Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 19

MEETING DATE: **August 19, 2026**

SUBJECT: **Liquidity Study**

SUBMITTED FOR: ___ **Action** __X__ **Information**

RECOMMENDATION

Receive and file the liquidity study and cash-flow profile of SCERS' portfolio, as presented by Cerity.

PURPOSE/STRATEGIC PRIORITY

This item supports SCERS' Cash Management Policy, which calls for Staff and SCERS' general investment consultant to update the Board annually on SCERS' liquidity profile.

DISCUSSION

A liquidity study provides an understanding of the plan's overall cash flow profile, and insight into how the plan can address future cash flow needs. The analysis is particularly useful given SCERS' meaningful private markets exposure, which is illiquid. Past studies have determined that while SCERS has negative cash flows, due to benefit payments exceeding contributions, its overall liquidity profile remains healthy.

Keritys' approach to liquidity studies analyzes a plan's liquidity by comparing a plan's liquid assets and cash inflows to a plan's cash outflows. Within the study, Cerity measures SCERS' liquidity over a 10-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
- Capital calls for illiquid assets

Cerity generates two measures for liquidity, a (1) Liquidity Coverage Ratio (LCR) and a (2) Modified Liquidity Coverage Ratio (MLCR). Both ratios measure whether an institutional investor has sufficient cash flows over a 10-year period. The MLCR is a more conservative measure, as it includes only liquid diversifying assets in its measure, whereas the LCR includes both liquid risk assets and liquid diversifying assets (page 5 of the Cerity presentation).

The results of the liquidity study show that SCERS has an LCR of 1.82 over a 10-year measurement period, which is slightly lower than the 2025 measure of 1.84 over the same 10-year period. The MLCR of 1.09 is slightly lower than the 2025 measure of 1.11 over a 10-year measurement period.

The analysis demonstrates that SCERS is in a healthy liquidity position. The LCR is well above the 1.0 threshold, and the more conservative MLCR is also above the 1.0 target. The measures should not be viewed in isolation, as both the LCR and MLCR complement one another. SCERS' LCR rating of 1.84 means that SCERS has ample liquidity within liquid risk assets that can be accessed through rebalancing to account for any potential deterioration in the MLCR if there was an insufficient level of liquid diversifying assets, such as within the 'adverse private market cash flow' scenario modeled on page 11 of the Cerity presentation, in which Cerity assumes that private market distributions are 50% lower than expected over a five-year period during a distressed market environment.

Please note that while the Credit asset class can contain up to 40% Liquid Credit exposure, the majority of the Credit exposure is expected to be comprised of Illiquid (Private) Credit in the form of drawdown vehicles. Cerity took a more conservative approach in modeling all of Credit as illiquid risk assets, especially since Liquid Credit can take the form of a drawdown vehicle similar to a private credit fund, in addition to more liquid open-end funds and vehicles.

ATTACHMENTS

- Board Order
- Cerity Liquidity Risk Assessment Presentation

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

Retirement Board Order

Sacramento County Employees' Retirement System

Before the Board of Retirement
August 19, 2026

AGENDA ITEM:

Liquidity Study

THE BOARD OF RETIREMENT hereby approves the Staff recommendation to receive and file the liquidity study and cash-flow profile of SCERS' portfolio, as presented by Cerity Partners.

I HEREBY CERTIFY that the above order was passed and adopted on August 19, 2026 by the following vote of the Board of Retirement, to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

ALTERNATES (Present but not voting):

Chris Giboney
Board President

Eric Stern
Chief Executive Officer and
Board Secretary

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Sacramento County Employees' Retirement System

2026 Liquidity Risk Assessment

August 2026

Introduction

- Annual Liquidity Study
  - SCERS' Cash Management Policy calls for an annual update on the Plan's liquidity profile
  - Liquidity study is conducted by general investment consultant, Cerity Partners

- Purpose
  - Understanding of the Plan's overall cash flow profile
    - Investment and actuarial data as inputs
  - Insight into how the Plan can address future cash flow needs

Objectives and characteristics

Managing liquidity risk is imperative for the trustees

- **OBJECTIVES**

  1. Achieve the Long-Term Rate of Return Assumption of 6.75%
  2. Achieve this return as efficiently 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

Liquidity assessment overview

Cerity Partners uses the **Liquidity Coverage Ratio (LCR)** to quantify liquidity risk.

The LCR is the ratio of liquidity available to the liquidity needed over a specified time-period. The calculation reflects SCERS' specific asset allocation and cashflow profile.

We have applied a variety of lenses to the LCR calculation:

› **Calculation methods**:

- Deterministic
- Monte Carlo

› **Private market cashflow scenarios:**

- Baseline private market cashflows
- Adverse private market cashflows with distributions cut to 50% of expected for last 5 of 10 years

› **Liquidity scenarios:**

- Baseline LCR which includes all liquid asset classes
- Modified LCR which includes only diversifying liquid asset classes as a source of liquidity

Liquidity Coverage Ratio (LCR) Formula

$$LCR = \frac{\begin{gathered} Starting\ Liquid\ Financial\ Assets \\ \sum(Distributions\ from\ Illiquid\ Assets) \\ \sum(Employer\ and\ Employee\ Contributions) \\ \sum(Liquid\ Investment\ Return) \end{gathered}}{\begin{gathered} \sum(Benefit\ Payments) \\ \sum(Capital\ Calls\ for\ Illiquid\ Assets) \end{gathered}}$$

LCR Value	Implication
<1	Insufficient liquidity
>1	Sufficient liquidity

Liquidity assumptions

By asset class

Liquidity Grouping	Asset Class	Actual (12/31)	Policy Allocation	Days to Convert to Cash
Liquid Diversifying Assets	Cash	3.3	2	1
	US Treasury	3.3	4	1-3
	Core Plus Fixed Income	10.8	12	3
	Liquid Real Return	1.9	1	3
	Total Liquid Diversifying	**19.3**	**19**	
Liquid Risk Assets	Global Equity	42.4	39	3
	Absolute Return	6.7	7	30-90
	Total Liquid Growth	**49.1**	**46**	
Illiquid Risk Assets	Private Real Estate	6.0	8	Illiquid
	Private Equity	11.8	11	Illiquid
	Private Credit	5.3	9	Illiquid
	Private Real Assets	8.3	7	Illiquid
	Total Illiquid	**31.4**	**35**	

Standard LCR: Liquid diversifying and liquid risk assets are a source of liquidity

Modified LCR: Only liquid diversifying assets are a source of liquidity

Cashflow projection

6.75% Discount Rate

January 1,	Market Value of Assets (BOY): Liquid	Illiquid	Total
2026	10.8	4.9	15.7
2027	11.3	5.1	16.4
2028	11.8	5.4	17.2
2029	12.4	5.6	18.0
2030	12.9	5.9	18.8
2031	13.3	6.3	19.6
2032	13.7	6.7	20.4
2033	14.2	7.1	21.3
2034	14.7	7.4	22.1
2035	15.2	7.7	22.9

Total Fund Cashflows: Contributions	Benefit Payments & Expenses	Total Fund Net Cashflow: Net Cash Flow (%)	Net Cash Flow ($)
0.6	-0.9	-1.9%	(0.3)
0.6	-0.9	-1.8%	(0.3)
0.6	-0.9	-1.7%	(0.3)
0.6	-1.0	-2.2%	(0.4)
0.6	-1.0	-2.1%	(0.4)
0.6	-1.1	-2.6%	(0.5)
0.6	-1.1	-2.5%	(0.5)
0.6	-1.2	-2.8%	(0.6)
0.5	-1.2	-3.2%	(0.7)
0.4	-1.2	-3.5%	(0.8)

Private Market Cashflows: Private Market Distributions	Private Market Capital Calls	Total Fund Net Cashflow: Net Cash Flow (%)	Net Cash Flow ($)
0.8	-0.6	-0.6%	(0.1)
0.9	-0.8	-1.2%	(0.2)
1.1	-0.8	0.0%	0.0
1.0	-0.8	-1.1%	(0.2)
1.0	-0.9	-1.6%	(0.3)
1.1	-0.9	-1.5%	(0.3)
1.2	-1.0	-1.5%	(0.3)
1.3	-1.0	-1.4%	(0.3)
1.4	-1.0	-1.4%	(0.3)
1.4	-1.0	-1.7%	(0.4)

Under the forecasted return and current actuarial discount rate of 6.75%, SCERS annual net cash flow position is expected to grow increasingly negative, from (1.9%) to (3.5%) over the next ten years. This is driven by a reduction in contributions after the plan achieves full funding.

The cashflow position is expected to improve when including private market investments but remains negative.

Reflects 2026 CMA return forecasts of 5.8% and 8.9% for the liquid and illiquid portfolio respectively. See appendix for additional details.

Cashflow projection

6.50% Discount Rate

	Market Value of Assets (BOY)			Total Fund Cashflows		Total Fund Net Cashflow		Private Market Cashflows		Total Fund Net Cashflow	
January 1,	Liquid	Illiquid	Total	Contributions	Benefit Payments & Expenses	Net Cash Flow (%)	Net Cash Flow ($)	Private Market Distributions	Private Market Capital Calls	Net Cash Flow (%)	Net Cash Flow ($)
2026	10.8	4.9	15.7	0.6	-0.9	-1.9%	(0.3)	0.8	-0.6	-0.6%	(0.1)
2027	11.3	5.1	16.4	0.6	-0.9	-1.8%	(0.3)	0.9	-0.8	-1.2%	(0.2)
2028	11.8	5.4	17.2	0.6	-0.9	-1.7%	(0.3)	1.1	-0.8	0.0%	0.0
2029	12.5	5.6	18.1	0.6	-1.0	-2.2%	(0.4)	1.0	-0.8	-1.1%	(0.2)
2030	13.0	5.9	18.9	0.6	-1.0	-2.1%	(0.4)	1.0	-0.9	-1.6%	(0.3)
2031	13.5	6.3	19.8	0.6	-1.1	-2.5%	(0.5)	1.1	-0.9	-1.5%	(0.3)
2032	14.0	6.7	20.7	0.6	-1.1	-2.4%	(0.5)	1.2	-1.0	-1.4%	(0.3)
2033	14.6	7.1	21.7	0.6	-1.2	-2.8%	(0.6)	1.3	-1.0	-1.4%	(0.3)
2034	15.2	7.4	22.6	0.7	-1.2	-2.2%	(0.5)	1.4	-1.0	-0.4%	(0.1)
2035	15.9	7.7	23.6	0.7	-1.2	-2.1%	(0.5)	1.4	-1.0	-0.4%	(0.1)

Under the forecasted return and assuming a reduction in the discount rate to 6.50%, SCERS annual net cash flow position is expected to remain at a steady outflow position over time, around 2%.

With the lower discount rate, the fund is not expected to achieve full funding in the next ten years and there is no contribution reduction.

Reflects 2026 CMA return forecasts of 5.8% and 8.9% for the liquid and illiquid portfolio respectively. See appendix for additional details.

10-year LCR: 2026 vs. 2025

Deterministic analysis

2026 LCR – 6.75% Discount Rate

Liquidity Available	Starting Liquid Assets	10.8
	10-Year Contributions	5.4
	10-Year Private Market Distributions	11.2
	10-Year Liquid Investment Income	7.5
	10-Year Liquidity Available	**34.9**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	10.5
	10-Year Private Market Capital Calls	8.7
	10-Year Liquidity Needed	**19.2**
	10-Year Liquidity Coverage Ratio	**1.82**

2025 LCR – 6.75% Discount Rate

Liquidity Available	Starting Liquid Assets	9.5
	10-Year Contributions	5.9
	10-Year Private Market Distributions	9.4
	10-Year Liquid Investment Income	6.6
	10-Year Liquidity Available	**31.4**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	9.8
	10-Year Private Market Capital Calls	7.2
	10-Year Liquidity Needed	**17.0**
	10-Year Liquidity Coverage Ratio	**1.84**

2026 LCR – 6.50% Discount Rate

Liquidity Available	Starting Liquid Assets	10.8
	10-Year Contributions	6.3
	10-Year Private Market Distributions	11.2
	10-Year Liquid Investment Income	7.7
	10-Year Liquidity Available	**36.0**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	10.5
	10-Year Private Market Capital Calls	8.7
	10-Year Liquidity Needed	**19.2**
	10-Year Liquidity Coverage Ratio	**1.88**

Under the forecasted return and current actuarial discount rate of 6.75%, SCERS is expected to have 1.82 times the amount of liquidity needed over the next ten years. This is in line with the prior year analysis.

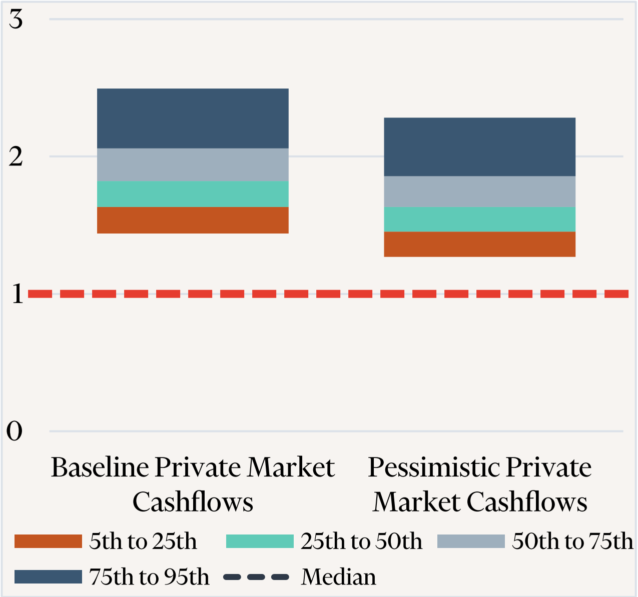
The LCR improves to 1.88 when reflecting the higher contributions under a 6.50% assumed discount rate.

Reflects 2026 CMA return forecasts of 5.8% and 8.9% for the liquid and illiquid portfolio respectively. See appendix for additional details.

10-year LCR: 2026 vs. 2025

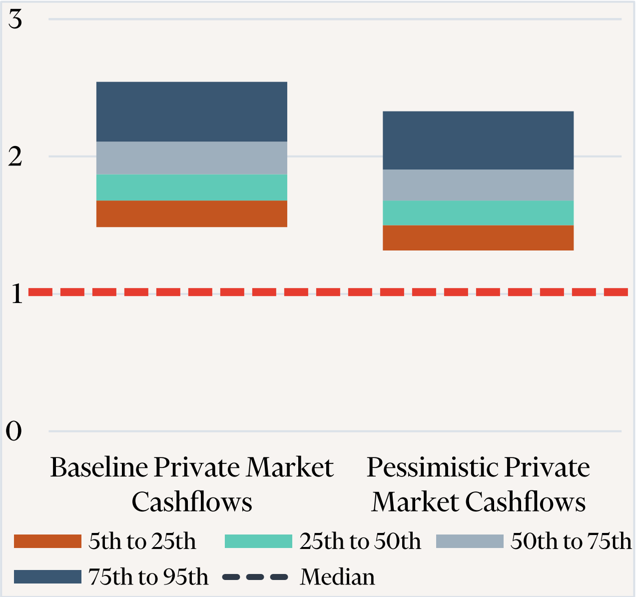
Monte Carlo analysis

2026 LCR – 6.75% Discount Rate



10-Year LCR	Baseline PM Cashflows	Adverse PM Cashflows
Percentile		
95% Percentile	2.5	2.3
75% Percentile	2.0	1.8
50% Percentile	1.8	1.6
25% Percentile	1.6	1.5
5% Percentile	1.4	1.3
Probability of Liquidity Event	**~0%**	**~0%**

2026 LCR – 6.50% Discount Rate



10-Year LCR	Baseline PM Cashflows	Adverse PM Cashflows
Percentile		
95% Percentile	2.5	2.3
75% Percentile	2.1	1.9
50% Percentile	1.9	1.7
25% Percentile	1.7	1.5
5% Percentile	1.5	1.3
Probability of Liquidity Event	**~0%**	**~0%**

The 'baseline private market cashflow' scenario assumes the private market cashflows are as expected. The 'adverse private market cashflow' scenario assumes the private market distributions are 50% lower than expected for the last five of ten-years.

The fund is expected to have sufficient liquidity to meet cashflow needs over the next 10 years, including in adverse return and private market cashflow scenarios, under either discount rate scenario.

Reflects 5,000 simulations of the liquidity coverage ratio. See appendix for additional details.

10-year modified LCR: 2026 vs. 2025

Deterministic analysis

2026 Modified LCR – 6.75% Discount Rate

Liquidity Available	Starting Liquid Diversifying Assets	3.0
	10-Year Contributions	5.4
	10-Year Private Market Distributions	11.2
	10-Year Liquid Investment Income	1.3
	10-Year Liquidity Available	**20.9**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	10.5
	10-Year Private Market Capital Calls	8.7
	10-Year Liquidity Needed	**19.2**
	10-Year Liquidity Coverage Ratio	**1.09**

2025 Modified LCR - 6.75% Discount Rate

Liquidity Available	Starting Liquid Diversifying Assets	2.6
	10-Year Contributions	5.9
	10-Year Private Market Distributions	9.4
	10-Year Liquid Investment Income	1.1
	10-Year Liquidity Available	**19.0**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	9.8
	10-Year Private Market Capital Calls	7.2
	10-Year Liquidity Needed	**17.0**
	10-Year Liquidity Coverage Ratio	**1.11**

2026 Modified LCR – 6.50% Discount Rate

Liquidity Available	Starting Liquid Assets	3.0
	10-Year Contributions	6.3
	10-Year Private Market Distributions	11.2
	10-Year Liquid Investment Income	1.4
	10-Year Liquidity Available	**21.9**
Liquidity Needs	10-Year Benefit Payments & Admin Expenses	10.5
	10-Year Private Market Capital Calls	8.7
	10-Year Liquidity Needed	**19.2**
	10-Year Liquidity Coverage Ratio	**1.14**

Under the forecasted return and current actuarial discount rate of 6.75%, SCERS is expected to have 1.09 times the amount of liquidity needed over the next ten years in the diversifying asset classes alone. This is a reduction but in line with prior year.

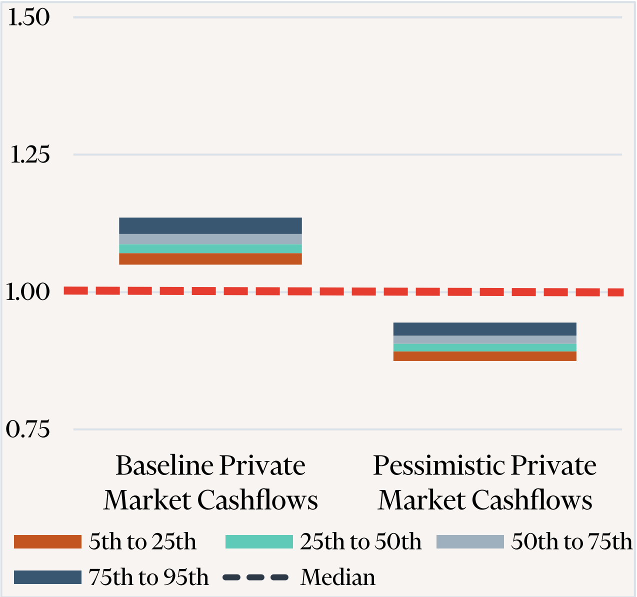
The modified LCR improves to 1.14 when reflecting the higher contributions under a 6.50% assumed discount rate.

Reflects 2026 CMA return forecasts of 5.8% and 8.9% for the liquid and illiquid portfolio respectively. See appendix for additional details.

10-year modified LCR: 2026 vs. 2025

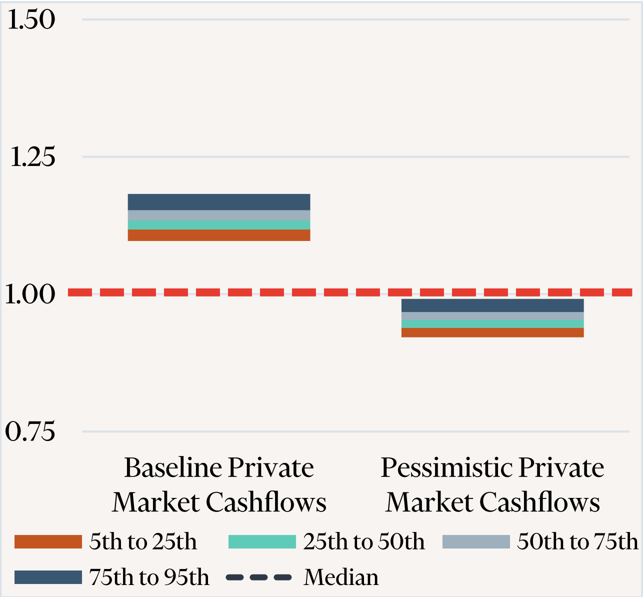
Monte Carlo analysis

2026 Modified LCR – 6.75% Discount Rate



10-Year Modified LCR	Baseline PM Cashflows	Adverse PM Cashflows
Percentile		
95% Percentile	1.14	0.94
75% Percentile	1.11	0.92
50% Percentile	1.09	0.91
25% Percentile	1.07	0.89
5% Percentile	1.05	0.87
Probability of Insufficient Diversifying Liquidity	**~0%**	**~100%**

2026 Modified LCR – 6.50% Discount Rate



10-Year Modified LCR	Baseline PM Cashflows	Adverse PM Cashflows
Percentile		
95% Percentile	1.19	1.00
75% Percentile	1.16	0.97
50% Percentile	1.14	0.95
25% Percentile	1.12	0.94
5% Percentile	1.10	0.92
Probability of Insufficient Diversifying Liquidity	**~0%**	**96%**

The ‘baseline private market cashflow’ scenario assumes the private market cashflows are as expected. The ‘adverse private market cashflow’ scenario assumes the private market distributions are 50% lower than expected for the last five of ten-years.

The fund is expected to have sufficient liquidity in diversifying liquid assets alone. However, under adverse private market scenarios, the fund may need to fund outflows through liquid risk assets towards the end of the projection.

Reflects 5,000 simulations of the liquidity coverage ratio. See appendix for additional details.

Summary

- SCERS has a healthy liquidity profile that is in line with the prior year assessment
  - The analysis shows that SCERS should expect to have sufficient liquidity in its defensive asset classes alone to meet cashflow needs over a 10-year period.

- The cash flow projections show an increasingly negative cashflow position which we expect to continue as the demographics of the Plan matures and approaches full funding.
  - Therefore, monitoring liquidity annually remains prudent.

Appendix

Liquidity model assumptions and inputs

GENERAL INPUTS, ASSUMPTIONS, AND METHODS

Starting Asset Value	$15,677,612,831 as of 12/31/2025
Capital market assumptions	Cerity Partners' 2026 10-year institutional CMAs (details in Appendix)
Cashflows	Unless stated otherwise, cashflows are assumed to be consistent with those shown below. Contributions and benefit payments were provided by Segal. Private market cashflows were provided by Cliffwater and Townsend.
Rebalancing methodology	The liquid portfolio is rebalanced after every projection year so that each liquid asset class makes up its target weight of the total liquid portfolio.

CASHFLOW ASSUMPTIONS

	Contributions – 6.75% DR	Contributions – 6.50% DR	Benefit Payments	Administrative Expenses	Illiquid Distributions	Illiquid Capital Calls
2026	568,395,697	568,395,697	851,793,244	15,587,906	763,923,955	555,305,839
2027	566,184,447	593,918,434	881,938,187	16,332,450	942,565,311	762,758,665
2028	559,869,204	618,197,104	922,012,254	17,086,370	1,126,013,758	803,402,568
2029	562,780,432	624,976,640	962,849,346	17,840,690	1,008,342,813	848,058,508
2030	570,103,642	634,271,462	1,004,538,284	18,610,908	1,001,667,586	896,286,614
2031	569,931,438	635,968,724	1,046,701,109	19,392,881	1,078,630,967	934,646,356
2032	570,496,206	638,458,263	1,089,443,910	20,181,865	1,180,784,585	963,783,742
2033	576,023,728	645,956,823	1,131,801,706	20,979,800	1,286,986,653	981,223,551
2034	484,818,416	651,307,514	1,172,885,871	21,794,420	1,370,201,406	989,549,556
2035	392,691,167	666,592,068	1,213,091,048	22,470,696	1,429,072,398	978,464,037

10-Year Return & Risk Assumptions

ASSET CLASS	INDEX PROXY	TEN YEAR RETURN FORECAST GEOMETRIC	TEN YEAR RETURN FORECAST ARITHMETIC	STANDARD DEVIATION FORECAST	SHARPE RATIO FORECAST (G)	SHARPE RATIO FORECAST (A)	10-YEAR HISTORICAL SHARPE RATIO (G)	10-YEAR HISTORICAL SHARPE RATIO (A)
EQUITIES								
U.S. Large	S&P 500	5.4%	6.5%	15.5%	0.10	0.17	0.86	0.88
U.S. Small	Russell 2000	6.4%	8.4%	21.2%	0.12	0.22	0.37	0.45
International Developed	MSCI EAFE	6.8%	8.2%	17.4%	0.17	0.25	0.44	0.50
International Small	MSCI EAFE Small Cap	9.4%	11.4%	21.2%	0.26	0.36	0.35	0.42
Emerging Markets	MSCI EM	6.7%	9.3%	24.2%	0.12	0.23	0.38	0.45
Global Equity	MSCI ACWI	6.0%	7.3%	16.6%	0.13	0.21	0.67	0.70
Global Equity ex USA	MSCI ACWI ex USA	6.9%	8.6%	19.2%	0.16	0.25	0.42	0.47
Private Equity	CA Private Equity	8.0%	10.9%	26.0%	0.16	0.27	-	-
Private Equity Direct	CA Private Equity	9.0%	11.9%	26.0%	0.20	0.31	-	-
Private Equity (FoF)	CA Private Equity	7.0%	10.0%	26.0%	0.12	0.24	-	-
FIXED INCOME								
Cash	30 Day T-Bills	3.7%	3.7%	1.1%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	4.5%	4.7%	5.5%	0.13	0.16	0.18	0.20
Non-U.S. Inflation Linked Bonds	Bbg World Govt. Inf Linked Bond ex U.S.	4.1%	3.7%	7.3%	0.04	-0.01	-0.04	-0.01
U.S. Treasury	Bloomberg Treasury 7-10 Year	4.2%	4.4%	7.1%	0.06	0.08	-0.15	-0.11
Long U.S. Treasury	Bloomberg Treasury 20+ Year	4.7%	5.6%	13.4%	0.07	0.13	-0.19	-0.13
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	2.7%	3.2%	9.9%	-0.11	-0.06	-0.26	-0.21
Global Aggregate	Bloomberg Global Aggregate	3.8%	4.0%	6.6%	0.00	0.03	-0.15	-0.11
Core Fixed Income	Bloomberg U.S. Aggregate Bond	4.7%	4.8%	4.9%	0.18	0.20	-0.05	-0.02
Core Plus Fixed Income	Bloomberg U.S. Universal	4.8%	4.9%	4.6%	0.22	0.24	0.04	0.06
Investment Grade Corp. Credit	Bloomberg U.S. Corporate Investment Grade	4.8%	5.1%	8.3%	0.12	0.16	0.15	0.18
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	4.2%	4.3%	3.6%	0.11	0.14	-0.10	-0.09
Short-Term Credit	Bloomberg Credit 1-3 Year	4.4%	4.5%	3.6%	0.17	0.19	0.23	0.24
Intermediate Credit	Bloomberg U.S. Intermediate Credit	4.6%	4.8%	5.9%	0.14	0.17	0.21	0.22
Long-Term Credit	Bloomberg Long U.S. Credit	4.7%	5.3%	11.0%	0.08	0.14	0.11	0.16
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	5.7%	6.2%	10.7%	0.18	0.22	0.55	0.56
Bank Loans	Morningstar LSTA US Leveraged Loan	6.1%	6.5%	8.7%	0.26	0.31	0.62	0.63
Global Credit	Bloomberg Global Credit	4.3%	4.6%	7.7%	0.06	0.10	0.13	0.16
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	7.4%	7.8%	10.5%	0.35	0.38	0.23	0.27
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	5.6%	6.3%	12.1%	0.16	0.21	0.13	0.19
Securitized Credit	Bbg U.S. Securitized: MBS, ABS, and CMBS	5.1%	5.2%	4.0%	0.35	0.35	-0.12	-0.09
Multi-Asset Credit	50/50 (High Yield / Bank Loans)	5.9%	6.4%	9.3%	0.23	0.27	-	-

10-Year Return & Risk Assumptions

ASSET CLASS	INDEX PROXY	TEN YEAR RETURN FORECAST GEOMETRIC	TEN YEAR RETURN FORECAST ARITHMETIC	STANDARD DEVIATION FORECAST	SHARPE RATIO FORECAST (G)	SHARPE RATIO FORECAST (A)	10-YEAR HISTORICAL SHARPE RATIO (G)	10-YEAR HISTORICAL SHARPE RATIO (A)
FIXED INCOME (CONT'D)								
Private Credit	Morningstar LSTA US Leveraged Loan	7.7%	8.5%	13.3%	0.29	0.35	-	-
Private Credit (Direct Lending - Unlevered)	Morningstar LSTA US Leveraged Loan	6.3%	6.7%	8.7%	0.29	0.33	-	-
Private Credit (Direct Lending - Levered)	Morningstar LSTA US Leveraged Loan	7.4%	8.1%	12.3%	0.29	0.35	-	-
Private Credit (Credit Opportunities)	Morningstar LSTA US Leveraged Loan	8.4%	9.6%	16.0%	0.29	0.36	-	-
Private Credit (Junior Capital / Mezzanine)	Morningstar LSTA US Leveraged Loan	7.8%	8.7%	14.0%	0.29	0.35	-	-
Private Credit (Distressed)	Morningstar LSTA US Leveraged Loan	8.6%	12.2%	29.1%	0.16	0.29	-	-
OTHER								
Commodities	Bloomberg Commodity	6.4%	7.7%	15.8%	0.17	0.25	0.14	0.20
Hedge Funds	HFRI Fund Weighted Composite	5.1%	5.4%	7.5%	0.17	0.21	0.70	0.70
Hedge Fund of Funds	HFRI Fund of Funds Composite	4.1%	4.4%	7.5%	0.04	0.08	0.50	0.51
Hedge Funds (Equity Style)	Custom HFRI Benchmark Mix*	5.4%	6.3%	14.0%	0.11	0.18	0.50	0.53
Hedge Funds (Credit Style)	Custom HFRI Benchmark Mix*	5.3%	5.7%	9.3%	0.16	0.20	0.77	0.77
Hedge Funds (Asymmetric Style)	Custom HFRI Benchmark Mix*	5.3%	5.6%	6.3%	0.25	0.29	0.63	0.63
Real Estate Debt	Bloomberg CMBS IG	6.3%	6.6%	7.3%	0.34	0.38	0.12	0.14
Core Real Estate	NCREIF Property	7.2%	7.9%	11.7%	0.29	0.35	-	-
Value-Add Real Estate	NCREIF Property + 200bps	9.2%	10.2%	14.4%	0.38	0.44	-	-
Opportunistic Real Estate	NCREIF Property + 300bps	10.2%	12.0%	19.8%	0.32	0.41	-	-
REITs	FTSE Nareit Equity REITs	7.2%	8.8%	18.0%	0.19	0.28	0.25	0.33
Global Infrastructure	S&P Global Infrastructure	8.2%	9.5%	16.5%	0.27	0.35	0.44	0.50
Risk Parity**	S&P Risk Parity 10% Vol Index	6.9%	7.4%	10.0%	0.32	0.36	0.52	0.55
Currency Beta	MSCI Currency Factor Index	2.1%	2.2%	3.3%	-0.52	-0.48	-0.74	-0.72
Inflation		2.7%	-	-	-	-	-	-
60/40 Portfolio (Global Equity / Core Fixed)		5.7%	6.3%	11.0%	0.17	0.23	0.62	0.60

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro

**The Risk Parity forecast shown here assumes a 10% target volatility strategy. We recommend customizing this forecast to the target volatility specifications of the risk parity strategy that an investor wishes to model. Please speak with your Cerity Partners Institutional Consulting consultants for customization needs.

Correlation Assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Currency Beta	Risk Parity
Cash	1.0																											
US Large	0.0	1.0																										
US Small	-0.1	0.9	1.0																									
Intl Large	0.0	0.8	0.8	1.0																								
Intl Small	0.0	0.8	0.8	1.0	1.0																							
EM	0.0	0.7	0.6	0.8	0.8	1.0																						
Global Equity	0.0	1.0	0.9	0.9	0.9	0.8	1.0																					
PE	0.0	0.7	0.6	0.5	0.5	0.5	0.7	1.0																				
US TIPS	0.0	0.5	0.4	0.5	0.5	0.4	0.5	0.1	1.0																			
US Treasury	0.2	0.2	0.1	0.2	0.2	0.2	0.2	-0.1	0.8	1.0																		
Global Sovereign ex-US	0.1	0.4	0.3	0.5	0.6	0.6	0.5	0.1	0.7	0.7	1.0																	
US Core	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.1	0.8	0.9	0.8	1.0																
Core Plus	0.1	0.5	0.4	0.5	0.5	0.5	0.5	0.1	0.9	0.9	0.8	1.0	1.0															
Short-Term Gov't/Credit	0.4	0.2	0.1	0.3	0.3	0.3	0.3	0.0	0.7	0.8	0.7	0.9	0.8	1.0														
Short-Term Credit	0.2	0.4	0.4	0.5	0.6	0.5	0.5	0.1	0.7	0.6	0.7	0.8	0.9	0.9	1.0													
Long-Term Credit	0.0	0.6	0.5	0.6	0.6	0.6	0.6	0.2	0.8	0.7	0.8	0.9	0.9	0.7	0.8	1.0												
US HY	0.0	0.8	0.8	0.8	0.8	0.7	0.8	0.4	0.6	0.2	0.5	0.5	0.6	0.4	0.7	0.7	1.0											
Bank Loans	0.0	0.6	0.7	0.6	0.7	0.6	0.6	0.3	0.3	-0.1	0.2	0.2	0.3	0.1	0.5	0.4	0.8	1.0										
Global Credit	0.0	0.6	0.6	0.8	0.8	0.7	0.7	0.2	0.8	0.6	0.8	0.8	0.9	0.7	0.9	0.9	0.8	0.6	1.0									
EMD USD	0.1	0.7	0.6	0.7	0.7	0.7	0.7	0.4	0.6	0.4	0.7	0.7	0.7	0.5	0.7	0.8	0.8	0.7	0.9	1.0								
EMD Local	0.1	0.5	0.4	0.7	0.7	0.8	0.7	0.4	0.5	0.3	0.7	0.5	0.6	0.4	0.6	0.7	0.7	0.5	0.8	0.8	1.0							
Commodities	-0.1	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.2	-0.2	0.1	0.0	0.0	-0.1	0.1	0.1	0.5	0.5	0.3	0.3	0.4	1.0						
Hedge Funds	-0.1	0.8	0.9	0.8	0.8	0.7	0.8	0.4	0.4	0.0	0.3	0.3	0.4	0.1	0.5	0.5	0.8	0.7	0.7	0.7	0.5	0.5	1.0					
Real Estate	-0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.1	0.1	0.2	0.0	0.2	0.2	0.3	0.1	0.3	0.3	0.1	0.2	0.4	1.0				
REITs	-0.1	0.8	0.8	0.7	0.7	0.6	0.8	0.5	0.6	0.3	0.5	0.5	0.6	0.3	0.5	0.7	0.7	0.6	0.7	0.7	0.5	0.4	0.7	0.3	1.0			
Infrastructure	0.0	0.8	0.7	0.8	0.8	0.7	0.8	0.5	0.5	0.2	0.5	0.4	0.5	0.3	0.6	0.6	0.8	0.7	0.7	0.8	0.7	0.5	0.7	0.2	0.8	1.0		
Currency Beta	0.0	-0.1	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	-0.2	1.0	
Risk Parity	0.0	0.8	0.7	0.8	0.8	0.7	0.8	0.5	0.7	0.5	0.6	0.6	0.7	0.5	0.7	0.7	0.8	0.6	0.8	0.8	0.6	0.5	0.7	0.3	0.8	0.8	-0.1	1.0

Important Notes

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