.

Private Equity Portfolio Performance Details – as of September 30, 2018

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2006												
HarbourVest Partners VIII - Buyout Fund L.P.	Fund of Funds	37,500	1,688	35,813	96%	48,051	14,024	62,076	26,263	11.01%	7.53%	1.73x
HarbourVest Partners VIII - Mezzanine and Distressed Debt Fund L.P.	Fund of Funds	5,000	200	4,800	96%	5,618	1,039	6,657	1,857	7.61%	7.53%	1.39x
HarbourVest Partners VIII - Venture Fund L.P.	Fund of Funds	7,500	150	7,350	98%	9,066	4,637	13,703	6,353	10.86%	7.53%	1.86x
Vintage Year 2006 Total		50,000	2,038	47,963	96%	62,735	19,700	82,436	34,473	10.72%	7.49%	1.72x
Vintage Year 2008												
Abbott Capital Private Equity Fund VI, L.P.	Fund of Funds	75,000	1,500	73,500	98%	60,376	57,037	117,413	43,913	12.44%	13.25%	1.60x
Goldman Sachs Private Equity Partners X, L.P.	Fund of Funds	75,000	12,917	68,958	83%	82,369	34,255	116,624	47,667	12.09%	13.25%	1.69x
HarbourVest International Private Equity Partners VI-Partnership Fund L.P.	Fund of Funds	37,368	2,522	37,342	93%	20,482	37,759	58,241	20,899	12.38%	9.65%	1.56x
Vintage Year 2008 Total		187,368	16,940	179,800	91%	163,227	129,052	292,279	112,479	12.27%	8.17%	1.63x
Vintage Year 2011												
Waterland Private Equity Fund V C.V.	Buyout	18,568	3,904	15,441	79%	24,678	14,351	39,029	23,588	37.44%	13.06%	2.53x
Khosla Ventures IV, L.P.	Venture Capital	10,000	190	9,810	98%	5,755	17,521	23,276	13,466	21.09%	15.93%	2.37x
Vintage Year 2011 Total		28,568	4,094	25,251	86%	30,433	31,872	62,305	37,054	29.83%	13.75%	2.47x
Vintage Year 2012												
Garrison Opportunity Fund III A LLC	Distressed Debt	20,000	0	20,000	100%	7,394	13,813	21,206	1,206	1.37%	9.77%	1.06x
New Enterprise Associates 14, L.P.	Venture Capital	25,000	1,500	23,500	94%	11,306	36,755	48,061	24,561	18.33%	13.93%	2.05x
Summit Partners Venture Capital III-A, LP	Venture Capital	16,350	1,913	18,865	88%	17,469	16,661	34,129	15,265	18.05%	13.93%	1.81x
Vintage Year 2012 Total		61,350	3,413	62,365	94%	36,168	67,228	103,397	41,032	13.10%	13.05%	1.66x
Vintage Year 2013												
Accel-KKR Capital Partners IV, L.P.	Buyout	15,000	2,600	12,400	83%	9,718	20,156	29,873	17,473	37.64%	15.14%	2.41x
H.I.G. Capital Partners V, L.P.	Buyout	14,000	4,710	9,290	66%	3,317	11,189	14,506	5,217	28.48%	15.14%	1.56x
Marlin Equity IV, L.P.	Buyout	20,000	1,252	18,748	94%	7,338	14,405	21,743	2,996	6.35%	15.14%	1.16x
RRJ Capital Master Fund II, L.P.	Buyout	35,000	4,735	35,016	86%	26,170	20,459	46,629	11,613	11.05%	15.00%	1.33x
H.I.G. Bayside Loan Opportunity Fund III (Europe-US\$), L.P.	Distressed Debt	30,000	5,769	24,231	81%	11,521	21,135	32,656	8,425	10.52%	5.57%	1.35x
Wayzata Opportunities Fund III, L.P.	Distressed Debt	30,000	22,835	14,718	24%	7,911	6,361	14,271	-447	-1.18%	8.60%	0.97x

¹Benchmarks:

Private Equity Investments: Cambridge Associates median return for the respective strategies and vintage years

Vintage Year Comparison: Cambridge Associates Global Private Equity & Venture Capital median return for the respective vintage years

Private Equity Portfolio: Cambridge Associates Global Private Equity & Venture Capital pooled internal rate of return

Private Equity Portfolio Performance Details – as of September 30, 2018 (continued)

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Trinity Ventures XI, L.P.	Venture Capital	25,000	3,750	21,250	85%	2,996	31,004	34,001	12,751	14.65%	12.96%	1.60x
Vintage Year 2013 Total		169,000	45,652	135,652	73%	68,971	124,709	193,679	58,027	13.53%	12.81%	1.43x
Vintage Year 2014												
Dyal Capital Partners II	Buyout	35,000	15,885	20,149	55%	3,314	14,237	17,551	-2,598	-8.15%	17.16%	0.87x
H.I.G. Europe Capital Partners II, L.P.	Buyout	16,247	5,518	10,899	66%	362	11,011	11,374	474	4.35%	13.99%	1.04x
Marlin Heritage Fund	Buyout	10,000	1,346	8,654	87%	7,753	8,729	16,482	7,828	33.96%	17.16%	1.90x
Thoma Bravo XI	Buyout	30,000	3,430	30,952	89%	16,898	46,366	63,264	32,312	26.43%	17.16%	2.04x
TPG Opportunities Partners III	Distressed Debt	40,000	20,251	34,255	49%	18,279	23,563	41,842	7,587	12.44%	10.31%	1.22x
Khosla Ventures V	Venture Capital	20,000	4,540	15,460	77%	1,013	18,767	19,780	4,320	11.35%	12.26%	1.28x
Spectrum Equity Investors VII, L.P.	Venture Capital	25,000	2,375	22,625	91%	9,318	35,724	45,042	22,417	36.96%	12.26%	1.99x
Vintage Year 2014 Total		176,247	53,345	142,995	70%	56,938	158,397	215,335	72,340	20.74%	14.65%	1.51x
Vintage Year 2015												
RRJ Capital Master Fund III, LP	Buyout	40,000	12,825	28,232	68%	1,803	30,005	31,808	3,576	11.03%	11.61%	1.13x
WPEF VI Feeder, L.P.	Buyout	27,852	12,744	14,597	54%	0	21,480	21,480	6,883	31.55%	11.61%	1.47x
WPEF VI Overflow Fund C.V.	Buyout	6,963	6,953	10	0%	0	0	0	-10	0.00%	11.61%	0.00x
Accel-KKR Growth Capital Partners II	Mezzanine	15,000	6,397	8,603	57%	1,983	7,840	9,823	1,220	9.19%	11.55%	1.14x
New Enterprise Associates 15, L.P.	Venture Capital	35,000	7,350	27,654	79%	3,103	39,775	42,878	15,223	21.99%	14.79%	1.55x
Summit Partners Venture Capital Fund IV-A, L.P.	Venture Capital	35,000	21,511	18,425	39%	4,936	23,112	28,048	9,623	42.20%	14.79%	1.52x
Vintage Year 2015 Total		159,815	67,779	97,521	58%	11,825	122,212	134,037	36,516	22.79%	14.53%	1.37x
Vintage Year 2016												
Accel-KKR Capital Partners V, L.P.	Buyout	25,000	17,241	7,759	31%	137	8,009	8,146	388	5.48%	7.98%	1.05x
Dyal III Pension Investors LP	Buyout	35,000	23,721	14,487	32%	2,850	17,007	19,856	5,369	N/M	N/M	1.37x
Linden Capital Partners III	Buyout	35,000	2,147	32,853	94%	3,512	42,094	45,606	12,753	24.92%	7.98%	1.39x
Marlin Heritage Europe, L.P.	Buyout	15,086	10,252	4,970	32%	0	4,985	4,985	15	N/M	N/M	1.00x
Thoma Bravo Fund XII, L.P.	Buyout	30,000	3,437	34,012	89%	7,451	29,143	36,594	2,582	8.64%	7.98%	1.08x
TSG7 A L.P.	Buyout	16,000	6,799	9,201	58%	72	10,279	10,351	1,150	10.40%	7.98%	1.12x
TSG7 B L.P.	Buyout	4,000	2,815	1,185	30%	0	933	933	-252	-23.93%	7.98%	0.79x

¹Benchmarks:

Private Equity Investments: Cambridge Associates median return for the respective strategies and vintage years

Vintage Year Comparison: Cambridge Associates Global Private Equity & Venture Capital median return for the respective vintage years

Private Equity Portfolio: Cambridge Associates Global Private Equity & Venture Capital pooled internal rate of return

Private Equity Portfolio Performance Details – as of September 30, 2018 (continued)

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Atalaya Special Opportunities Fund VI, L.P.	Distressed Debt	25,000	2,454	28,940	90%	8,470	24,717	33,187	4,247	10.49%	9.27%	1.15x
Trinity Ventures XII, L.P.	Venture Capital	30,000	14,400	15,600	52%	0	16,979	16,979	1,379	7.61%	10.79%	1.09x
Vintage Year 2016 Total		215,086	83,266	149,007	61%	22,492	154,145	176,637	27,630	14.96%	10.09%	1.19x
Vintage Year 2017												
Marlin Heritage II	Buyout	10,000	6,463	3,537	35%	0	3,310	3,310	-228	N/M	N/M	0.94x
New Enterprise Associates 16, L.P.	Venture Capital	35,000	25,113	9,888	28%	0	11,266	11,266	1,379	N/M	N/M	1.14x
Vintage Year 2017 Total		45,000	31,575	13,425	30%	0	14,576	14,576	1,151	N/M	N/M	1.09x
Vintage Year 2018												
Linden Capital Partners IV LP	Buyout	44,330	42,444	1,886	4%	0	1,940	1,940	54	N/M	N/M	1.03x
Marlin Equity V	Buyout	25,000	20,153	4,847	19%	0	4,527	4,527	-320	N/M	N/M	0.93x
Summit Partners Europe Growth Equity Fund II, SCSP	Buyout	30,000	28,271	9,078	6%	7,349	6,482	13,831	4,753	N/M	N/M	1.52x
Davidson Kempner Long-Term Distressed Opportunities Fund IV LP	Distressed Debt	35,000	25,900	9,100	26%	0	9,727	9,727	627	N/M	N/M	1.07x
TSSP Opportunities Partners IV (A), L.P.	Distressed Debt	35,000	35,000	0	0%	0	0	0	0	N/M	N/M	N/A
RCP Fund XIII	Fund of Funds	50,000	50,000	0	0%	0	0	0	0	N/M	N/M	N/A
Accel-KKR Growth Capital Partners III	Mezzanine	33,320	33,320	0	0%	0	0	0	0	N/M	N/M	N/A
Khosla Ventures VI, L.P.	Venture Capital	35,000	32,795	2,205	6%	0	2,091	2,091	-114	N/M	N/M	0.95x
Spectrum Equity VIII, L.P.	Venture Capital	25,000	24,563	438	2%	0	85	85	-353	N/M	N/M	0.19x
Vintage Year 2018 Total		312,650	292,446	27,553	6%	7,349	24,852	32,201	4,648	N/M	N/M	1.17x
Portfolio Total :		1,405,085	600,547	881,531	57%	460,138	846,744	1,306,882	425,351	14.59%	13.02%	1.48x
Portfolio Strategy Totals												
Buyout		538,046	239,645	328,202	55%	122,723	341,096	463,819	135,617	21.12%		1.41x
Distressed Debt		215,000	112,210	131,244	48%	53,575	99,315	152,890	21,646	6.82%		1.16x
Fund of Funds		287,368	68,977	227,762	76%	225,962	148,752	374,714	146,952	11.80%		1.65x
Mezzanine		48,320	39,717	8,603	18%	1,983	7,840	9,823	1,220	9.19%		1.14x
Venture Capital		316,350	139,998	185,719	56%	55,895	249,740	305,635	119,916	20.20%		1.65x
Portfolio Total :		1,405,085	600,547	881,531	57%	460,138	846,744	1,306,882	425,351	14.59%	13.02%	1.48x

¹Benchmarks:

Private Equity Investments: Cambridge Associates median return for the respective strategies and vintage years

Vintage Year Comparison: Cambridge Associates Global Private Equity & Venture Capital median return for the respective vintage years

Private Equity Portfolio: Cambridge Associates Global Private Equity & Venture Capital pooled internal rate of return

Private Credit Portfolio – as of September 30, 2018

The Private Credit portfolio's net IRR since inception is 8.71%, versus the benchmark return of 7.45%

- The benchmark is the Credit Suisse Leveraged Loan Index + 2%

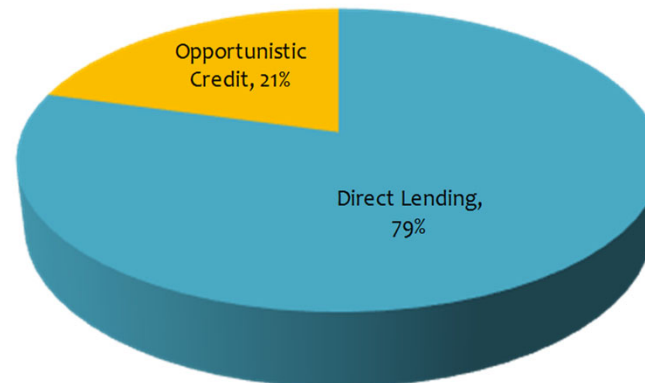
The Private Credit portfolio includes seven lending-oriented funds; three were previously included within Private Equity

- Five of the funds pursue Direct Lending strategies; Athyrium II & III are Opportunistic Credit
- The Private Credit funds continued to generate steady performance during Q3
 - Overall return of 2.0% in Q3 and 7.6% for the trailing 1 year period ending September 30, 2018
 - Recent performance being held back slightly by the younger portfolios of the newer fund commitments

Changes during the quarter

- SCERS made no new commitments to Private Credit funds during Q3
- \$7.1 million in new contributions, \$6.0 million in distributions
- Portfolio IRR nearly unchanged (down 8 bps) while the total portfolio gain increased by \$2.2 million

*Market Value Strategy Exposure
(based on fair value of investments)
as of September 30, 2018*



Private Credit Portfolio Details – as of September 30, 2018

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2011												
Summit Partners Credit Fund, LP	Direct Lending	20,000	0	20,697	100%	23,379	3,606	26,985	6,289	9.50%	N/A	1.30x
Vintage Year 2011 Total		20,000	0	20,697	100%	23,379	3,606	26,985	6,289	9.50%	13.75%	1.30x
Vintage Year 2014												
Summit Partners Credit Fund II, L.P.	Direct Lending	35,000	14,038	37,807	60%	22,506	21,585	44,091	6,285	9.68%	3.98%	1.17x
Vintage Year 2014 Total		35,000	14,038	37,807	60%	22,506	21,585	44,091	6,285	9.68%	14.65%	1.17x
Vintage Year 2015												
Athyrium Opportunities Fund II	Opportunistic Credit	32,000	8,813	36,103	72%	25,742	15,490	41,232	5,129	8.82%	11.55%	1.14x
Vintage Year 2015 Total		32,000	8,813	36,103	72%	25,742	15,490	41,232	5,129	8.82%	14.53%	1.14x
Vintage Year 2017												
Athyrium Opportunities Fund III	Opportunistic Credit	25,000	15,433	11,150	38%	1,548	9,504	11,052	-98	N/M	N/M	0.99x
Vintage Year 2017 Total		25,000	15,433	11,150	38%	1,548	9,504	11,052	-98	N/M	N/M	0.99x
Vintage Year 2018												
Benefit Street Partners Senior Secured Opportunities Fund L.P.	Direct Lending	50,000	11,755	40,021	76%	2,393	39,637	42,030	2,009	N/M	N/M	1.05x
Summit Partners Credit Fund III, L.P.	Direct Lending	50,000	50,000	0	0%	0	-437	-437	-437	N/M	N/M	N/A
TCP Direct Lending Fund VIII-S, LLC	Direct Lending	100,000	73,362	26,638	27%	0	27,299	27,299	661	N/M	N/M	1.02x
Vintage Year 2018 Total		200,000	135,117	66,659	32%	2,393	66,500	68,892	2,233	N/M	N/M	1.03x
Portfolio Total :		312,000	173,401	172,415	44%	75,569	116,684	192,252	19,837	8.71%	7.45%	1.12x

¹Benchmarks:

Private Credit Investments: Cambridge Associates median return for the respective debt strategies and vintage years

Private Credit Portfolio: Credit Suisse Leveraged Loan Index + 2%

Real Assets Portfolio – as of September 30, 2018

The Real Assets portfolio's net IRR since inception is 15.74%, versus the blended benchmark return of 7.24%

- The Real Assets portfolio includes private Infrastructure, Energy, and Agriculture, Timber and Other
- Real Assets is part of the broader Real Return asset category

The Real Assets portfolio is primarily Energy and Infrastructure partnerships

- Both Energy and Infrastructure partnerships have performed well since inception
 - Since inception net IRRs of 18.5% for Energy and 14.4% for Infrastructure
- The Real Asset Debt separate account has also performed well with a 10.6% since inception net IRR
 - That separate account remains small, with a fair market value of \$18.7 million

The portfolio generated a 4.5% net return during a quarter that saw a continued moderate recovery in the Energy sector

- Gains in many of the Energy funds led performance (Quantum VI & VII, ArcLight VI, and EnCap IX)
 - The IFM Infrastructure Fund also performed well, with a 6.0% return in Q3
- Wastewater and EnCap Flatrock III were the laggards during the quarter
 - The Wastewater fund has had a relatively slow investment pace with weak performance thus far

Changes during the quarter

- SCERS committed a total of \$122 million across three funds (Energy, Infrastructure, and Agriculture funds) during Q3
 - SCERS made no new commitments to Real Assets funds in Q4 2018
- \$29.2 million in new contributions, \$28.9 million in distributions
- Portfolio IRR increased 0.44% while the total portfolio gain increased by \$18.1 million

Real Assets Portfolio Performance Details – as of September 30, 2018

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2013												
EnCap Energy Capital Fund IX, L.P.	Energy	33,000	2,688	36,196	92%	25,077	25,130	50,207	14,011	15.81%	6.36%	1.39x
Vintage Year 2013 Total		33,000	2,688	36,196	92%	25,077	25,130	50,207	14,011	15.81%		1.39x
Vintage Year 2014												
Carlyle Power Partners II, L.P.	Energy	40,000	25,029	20,339	37%	5,210	16,241	21,451	1,113	2.79%	12.24%	1.05x
EnCap Flatrock Midstream III	Energy	20,000	5,920	17,849	70%	8,154	13,406	21,560	3,711	20.57%	12.24%	1.21x
Global Energy & Power Infrastructure Fund II	Energy	35,000	11,603	26,355	67%	16,709	20,762	37,470	11,115	39.84%	12.24%	1.42x
Quantum Energy Partners VI, LP	Energy	35,000	14,488	25,506	59%	12,041	30,836	42,877	17,372	41.84%	12.24%	1.68x
Pantheon SCERS SIRF MM, LLC	Infrastructure	100,000	46,668	53,332	53%	3,800	70,839	74,639	21,307	16.18%	6.57%	1.40x
Wastewater Opportunity Fund	Infrastructure	25,000	11,584	13,423	54%	0	11,499	11,499	-1,924	-15.02%	6.57%	0.86x
Vintage Year 2014 Total		255,000	115,292	156,803	55%	45,914	163,583	209,497	52,694	19.34%		1.34x
Vintage Year 2015												
ArcLight Energy Partners Fund VI	Energy	40,000	9,314	37,470	77%	12,253	36,094	48,346	10,876	15.76%	16.85%	1.29x
EnCap Energy Capital Fund X, L.P.	Energy	40,000	10,474	32,026	74%	6,093	30,538	36,631	4,605	10.43%	16.85%	1.14x
Atalaya Real Assets SMA	Real Asset Debt	100,000	83,467	35,624	17%	22,050	18,748	40,799	5,175	10.63%	N/A	1.15x
Vintage Year 2015 Total		180,000	103,256	105,120	43%	40,396	85,380	125,775	20,655	12.77%		1.20x
Vintage Year 2016												
ACM Fund II, LLC	Agriculture	25,000	11,148	17,998	55%	4,194	12,751	16,945	-1,053	-7.21%	6.68%	0.94x
Brookfield Infrastructure Fund III, L.P.	Infrastructure	40,000	19,187	20,802	52%	3,013	20,006	23,019	2,217	9.45%	N/A	1.11x
IFM Global Infrastructure Fund	Infrastructure	125,000	25,000	100,000	80%	22,531	98,758	121,289	21,289	N/M	N/M	1.21x
Vintage Year 2016 Total		190,000	55,335	138,800	71%	29,738	131,515	161,253	22,453	13.83%		1.16x
Vintage Year 2017												
Quantum Energy Partners VII, LP	Energy	40,000	26,990	15,319	33%	2,366	12,968	15,334	16	N/M	N/M	1.00x
Meridiam Infrastructure North America Fund III	Infrastructure	50,000	48,842	1,158	2%	1	170	171	-987	N/M	N/M	0.15x
Vintage Year 2017 Total		90,000	75,831	16,477	16%	2,367	13,138	15,505	-972	N/M		0.94x
Vintage Year 2018												
EnCap Flatrock Midstream IV, L.P.	Energy	22,500	14,493	8,007	36%	0	7,758	7,758	-249	N/M	N/M	0.97x

¹ Benchmarks:

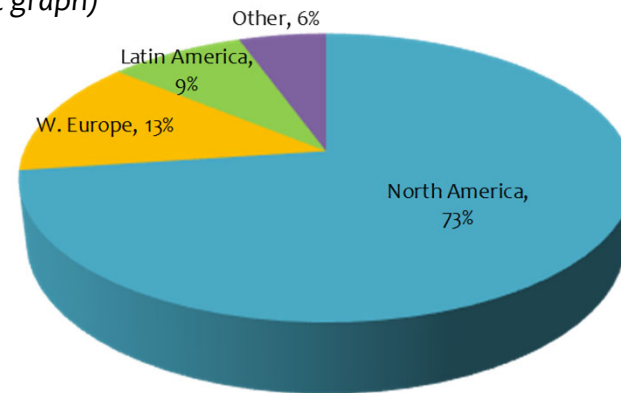
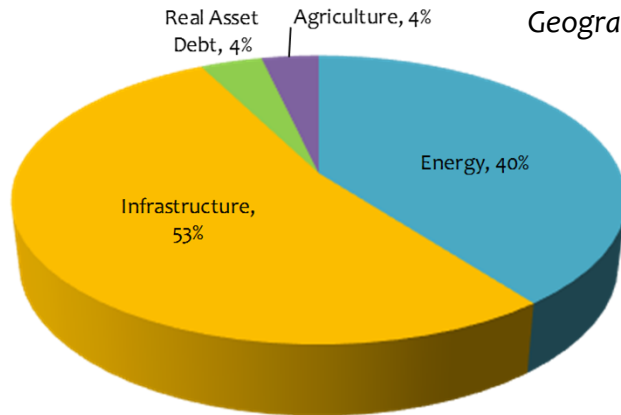
Real Assets Portfolio: 45% Cambridge Infrastructure, 35% Cambridge Energy, 10% NCREIF Timberland, 10% NCREIF Farmland
 Energy Investments: Cambridge Associates median return for the respective vintage years.
 Infrastructure Investments: Cambridge Associates median return for the respective vintage years.

Real Assets Portfolio Performance Details – as of September 30, 2018 (continued)

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Tailwater Energy Fund III, LP	Energy	32,000	32,000	0	0%	0	0	0	0	N/M	N/M	N/A
ISQ Global Infrastructure Fund II	Infrastructure	50,000	50,000	0	0%	0	0	0	0	N/M	N/M	N/A
Vintage Year 2018 Total		104,500	96,493	8,007	8%	0	7,758	7,758	-249	N/M		0.97x
Portfolio Total :		852,500	448,896	461,404	47%	143,492	426,504	569,997	108,593	15.74%	7.24%	1.24x

Portfolio Strategy Totals												
Agriculture		25,000	11,148	17,998	55%	4,194	12,751	16,945	-1,053	-7.21%		0.94x
Energy		337,500	152,999	219,066	55%	87,903	193,732	281,635	62,569	18.48%		1.29x
Infrastructure		390,000	201,281	188,715	48%	29,344	201,273	230,617	41,902	14.38%		1.22x
Real Asset Debt		100,000	83,467	35,624	17%	22,050	18,748	40,799	5,175	10.63%		1.15x

Portfolio Exposures*
Strategy Exposure (left graph)
Geographic Exposure (right graph)



* Exposures are based on the market values of investments as of 9/30/18

¹ Benchmarks:

Real Assets Portfolio: 45% Cambridge Infrastructure, 35% Cambridge Energy, 10% NCREIF Timberland, 10% NCREIF Farmland
Energy Investments: Cambridge Associates median return for the respective vintage years.
Infrastructure Investments: Cambridge Associates median return for the respective vintage years.

Opportunities Portfolio – as of September 30, 2018

The Opportunities portfolio's net IRR since inception is 18.44%

- The long-term benchmark is SCERS' 7.00% total portfolio actuarial return objective
- Also tracking the portfolio's 3 year IRR versus an intermediate-term benchmark
 - 6.48% portfolio IRR v 9.31% IRR for the SCERS' total portfolio policy weighted benchmark over the last 3 years
- The portfolio only includes legacy distressed debt funds (fully liquidated) and one post-2009 distressed fund (Atalaya V)

The legacy distressed funds performed very well, the current fund is performing at expectations

- SCERS' earlier vintage distressed debt funds are liquidated and have distributed significant capital back to SCERS
 - Stone Tower, MetWest TALF, and PIMCO have distributed \$129.3 million
- Atalaya SOF V, a vintage 2013 fund, has produced a 7.99% net IRR since inception

Changes during the quarter

- SCERS made no new commitments categorized as Opportunities funds during Q3 2018
- No new contributions, \$0.6 million in distributions
- Portfolio IRR decreased 0.02%, total portfolio gain increased slightly

As mentioned, the Opportunities portfolio only includes certain distressed debt funds

- SCERS has additional distressed debt investments within its Private Equity portfolio
- Categorizations were made at the time of each investment

Opportunities Portfolio Performance Details – as of September 30, 2018

Partnership Name	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2007												
* PIMCO Distressed Mortgage Fund, LP	Distressed Debt	18,000	0	18,000	100%	25,384	0	25,384	7,384	8.96%	8.60%	1.41x
Vintage Year 2007 Total		18,000	0	18,000	100%	25,384	0	25,384	7,384	8.96%		1.41x
Vintage Year 2008												
* PIMCO Distressed Mortgage Fund II, L.P.	Distressed Debt	12,000	0	12,000	100%	35,277	0	35,277	23,277	34.39%	12.34%	2.94x
Vintage Year 2008 Total		12,000	0	12,000	100%	35,277	0	35,277	23,277	34.39%		2.94x
Vintage Year 2009												
* MetWest Enhanced TALF Strategy Fund LP	Distressed Debt	20,000	0	20,000	100%	25,304	0	25,304	5,304	11.21%	14.92%	1.27x
* Stone Tower Structured Credit Recovery Fund LP	Distressed Debt	25,000	0	25,248	100%	43,383	0	43,383	18,135	25.30%	14.92%	1.72x
Vintage Year 2009 Total		45,000	0	45,248	100%	68,687	0	68,687	23,439	19.71%		1.52x
Vintage Year 2013												
Atalaya Special Opportunities Fund V, L.P.	Distressed Debt	25,000	1,117	24,875	96%	21,331	9,083	30,415	5,540	7.99%	8.60%	1.22x
Vintage Year 2013 Total		25,000	1,117	24,875	96%	21,331	9,083	30,415	5,540	7.99%		1.22x
Portfolio Total :		100,000	1,117	100,123	99%	150,679	9,083	159,763	59,640	18.44%	7.00%	1.60X

* Liquidated partnership

¹ Benchmarks:

Opportunities Investments: Cambridge Associates median return for the respective strategies and vintage years
Opportunities Portfolio: 7.00% actuarial return objective

Important Notice

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