



BENCHMARK CONSIDERATIONS

SAN BERNARDINO COUNTY
EMPLOYEES' RETIREMENT
ASSOCIATION

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WHAT IS A BENCHMARK?

A benchmark may have many definitions:

“A collection of unmanaged assets used to assess the quality of an investor’s choices.”

“An articulation of the mix of assets chosen by our Board to reflect our risk tolerance in achieving our goals.”

▪ **How are individual benchmarks constructed?**

- Assets are grouped using certain criteria to construct a reference point for an investor within a same-or-like asset type
- Market cap weighted (Russell 3000, MSCI ACWI IMI)
- Equal weighted; all assets within a group are tracked in equal proportions
- Style tilted; over-allocate to certain metrics, for example, price-to-book, last 3 months of price movements
- Universe-based; Private Equity (Cambridge, Burgiss, Preqin; Real Estate (NCREIF ODCE)

▪ **Not all benchmarks are constructed equally; Investor beliefs play a role in choosing a benchmark**

- Benchmark providers use definitions and calculations that differ and result in different outcomes
 - Rebalancing frequency, earnings screens, security inclusion rules

▪ **Staff and NEPC are tasked with assessing the relevance of the current benchmarking regime to ensure best practices and more importantly the Strategic Asset Allocation Policy is properly interpreted and investment program implementation is measured prudently**

THE ROLE OF BENCHMARKS

- **Benchmarks are used to measure the performance and risk characteristics from the top down (Total Plan) and bottom-up (Portfolios and Asset Classes) within the investment program**
 - Provides the ability to measure the quality of active or passive decisions within the Plan (e.g. asset allocation, manager selection and manager skill)
- **Investment strategies typically fall into one of three categories:**
 1. **Benchmark Relative:** In this category, investment decisions are made relative to benchmark weights, exposures, and risks. The portfolio may be very similar to the benchmark in this instance (e.g. passive and active index strategies).
 2. **Benchmark Aware:** In this category, benchmark relativity is observed or the benchmark serves as an investable universe. Generally, there will be distinct differences between the portfolio and the benchmark (e.g. concentrated strategies).
 3. **Benchmark Neutral:** In this category, benchmarks are treated more as target returns or hurdles to beat or there is no appropriate benchmark. This is common with absolute return and alternative strategies and for strategies not covered by index providers. In these instances, a predefined target return that is not based on a market index may be used.
 - Measuring risk on a relative basis becomes impeded.

CONSTRUCTING A TOTAL FUND BENCHMARK

- **Total Fund benchmarking is an outcome of the Board setting a Strategic Asset Allocation; choosing a mix of assets that produces a rate of return at a certain level of risk**
 - Asset Liability Modeling, Actuarial Studies, Investment Policies and Beliefs, Risk Budgeting all play a role in defining the categories of assets invested in
- **The mix of asset weights as identified by the investment policy determines the asset mix in a benchmark**
- **Asset allocation models use broad indexes and their characteristics as an input to model expected returns and risk**
 - Consider and assess asset allocation inputs as a means to assess objectives and appropriateness of benchmark selection
- **Public markets or “traditional” investments have largely well-defined and ubiquitously understood benchmarks**
- **Private markets or “alternatives” may create some challenges**
 - Opportunity cost, strategy, objective, risk profile and program start date may play a role

TYPES OF BENCHMARKS

- **Absolute return target**
 - A static goal to beat, for example, 7.25% actuarial rate of return
 - Typically involves very in-depth work behind the scenes
- **Real return target**
 - A target that is defined by a market index for inflation plus a risk premium to account for the risk of assets invested in
- **Investable market index**
 - Typically an aggregation of public markets equity or fixed income representing a ubiquitously known segment of the market
 - Liquidity is key
 - Have many flavors of index construction based on, for example, cap weight, style (growth, value), cap size (large, small), “factors” (momentum, low volatility, carry, size)
- **Opportunity cost benchmark**
 - An aggregation of assets that represents an investment that was forgone, for example, public equity indexes may be used to benchmark private equities
- **Universe-based or peer benchmark**
 - An aggregation of investments tracking particular implemented strategies, for example, Hedge Funds (HFRI), Private Equity (Preqin, Cambridge)

STANDARDS IN BENCHMARKING - GIPS

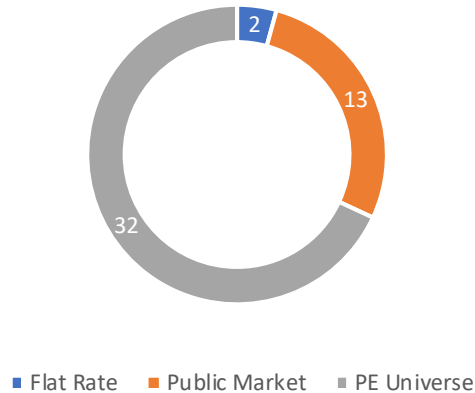
- **There are standards; governed by CFA Institute's Global Investment Performance Standards (GIPS)**
 - Ethical standards for the calculation and presentation of investment performance to ensure fair representation and full disclosure of investment performance.
 - Investment managers in public markets are typically GIPS compliant
 - Private market investment managers may be GIPS compliant or produce performance in substitutable best practice methodology
- **Asset owners are voluntarily taking on GIPS compliance**
 - Sets best practices across performance measurement including benchmarking
- **Compliant firms are required to select a benchmark if one is appropriate and present benchmark performance in compliant presentations**
 - The GIPS standards define a benchmark as a point of reference against which the composite's or portfolio's performance and/or risk is compared
 - The benchmarks used by each asset class must be disclosed, along with their weights as of the most recent annual period end as well as general information regarding the investments, structure, and/or characteristics of the benchmarks.
- **Properly used, a benchmark should be a focal point in the relationship between the firm and the fiduciary body overseeing the prudent management of the assets**

BEST PRACTICES IN BENCHMARKING

- **Benchmarks are not model portfolios**
 - but may be in certain efficient asset sectors based on investment beliefs and risk budget
- **Benchmarks should allow for ease of implementation and may facilitate tactical asset allocation**
- **Benchmark returns and characteristics serve as a baseline for risk assessment in the portfolio**
 - Active risk budget, portfolio structure, active implementation and investment manager skill are informed by benchmarks
 - Ex-poste risk adjusted returns use benchmarks as inputs and are key to evaluating implementation quality
 - Ex-ante risk analysis is keyed off of benchmarks
- **Benchmarks may serve as a base-line for compliance monitoring**
- **Benchmarks that are absolute return-based pose issues when assessing volatility and or risk, both ex-ante and ex-poste**
- **Evaluate validity using CFA Institute's SAMURAI framework**

WHICH PRIVATE EQUITY BENCHMARK FOR POLICY INDEX?

PE Asset Class Benchmark
Based on 47 NEPC Public Fund Clients



The most common benchmark used is the Cambridge Associates US All PE index (49%)

- **Flat Rate**
 - 7.5%, 10%
- **Public Market**
 - Russell 2000
 - Russell 3000 + 1%, 2%, or 3%
 - S&P 500 + 3%, 5%
 - 75% Russell 3000/25% MSCI ACWI ex US + 3%
 - NASDAQ without income
- **PE Universe**
 - Cambridge Associates US All PE
 - Cambridge Associates Global All PE
 - Venture Economic PE
 - SSgA PE Index
 - Burgess All PE
 - ILPA All Funds
 - TUCS

PRIVATE MARKETS BENCHMARKING

HOW ARE WE CURRENTLY EVALUATING PERFORMANCE?

SBCERA Performance Summary as of December 31, 2022

	Allocation		Performance (%)				
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Private Equity Composite	2,602,337,563	19.2	1.6	2.0	20.2	17.4	15.3
<i>CJA Global All PE (Qtr Lag)</i>			<u>-1.7</u>	<u>-2.9</u>	<u>18.3</u>	<u>15.7</u>	<u>14.2</u>
Over/Under			3.3	4.9	1.9	1.7	1.1
<i>Russell 3000 Index</i>			<u>7.2</u>	<u>-19.2</u>	<u>7.1</u>	<u>8.8</u>	<u>12.1</u>
Over/Under			-5.6	21.2	13.1	8.6	3.2
<i>CJA US All PE (1 Qtr Lag)</i>			<u>0.1</u>	<u>2.9</u>	<u>19.4</u>	<u>16.8</u>	<u>15.0</u>
Over/Under			1.5	-0.9	0.8	0.6	0.3
Real Estate Composite	610,312,417	4.5	0.7	13.3	10.8	9.3	9.2
<i>NCREIF Property Index 1 Qtr. Lag</i>			<u>0.6</u>	<u>16.1</u>	<u>9.9</u>	<u>8.6</u>	<u>9.5</u>
Over/Under			0.1	-2.8	0.9	0.7	-0.3
Real Assets Composite	651,443,294	4.8	1.8	11.2	13.5	9.2	5.9
<i>Real Assets Custom Blend</i>			<u>3.0</u>	<u>2.6</u>	<u>7.8</u>	<u>4.9</u>	<u>2.1</u>
Over/Under			-1.2	8.6	5.7	4.3	3.8

Note: Real Assets Custom Blend is 67% S&P GSCI + 33% BBG US TIPS Index

	Allocation		Performance (%)				
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Global Fixed Income With Beta Overlay	4,823,549,172	35.7	1.6	-3.3	5.3	4.5	
<i>Blmbg. Global Aggregate</i>			<u>4.5</u>	<u>-16.2</u>	<u>-4.5</u>	<u>-1.7</u>	
Over/Under			-2.9	12.9	9.8	6.2	
Total Fixed	3,742,849,172	27.7	-0.4	-5.2	3.1	3.5	5.2
<i>Blmbg. U.S. Aggregate Index</i>			<u>1.9</u>	<u>-13.0</u>	<u>-2.7</u>	<u>0.0</u>	<u>1.1</u>
Over/Under			-2.3	7.8	5.8	3.5	4.1
U.S. Credit Strategies	1,549,153,309	11.5	1.1 (100)	-2.9 (3)	6.9 (1)	6.7 (1)	6.9 (1)
<i>50% CS Leveraged Loan / 50% ICE BofA US HY BB-B Rated Constrained Index</i>			<u>3.3 (64)</u>	<u>-5.8 (9)</u>	<u>1.1 (3)</u>	<u>2.8 (1)</u>	<u>3.9 (3)</u>
Over/Under			-2.2	2.9	5.8	3.9	3.0

Source: NEPC Quarterly Report as of December 31, 2022



PRIVATE MARKETS BENCHMARKING

HOW ARE WE CURRENTLY EVALUATING PERFORMANCE?

	Allocation		Performance (%)				
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Non-U.S. Fixed Income Composite	2,193,695,863	16.2	3.4	-2.2	2.2	2.6	4.6
<i>Blmbg. Global Aggregate Ex USD</i>			<u>6.8</u>	<u>-18.7</u>	<u>-5.9</u>	<u>-3.1</u>	<u>-1.6</u>
Over/Under			-3.4	16.5	8.1	5.7	6.2
Non-U.S. Credit Composite	1,296,173,466	9.6	4.0	-0.3	5.4	5.3	6.6
<i>ICE BofA Euro High Yield Constrained TR</i>			<u>14.0</u>	<u>-17.0</u>	<u>-3.7</u>	<u>-2.2</u>	<u>1.1</u>
Over/Under			-10.0	16.7	9.1	7.5	5.5

	Allocation		Performance (%)				
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Emerging Markets Debt Composite	897,522,397	6.6	2.7 (99)	-5.2 (6)	-2.0 (24)	-1.3 (55)	1.1 (37)
<i>50% JPM EMBI Global Diversified/50% JPM GBI - EM Global Diversified</i>			<u>8.3</u> (52)	<u>-14.8</u> (66)	<u>-5.7</u> (82)	<u>-1.9</u> (67)	<u>-0.2</u> (66)
Over/Under			-5.6	9.6	3.7	0.6	1.3
<i>eV All Emg Mkts Fixed Inc Median</i>			8.3	-12.8	-4.1	-1.1	0.8



Source: NEPC Quarterly Report as of December 31, 2022

FRAMEWORK FOR EVALUATING APPROPRIATE BENCHMARKS

Valid benchmarks (per the CFA Institute) must meet certain criteria.

The CFA Institute outlines these requirements as SAMURAI.

Is the benchmark:

Specified in advance: Benchmark is known to all at start of evaluation period

Appropriate: The benchmark should accurately reflect the manager's performance style

Measurable: You must be able to measure the results

Unambiguous: A good benchmark's components should be known

Reflective: Of manager's current investment expertise

Accountable: Manager should agree that the benchmark is an appropriate measure

Investable: You should be able to replicate and invest in a benchmark

SBCERA POLICY BENCHMARK

INDEX DEFINITIONS AND CONSIDERATIONS

Asset Class	Policy Target	Benchmark	Index Definition	Benchmark Type	Preferred Market Index	Aligned With Asset Allocation Policy	Considerations
Domestic Equities	17.00%	Russell 3000 Index	Market-cap-weighted index measuring the entire U.S. stock market. The index tracks the performance of the 3,000 largest U.S.-traded stocks, which represent about 97% of all U.S.-incorporated equity securities	Investable Index	Yes	Yes	None
International Equities	13.00%	MSCI ACWI ex USA Index	Market-cap-weighted index of Large and mid cap representation across 22 of 23 Developed Markets (DM) countries (excluding the US) and 24 Emerging Markets (EM) countries*. With 2,257 constituents, the index covers approximately 85% of the global equity opportunity set outside the US	Investable Index	Yes	Yes	None
US Fixed Income	15.00%	BBG US Aggregate Bond Index	Market-cap-weighted bond market index representing intermediate term investment grade bonds traded in the United States. Index tracks investment-grade corporate debt, government debt, mortgage-backed securities (MBS) and asset-backed securities (ABS).	Opportunity Cost	Yes*	Yes	Credit risk is investment-grade
Global Fixed Income	17.00%	BBG Global Aggregate Bond ex US Index	Measures the performance of global investment grade fixed-rate debt markets that excludes USD-dominated securities.	Opportunity Cost	Yes*	Yes	Credit risk is investment-grade
Real Estate	5.00%	NCREIF Property Index	Market-value weighted, includes Apartment, Hotel, Industrial, Office and Retail properties, and sub-types within each type. Includes properties with leverage, but all returns are reported on an unleveraged basis.	Universe	Yes*	Yes	NCREIF ODCE Index has gained traction among clients.
Real Assets	6.00%	67% S&P GSCI + 33% BBG US TIPS Index	S&P GSCI tracked investments in the commodity markets. It is a tradable index that is readily available to market participants of the Chicago Mercantile Exchange. BBG US TIPS Index measures the performance of the US Treasury Inflation Protected Securities market. Federal Reserve holdings of US TIPS are not index eligible and are excluded from the face amount outstanding of each bond in the index.	Opportunity Cost	Yes*	Yes	Private markets implementation
Private Equity	18.00%	Russell 3000 Index	See above.	Opportunity Cost	Yes/No*	Yes	Measures Board's decision to invest in private markets. Universe indexes used by others.
Absolute Return	7.00%	BBG US Aggregate Bond Index	See above.	Opportunity Cost	Yes*	Yes	Credit risk is investment-grade
Cash	2.00%	91 Day T-Bill Index	Measures the performance of the U.S. short-term Treasury Bill market.	Investable Index	Yes	Yes	None

* Denotes considerations may be need to be taken into account.



POLICY INDEX COMPOSITION

Index	7/1/ 2022	7/1/ 2021	7/1/ 2019	7/1/ 2018	7/1/ 2014	7/1/ 2012	6/1/ 2012	6/1/ 2010	6/1/ 2009	6/1/ 2008	9/1/ 2006	7/1/ 2005	4/1/ 2004	6/1/ 2002
Russell 3000 Index	35	31	29	29	29	30	29	29	28	34	38	38	43	43
MSCI ACWI ex USA Index	13	15	15	15	15	13	7	7	7	11	13	13	18	18
MSCI Emerging Markets Index							4	4	3	4	3	3		
Bloomberg US Aggregate Bond Index	22	22	22	22	22	24	13	13	18	15	21	21	18	26
Bloomberg Global Aggregate Bond ex US Index	17	19	20	20	18	16	10	10	9	8	5			
Bloomberg Global Aggregate Bond Index Hedged												5	5	5
Merrill Lynch High Yield Master II Index							13	13	13	8	8	8	8	
JP Morgan EMBI Global Diversified Index							6	6	4	4	2	2		
NCREIF Property Index	5	5	7	7	9	9	12.5	12.5	13	11	10	10	8	8
67% S&P GSCI + 33% BBG US TIPS Index	6													
67% Bloomberg Commodity Index+ 33% BBG US TIPS Index		6	5											
NCREIF Timberland 1Q Lag				2.5	2.5	3								
Bloomberg Commodity Index				2.5	2.5	3	3.5	3.5	3	3				

SBCERA BENCHMARKING EVALUATION

Asset Class	Domestic Equities	International Equities	US Fixed Income	Global Fixed Income	Real Estate	Real Assets	Private Equity	Absolute Return	Cash
Policy Target	17%	13%	15%	17%	5%	6%	18%	7%	2%
Benchmark	Russell 3000 Index	MSCI ACWI ex USA Index	BBG US Aggregate Bond Index	BBG Global Aggregate Bond ex US Index	NCREIF Property Index	67% S&P GSCI + 33% BBG US TIPS Index	Russell 3000 Index	BBG US Aggregate Bond Index	91 Day T-Bill Index
Specified in Advance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Appropriate	Yes	Yes	Yes*	Yes*	Yes	Yes	Yes*	Yes	Yes
Measurable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unambiguous	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reflective	Yes	Yes	Yes*	Yes*	Yes	Yes*	Yes*	Yes*	Yes
Accountable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investable	Yes	Yes	Yes	Yes	No*	Yes	Yes	Yes	Yes
Considerations			SBCERA portfolio is credit risk focused	SBCERA portfolio is credit risk focused	Many clients use ODCE	SBCERA implementation is in private assets	Index measures the Board's decision to invest in private markets	SBCERA portfolio is credit risk focused	

- **Asset classes effectively capture the characteristics of asset classes set by board approved Investment Policy and Investment Beliefs**
- **Investment-grade credit related benchmarks measure the risk and return differential associated with the decision to investment in private markets, an opportunity cost approach, rather than an investable market approach. Portfolio characteristics differ from benchmark by design.**

WHAT ARE THE ALTERNATIVES?

ALTERNATIVES IN PRIVATE EQUITY AND PRIVATE DEBT

Approach	Rationale	Advantages	Limitations
Private Equity or Debt Universe	<ul style="list-style-type: none"> • Best matching of assets • Consider maturity of private markets program as some indexes are mismatched (e.g) vintage year, strategy 	<ul style="list-style-type: none"> • Compares performance directly to other PE/PD funds • Has volatility in benchmark reflective of the asset class • Matches valuation frequency 	<ul style="list-style-type: none"> • Not typically available until 105-120 days after quarter end • Limited transparency • Readily used benchmarks limited by PE/PD strategy and geography • Potential mismatch of maturity of PE/PD program with average maturity of funds in benchmark • Quality of data and return precision questions
Public Market	<ul style="list-style-type: none"> • Opportunity cost of allocating capital to PE/PD 	<ul style="list-style-type: none"> • Readily available • High level of familiarity • Can add basis points to reflect additional risk/illiquidity of market 	<ul style="list-style-type: none"> • Public indices generally have higher short-term volatility than private equity • Public companies generally larger than most private equity-backed companies • When unlagged, creates mismatch of timing of actual and benchmark valuation changes • Appropriate risk/illiquidity premium varies • “Opportunity Cost” approach may not be used to benchmark other asset classes
Flat Rate	<ul style="list-style-type: none"> • Minimum return expected for asset class 	<ul style="list-style-type: none"> • Easy to understand 	<ul style="list-style-type: none"> • Not responsive to changes in economic conditions • Not effective for short term comparisons
Actual Return	<ul style="list-style-type: none"> • PE benchmarking in total Plan is too problematic 	<ul style="list-style-type: none"> • Removes PE from total plan benchmarking assessment (makes benchmark PE neutral) 	<ul style="list-style-type: none"> • Does not recognize PE program as source of alpha to the Plan

SUMMARY OF OBSERVATIONS

- **The SAMURAI framework highlights that there are no perfect or universally accepted benchmarks for alts.**
- **Many public funds use some variant of all these benchmark types:**
 - POLICY INDEX using Public Market Equivalents to measure strategic decision to invest in private markets.
 - PASSIVE INDEX to measure active management decision versus a similar passive mix of return-seeking and risk-reducing assets.
 - ASSET CLASS AND MANAGER BENCHMARKS to measure implementation at the manager and asset class level.