MEKETA INVESTMENT GROUP

Employees' Retirement System of Rhode Island

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Benchmark Review

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Introduction and Foundations

Today's Goal

→ **The goal of this presentation is to review and potentially modify the ERSRI benchmark(s).**

→ Benchmarks are important tools in assessing the successes and/or shortcomings of an investment portfolio.

- Benchmarking is a complimentary exercise to other mechanisms of assessment, such as clearly defined and monitored portfolio objectives (e.g., return levels, correlation behavior, volatility levels, liquidity amounts, etc.).

→ When examining portfolio results versus a benchmark, it is important to understand what is and is not being measured.

- Different benchmarking approaches measure different things.
- There is no single benchmark that measures all elements of investment results.
- Meketa recommends that ERSRI continue to utilize multiple benchmarks, including when examining specific asset classes in isolation (e.g., opportunity cost, return target, universe comparisons, etc.).

Investment Decisions

→ The actual investment experience of ERSRI is a result of two major investment decisions:

1. Asset Allocation (ultimately an SIC decision)
   - The asset classes and corresponding policy weights that the SIC selects as a result of asset-liability studies and/or asset allocation reviews.
2. Portfolio Implementation (generally a Staff-driven decision)
   - Within asset classes, the specific approaches that are used to put the dollars to work.

→ There are different approaches, and corresponding pros/cons, for assessing both decisions.

→ Benchmarking is a critical form of assessment.

→ **The fundamental question: *What does this benchmark measure?***

Investment Decisions - continued

→ As it relates to the two key investment decisions, assessment can be reframed to the following:

1. Asset Allocation
   - "Are we in the correct asset classes?"
   - "Was our diversified approach to asset allocation and complexity worth it?"
2. Portfolio Implementation
   - "Within a given asset class, how did we do?"
   - "Across asset classes, did allocation decisions contribute or detract from performance?"

→ Total Fund benchmarks often measure a mixture of decisions which can obfuscate their utility.

→ As public pension portfolios increased in complexity over time, benchmarking did not keep up.

- This is changing, but it comes with a cost (e.g., multiple benchmarks for different purposes).

Approaches to Total Fund Benchmarking

→ There are three commonly used approaches at the Total Fund level:

- Reference Portfolio
  - Can also be referred to as a "Simple Portfolio."
  - Consists of a mix of a relatively few public market investments.
  - ERSRI performance reports currently utilize a 60% MSCI ACWI / 40% Bloomberg Aggregate mix.
- Static/Policy
  - A blend of individual asset class benchmarks at their policy target weights.
  - Asset class benchmarks are often one of the following:
    - Broad market (e.g., MSCI ACWI)
    - Return target (e.g., Tbills + 2.5%, CPI + 3%, etc.)
    - Strategy/fund universes for alternatives (e.g., NCREIF ODCE, Cambridge Private Equity Index, HFRI Fund of Fund Index, etc.)
- Dynamic
  - Similar to Static/Policy, but blends asset class benchmarks at their actual weights.

Approaches to Total Fund Benchmarking - continued

→ The three approaches to Total Fund benchmarking serve different purposes:

Reference Portfolio Benchmark

- Used primarily to determine asset allocation success.
- Represents an "opportunity cost" portfolio, particularly as it relates to the payoff of alternatives/complexity.
- Requires a long-term (e.g., 10-year) horizon to ensure efficacy and align with investment horizon.
- Needs to exhibit a similar risk posture as the Board-selected asset allocation.

Static/Policy Portfolio Benchmark

- Compared to the actual portfolio, it measures the two components of implementation success: asset class weightings and selection within asset classes. Requires attribution analysis to separate.
- Because there are no perfect benchmarks for all asset classes, there are challenges to this approach.
- Over short-term time periods, it is the best gauge of implementation success.
- Over longer-term time periods, it can be compared to the reference benchmark for asset allocation decisions.

Dynamic Portfolio Benchmark

- While similar to the Static/Policy Portfolio Benchmark, it largely focuses on the selection within asset classes because it seeks to removes weighting decisions.
- Exhibits similar shortcomings as the Static/Policy Benchmark in that its components may be imperfect.

Reference Portfolio Benchmark Design Spectrum

→ While reference benchmarks are designed to be "simple," there is a spectrum of complexity.

→ One commonality is that they all seek to measure forms of tradeoffs.

More Basic ⟷ **More Complex**

More Basic

- Public Equity
- Public Investment Grade Bonds

→ With this approach, an entity seeks to examine if there is any value outside of traditional public equity and fixed income allocations.

→ The benchmark effectively breaks the world into "Growth" and "Diversifying" assets and uses the most commonly accepted proxies for each (public equity = growth, fixed income = diversifying).

More Complex

- Public Equity
- Public Investment Grade Fixed Income
- Public Below Investment Grade Fixed Income
- Public Real Assets
- Low-cost proxies for other asset classes (e.g., hedge funds)

→ With this approach, an entity seeks to examine if the cost/complexity of sophisticated implementations added or detracted value.

→ Basic Reference Portfolios are more commonly used and is what Meketa recommends for ERSRI.

ERSRI Benchmarks

ERSRI Benchmark Summary

→ **As discussed at the onset of the ERSRI-Meketa relationship, there are no glaring issues with the currently utilized ERSRI benchmarks.**

→ Meketa recommends modest enhancements to the Policy Benchmark by modifying certain asset class benchmarks to be more representative of the respective market segment(s).

- Policy Benchmark component weights should be modified when the new Strategic Asset Allocation becomes effective on 1/1/27.

→ Meketa recommends elevating the Reference Benchmark in importance, and modifying its weights, to be used as another point of comparison.

→ Details of these changes are discussed in the remainder of this presentation.

Reference Benchmark Recommendation

→ Reference Portfolio Benchmarks should generally align with the overall risk posture that was adopted during the asset allocation selection process.

→ There is no "standard" method for developing the Equity/Bond weights in a Reference Benchmark.

- Majority of public plan Reference Benchmarks fall in the range of 60/40 to 70/30.

→ Meketa has utilized multiple methods for determining the Reference Benchmark weights for ERSRI, including:

- Total Portfolio projected equity beta
- Total Portfolio volatility vs different Reference Benchmark volatilities
- Standard and private market "smoothed" CMAs

→ The primary conclusion is that the new ERSRI policy portfolio exhibits greater risk than a 60/40 portfolio, which is currently shown in ERSRI performance reports.

→ **Meketa recommends a 70% ACWI / 30% Bloomberg Aggregate Index as a Reference Benchmark.**

Commentary on ERSRI's Policy Benchmarks

Strategic Class	Component	Strategy Type	Current Benchmark	*Notes/Recommendation*
Growth	Public Growth	Public Equity	MSCI ACWI ND	*Broad representation of Global Equity.* ***No changes recommended.***
	Private Growth	Private Equity	Cambridge Associates Private Equity and Venture Capital Aggregated Index (1Q Lag)	*Cambridge is one of three large, commonly-utilized providers of private markets indices. Broadly represents a median/pooled return of a Private Equity portfolio.* ***No changes recommended.***
		Non-Core Real Estate	Cambridge Associates Value Add Real Estate Index (1Q Lag)	*Non-Core RE is more challenging to benchmark than PE and Core RE. No alternative Non-Core RE benchmark improves qualities as a benchmark.* ***No changes recommended.***

Commentary on ERSRI's Policy Benchmarks

Strategic Class	Strategy Type	Current Benchmark	*Notes/Recommendation*
Income	Equity Options	CBOE Put Write Index	*As the portfolio transitions to the new SAA targets, Equity Options and CLOs are no longer strategic allocations and will be removed from the Policy Benchmark.* ***While in the portfolio, individual manager benchmarks will remain unchanged.***
	Collateralized Loan Obligations (CLOs)	JPM CLOIE BB Index	
	Liquid Credit	Bank of America US HY Index	*Liquid Credit will potentially be enhanced over the intermediate timeframe to include Multi-Asset Credit (i.e., high yield, banks loans, etc.).* ***No changes recommended in the interim.***
	Private Credit	Cambridge Associates Senior Debt Index (1Q Lag)	*While direct lending is a meaningful component of Private Credit portfolios (particularly during their early stages), there are other components within Private Credit that should be reflected in the benchmark.* ***Meketa recommends shifting to a broader benchmark: Cambridge Private Credit Index (1Q Lag)***

Commentary on ERSRI's Policy Benchmarks

Strategic Class	Component	Strategy Type	Current Benchmark	*Notes/Recommendation*
Stability	Crisis Protection Crisis (CPC)	Systematic Trend Following	Credit Suisse Managed Futures Index (18% Vol)	*See Pages 16-18 for more detail.* ***Meketa recommends shifting to a manager universe benchmark: Societe Generale Trend Index (SG Trend Index)***
		Long Duration Treasuries	Bloomberg Long Duration US Treasury Bond Index	*Broad representation of US Treasury Bonds with 10+ years of maturity.* ***No changes recommended.***
		Long Volatility	---	*See Pages 19-20 for more detail.* ***Meketa recommends utilizing the HFR Long Volatility Index.***

Systematic Trend Following Index

→ When ERSRI (and other PCA clients) first adopted STF portfolios, the general approach was to utilize a benchmark that could also be implemented at a low cost (i.e., passive-like).

- This resulted in the adoption of the Credit Suisse Managed Futures Index (18% Vol) for ERSRI.
- The initial intent of the index was to represent the general performance (i.e., beta) of the Trend Following/Managed Futures market segment in a straight-forward manner.
- In 2023, UBS acquired Credit Suisse in a government-facilitated deal that included the historical indices overseen by Credit Suisse. As a result of this transaction, several groups within the UBS/Credit Suisse umbrella, as well as data/index information, have been subject to organizational change. Manteio Partners, an investment management company focused on systematic investment strategies, acquired the quantitative investment strategies (QIS) arm of UBS Asset Management in Q3 2024. The QIS group directly oversaw the Credit Suisse Managed Futures indices.

→ There are two primary challenges with the CS Index:

1) Long-term viability/existence of the index
2) Failure to broadly represent the STF market segment and client experience/portfolios.

Systematic Trend Following Index - continued

→ Meketa recommends the ERSRI shift to the SG Trend Index for the STF portfolio.

- This proposed index is aligned with other alternative asset class benchmarks, which are universe composites.

→ The SG Trend Index is designed to be representative of the Trend Following market segment. The index is composed of the 10 largest STF managers that fulfill several criteria:

- Must trade a primarily futures (inc. FX forwards) based strategy (as determined by SG)
- Must be broadly diversified (across asset classes and/or markets) (as determined by SG)
- Must be an industry recognized trend follower (as determined by SG)
- Must exhibit significant correlation to trend following peers and the SG Trend Indicator (as determined by SG)
- Must be open to new investment
- Must report returns on a daily basis (net of fees)

<u>Additional Information</u>

- Index is equally weighted
- Index is rebalanced annually on 1st January
- Index is reconstituted annually on 1st January
- Index is net of fees
- Calculated in base currency (i.e. with no currency hedging)
- Index inception date: 1st January 2000

Systematic Trend Following Index - continued

	1 Yr	3 Yr	5 Yr	S.I. (6/2017)
Systematic Trend[1]	19.87	-2.92	4.26	4.59
Credit Suisse Liquid Alt Beta	*13.29*	*-10.16*	*-1.99*	*-0.43*
SG Trend	*24.14*	*3.15*	*7.29*	*6.03*

	2025	2024	2023	2022	2021	2020	2019	2018
Systematic Trend	-3.06	-2.57	-6.73	38.49	6.14	12.78	3.86	-15.11
Credit Suisse Liquid Alt Beta	*-13.18*	*-10.63*	*-14.91*	*38.92*	*13.69*	*2.20*	*-9.85*	*-10.01*
SG Trend	*2.39*	*2.64*	*-4.17*	*27.35*	*9.09*	*6.28*	*9.23*	*-8.11*

	Correlation	Tracking Error
Vs. Credit Suisse Liquid Alt Beta	0.88	8.67
Vs. SG Trend Index	0.92	6.63

[1] Performance as of 6/30/2026.

Long Volatility Index

→ There is not a passive (i.e., market cap weighted) index within the Long Volatility segment.

- Meketa recommends clients utilize a well-designed, manager universe index for Long Vol.
- In 2025, Meketa worked with HFR to design such an index.

→ HFR Long Volatility Index:

- Designed to track investment strategies engineered to achieve asymmetric gains from market turbulence, financial stress, and sharp spikes in asset price volatility.
- Constituents must:
  - Report monthly, net of fee returns with assets reported in USD
  - Meet the AUM minimum eligibility criteria of: Having at least $50 Million USD under management on the last reported month prior to the annual rebalance, or having at least $10 Million USD under management on the last reported month prior to the annual rebalance and have been actively trading for at least twelve (12) months.
  - Open to new investment
  - Be available in a fund structure or as a separately managed account
- Currently composed of 19 strategies.

Long Volatility Details

Long Volatility Index - continued

	1 Yr	3 Yr	5 Yr	10 Yr	S.I. (11/2007)
HFR Long Volatility[1]	2.46	2.17	2.18	2.54	4.40

	2025	2024	2023	2022	2021	2020	2019	2018
HFR Long Volatility	6.56	0.55	-6.51	11.54	-3.55	39.21	-9.92	4.53

	H1 2022	Q1 2020	Q1 2018	Q4 2018	August 2015
HFR Long Volatility	14.51	46.52	3.15	4.50	5.17

	1 Yr	3 Yr	5 Yr	10 Yr	S.I. (11/2007)
Beta vs. MSCI ACWI	0.01	-0.10	-0.20	-0.43	-0.45

[1]Performance as of 6/30/2026.

Commentary on ERSRI's Policy Benchmarks

Strategic Class	Component	Strategy Type	Current Benchmark	*Notes/Recommendation*
Stability	Inflation Protection Class	Private Real Assets (ex. Real Estate)	Cambridge Associates Private Infrastructure Index (1Q Lag)	*Similar to other private markets segments, the Cambridge index broadly represents a median/pooled return of a Private Infrastructure portfolio.* ***No changes recommended.***
		Core Real Estate	NFI-ODCE Net Index (1Q Lag)	*Universe of open-ended core real estate funds (cap/value-weighted) that are focused on private real estate within the United States.* ***No changes recommended.***

Commentary on ERSRI's Policy Benchmarks

Strategic Class	Component	Strategy Type	Current Benchmark	*Notes/Recommendation*
Stability	Volatility Protection	Absolute Return	HFRI Fund of Funds Index	*Challenging segment to benchmark. Hedge fund of funds largely seek to generate uncorrelated returns, identical to the objective of the Absolute Return portfolio.* ***No changes recommended.***
		Investment Grade Fixed Income (ex-Treasuries)	50% Bloomberg US Corporate Bond Index 50% Bloomberg Securitized MBS/ABS/CMBS Index	*This index effectively aligns with the Bloomberg Aggregate Index after removing Treasuries. The 50/50 weighting represents an appropriate indifference to the non-Treasury segments.* ***No changes recommended.***
		Cash	Bank of America Merrill Lynch 0-1 Year US Treasury Index	*There are many potential "cash" benchmarks available. Most peers will utilize a 3-month maturity or a 0-1 year maturity.* ***No changes recommended.***

Recommended Changes

Summary of Changes

Strategy Type	Current Benchmark	*Recommendation*
Private Credit	Cambridge Associates Senior Debt Index (1Q Lag)	***Cambridge Private Credit Index (1Q Lag)***
Systematic Trend Following	Credit Suisse Managed Futures Index (18% Vol)	***Societe Generale Trend Index (SG Trend Index)***
Long Volatility	---	***HFR Long Volatility Index.***

Conclusion

Next Steps

Conclusion

→ Meketa believes that the benchmarks employed at ERSRI are generally appropriate, but there are a few areas that can be fine-tuned.

→ Recommendations:

- Update the ERSRI benchmarks when the new Strategic Asset Allocation takes effect on 1/1/27.
- Adopt a 70% MSCI ACWI / 30% Bloomberg Aggregate index as a Reference Benchmark.
- Modify two of the ERSRI asset class benchmarks (Private Credit and Systematic Trend Following) to better represent the respective market segments.
  - Private Credit | Cambridge Associated Private Credit Index (1Q lag)
  - STF | SG Trend Index
- Adopt the HFR Long Volatility Index for the new Long Volatility portfolio.

Appendix

Benchmark Characteristics

→ **Bailey Criteria[1]:**

- Unambiguous – well-defined identities and weights;
- Investable – one can own the benchmark's constituents;
- Measurable – can calculate performance at reasonable intervals;
- Appropriate – consistent with the investment approach/style;
- Reflective of current investment options – representative of the segment; and
- Specified in advance – constructed before evaluation period.

→ **Other example characteristics**

- Accessible - difficult-to-produce benchmarks should be avoided;
- Transparent – understandable constituency of the benchmark;
- Independent – a manager's performance should not impact the benchmark return; and
- Relevant – correlation between a portfolio and a benchmark influences its relevance but is not sufficient due to potential spurious relationships.

[1] The Bailey Criteria: Financial Analysts Journal, CFA Institute, 1992.

Key Considerations of Total Fund Benchmarking

→ There is no such thing as a "passive" Total Fund benchmark.

- Even when using a simple reference portfolio benchmark (e.g., Simple Target Index), the underlying weights are actively selected based on a Board's risk level.

→ No single Total Fund benchmark encompasses all elements of assessment.

→ When using a relatively simple benchmark, its utility remains as a form of long-term (~10+ years) assessment.

- When illiquid asset classes are included in the portfolio, this time horizon inherently increases.

→ Understanding the flaws in a given benchmarking approach is just as important as understanding its role.

→ All benchmarks are hypothetical and ignore frictions that are required for actual implementations (e.g., transaction costs, rebalancing, taxes, dividend reinvestment, security/strategy access, etc.).

Common Approaches to Private Markets Benchmarks

→ No single approach to benchmarking private markets addresses all questions.

Approach	Examples	What does this measure? What does it not?
Return Target	• Tbills + 5% • CPI + 3%	• Measures whether actual results are aligned with long-term return/behavior expectations. • *Does not measure opportunity cost or selection/implementation success.*
Liquid Market Proxy (with or without an illiquidity premium)	• MSCI ACWI + 2% • Russell 3000 + 2% • 50% Bloomberg HY / 50% MSTA Leveraged Loan Index	• Focused on measuring opportunity cost. • The addition of an illiquidity premium also marginally addresses overall return expectations. • *Does not measure selection/implementation success.*
Universe Composite	• Cambridge Private Equity Index • NCREIF ODCE • Cambridge Global Private Infrastructure	• Focused on measuring selection/implementation success (e.g., how good were we at selecting private equity managers?). • *Does not measure opportunity cost.*

Preliminary Assessment Framework for Private Markets

Concept	Meketa Comments
Time Horizon	• Private markets are inherently long-term (10+ years) classes. • The majority of performance comparisons should focus on long-term horizons. • Quarter-to-quarter results contain more noise than signal.
Opportunity Cost	• Elevate in importance the Reference Benchmark as a key tool for the SIC in assessing opportunity cost and the payoff for illiquidity/complexity. • In annual asset class reviews, focus on long-term horizons that utilize Public Market Equivalent (PME) calculations rather than simple time-weighted returns and/or internal rates of return.
Implementation/Selection	• Continue to utilize universe composite indices within the Policy Index. • In annual asset class reviews, explore more granular data (e.g., sectors, vintage years, etc.) for assessing pockets of success/shortcoming.