Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 17

MEETING DATE: December 19, 2018

SUBJECT: Liquidity Analysis

SUBMITTED FOR: ___ Consent ___ Deliberation and Action _X_ Receive and File

RECOMMENDATION

Staff recommends that the Board receive and file the liquidity analysis performed by SCERS' general investment consultant, Verus Advisory.

PURPOSE

This agenda item supports the 2018-19 Strategic Management Plan by analyzing SCERS' liquidity profile in anticipation of formulating a cash management policy.

BACKGROUND

In 2016, Verus and Staff incorporated a formal cash flow and liquidity analysis into the asset liability modeling (ALM). A liquidity analysis provides an understanding of the plan's overall cash flow profile, and insight into how the plan can address future cash flow needs, both from the actuarial and investment sides. The analysis was particularly useful given SCERS' increasing private markets exposure, which is more illiquid. The study determined that while SCERS had negative cash flows, similar to most mature public pension plans, its overall liquidity profile remained in solid shape. It has been two years since the last liquidity analysis, so Staff asked Verus to perform a subsequent liquidity analysis on SCERS' plan. An upcoming cash management policy will factor in the results of the liquidity analysis.

LIQUIDITY MANAGEMENT OBJECTIVES

As identified in the Verus presentation, there are multiple objectives of a liquidity management framework. These include:

- Maintaining sufficient cash to meet member benefit payment and other funding obligations such as plan expenses and the funding of investment commitments.
- The ability to rebalance the investment portfolio to target allocations.
- The ability to make modifications to the asset allocation when needed.

SCERS' annualized actuarial rate of return is 7%. The investment program aims to earn this return consistently, with less volatility in the range of outcomes that the portfolio is subjected. The current strategic asset allocation emphasizes diversification across market segments to reduce volatility and portfolio downside and to generate increasing levels of cash flows. However, in a stressed market environment SCERS' assets can experience negative returns, which makes earning the actuarial rate of return difficult. Falling short of the actuarial rate of return over an extended period puts pressure on SCERS' ability to meet benefit payment and funding obligations, which emphasizes the need for maintaining sufficient liquidity within the investment portfolio.

That scenario requires additional consideration given that SCERS, like many public pension plans, is a mature plan with negative cash flows, meaning member benefit payments going out are greater than employer and employee contributions, and net investment income, coming in on an annual basis.

The negative cash flow profile is also influenced by private market investments, where due to the 'J-curve effect' in the earlier stages of allocating toward a target allocation, cash outflows (capital calls) are greater than cash inflows (distributions). Once private market portfolios become more mature, cash inflows eventually outpace cash outflows to create a positive net cash flow profile. SCERS' private equity portfolio is close to being cash flow positive, whereas private real assets and private credit are still earlier in their existence and are therefore still cash flow negative.

It should be noted that a negative cash flow position represents the gap between a plan's cash inflows and cash outflows, but does not necessarily represent a requirement to cut or liquidate plan assets to cover the gap. If a plan is in a negative cash flow position, there are ways to address the gap. For SCERS this could include: (1) using available cash; (2) rebalancing portions of the portfolio that are overweight to their respective targets; (3) waiting for the maturation of private market investments, which as mentioned previously should become cash flow positive over time; (4) increasing contributions toward the plan; or (5) selling assets (which would be a last case scenario).

SCERS, like many public plans, is operating in a cash flow environment that has less of a margin for error compared to past eras, where most plan had positive net cash flows. This places greater emphasis on managing cash flows, and creates limits on the level of illiquid asset exposures within a portfolio. At the same time, illiquid assets have demonstrated an ability to earn higher returns than liquid assets, as well as higher and more consistent cash flows (in the case of private credit and parts of real assets).

SCERS LIQUIDITY PROFILE

Verus broke SCERS' assets into different liquidity categories on pages 7–9 of their presentation. The first category includes liquid assets, which are assets that have the ability to convert to cash within 1 to 7 days. Liquid financial assets include pubic equities (both domestic and international) and fixed income (U.S. Treasuries; core plus fixed income; global fixed income). According to

Verus, approximately 66% of SCERS' assets are categorized as liquid in a normal market liquidity environment, and approximately 46% in a stressed market liquidity environment.

The second category includes illiquid assets such as private equity, private credit, private real assets, and non-core real estate. These assets are invested within multi-year fund structures, so liquidity, for purposes of this analysis, is measured at one year, or 365 days. Absolute Return and Core real estate, while implemented through open-end commingled funds with monthly and quarterly liquidity in a normal liquidity environment, can also see liquidity move to one year in a stressed liquidity environment, in which a fund could be subject to exit queues and investor gates. According to Verus, approximately 16% of SCERS' assets are categorized as illiquid in a normal market liquidity environment, and approximately 32% in a stressed market liquidity environment.

LIQUIDITY ANALYSIS

Verus' current approach to liquidity analysis analyzes a plan's liquidity by comparing a plan's liquid assets and cash inflows to a plan's cash outflows. Within the analysis, Verus measured SCERS' liquidity over a 5-year period.

Cash inflows include:
- Liquid financial assets
- Employer and employee contributions
- Investment Income
- Distributions from illiquid assets (i.e., private equity; private credit; real assets; real estate)

Cash outflows include:
- Member benefit payments
- Plan expenses
- Capital calls for illiquid assets

Verus ran a liquidity analysis using two measures
- Liquidity Coverage Ratio (LCR)
- Modified Liquidity Coverage Ratio (MLCR)

LCR:

The LCR measures whether a plan has enough cash flows and liquid assets to meet cash outflows over a 5-year period, without having to sell illiquid assets to cover liquidity needs. SCERS' LCR measures 4.52, meaning it has 4.52x coverage in liquidity available relative to SCERS' spending needs over the next 5 years. Verus views any measure greater than 1 as sufficient liquidity, so SCERS' measure of 4.52 is strong for a mature public pension plan.

In the table below, Verus ran the LCR analysis across various drawdown scenarios, and the impact that drawdowns would have on the LCR. In a worst case scenario, where SCERS experiences an immediate 50% drawdown in plan assets, and an annual assumed rated of return of 1.75% over the subsequent 5-year period, SCERS' LCR would drop to 2.02, which is still good coverage to meet the plan's liquidity needs. In an extreme case drawdown, where SCERS experiences an immediate 20% drawdown in plan assets, and an annual assumed rated of return of 3.75% over the subsequent 5-year period, SCERS' LCR would drop to 3.35, which is sufficient coverage to meet the plan's liquidity needs

DRAWDOWN SCENARIO AND CHANGE IN FUTURE RETURN

Drawdown Scenario (Immediate)	Assumed Return (Subsequent 5-years)					
	1.75%	2.75%	3.75%	4.75%	5.75%	6.75%
-50%	2.02	2.09	2.16	2.24	2.32	2.41
-40%	2.30	2.40	2.50	2.61	2.72	2.85
-30%	2.63	2.75	2.89	3.04	3.20	3.38
-20%	3.00	3.16	3.35	3.53	3.66	3.79
-10%	3.43	3.59	3.72	3.85	3.99	4.13
0%	3.74	3.88	4.02	4.17	4.32	4.48

Source: Verus Advisory

MLCR:

While the LCR measure is useful in understanding SCERS' liquidity profile, it assumes that SCERS would be comfortable selling all types of liquid assets in a drawdown period to meet the plan's liquidity needs.

Within the category of 'liquid plan assets', not all assets would be optimal to sell in a stressed market environment. In particular, U.S. and non-U.S. equities would most likely experience meaningful losses in a broad market downturn, and would not be favorable to sell for liquidity purposes. Rather, SCERS would most likely be more comfortable selling U.S. Treasuries and SCERS' core plus fixed income assets under this scenario. U.S. Treasuries often trade at a higher value in a stressed market environment, and represent SCERS' most liquid asset outside of cash, while core plus fixed income can sometimes trade at a higher value, or trade at a lower negative value, than public equities.

Verus also ran the liquidity analysis using an alternative measure called the Modified Liquidity Coverage Ratio (MLCR). The MLCR measures whether a plan would need to sell 'risky' liquid assets (liquid assets that tend to experience a significant deterioration in value during a market drawdown; i.e., U.S. and non-U.S. equities, high yield credit) to cover cash outflows in the 5 years after a major market dislocation. Instead of measuring all 'liquid financial assets', the MLCR only includes the value of U.S. Treasuries and core plus fixed income, in addition to the cash inflows and cash outflows that are also included in the LCR. Both Verus and Staff prefer to measure SCERS' liquidity profile using the MLCR, rather than the LCR.

SCERS' MLCR measures 1.58, meaning it has 1.58x coverage on assets that SCERS would be comfortable selling (U.S. Treasuries and core plus fixed income) to cover liquidity needs over the 5 years following a market dislocation. In other words, SCERS should not find itself in a position of needing to sell any 'risky' assets to meet planned obligations over the 5 years following a market dislocation. Verus views any MLCR measure greater than 1 as a sufficient gauge. A measure above one translates to a plan having excess liquidity and being in a position to maintain exposure to illiquid assets.

NEXT STEPS

The liquidity analysis performed by Verus provides a good look-through as to SCERS' current liquidity profile. The analysis demonstrates that SCERS is in a healthy liquidity position, especially giving its meaningful footprint within the illiquid private markets.

With the liquidity analysis complete, Staff and Verus plan to introduce a formal cash management policy to SCERS' Board for consideration in the first half of 2019. It is anticipated that the cash management policy will assign responsibilities related to management of cash, monitoring of liquidity, and the management of liquidity risk. Objectives of the policy will be to (1) ensure that member benefit payment and funding obligations are met without interruption regardless of financial market conditions; (2) provide a process for the oversight and management of cash during normal and stressed market conditions; and (3) oversee liquidity risk and maintain appropriate liquidity profiles within the SCERS plan.

ATTACHMENTS

Verus Liquidity Analysis Presentation

Prepared by:	Reviewed by:
/S/	/S/
Steve Davis Chief Investment Officer	Eric Stern Chief Executive Officer

Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

DECEMBER 2018

Liquidity Analysis Presentation

Sacramento County Employees’ Retirement System

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Introduction

SCERS Objectives and Characteristics

Defined Benefit Plan

OBJECTIVES

1. Achieve 7.0% Long Term Rate of Return Assumption
2. Achieve the return as efficiently & effectively as possible
3. ***Always have enough cash and available liquidity on hand to fund benefit payments and plan commitments***

PLAN CHARACTERISTICS

1. Cash flow negative (benefit payments > contributions)
2. Meaningful exposure to illiquid private market investments

Managing liquidity risk is a primary imperative for the trustees

Purpose and objective

Purpose

The purpose of the liquidity management framework is to ensure the 5-year liquidity profile of SCERS is consistent with the guiding principles set forth in the Investment Policy Statement.

Objective

The objective of the liquidity management framework is to establish limits on the 5-year liquidity profile of the Plan Portfolio and control the element of risk resulting from uncertainties associated with the ability to convert investments to cash in order to: (1) always have enough cash on hand to pay fund obligations, (2) rebalance the Plan Portfolio and (3) change investment strategy / asset allocation.

Liquidity Risk Framework

Assumptions

Liquidity assumptions assume days to convert to cash

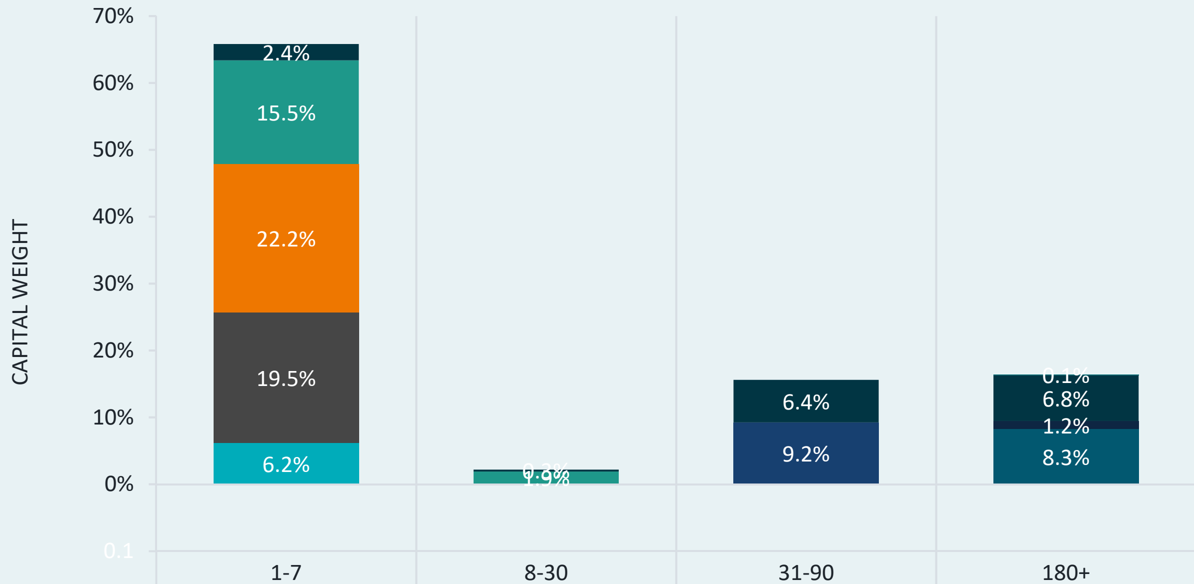
Asset Class	Account	Manager Normal Liquidity	Manager Stressed Liquidity	Market Value
Cash	Cash	1	1	591,058,101.00
U.S. Equity	AB	3	3	1,278,364,101.00
U.S. Equity	AQR	3	7	246,465,009.00
U.S. Equity	JP Morgan 130/30	3	7	134,492,152.00
U.S. Equity	Eagle Capital	3	7	252,938,041.00
U.S. Equity	Weatherbie	3	7	104,701,712.00
U.S. Equity	Dalton	3	7	102,246,278.00
Non U.S. Equity	Lazard	7	10	373,139,041.00
Non U.S. Equity	Walter Scott	7	10	505,000,047.00
Non U.S. Equity	LSV	7	10	454,748,769.00
Non U.S. Equity	Modrian Dev SC	7	10	97,359,201.00
Non U.S. Equity	William Blaire Dev SC	7	10	90,386,314.00
Non U.S. Equity	Baillie EM	7	10	182,394,794.00
Non U.S. Equity	Mondrian EM	7	10	161,866,701.00
Fixed Income	Brigade	30	45	182,200,301.00
Fixed Income	Prudential	3	7	434,910,957.00
Fixed Income	TCW	3	7	411,517,881.00
Fixed Income	Neuberger Berman US Treasury	1	1	416,517,881.00
Fixed Income	Brandywine Global	3	7	219,177,965.00
Absolute Return	Absolute Return	90	365	883,576,154.00
Opportunistic	Atalaya	365	365	8,902,111.00
Private Credit	Private Credit	365	365	114,446,139.00
Private Equity	Private Equity Composite	365	365	789,213,698.00
Real Return	Liquid Proxy	3	3	232,680,868.00
Real Return	Core Real Estate	90	365	608,444,618.00
Real Return	Opportunistic Real Estate	365	365	164,561,897.00
Real Return	Value Add Real Estate	365	365	63,015,210.00
Real Return	Private Real Assets	365	365	424,277,039.00
Real Return	Gresham	30	45	27,477,461.00

— Investments that convert to cash in 3 days are considered the most liquid

— Investments that convert to cash in 365 days have no liquidity

Liquidity – Normal markets

NORMAL MARKET LIQUIDITY



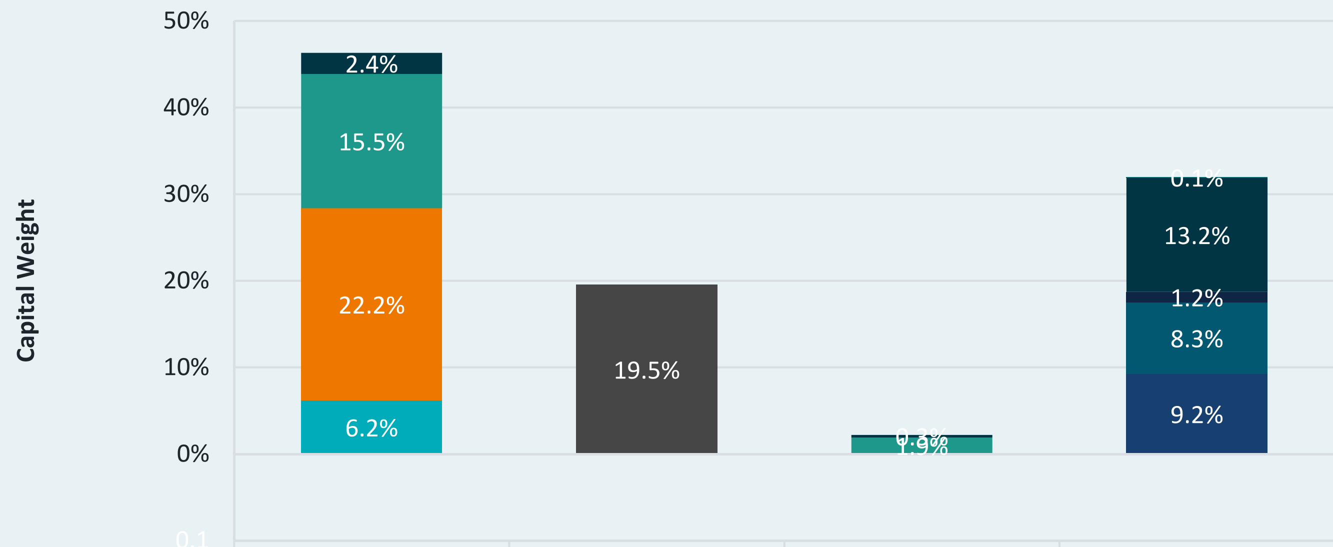
	1-7	8-30	31-90	180+
Opportunistic				0.1%
Real Return	2.4%	0.3%	6.4%	6.8%
Private Credit				1.2%
Fixed Income	15.5%	1.9%		
U.S. Equity	22.2%			
Non U.S. Equity	19.5%			
Cash	6.2%			
Private Equity				8.3%
Absolute Return			9.2%	
Total (%)	65.8%	2.2%	15.6%	16.4%
Total ($)	$6,289,965,813.00	$209,677,762.00	$1,492,020,772.00	$1,564,416,094.00

65.8% of SCERS' portfolio can be converted to cash within 1-7 days in a normal market environment

Around 16.0% of SCERS' assets would be considered mostly or completely illiquid

Liquidity – Stressed markets

STRESSED MARKET LIQUIDITY



	1-7	8-30	31-90	180+
Opportunistic				0.1%
Real Return	2.4%		0.3%	13.2%
Private Credit				1.2%
Fixed Income	15.5%		1.9%	
U.S. Equity	22.2%			
Non U.S. Equity		19.5%		
Cash	6.2%			
Private Equity				8.3%
Absolute Return				9.2%
Total (%)	46.3%	19.5%	2.2%	32.0%
Total ($)	$4,425,070,946.00	$1,864,894,867.00	$209,677,762.00	$3,056,436,866.00

45.6% of SCERS' portfolio can be converted to cash within 1-7 days in a stressed market environment

32.0% of SCERS' assets would be considered mostly or completely illiquid in a stressed market environment

Assumptions (con't)

—Portfolio grows at a rate of 7.0%/year

—Investment income is 2.0%

—Benefit Payments, Contributions and Expenses derived from actuary study

CONTRIBUTIONS, BENEFIT PAYMENTS AND PLAN EXPENSES

Fiscal Year	Employer/Employee Contributions	Benefit Payments	Other Expenses
2018	333,916,344.0	503,608,322.0	7,984,096.0
2019	384,914,219.0	532,688,769.0	8,385,617.0
2020	422,242,412.0	564,690,008.0	8,827,614.0
2021	449,149,633.0	598,338,256.0	9,305,041.0
2022	467,065,527.0	633,401,953.0	9,803,592.0
2023	484,903,198.0	669,921,944.0	10,321,329.0
2024	497,045,067.0	707,445,813.0	10,855,920.0
2025	508,126,607.0	745,513,055.0	11,402,161.0
2026	522,144,126.0	784,342,250.0	11,961,830.0
2027	536,837,270.0	823,591,497.0	12,537,136.0

Data provided by Segal

RETURN AND CASHFLOW ASSUMPTIONS

Analysis Date	9/30/2018
Funded Ratio	85.0%
Drawdown Scenario	0.0%
Expected Return	7.00%
Distribution Shock (Reduction)	0%
Capital Call Shock (Reduction)	0%
Amortization Period (years)	20
LCR Time Period (years)	5
Contribution Reduction	0%
Investment Income	2.0%
Illiquid Asset Allocation Increase	0%
Assumed Return	7.00%

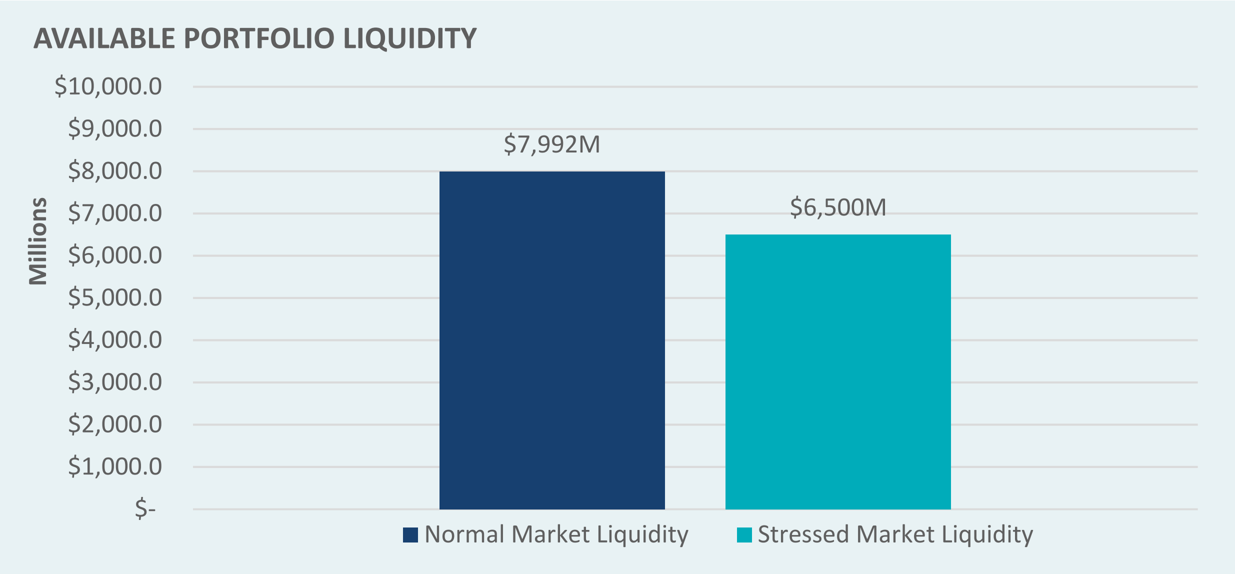
Liquidity risk

Market Liquidity Risk

A measurement of the timing required to convert an investment position to cash

—**Normal market conditions:** defined as periods when liquidity is consistent with historical functioning markets and managers are not imposing gates.

—**Stressed market conditions:** defined as periods when liquidity is withdrawn from the market and managers are imposing gates.



Funding liquidity risk

Funding Liquidity Risk

1. **Liquidity Coverage Ratio (LCR):** Does the plan need to sell illiquid assets to cover cash outflows in the next 5 years?

2. **Modified Liquidity Coverage Ratio (MLCR):** Does the plan need to sell risky liquid assets to cover cash outflows in the next 5 years?

LCR

Does the plan need to sell illiquid assets to cover cash outflows in the next 5 years?

$$Liquidity\ Coverage\ Ratio\ (LCR) = \frac{\begin{matrix} Liquid\ Financial\ Assets\ (normal\ market\ condition) \\ \sum(Distributions\ from\ Illiquid\ Assets) \\ \sum\left(\frac{Employer}{Employee}\ Contributions\right) \\ \sum(Investment\ Income) \end{matrix}}{\begin{matrix} \sum(Benefit\ Payments) \\ \sum(Capital\ Calls\ for\ Illiquid\ Assets) \\ \sum(Plan\ Expenses) \end{matrix}}$$

LCR Value	Implication
<1	The plan will need to sell illiquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan will not be required to sell illiquid assets to cover liquidity needs

SCERS LCR

Liquidity Available	Liquid Financial Assets	$	11,208,722,661.06
	Distributions from Illiquids	$	148,729,611.00
	Employer + Employee Contributions	$	2,057,288,135.00
	Investment Income		955,608,044.10
Liquidity Needs	Benefit Payments	$	2,832,727,308.00
	Capital Calls	$	299,351,117.00
	Plan Expenses	$	44,305,960.00
	UAAL Amortization	-	
LCR			**4.52**

LCR = 4.52

4.52x coverage in liquidity available relative to your spending needs over the next 5 years

DRAWDOWN SCENARIO AND CHANGE IN FUTURE RETURN

Drawdown Scenario (Immediate)	Assumed Return (Subsequent 5-years)					
	1.75%	2.75%	3.75%	4.75%	5.75%	6.75%
-50%	2.02	2.09	2.16	2.24	2.32	2.41
-40%	2.30	2.40	2.50	2.61	2.72	2.85
-30%	2.63	2.75	2.89	3.04	3.20	3.38
-20%	3.00	3.16	3.35	3.53	3.66	3.79
-10%	3.43	3.59	3.72	3.85	3.99	4.13
0%	3.74	3.88	4.02	4.17	4.32	4.48

SENSITIVITY TO CAPITAL CALL AND DISTRIBUTION CHANGES

Distribution Reduction	Capital Call Reduction					
	5%	15%	25%	35%	45%	55%
95%	4.50	4.54	4.59	4.63	4.68	4.72
85%	4.51	4.55	4.59	4.64	4.68	4.73
75%	4.51	4.55	4.60	4.64	4.69	4.73
65%	4.51	4.56	4.60	4.65	4.69	4.74
55%	4.52	4.56	4.61	4.65	4.70	4.74
45%	4.52	4.57	4.61	4.66	4.70	4.75

MLCR

Does the plan need to sell risky liquid assets to cover cash outflows in the next 5 years?

$$\text{Modified Liquidity Coverage Ratio (MLCR)} = \frac{\begin{array}{c}\sum(\text{Treasury and Core Fixed Income Assets}) \\ \sum(\text{Distributions from Illiquid Assets}) \\ \sum\left(\frac{\text{Employer}}{\text{Employee}}\,\text{Contributions}\right) \\ \sum(\text{Investment Income})\end{array}}{\begin{array}{c}\sum(\text{Benefit Payments}) \\ \sum(\text{Capital Calls for Illiquid Assets}) \\ \sum(\text{Plan Expenses})\end{array}}$$

MLCR Value	Implication
<1	The plan will need to sell liquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan has excess liquidity and may consider increasing illiquid allocation

SCERS MLCR

Liquidity Available	Treasury + Core Fixed Income Assets	$	1,854,004,820.00
	Distributions from Illiquids	$	148,729,611.00
	Employer + Employee Contributions	$	2,057,288,135.00
	Investment Income	$	955,608,044.10
Liquidity Needs	Benefit Payments	$	2,832,727,308.00
	Capital Calls	$	299,351,117.00
	Plan Expenses	$	44,305,960.00
	UAAL Amortization	-	
MLCR			**1.58**

MLCR = 1.58

1.58x coverage on assets that you would want to sell to cover liquidity needs over the next 5 years

SCERS should not need to sell any risk assets to meet planned obligations over the next 5 years

Assets included in MLCR are Treasuries and Core Fixed Income

SENSITIVITY TO CAPITAL CALL AND DISTRIBUTION CHANGES

		Capital Call Reduction						
		5.0%	15.0%	25.0%	35.0%	45.0%	55.0%	65.0%
Distribution Reduction	5.0%	1.58	1.60	1.61	1.63	1.65	1.66	1.68
	15.0%	1.58	1.59	1.61	1.63	1.64	1.66	1.67
	25.0%	1.57	1.59	1.61	1.62	1.64	1.65	1.67
	35.0%	1.57	1.59	1.60	1.62	1.63	1.65	1.66
	45.0%	1.57	1.58	1.60	1.61	1.63	1.64	1.66
	55.0%	1.56	1.58	1.59	1.61	1.62	1.64	1.65
	65.0%	1.56	1.57	1.59	1.60	1.62	1.63	1.65
	75.0%	1.55	1.57	1.58	1.60	1.61	1.63	1.64
	85.0%	1.55	1.56	1.58	1.59	1.61	1.62	1.64
	95.0%	1.54	1.56	1.57	1.59	1.60	1.62	1.63

Summary results

— As measured by the LCR, SCERS has sufficient liquidity to cover any planned cash flow needs over the next 5 years.

— Coverage ratios above 1 indicates sufficient liquidity and SCERS has 4.52x coverage

— Based on the MLCR coverage, SCERS should have enough liquidity within the Treasury and Core Fixed Income portfolios to meet any liquidity needs and avoid having to sell risk assets like public equities in a stressed market environment.

Next steps

— Present a cash management policy for the SCERS Board during 2019

— Objectives of cash management policy:

- Ensure that benefit payment and funding obligations are met without interruption
- Provide a process for the oversight and management of cash
- Oversee liquidity risk and maintain appropriate liquidity profiles within the SCERS plan