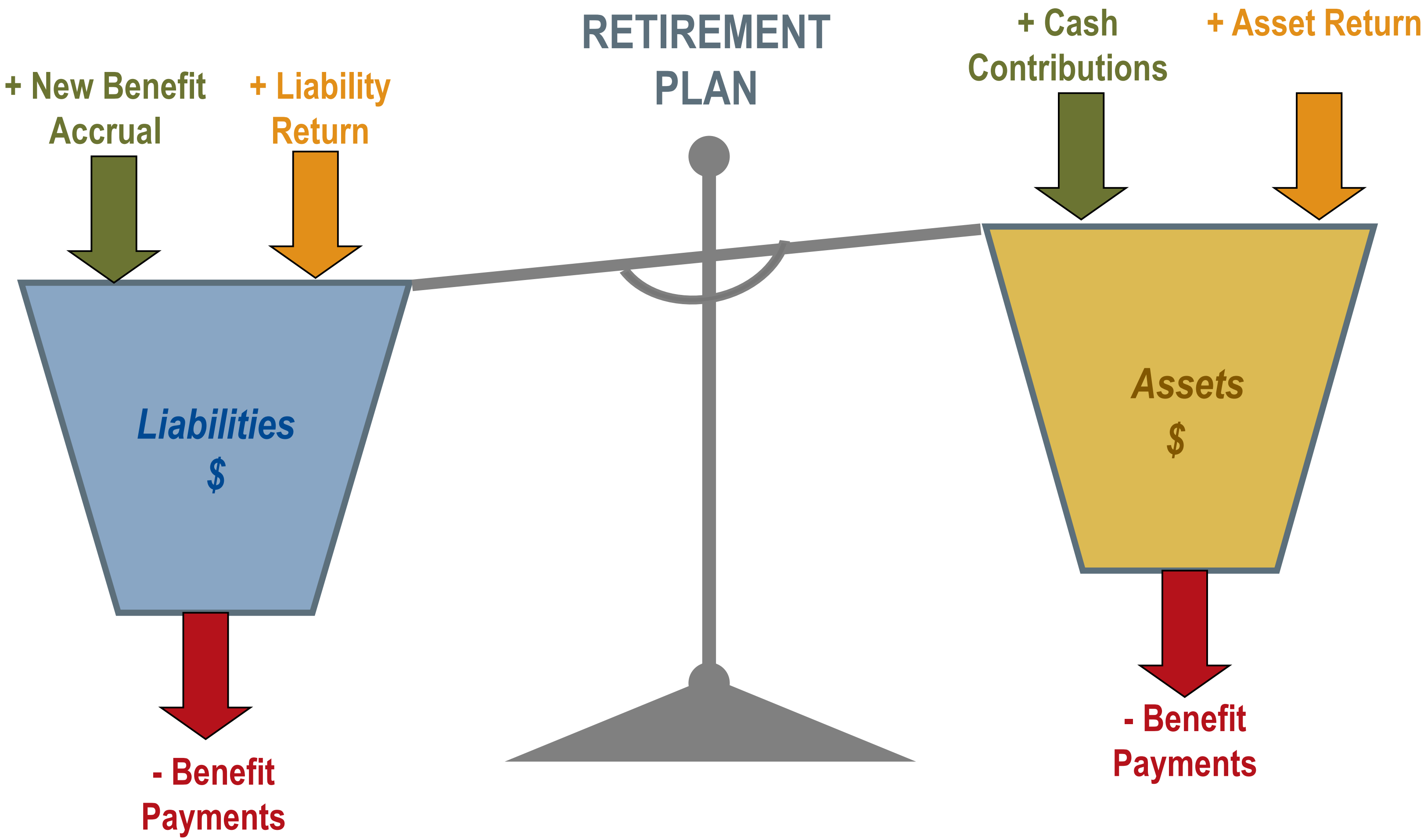
Public Pension Management & Asset Investment Review Commission (PPMAIRC)

September 20, 2018

Pension Accounting

Balance of Liabilities and Assets

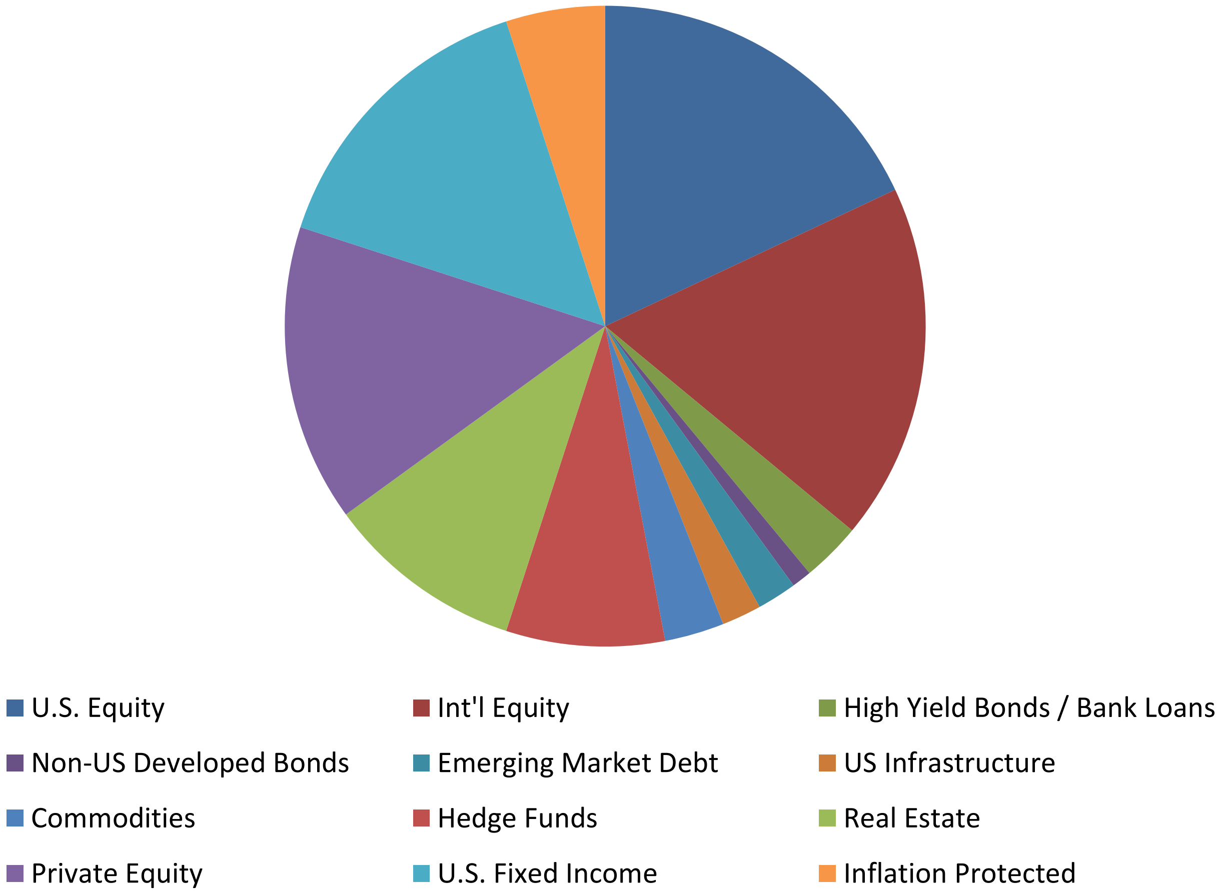


Bottom Line: Benefit Payments = Contributions + Investment Return

For illustrative purposes only

What is Asset Allocation?

Asset allocation refers to the implementation of an investment strategy that seeks to balance reward (investment return) and risk (investment loss) by mixing various assets based on investor's risk profile and return goal



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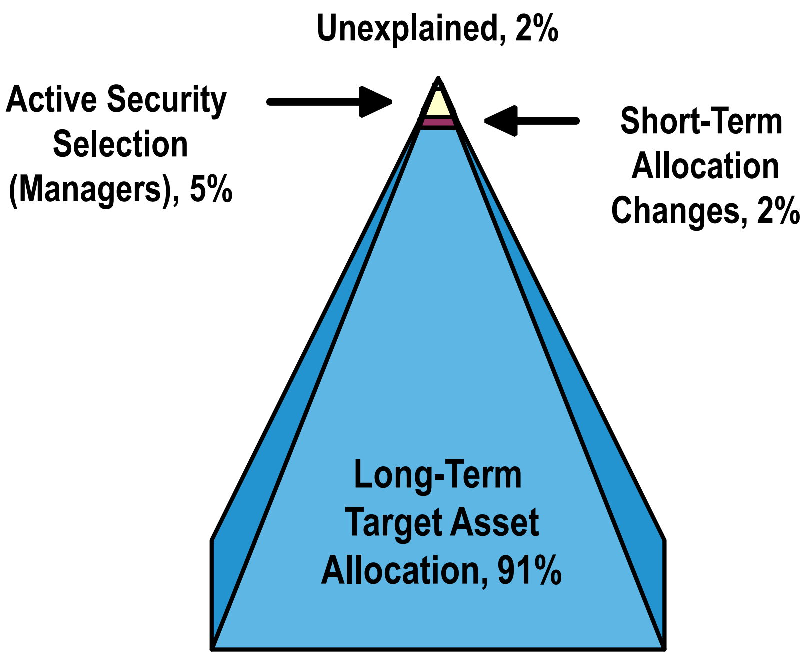
Asset Allocation—The Most Important Decision



Asset allocation is the most important investment decision as it explains more than 90% of investment return

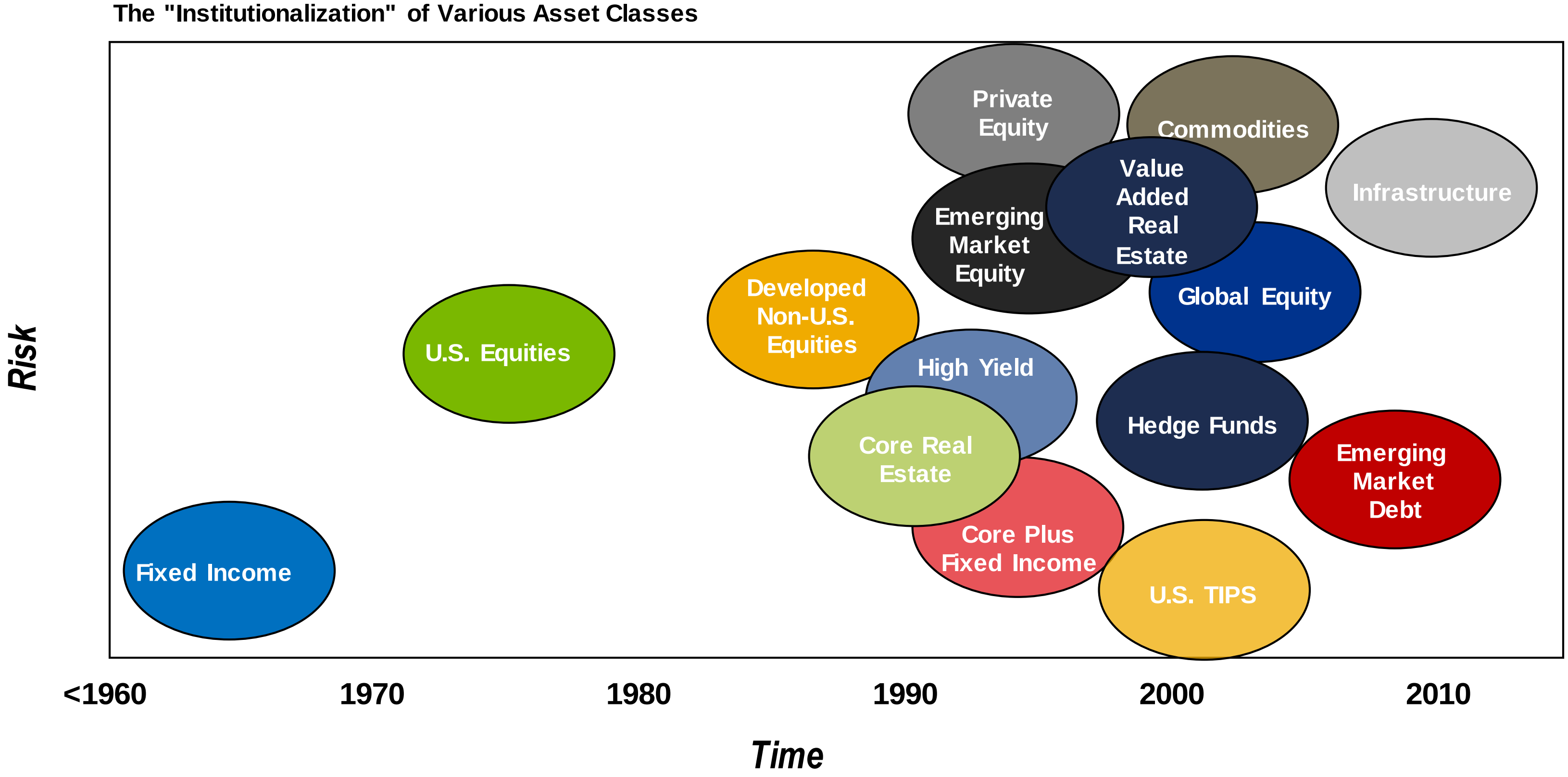
Source: Brinson, Singer and Beebower, "Determinants of Portfolio Performance II: An Update" 1991.

Factors Driving Asset Allocation Implementation

Factor	Range of Investor Circumstances for Factor			
Governance ▪ Oversight resources ▪ Speed of action ▪ Tolerance for higher cost	**Strategic**	▪ More strategic investing ▪ Greater reliance on market risk ▪ Less alternatives	▪ More opportunistic investing ▪ Greater reliance on active risk ▪ More alternatives	**Flexible**
Time Horizon ▪ Life span ▪ Cash flow position ▪ Tolerance for illiquidity	**Short**	▪ No illiquid alternatives ▪ Diversification over return-seeking	▪ Most illiquid alternatives ▪ Return-seeking over diversification	**Long**
Portfolio Size ▪ Ability to diversify across strategies ▪ Market impact of trades ▪ Potential for closet indexing	**Small**	▪ Less alternatives ▪ Greater reliance on market risk	▪ More alternatives ▪ Greater reliance on active risk	**Large**
Investor Type	**Efficiency**	← **Balance** →		**Opportunity**

Empower Results®

The Evolution of Institutional Investors' Asset Allocation



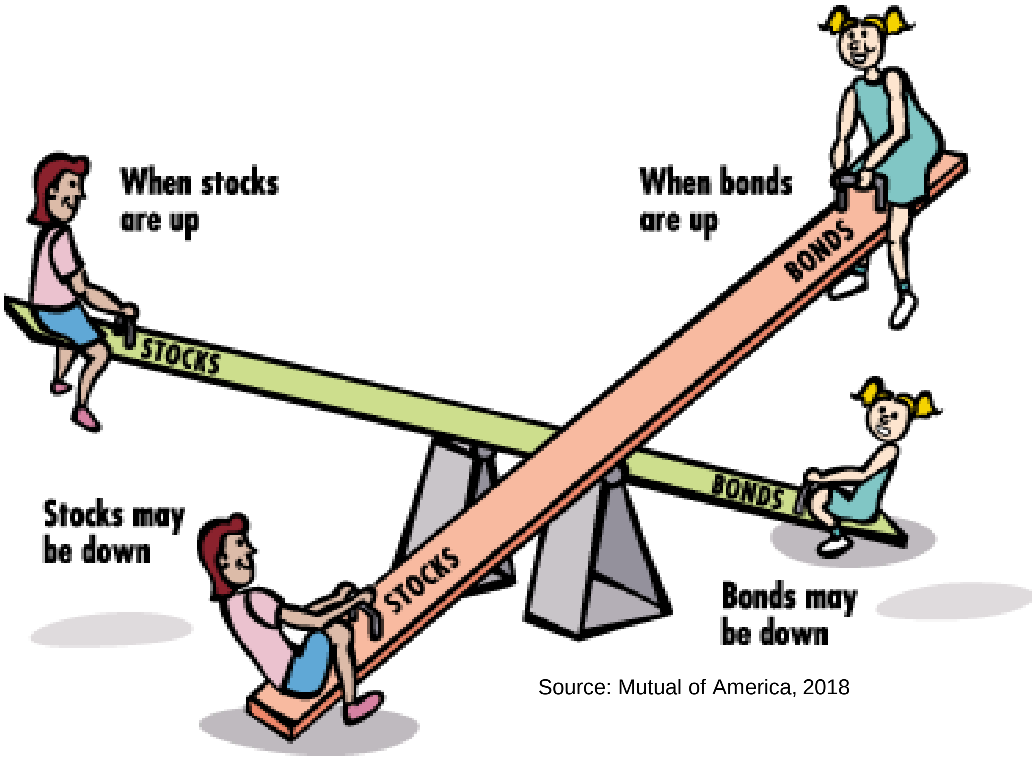
- The asset allocation of institutional investors has and likely will continue to evolve over time.

*The chart provided above is for illustrative purposes based on AHIC's experience working with Institutional investors

Diversification

Diversification is a requirement in the definition of prudent fiduciary investing

- Diversified portfolios are meant to reduce risk while maintaining an expected return
- All asset classes do not produce the same results in a particular economic environment
- An optimization analysis is used to determine optimal portfolios or mixes of assets depending on an investors' risk tolerance



Source: Mutual of America, 2018

Diversification does not ensure a profit nor does it protect against loss of principal. Diversification among investment options and asset classes may help to reduce overall volatility.

Diversification Example

Diversification usually reduces volatility and, under certain conditions, can help increase returns

Example – Investor Starts with $100

	Year 1 Return	Year 2 Return	Cumulative Return
Investment A: %	20.00%	-10.00%	8.00%
Investment A: $	$100*1.2 = $120	$120*0.9 = $108	Final: $108
Investment B: %	-10.00%	20.00%	8.00%
Investment B: $	$100*0.9 = $90	$90 * 1.2 = $108	Final: $108
50/50 Portfolio: %	5.00%	5.00%	10.25%
50/50 Portfolio: $	$100*1.05 = $105	$105*1.05 = $110.25	Final: $110.25

- This example makes the following assumptions to reach its conclusions:
  - Perfect negative correlation between stocks and bonds
  - Rebalancing at the end of Year 1
  - No cash inflows or outflows

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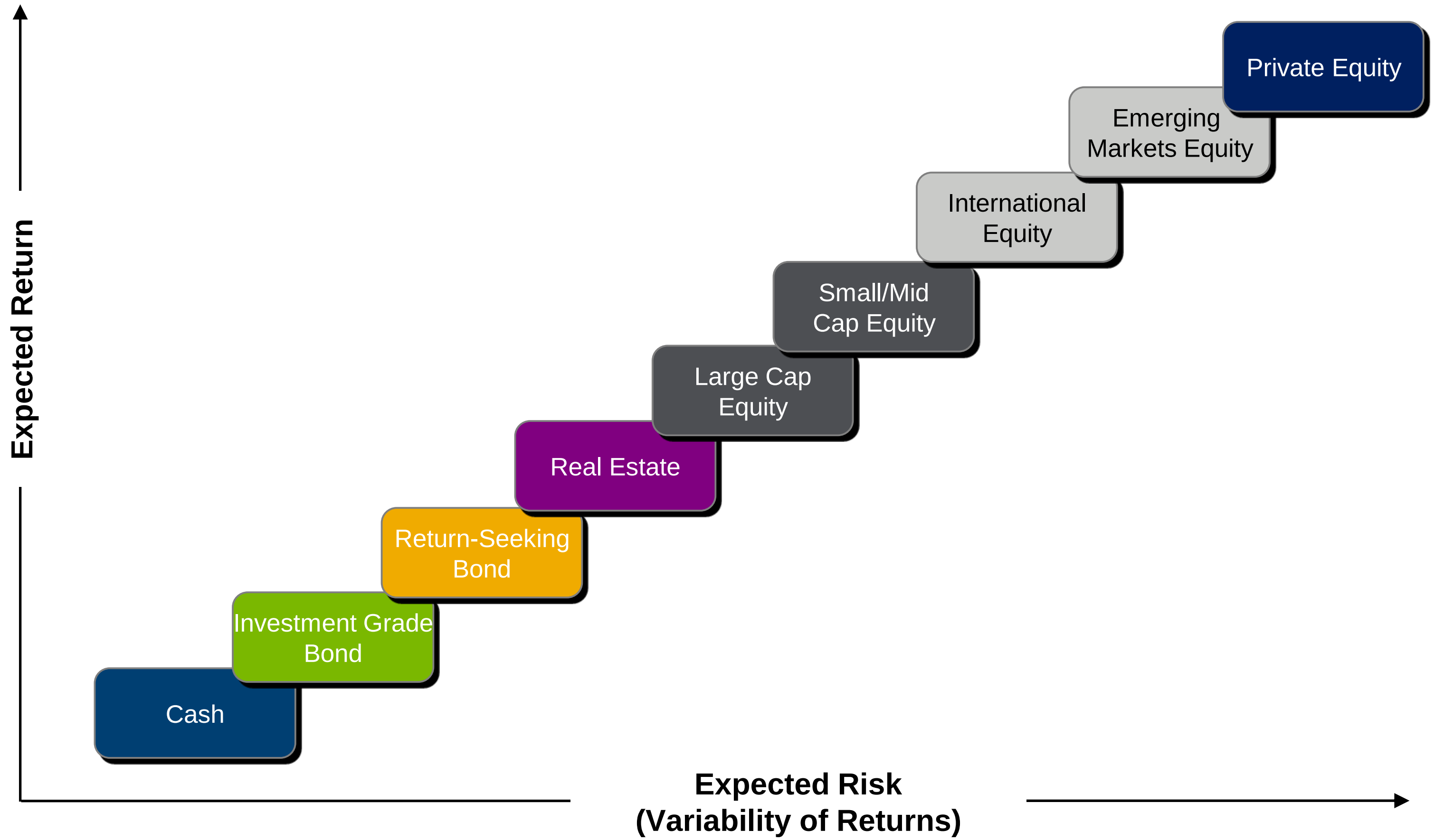
Risk-Return Spectrum (Illustrative)



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Benchmarking: Purposes & Types

- Benchmarks are used to measure the performance of the Total Fund, asset classes, and individual managers over various time periods and across methodologies to determine the effectiveness of implementation of an investment program
- We believe benchmarks are **essential to good governance**
- There are many types of benchmarks that can be used to analyze relative performance of an investment
  - Broad market (MSCI ACWI IMI Index)
  - Style-specific (S&P 500 Value Index)
  - Risk adjusted returns (vs. benchmark Sharpe ratio)
  - Absolute return metric (i.e. 7% return target)
  - Real return target (i.e. CPI + 3%)
  - Peer universe (i.e. Public Funds >$1 billion)
- Careful attention should be paid to appropriateness when selecting the benchmark for a given asset class, manager, or strategy

Characteristics of a Good Benchmark: SAMURAI[1,2]

- ***S**pecified in advance:* the benchmark is specified prior to the start of an evaluation period and known to all interested parties
- ***A**ppropriate:* the benchmark is consistent with the manager's investment style or area of expertise
- ***M**easurable:* the benchmark's return is readily calculable on a reasonably frequent basis
- ***U**nambiguous:* the identities and weights of securities constituting the benchmark are clearly defined
- ***R**eflective* of current investment opinions: the manager has current knowledge of the securities or factor exposures within the benchmark
- ***A**ccountable:* the manager is aware of and accepts accountability for the constituents and performance of the benchmark
- ***I**nvestable:* it is possible to forgo active management and simply hold the benchmark

[1] As per CFA Institute's **SAMURAI** characteristics. The criteria commonly referenced as industry standard is based on research conducted by Jeffrey Bailey and others. Mr. Bailey published an initial paper titled "Are Manager Universes Acceptable Performance Benchmarks?" in the May-June, 1992, edition of the *Financial Analysts Journal*.
[2] The criteria listed above are more easily fulfilled for publicly traded, more liquid asset classes. Good benchmarks exist for private markets but they are more challenging to identify.

Private Market Benchmarking

Asset Class	Most Commonly Used Benchmark	Alternative Benchmark
Private Equity	Broad Public Market Index[1] + Premium (Longer Time Periods) OR Peer Universe (Shorter Time Periods)	--
Core Real Estate	NCREIF ODCE	--
Non-Core Real Estate	NCREIF ODCE + Premium	Peer Universe
Hedge Funds	HFR Suite of Indices	CPI + Premium or Absolute Return

- Benchmarking private asset classes has challenges (timing, applicability, depth, tracking error, etc.)
- As peer benchmarks in private equity and private real estate become more robust, more plans are moving to adopt, for shorter time periods (~<10 years)

[1]Most plans use the Russell 3000 or MSCI ACWI as the Public Market Index when applying a premium

Q & A

Legal Disclosures and Disclaimers

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Index Definitions

Benchmark performance is:

- The relevant index for that asset class or sub asset class and is a standard market index, or
- A custom benchmark representing the benchmarks of the underlying investment strategies equally weighted
- The individual monthly benchmark returns are compounded to result in the corresponding annualized benchmark returns
- Unmanaged index returns assume reinvestment of any and all distributions. Performance of the benchmark(s) is not an exact representation of any particular investment, as you cannot invest directly in an index or custom benchmark. All returns for investment advisor strategies and benchmarks are compiled from sources believed to be reliable and current, but accuracy cannot be guaranteed.

- **S&P 500 Value Index.** A capitalization-weighted index representing 500 publicly traded U.S. stocks with lower price-to-book ratios and lower forecasted growth values.
- **MSCI All Country World Investable Markets Index.** A float-adjusted capitalization-weighted index of stocks across large, mid, and small cap size segments in approximately 46 developed and emerging countries, including the U.S. and Canadian markets.
- **NCREIF Open End Diversified Core Equity (ODCE) Net Index.** An index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted.
- **Blended Benchmarks** – A weighted average of the underlying investment managers strategies' benchmarks.

About Aon

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