CERITY PARTNERS®

# Mendocino County Employees' Retirement Association

## Finalist Presentation

May 20, 2026

# Key Members Serving MCERA

Danny Sullivan, CAIA, FRM

Principal,
Consultant

Joe Abdou, CFA

Principal,
Consultant

**LEAD CONSULTANTS**

Brian Kwan, CFA, CAIA

Partner,
Senior Consultant

**STRATEGIC ADVISOR**

*Our clients are served by a team of consultants, analysts, and support personnel to ensure timely response to the bespoke needs of MCERA*

John Nicolini, CFA

Partner,
Senior Consultant

Ian Toner, CFA

Partner,
Head of Portfolio Solutions

Colleen Flannery, CFA

Principal,
Public Markets

Dan Hougard, FSA, CFA

Principal,
Actuarial Consultant

Phillip Thomas

Senior Associate,
Investment Analytics

**SUPPORT TEAM**

# Cerity Partners At a Glance

## Extensive Resources, personal approach

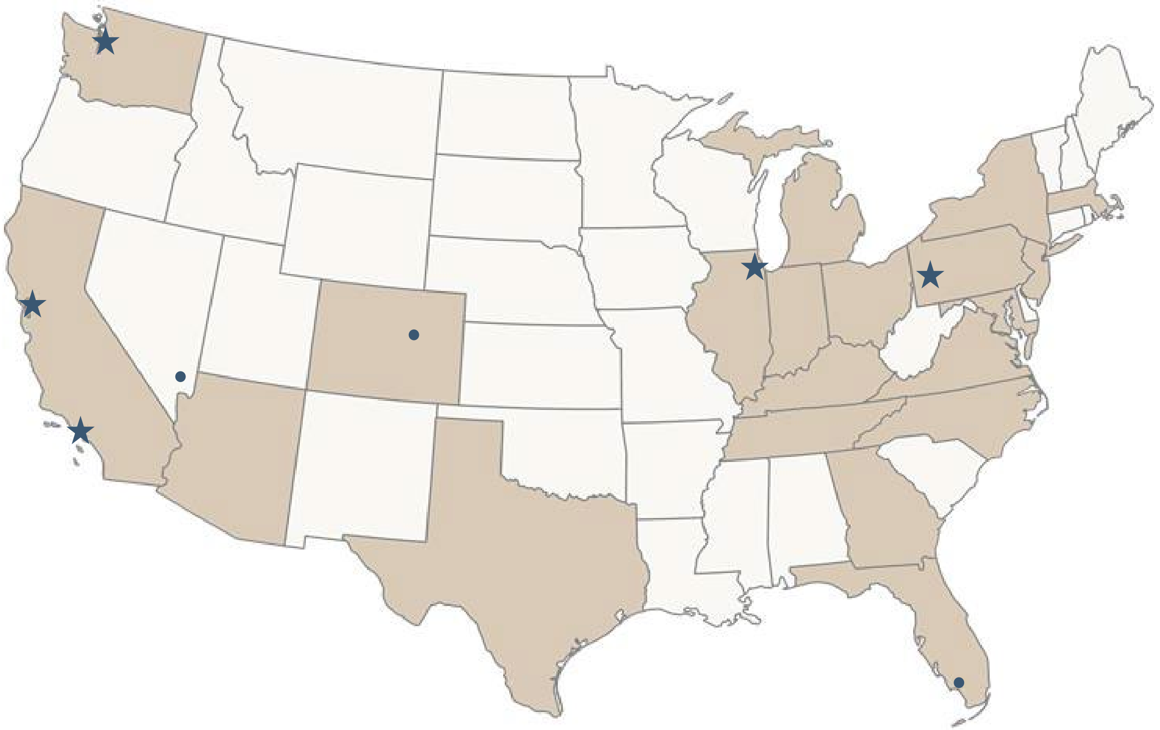
**Our Mission:** To enrich and have a positive impact on the financial well-being of the clients, colleagues, and the communities in which we operate

**Key Stats**

- $1.2 T+ in AUA*
- Ownership structure benefits clients
- 30+ markets in 20 states
- Over 4 Decades of Experience
- Serve 7 California County Plans

## Services

- Institutional Consulting
- Discretionary OCIO
- Corporate Venture Capital
- Executive Financial Planning
- Wealth Management



★ Institutional Consulting Colleagues   ● Remote Colleagues

*As of 12/31/2025

# Pure Consulting Focus

We serve as fiduciaries and are aligned with our clients

### Asset Allocation

- Capital market assumptions
- Portfolio modeling
- Risk management
- Liquidity analysis
- Market research

### Governance

- Defining long-term goals
- Enterprise risk tolerance
- Board & Staff education
- IPS development & ongoing maintenance
- Fiduciary best practices

### Investment Analytics

- Macro & capital markets
- Performance oversight & reporting
- Risk reporting
- Peer comparisons

### Public Markets

- Investment structure
- Manager search selection, & monitoring
- Portfolio planning
- Evaluation of manager & program fees

### Private Markets

- Pacing analysis
- Manager search, selection & monitoring
- Performance oversight & reporting
- Operational support

Within the industry, there are firms who also have the following revenue sources:

X Proprietary Investment Funds/Products

X Subscription to Database &/or manager conferences

X Other Business Lines (e.g., Actuarial, Accounting, Custody, etc.)

Cerity Partners Institutional Consulting does **not** receive revenue from **any** of the above sources

# Partnering With Clients That Invest Like You

**REPRESENTATIVE PUBLIC CLIENTS**

FORT WORTH EMPLOYEES' RETIREMENT FUND

MOSERS
MISSOURI STATE EMPLOYEES' RETIREMENT SYSTEM

PSERS
PENNSYLVANIA
Public School Employees' Retirement System

ICERS

KCERA
KERN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXCELLENT ADMINISTRATION • PRUDENT INVESTMENT • QUALITY SERVICE
EST. 1945

IPOPIF
Illinois Police Officers' Pension Investment Fund

TCRS

INPRS
INDIANA PUBLIC RETIREMENT SYSTEM

CITY OF Springfield

Metro

PERA
Public Employees Retirement Association of New Mexico

CITY OF PASADENA INCORPORATED
FIREFIGHTER
PASADENA FIRE DEPARTMENT

SCERS

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

COUNTY of SAN LUIS OBISPO

LONG BEACH TRANSIT

RSIC
Retirement System Investment Commission

WEST VIRGINIA INVESTMENT MANAGEMENT BOARD

TCERA
TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

*This is an excerpt of CPIC clients as of December 2025 who have provided permission to use their name or logo. It is not known whether the listed clients approve of CPIC or the advisory services provided*

# Meeting Your Objectives

ENTERPRISE RISK TOLERACE ASSESSMENT → ENTERPRISE RETURN OBJECTIVES → MULTIFACETED RISK ANALYSIS → STRATEGIC ASSET ALLOCATION

**DESIGN TOOLS**

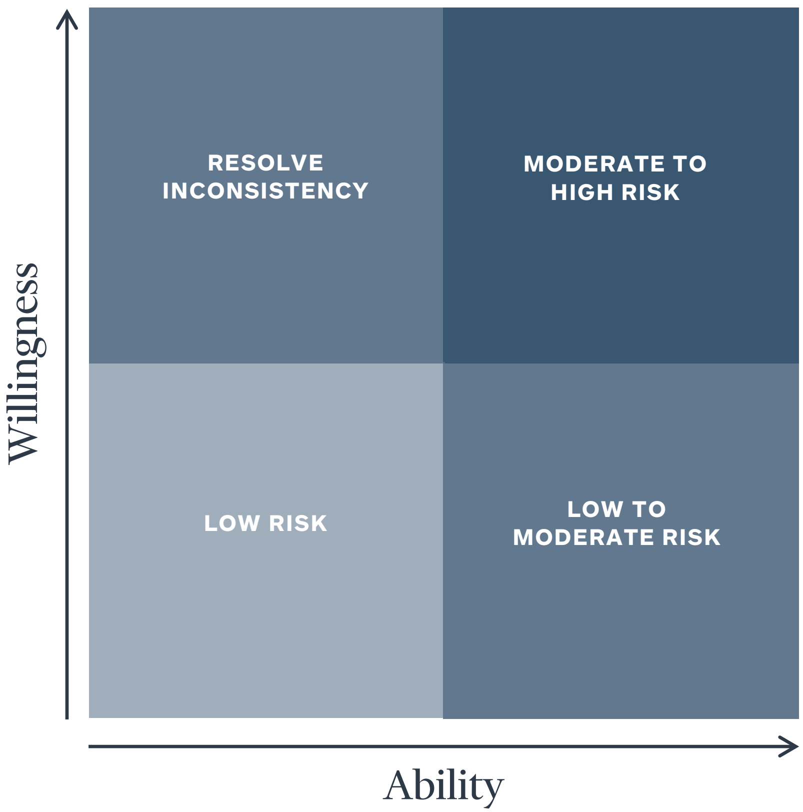
| Monte-Carlo stochastic modeling | Liquidity Analysis | Scenario analysis stress testing |
|---|---|---|

**STRENGTH AND DEPTH OF CAPITAL MARKETS**

# What is Risk Tolerance?

It is where the *willingness* and *ability* to assume risk intersect

- ***Willingness*** is a qualitative measure ascertained through discussions with the Board
- ***Ability*** is a quantitative measure based on economics of the assets
  - Historical cash flows and expectations
  - Liquidity needs
  - Time horizon



# Initial Thoughts on Asset Allocation

| | Policy | Mix 1 | Mix 2 | 2026 CMA's (10 Yr) Return (g) | Standard Deviation | Sharpe Ratio |
|---|---|---|---|---|---|---|
| **Domestic Equity** | | | | | | |
| US Large | 26 | 22 | 22 | 5.4 | 15.5 | 0.10 |
| US Mid/Small | 11 | 10 | 10 | 6.4 | 21.2 | 0.12 |
| **International Equity** | | | | | | |
| International Developed | 25 | 17 | 17 | 6.7 | 17.5 | 0.25 |
| **Total Public Equity** | **62** | **49** | **49** | | | |
| **Fixed Income** | | | | | | |
| Core Fixed Income | 10.5 | 10.5 | 10.5 | 4.7 | 4.9 | 0.18 |
| Core Plus Fixed Income | 10.5 | 10.5 | 10.5 | 4.8 | 4.6 | 0.22 |
| Multi-Asset Credit | - | - | 6 | 5.9 | 9.3 | 0.23 |
| **Total Public Fixed Income** | **21** | **21** | **27** | | | |
| **Real Assets** | | | | | | |
| Core Real Estate | 11 | 7 | 6 | 7.2 | 11.7 | 0.29 |
| Value Add Real Estate | - | 7 | 6 | 9.2 | 14.4 | 0.38 |
| Infrastructure | 6 | 6 | 6 | 8.1 | 16.8 | 0.33 |
| **Total Real Assets** | **17** | **20** | **18** | | | |
| **Private** | | | | | | |
| Private Equity | - | 5 | - | 8.0 | 26.0 | 0.16 |
| Private Credit | - | 5 | 5 | 7.7 | 13.3 | 0.29 |
| **Total Private Investments** | **-** | **10** | **5** | | | |
| **Cash** | **-** | **-** | **-** | 3.7 | 1.1 | |
| **Total Allocation** | **100** | **100** | **100** | | | |

There are potential opportunities to improve expected outcomes. Relative to the Policy:

- Mix 1 focuses on increasing expected return and reduces portfolio volatility
- Mix 2 focuses on a similar expected return but further reduces portfolio volatility
- Both Mix 1 and Mix 2 increase illiquidity and align the public equity portfolio with a global equity index

| | Policy | Mix 1 | Mix 2 |
|---|---|---|---|
| **Expected Outcomes (10-Year)** | | | |
| **Median Annual Return (%)** | **6.4** | **6.8** | **6.6** |
| 25th Percentile Annual Return (%) | -1.5 | -0.8 | -0.6 |
| 75th Percentile Annual Return (%) | 14.4 | 14.5 | 13.9 |
| Standard Deviation (%) | 11.9 | 11.1 | 10.9 |
| *Sharpe Ratio* | *0.29* | *0.33* | *0.32* |
| % Liquid Assets | 83% | 70% | 77% |
| % Illiquid Assets | 17% | 30% | 23% |
| Actuarial Assumed Return (%) | 6.5 | | |

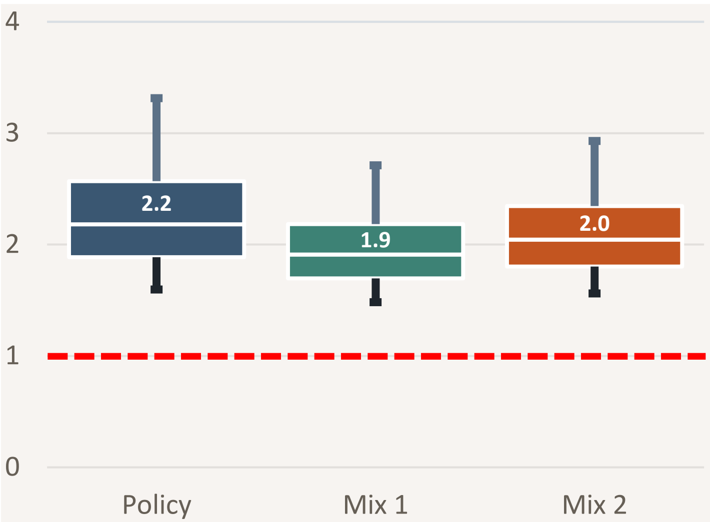
***Source***: *Cerity Partners Institutional Consulting, Markov Processes International (MPI)*

*MPI analysis demonstrates the likely allocation of the fund's assets to different risk factors (US Equity, global ex-US Equity, US Bonds, US Credit, etc.) over the prior five-year market environment. This chart is exponentially-weighted, meaning more emphasis is placed on more recent market behavior and less emphasis is placed on older data.*

# Assessing Liquidity Risk

Liquidity risk is a critical consideration for portfolios with variable cash flows and/or private market programs.

**DISTRIBUTION OF 10-YEAR LCR**




| 10-Year LCR | Policy | Mix 1 | Mix 2 |
|---|---|---|---|
| **Percentile** | | | |
| 95% | 3.3 | 2.7 | 2.9 |
| 75% | 2.6 | 2.2 | 2.3 |
| 50% | 2.2 | 1.9 | 2.0 |
| 25% | 1.9 | 1.7 | 1.8 |
| **5%** | **1.6** | **1.5** | **1.6** |
| **Probability of Liquidity Event** | **~0%** | **~0%** | **~0%** |

- Cerity uses the Liquidity Coverage Ratio (LCR) to analyze and communicate liquidity risk.
- Based on preliminary data, we do not expect any of the portfolios to experience liquidity issues over the next ten years, including in adverse market environments.

**LCR FORMULA**

$$Liquidity\ Coverage\ Ratio\ (LCR) = \frac{\begin{gathered} Starting\ Liquid\ Financial\ Assets \\ \sum(Distributions\ from\ Illiquid\ Assets) \\ \sum(Contributions) \\ \sum(Liquid\ Investment\ Return) \end{gathered}}{\begin{gathered} \sum Benefit\ Payments \\ \sum Administrative\ Expenses \\ \sum(Capital\ Calls\ for\ Illiquid\ Assets) \end{gathered}}$$

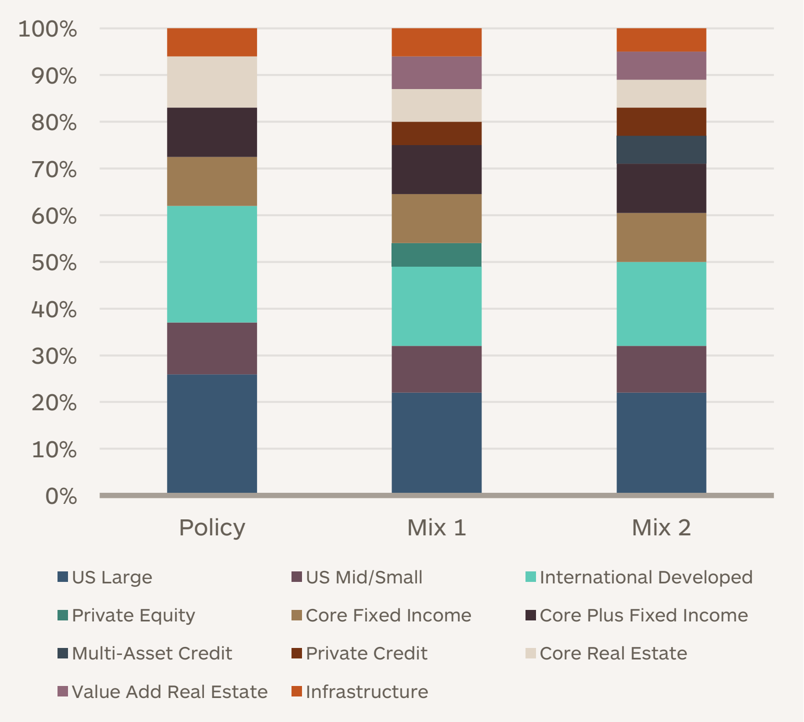
| LCR Value | Implication |
|---|---|
| **<1** | Insufficient liquid assets |
| **>1** | Sufficient liquid assets |

*Plan benefit payments and contributions sourced from the actuarial report. We assume 13% of illiquid assets are distributed annually and capital calls are set to maintain illiquid targets.*

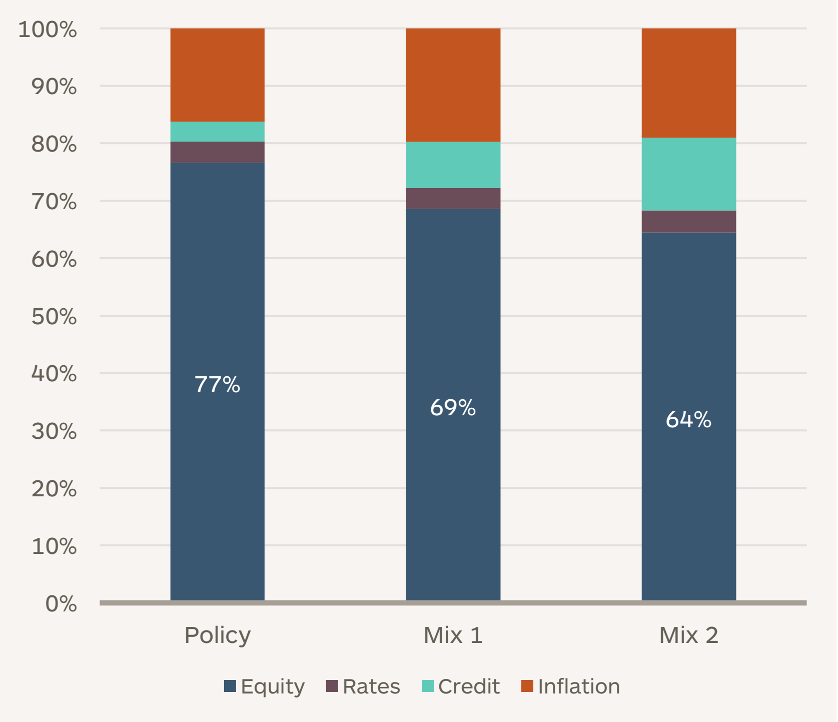
# Risk Contribution

## Equity risk is often the most significant contributor to overall portfolio risk

### ASSET ALLOCATION BY ASSET CLASS




### RISK CONTRIBUTION BY ASSET CLASS




***Source***: *Cerity Partners Institutional Consulting, Markov Processes International (MPI)*

*MPI analysis demonstrates the likely allocation of the fund's assets to different risk factors (US Equity, global ex-US Equity, US Bonds, US Credit, etc.) over the prior five-year market environment. This chart is exponentially-weighted, meaning more emphasis is placed on more recent market behavior and less emphasis is placed on older data.*

# Investment Research Team and Structure

## 65 colleagues in research

*Team organization by group*

### PUBLIC MARKETS

- Yelena Pelimskaya, CFA
- Maxine Jamison
- Aydan Panahova
- Kent Muckel, CFA
- Pat Machell, CFA
- Brecken Eatherton, CFA
- Brad Edson, CFA
- Charlie Fidler
- Andy Strong
- Colleen Flannery, CFA
- Vincent Francom, CFA, CAIA
- Joshua Freimark
- Kyle Jangard, CFA
- Nicholas Pecache
- Sneha Pendyala, CFA

### PRIVATE MARKETS

- Chris Burrows
- Sal Russo
- Tim Ringelstein, CFA
- Rafal Wojtanowski, CFA
- Nat Fraser, CFA
- Jeff Curtis, CFA
- Pat Callahan, CFA
- Bridget Walston
- Talene Tse
- Chambers Giblin, CFA
- Colton Eicher
- Wyatt Chochrek
- Faraz Shooshani
- Nico Caballero
- Jing Chen
- Matt Foppiano
- John Nicollini, CFA
- Vincent Phan
- Chris Shelby, CFA

### STRATEGY & SUPPORT

- Ben Pace
- Jim Lebenthal, CFA
- John Hyman
- Joe Matus, CFA
- Chase Norcini, CFA
- Ian Toner, CFA
- Thomas Garrett, CFA, FRM, CAIA
- Dan Hougard, FSA, CFA

### MARKETABLE ALTERNATIVES

- Darren Myers, CFA
- Nick Hartnett, CFA
- Kirill Buzinov
- Finn Reinemer
- Paul Kreiselmaier, CFA
- Trevor Parmelee, CFA, CAIA

### OPERATIONAL DUE DILIGENCE

- Adam Cohen, CAIA
- Luke Ketzenbarger
- Owen Evans, CFA
- Sonja Choate
- Jonathan Henderson
- James Wadner
- Callum Olsen

### INVESTMENT RISK MGMT.

- Karl Wichorek
- Tia Sun, CFA

### PORTFOLIO MGMT.

- Matt Westfall
- Greg Mitseas
- Adam Zona
- Stephon Boulay
- Tri Nguyen
- Dimitri Natsis, CFA
- Jason Fajardo
- Michael Hughes, CFA, CAIA

CERITY PARTNERS®

# Identifying Top-Tier Managers

## WHAT WE LOOK FOR

A

**Alignment**

Alignment reflects how the strategy is supported by a stable organizational, incentive and team structure

E

**Edge**

Reflects articulation of an inefficiency or market-based belief and willingness to take risk based on that belief

I

**Implementation**

Reflects an investment approach that is sensible and repeatable

O

**Optimal use of risk**

Reflects an effective framework of assessing, exploiting and managing risk inherent in the investment process

U

**Understandable performance**

Historical and future performance sensitivities are consistent with manager's expressed process

## HOW WE COMMUNICATE OUR ASSESSMENT

| RATING | CONVICTION | DEFINING CHARACTERISTICS |
|---|---|---|
| IQ1 | Very High | Earns Cerity Partners Institutional Consulting' highest conviction. Above-average characteristics most likely to achieve the strategy's desired results. |
| IQ2 | High | Maintains Cerity Partners Institutional Consulting' high conviction. Above-average characteristics most likely to achieve strategy's desired results. |
| IQ3 | Positive | Meets institutional quality standards that can achieve desired investment results. Strengths outweigh weaknesses. |
| 4 | Low | Concerns with the product's ability to meet institutional-quality standards. |
| 5 | Very Low | Significant issues inhibit the product's ability to meet institutional-quality standards. |

*This information is for Cerity Partners Institutional Consulting and its predecessor firm only.*

# Proactive Communication

Apprising clients about the economy, markets, and portfolio construction is a key component of our service

### Regular Quarterly Research Reports

- Macroeconomic conditions
- Capital market valuations
- Risk and trend analysis
- Quarterly investment landscape

### In-depth Annual Outlooks

- Private equity outlook
- Real assets outlook
- Hedge fund philosophy
- Active management environment
- Capital market assumptions

### Timely & Varied Thought Leadership

- Ten thoughts for 2026
- State of the Core Real Estate Fund Universe
- LDI for Public Sponsors
- So, What Now?
- Driving OCIO Through Governance
- Examining the Case for Private Credit
- Selecting exceptional private markets managers: Strategies for success in a complex arena
- Using fixed income to avoid downside risk
- Trends and challenges in the commercial real estate sector

# Customized Education

Public fund client examples

| | | | |
|---|---|---|---|
| 1<br>Active risk budgeting | 2<br>Implementing private markets | 3<br>Re-balancing best practices | 4<br>Currency hedging |
| 5<br>Portable alpha and total fund leverage | 6<br>Introduction to risk management | 7<br>Benchmarking | 8<br>EM ex China |

Creating and delivering educational sessions to assist client investment decision-making is one of Cerity Partners' key strengths

# Our Commitment

ALIGNMENT

## Part of your team

We focus on our clients and their fiduciary duty

CUSTOM PORTFOLIOS

## Meeting your goals

We help our clients build portfolios specific to their objectives and constraints

TIMELY

## Enhancing decision-making

We provide actionable research and education

FOCUSED

## Incorporating your preferences

We support due diligence on ideas generated by clients

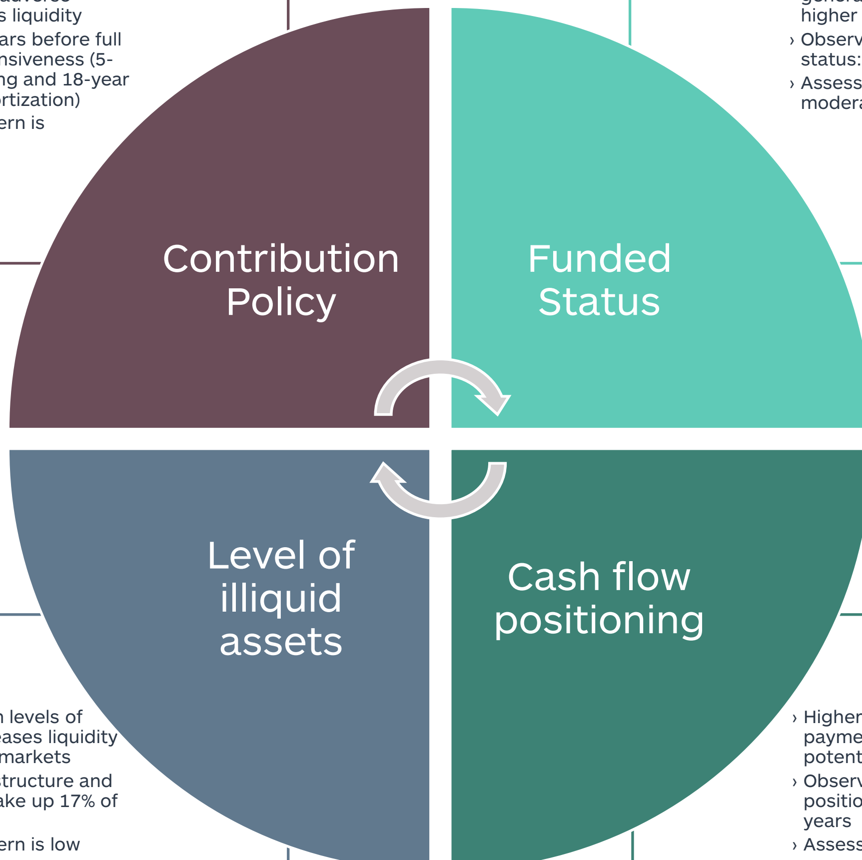
# Appendix

# MCERA Liquidity Considerations

## We will conduct a detailed liquidity analysis with the asset allocation study

- The contribution policy's responsiveness to adverse experience impacts liquidity
- Observation: 23 years before full contribution responsiveness (5-year asset averaging and 18-year funding policy amortization)
- Assessment: Concern is moderate

- A lower funded status is generally less supportive to higher levels of illiquid assets
- Observation: Market funded status: 80%
- Assessment: Concern is moderate




- Portfolios with high levels of illiquid assets increases liquidity risk in challenging markets
- Observation: Infrastructure and core real estate make up 17% of the portfolio
- Assessment: Concern is low

- Higher levels of benefit payments increases the potential for liquidity issues
- Observation: 1 – 2% net outflow position expected for next 10 years
- Assessment: Concern is low

# Our Investment Philosophy

Six key ideas that drive our approach

### Client

Return objectives, tolerance for risk, and the strategic mission of the enterprise should drive strategic asset allocation.

### Market

Risk-free rates and risk premia drive most market returns and are themselves influenced by market and economic fundamentals.

### Skill

Investment skill exists, and the deployment of active management where inefficiencies can be exploited is often essential to achieving investment success in both public and private markets.

### Costs

Fees and costs must be managed and minimized where appropriate.

### Humility

Good results can best be achieved by managing uncertainty using varied risk management tools, complemented by discipline, skepticism and humility.

### Simplicity

A portfolio should be as simple as possible for the goals it is designed to achieve. Investment complexity requires strong governance and appropriate investment oversight.

# Total Portfolio Performance Reporting

## ASSET ALLOCATION & IPS GUIDELINE MONITORING

Monitor current weights vs. policy weights, including the min and max allowable ranges

## MEANINGFUL PEER COMPARISONS & BENCHMARKING

Investment Metrics collects data from 45 institutional consultants and 5 third party data contributors

5,000+ monthly and 800+ daily indices

## PERFORMANCE ATTRIBUTION ANALYSIS

Calculations both at the total portfolio, asset composite, and manager levels

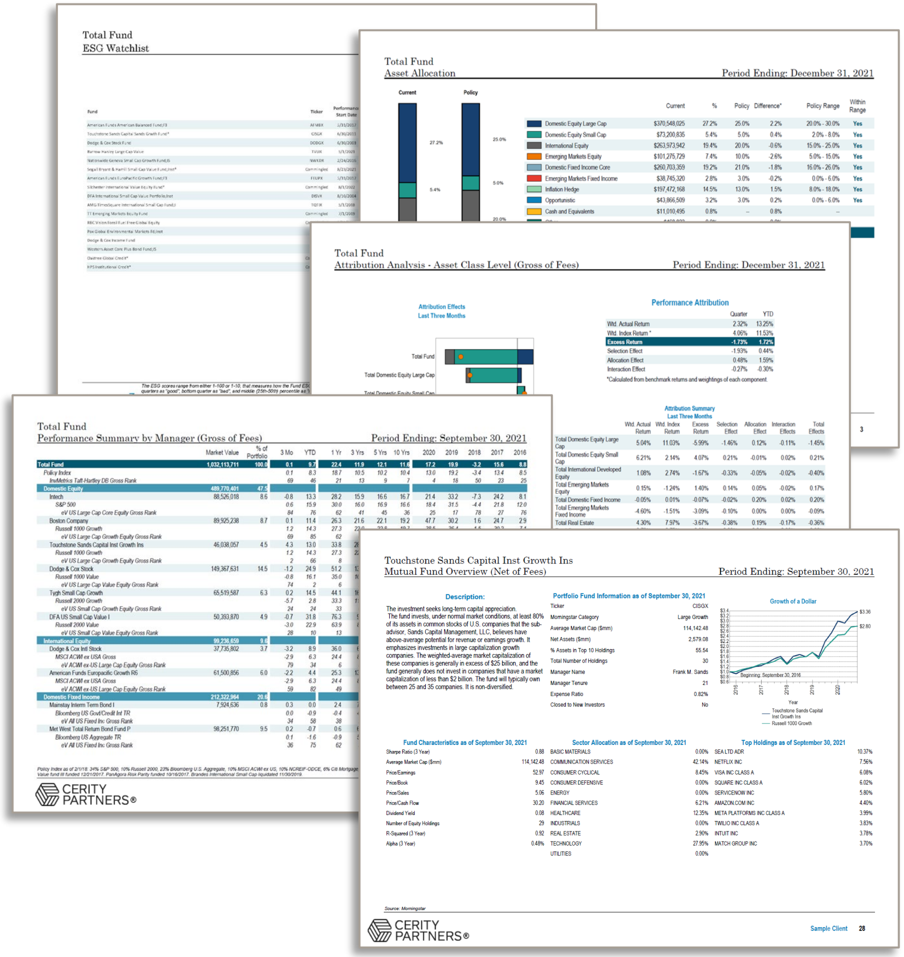
Isolates individual manager skill from market movements and rebalancing or policy changes

## CUSTOMIZED PRIVATE MARKETS REPORTING

Provide detail related to vintage year, sector, industry and peer rankings for IRR, DPI, and TVPI

## INVESTMENT MANAGER FEES

Track fees at the individual manager level




**Source** *Cerity Partners Institutional Consulting, Investment Metrics. For illustrative purposes only. This information is for Cerity Partners Institutional Consulting and its predecessor firm only.*

# Active risk and total fund returns (theory)

The amount of active risk a plan should take is a function of:

1. The amount of total alpha that is targeted
2. The expected efficiency in which that alpha can be obtained (information ratio)

› An example:

| REQUIRED RETURN | | RISK FREE RATE | | BETA | | ALPHA |
|---|---|---|---|---|---|---|
| 6.4-6.7% | = | 3.7% | + | 2.7% | + | 0.3% |
| | | | | Absolute Risk 11.9%<br>Sharpe Ratio 0.23 | | Active Risk 1.5%<br>Information Ratio 0.2 |

# Representative Workplan (illustrative)

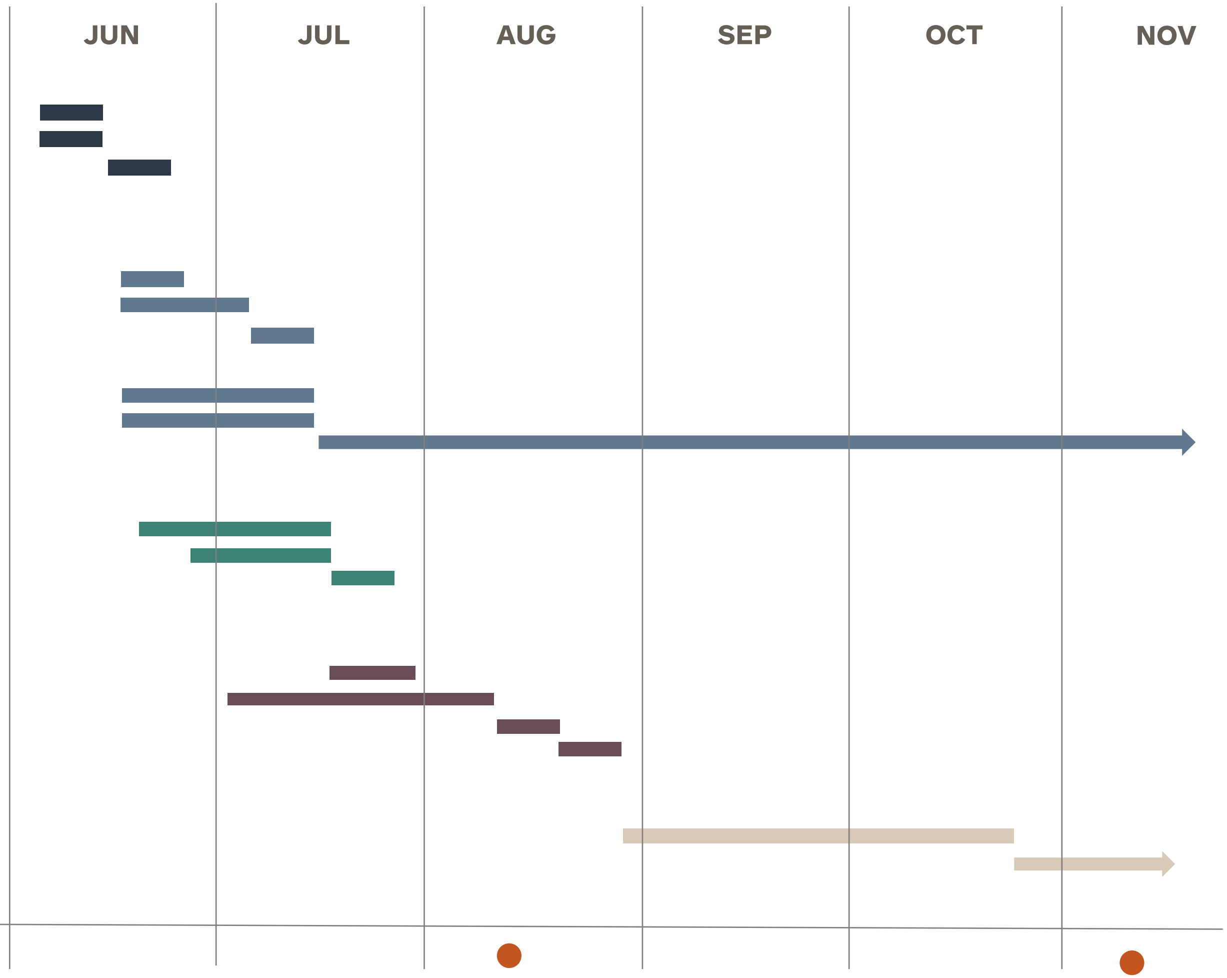
**INITIALIZE**
- Finalize agreement
- Develop implementation plan
- Obtain plan documents and reports

**STABILIZE**
- Liquid assets
  - Develop redemption calendar
  - Identify target exposures
  - Transition assets
- Illiquid assets
  - Develop redemption calendar
  - Identify target exposures
  - Transition assets

**ASSESS**
- Trustee/staff interviews
- Current state assessment
- Enterprise risk tolerance assessment

**DESIGN**
- Review decision-making authority
- Asset allocation
- Risk budget
- Manager structure

**IMPLEMENT**
- Transition assets
- Manager searches
- Transition assets




**Scheduled Board Meetings**

# 10-Year Return & Risk Assumptions

| ASSET CLASS | INDEX PROXY | TEN YEAR RETURN FORECAST | | STANDARD DEVIATION FORECAST | SHARPE RATIO FORECAST (G) | SHARPE RATIO FORECAST (A) | 10-YEAR HISTORICAL SHARPE RATIO (G) | 10-YEAR HISTORICAL SHARPE RATIO (A) |
|---|---|---|---|---|---|---|---|---|
| | | GEOMETRIC | ARITHMETIC | | | | | |
| **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 | - | - |

This information is for Cerity Partners Institutional Consulting and its predecessor firm only.

# 10-Year Return & Risk Assumptions

| ASSET CLASS | INDEX PROXY | TEN YEAR RETURN FORECAST | | STANDARD DEVIATION FORECAST | SHARPE RATIO FORECAST (G) | SHARPE RATIO FORECAST (A) | 10-YEAR HISTORICAL SHARPE RATIO (G) | 10-YEAR HISTORICAL SHARPE RATIO (A) |
|---|---|---|---|---|---|---|---|---|
| | | GEOMETRIC | ARITHMETIC | | | | | |
| **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 | - | - |
| **FIXED INCOME** | | | | | | | | |
| 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.

This information is for Cerity Partners Institutional Consulting and its predecessor firm only.

# 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 |

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