

Investment Policy Benchmarks and Performance Reporting

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Presentation Objectives

- ▶ Build consensus with the Board as to the Purpose of Asset Class (Policy) Benchmarks and Performance Reporting
- ▶ Discuss industry accepted benchmarking criteria for achieving our purpose
- ▶ Present an objective benchmark selection framework
- ▶ Discuss industry practice when the best available benchmark does not satisfy all the criteria
- ▶ Review our current Asset Class benchmarks in context of the above
- ▶ Share opportunities for benchmark improvement that staff is considering (and will bring to the Board with recommendations in October)

Statement of Purpose

- ▶ **Purpose of Investment Policy Benchmarks:**
 - Represent the return and risk expectations used to describe the asset classes in the Strategic Target Allocation
 - Communicate the Board's return goal and associated risk appetite to Investment Staff
 - Provide a standard against which the Board can evaluate the work of Investment Staff

- ▶ **Purpose of Performance Reporting:**
 - Monitor and communicate performance relative to stated objectives over relevant time horizons
 - Evaluate Investment Staff and manager skill

TMRS Performance Reporting Objectives

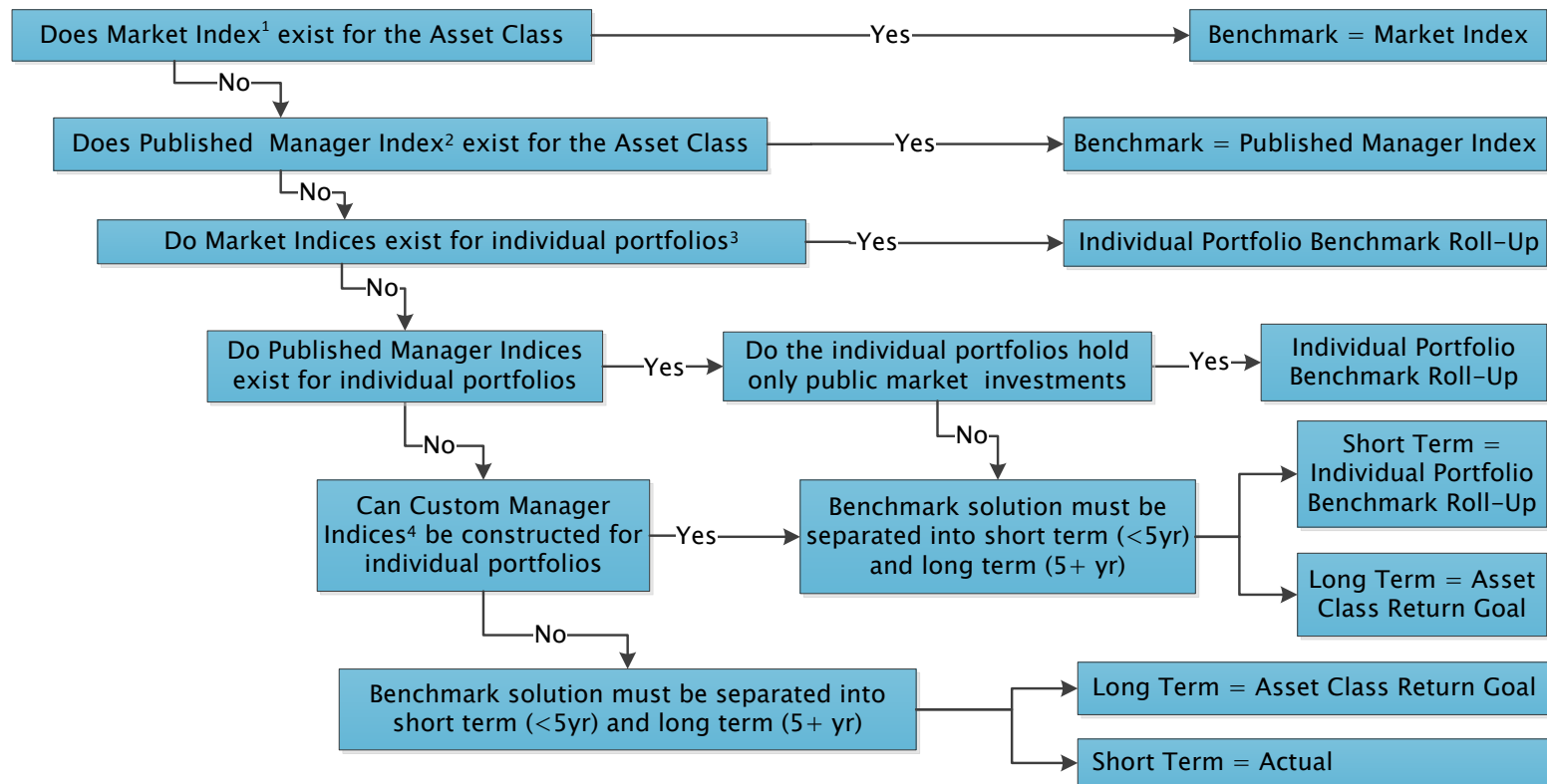
- ▶ Satisfy the IPS requirements for monitoring performance against stated objectives¹
 - Performance objectives for the Total Portfolio:
 - Meet or exceed the Actuarial Return Assumption over rolling 5-year periods
 - Exceed the Policy Index² over rolling 5-year periods
 - Performance objectives for Individual Portfolio Accounts
 - Exceed an appropriate benchmark net of fees over rolling 5-year periods
 - Rank above median in an appropriate universe of Managers over rolling 5-year periods
- ▶ Satisfy reporting expectation of TMRS oversight bodies and stakeholders
- ▶ Satisfy reporting for internal analysis of investment program effectiveness and manager skill

1. Exact IPS language is shown in Appendix 3
2. Total Plan Benchmark, as defined in the IPS

Investment Benchmarking Criteria (that will achieve our stated purpose)

- ▶ **Strategic**
 - Consistent with the asset class assumptions in the Strategic Target Allocation
- ▶ **Representative**
 - Representative of the intended underlying investments
- ▶ **Complete**
 - Covers the entire set of investment opportunities that are available and allowed in the asset class guidelines
- ▶ **Investable**
 - A qualified investor can construct a portfolio closely resembling the benchmark
- ▶ **Measurable**
 - Broadly accepted standards exist for calculating its return on a reasonably frequent and timely basis

Methodology for Identifying Best Possible Benchmark for Every Asset Classes



1. Market Index means either a single Market Index or a fixed blend. To serve as an Asset Class Market Index each index must be investable and have demonstrated stability in characteristics over time.
2. Manager Index means either a single Index of Managed Funds or a fixed blend (the HFRI indices are an example). To serve as an Asset Class level Manager Index the requirements are the same as for the Market Index but they are always weaker in practice.
3. As for the Asset Class, Market Index means either a single Market Index or a fixed blend; however, the requirement of demonstrated stability in characteristics is not as important since we are allowing compositional variability.
4. Custom Manager Indices are highly unlikely other than for Private market funds.

Traditional Asset Class Benchmarks Meet Benchmarking Criteria Very Well

Asset Class	US Public Equity	Core Fixed Income
Benchmark	Russell 3000	Barclays U.S. Aggregate
Strategic	✓	✓
Representative	✓	✓
Complete	✓	✓
Investable	✓	✓
Measurable	✓	✓

- ▶ Benchmark Challenges
 - None
- ▶ Current Benchmark Methodology
 - Public Market Index

Alternative Asset Class Benchmarks Do Not Meet Benchmarking Criteria

Asset Class	US Public Equity	Core Fixed Income	Absolute Return	Private Real Estate	Private Equity	Real Return	Non-Core Fixed Income
Benchmark	Russell 3000	Barclays U.S. Aggregate	HFRI FOF	NCREIF ODCE	Russell 3000 + 3%	Global Inflation Linked Bond Index	50% US High Yield 25% JPM EM Govt 25% JPM EM Corp
Strategic	✓	✓	✗	✗	✓	✗	✗
Representative	✓	✓	✓	✗	✗	✗	✗
Complete	✓	✓	✗	✗	✗	✗	✗
Investable	✓	✓	✗	✓	✗	✓	✓
Measurable	✓	✓	✓	✓	✓	✓	✓

When “Ideal” Doesn’t Exist

- ▶ When the best possible solution does not fulfill our stated purpose for Benchmarks, industry practice has been to use additional tools
 - **Represent:**
 - Recognize the assumptions in Strategic Target Allocation
 - Adopt a formal Asset Class Goal (reflective of asset class assumptions)
 - **Communicate:**
 - Define permissible investments and/or markets (IPS Asset Class Guidelines)
 - Explicitly discuss risk allowed and being taken in implementing investment policy (Report titled “Implementation Risk Ranges Implied by IPS Asset Class Guidelines” in the Quarterly Board Risk Report; introduced in the Feb 2017 Risk Management Presentation)
 - **Evaluate:**
 - Discuss manager performance vs. peers and expectations (Annual Asset Class Review)

Absolute Return and Real Estate Present Similar Benchmarking Challenges

Asset Class	Absolute Return	Private Real Estate
Benchmark	HFRI FOF	NCREIF ODCE
Asset Class Goal	LIBOR+5%	CPI+5%
Strategic	✗	✗
Representative	✓	✗
Complete	✗	✗
Investable	✗	✓
Measurable	✓	✓

- ▶ Benchmark Challenges
 - No Market Index

- ▶ Current Benchmark Methodology
 - Manager Index

- ▶ Performance Reporting
 - Addition of Asset Class Goal in performance reporting would address the “Strategic” criteria

With Private Equity the Benchmarking Challenges Increase

Asset Class	Private Equity	
Benchmark	Russell 3000 + 3%	Cambridge Associates Private Equity Index
Asset Class Goal	Russell 3000 + 3%	
Strategic	✓	✓
Representative	✗	✗
Complete	✗	✗
Investable	✗	✗
Measurable	✓	✓

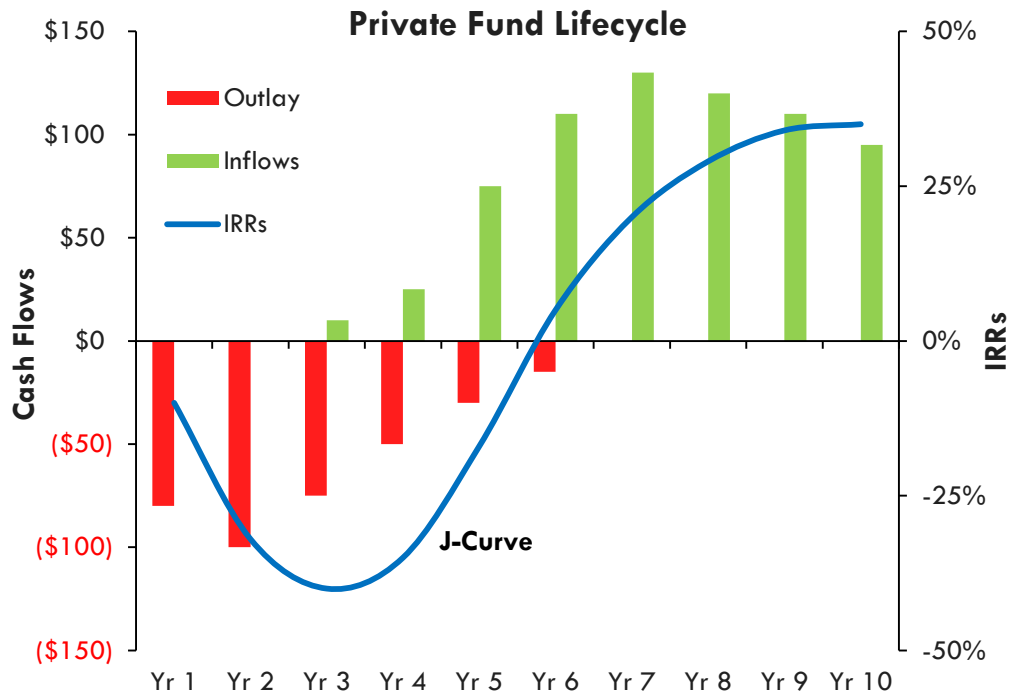
▶ Benchmark Challenges:

- No Market Index
- No viable Manager Index

▶ Cambridge Associates Index

- Includes all vintage years
- Includes funds accepting only previous investors
- Funds self report quarterly returns

Private Equity Lifecycle Makes Each Fund's Returns Comparable Only to Its Vintage Year and Strategy



- ▶ Private Equity funds:
 - Draw down capital commitments as they make investments
 - Pay out distributions as they realize investment goals
 - The unique pattern of investing and divesting creates the lifecycle
 - The J-Curve is caused by fund expenses not being offset by returns in the early part of the lifecycle
 - The fund lifecycle is not the same as a market cycle
- ▶ Given fund lifecycles and self reporting, Manager Indices like Cambridge Associates can not be
 - Representative
 - Complete
 - Investable

Current Private Equity Benchmark and Reporting

Asset Class	Private Equity
Benchmark	Russell 3000 + 3%
Asset Class Goal	Russell 3000 + 3%
Strategic	✓
Representative	✗
Complete	✗
Investable	✗
Measurable	✓

▶ Benchmark Challenges:

- No Public Market Index
- No viable Manager Index

▶ Current Benchmark Methodology

- Manager benchmark:
 - < 5 yr Benchmark = Actual
 - 5+ yr Benchmark = Asset Class Goal
- Asset Class benchmark:
 - Benchmark = Asset Class Goal

▶ Performance Reporting

- Asset Class Goal allows for evaluation of Staff's Strategy Selection
- Annual Asset Class Review allows for evaluation of manager performance and Staff's manager selection skill

Performance Reporting Methodology for Private Equity

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Private Equity Asset Class	Benchmark	Russell 3000 +3%									
	Goal	Russell 3000 +3%									
Private Manager 1	Benchmark	actual	actual	actual	actual	actual	R3+3%	R3+3%	R3+3%	R3+3%	R3+3%
Private Manager 2	Benchmark		actual	actual	actual	actual	actual	R3+3%	R3+3%	R3+3%	R3+3%
Private Manager 3	Benchmark			actual	actual	actual	actual	actual	R3+3%	R3+3%	R3+3%

Real Return is the Most Challenging Asset Class to Benchmark

Asset Class	Real Return	Real Return
Benchmark	Current: Global Inflation Linked Bond Index	Possible: Manager Benchmark Rollup
Asset Class Goal	CPI +4%	CPI +4%
Strategic	✘	✓
Representative	✘	✓
Complete	✘	✘
Investable	✓	✓
Measurable	✓	✓

▶ Benchmark Challenges:

- No Market Index or Manager Index
- Combination of public and private
- Combination of debt and equity
- Asset Class is relatively new
 - No industry consensus on benchmark
 - Evolving view of asset class components
 - Benchmarks of asset class components (to the extent they exist) suffer from thin markets, illiquidity, and changing characteristics

▶ Current Benchmark Methodology

- Public Manager Benchmarks = Market Indices
- Private Manager Benchmarks = Actual
- Asset Class benchmark = Global Inflation Linked Bond Index (appropriate for only a single Asset Class Strategy)

▶ Possible Benchmark Methodology

- Asset Class Benchmark < 5 yrs = Manager Benchmark Rollup
- Asset Class Benchmark 5+ yrs = CPI + 4%
- Annual Asset Class Review allows for evaluation of manager performance and Staff's manager selection skill

Performance Reporting Methodology for Real Return

			1 Month	3 Months	YTD	1 Yr.	3 Yrs.	5 Yrs.	7 Yrs.	10 Yrs.	ITD
Real Return Asset Class Composit	State Street and RVK Performance Report	Currently	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx	Global Inf Linked Bond Indx
		Possible Revision	Mngr Bmrk Rollup	Mngr Bmrk Rollup	Mngr Bmrk Rollup	Mngr Bmrk Rollup	Mngr Bmrk Rollup	Mngr Bmrk Rollup	CPI +4%	CPI +4%	CPI +4%

		Year 1	Year2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Real Return Asset Class Composit	Manager Benchmark Roll-up	Market Index for Public Manager									
		actual for private manager 1									
		actual for private manager 2									
		actual for private manager 3									
	Goal	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%	CPI +4%

Manager Level Benchmarks	Public Mngr Benchmark	Market Index	Market Index	Market Index	Market Index	Market Index	Market Index	Market Index	Market Index	Market Index	Market Index
	Private Mngr 1 Benchmark	actual	actual	actual	actual	actual	actual	actual	actual		
	Private Mngr 2 Benchmark		actual	actual	actual	actual	actual	actual	actual	actual	
	Private Mngr 3 Benchmark			actual	actual	actual	actual	actual	actual	actual	actual

Non-Core Fixed Income Presents Challenges Similar to Real Return

Asset Class	Non-Core Fixed Income
Benchmark	50% US High Yield 25% JPM EM Govt 25% JPM EM Corp
Strategic Target Allocation Return Assumption	6.4%
Strategic	✘
Representative	✘
Complete	✘
Investable	✔
Measurable	✔

- ▶ **Benchmark Challenges:**
 - No Public Market Index
 - Combination of public and private
 - Evolving definition of asset class

- ▶ **Current Benchmark Methodology**
 - Combination of Market Indices (capturing only some Asset Class Strategies)

- ▶ **Possible Benchmark Methodology**
 - Staff is evaluating options to better reflect this asset class's opportunity set and its role within the Strategic Target Allocation

Potential Benchmark Revisions Align With Our Statement of Purpose

Statement of Purpose	Improvements Sought in Review of Policy Benchmarks
<p>Best represent the return and risk expectations used to describe the associated asset class in the Strategic Target Allocation</p>	<ul style="list-style-type: none"> • Focus on long term Asset Class Return Objectives • Eliminate artificial tracking error from private investment • Avoid pre-determining strategy allocations for new and evolving Asset Classes
<p>Communicate the Board's return goal and associated risk appetite to Investment Staff</p>	<ul style="list-style-type: none"> • Report tracking error that measures Manager and Staff investment decisions • Evaluate performance over relevant time horizons
<p>Provide a standard against which the Board can evaluate the work of Investment Staff</p>	<ul style="list-style-type: none"> • Use benchmarks that allow the Board to evaluate Staff's recommendations of specific managers • Use Asset Class Goals where necessary to evaluate Staff's recommendations of sub-Asset Class Strategies

Conclusion

- ▶ As we move from Traditional to Alternative asset classes, benchmarking becomes more challenging.
- ▶ By refining our benchmarks when necessary and using a combination of tools alongside benchmarks, TMRS can achieve our stated purpose for Policy Benchmarks.
- ▶ Staff is reviewing all Investment Policy Benchmarks in advance of the Fall 2017 IPS review and will propose changes where we believe we can improve current benchmarks and performance reporting.

Appendix 1: IPS Benchmark Policy Calculations showing Possible Revision to Real Return Benchmark

IPS Asset Class	IPS Policy Benchmark	IPS Asset Class Goal	Calculation Methodology			
			Managers and Sub Asset Class Composites		Asset Class and Total Fund Composites	
			Periods less than 5 years	Periods 5 years and greater	Periods less than 5 years	Periods 5 years and greater
US Equities	Russell 3000 Index		Market Benchmark as appropriate for portfolio strategy		Asset Class Benchmark Return	
Int'l. Equities	MSCI ACW-ex US IMI (USD) net					
Core Fixed Income	Barclays US Aggregate					
Non-Core Fixed Income	50% US HY, 25% EMD, 25% EMD Local					
Real Estate	NCREIF-ODCE Index	CPI + 5%				
Absolute Return	HFRI Fund of Funds: Diversified Index	LIBOR +5%				
Real Return	Manager Benchmark Rollup	CPI + 4%	Public - Market Benchmark as appropriate for portfolio strategy		Manager Benchmark Rollup	Asset Class Goal
			Private – Benchmark equals actual			
Private Equity	Russell 3000 + 3%		Asset Class Benchmark		Asset Class Benchmark Return	

Real Return is described using the “Manager Rollup Benchmark” discussed in this presentation

Appendix 2: Asset Classes Valuation and Reporting Differences

		Reporting Frequency		
		daily	monthly	Quarterly
Valuation Method	<p>Transaction</p> <ul style="list-style-type: none"> • Uses transaction price on the valuation date • Accounting Standards Valuation Category - Level 1 (quoted prices for identical assets in active markets) • Reporting Lag - None 	<ul style="list-style-type: none"> • Public Equity • Core Fixed Income • Public Real Return 	<ul style="list-style-type: none"> • Public Equity • Public Real Return 	
	<p>Matrix</p> <ul style="list-style-type: none"> • Uses stale transaction prices and/or transaction prices for similar securities • Accounting Standards Valuation Category - Level 2 (quoted prices for similar assets in active or inactive markets; inputs other than quoted prices) • Reporting Lag – none to 30 days 	<ul style="list-style-type: none"> • Public Non-Core Fixed Income 	<ul style="list-style-type: none"> • Public Non-Core Fixed Income • Absolute Return Strategies 	
	<p>Appraisal</p> <ul style="list-style-type: none"> • Appraised value using methodology appropriate for the asset • Accounting Standards Valuation Category - Level 3 (based on the best reasonably available information and valuation methodology) • Reporting Lag - 60 to 90 days 			<ul style="list-style-type: none"> • Private Equity • Private Real Estate • Private Real Return • Private Non-Core Fixed Income

Appendix 3: IPS Performance Objectives

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XI. PERFORMANCE MONITORING

Performance measurement will be based on total rate of return and will be monitored over a sufficient time period to reflect the investment expertise of the Manager(s) over one full market cycle, or five years, whichever is less. Performance results and evaluation relative to objectives will be reported to the Board on a quarterly basis.

A. Return Expectations

1. Total Portfolio specific performance objectives include, but may not be limited to, the following:

- a) Achieve a total rate of return over rolling 5-year periods meeting or exceeding the Actuarial Return Assumption
- b) Exceed an appropriate benchmark reflective of asset class participation over rolling five-year periods (i.e. actual allocation index during the implementation period and policy index once fully implemented).

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Individual Portfolio Accounts. Investment staff and the Consultant, subject to review by the CIO, will determine performance expectations for each Manager. Specific performance objectives for active strategies include, but may not be limited to, the following:

- a) Exceed an appropriate index or benchmark net of fees over rolling five-year periods
- b) Rank above median in an appropriate universe of Managers possessing a similar style over rolling five-year periods.
- c) Investment staff and the Consultant will evaluate performance relative to expectations and appropriate peer groups for each real estate, real return, private equity, absolute return and other unique Manager or fund structure.