2022 ASSET ALLOCATION UPDATE

FIREFIGHTERS' RETIREMENT SYSTEM OF LOUISIANA

AUGUST 10-11, 2022

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INTRODUCTION

ASSET CLASS ASSUMPTIONS

OVERVIEW

- **NEPC's capital market assumptions are available each quarter and currently reflect June 30, 2022 market data**
- **Higher interest rates lifted fixed income return assumptions and temper the outlook for equities given the expected valuation headwinds**
- **We encourage investors to hold a dedicated safe-haven fixed income allocation to be a source of portfolio liquidity and downside protection**
- **NEPC's expectation for inflation is elevated over the near-term, but the long-term outlook reflects a more subdued inflation environment**

ASSET CLASS ASSUMPTIONS

DEVELOPMENT

- **Assumptions are published for over 70 asset classes**
  - NEPC publishes return forecasts for 10-year and 30-year periods
- **Market data as of 06/30/2022**
  - Assumptions are developed with NEPC valuations models and rely on a building block approach
- **The 10-year return outlook is intended to support strategic asset allocation analysis**
- **30-year return assumptions are used for actuarial inputs and long-term planning**

Asset Allocation Process

1. Finalize list of new asset classes
2. Calculate asset class volatility and correlation assumptions
3. Set model terminal values, growth, and inflation inputs
4. Model data updated at quarter-end
5. Review model outputs and produce asset class return assumptions
6. Assumptions released on the 15th calendar day after quarter-end

ASSET CLASS BUILDING BLOCKS
METHODOLOGY

- **Asset models reflect current and forecasted market data to inform expected returns**
- **Systematic inputs are paired with a long-term trend to terminal values**
- **Model inputs are aggregated to capture key return drivers for each asset class**
- **Building block inputs will differ across asset class categories**

CORE ASSET CLASS RETURN ASSUMPTIONS

	Asset Class	06/30/22 10-Year Return	06/30/21 10-Year Return	Delta
	Cash	2.9%	1.2%	+1.7%
	U.S. Inflation	2.4%	2.3%	+0.1%
Equity	U.S. Large-Cap Equity	5.8%	4.9%	+0.9%
Equity	Non-U.S. Developed Equity	6.4%	5.2%	+1.2%
Equity	Emerging Market Equity	9.6%	7.4%	+2.2%
Equity	Global Equity*	6.8%	5.6%	+1.2%
Equity	Private Equity*	9.8%	8.9%	+0.9%
Fixed Income	U.S. Treasury Bond	3.2%	1.4%	+1.8%
Fixed Income	U.S. Aggregate Bond*	3.8%	1.9%	+1.9%
Fixed Income	U.S. TIPS	3.0%	1.5%	+1.5%
Fixed Income	U.S. High Yield Corporate Bond	6.9%	3.1%	+3.8%
Fixed Income	Private Debt*	8.0%	6.4%	+1.6%
Real Assets	Commodity Futures	3.4%	1.3%	+2.1%
Real Assets	REIT	6.1%	4.7%	+1.4%
Real Assets	Gold	4.4%	3.4%	+1.0%
Real Assets	Real Estate - Core	4.4%	4.8%	-0.4%
Real Assets	Private Real Assets - Infrastructure	6.1%	5.4%	+0.7%
Multi-Asset	60% S&P 500 & 40% U.S. Aggregate	5.3%	4.0%	+1.3%
Multi-Asset	60% MSCI ACWI & 40% U.S. Agg.	6.0%	4.5%	+1.5%
Multi-Asset	Hedge Fund*	6.0%	4.2%	+1.8%

*Calculated as a blend of other asset classes

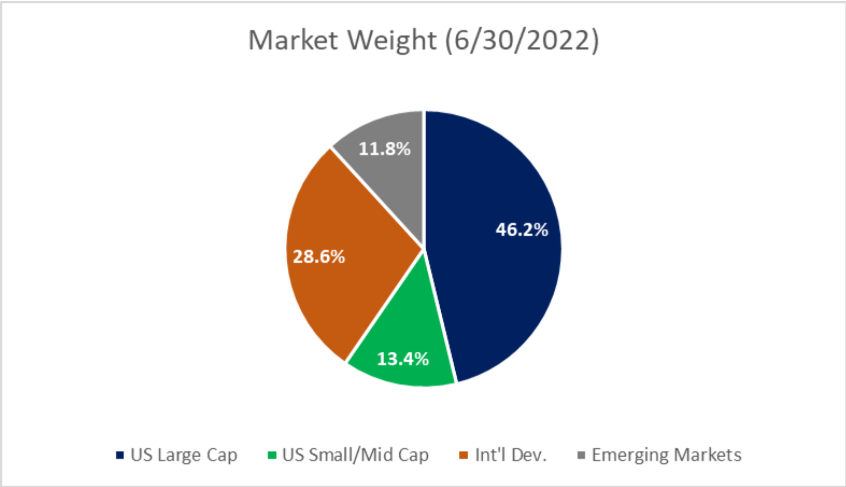
FRS ASSET ALLOCATION REVIEW

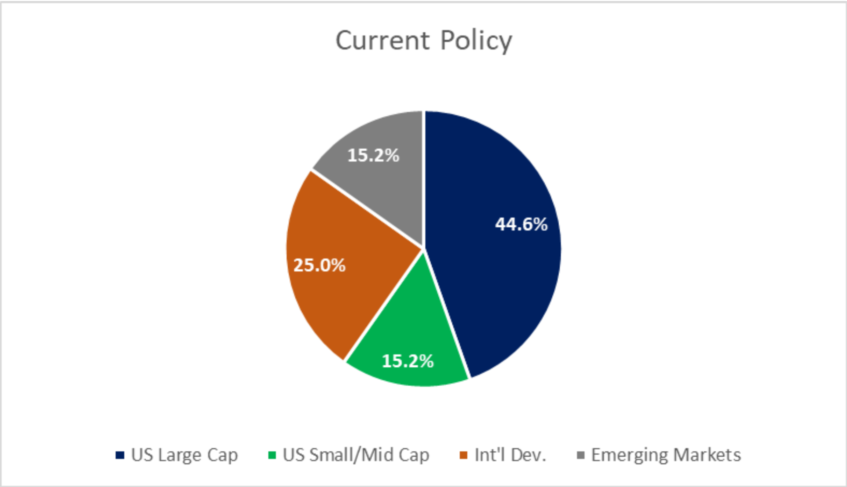
JUNE 2022 FRS ASSET ALLOCATION REVIEW

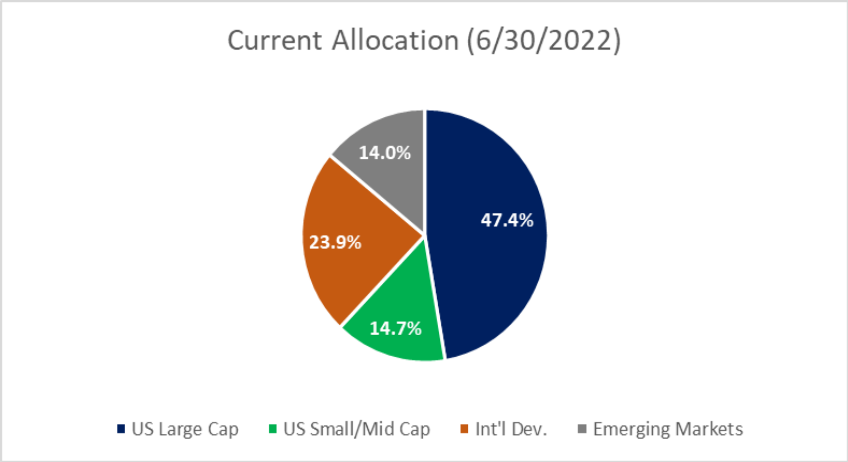
Asset Class	Current Policy Target	Mix A	Mix B
Large Cap Equity	20.5%	24.0%	27.5%
Small/Mid Cap Equity	7.0%	7.0%	7.0%
International Equity	11.5%	11.5%	11.5%
Emerging Markets Equity	7.0%	3.5%	--
Global Equity	10.0%	10.0%	10.0%
Total Equities	**56.0%**	**56.0%**	**56.0%**
Core Bonds	18.0%	20.5%	23.0%
US TIPS	3.0%	3.0%	3.0%
Emerging Market Debt (Blended)	5.0%	2.5%	--
Total Fixed Income	**26.0%**	**26.0%**	**26.0%**
Private Equity/Private Debt	9.0%	9.0%	9.0%
Core Real Estate	6.0%	6.0%	6.0%
Private Real Assets (Infrastructure)	3.0%	3.0%	3.0%
Total Alternative Assets	**18.0%**	**18.0%**	**18.0%**
10 Year Expected Return	***6.7%***	***6.4%***	***6.2%***
30 Year Expected Return	***7.3%***	***7.1%***	***6.9%***
Standard Deviation	***13.1%***	***12.6%***	***12.2%***

[1]Emerging Market Debt (Blended) is modeled as 1/2 emerging markets debt (local), 1/2 emerging markets debt (external)

JUNE 2022 FRS ASSET ALLOCATION REVIEW

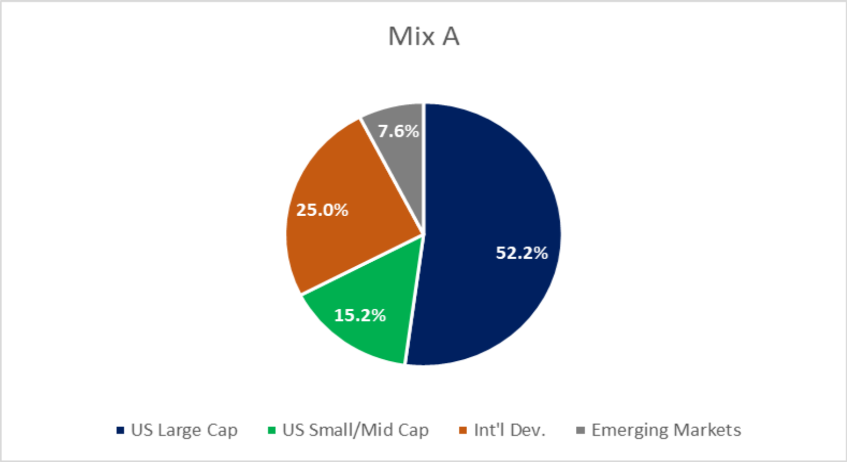


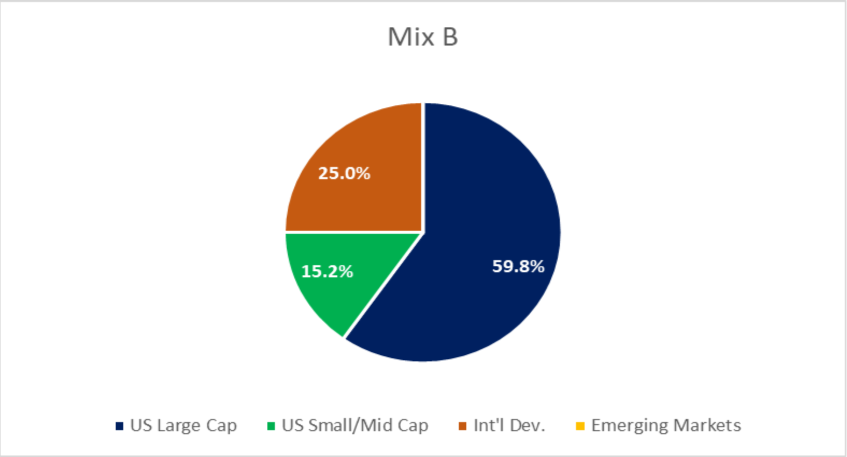




[1]Markets weights determined by MSCI ACWI IMI as of June 30, 2022.

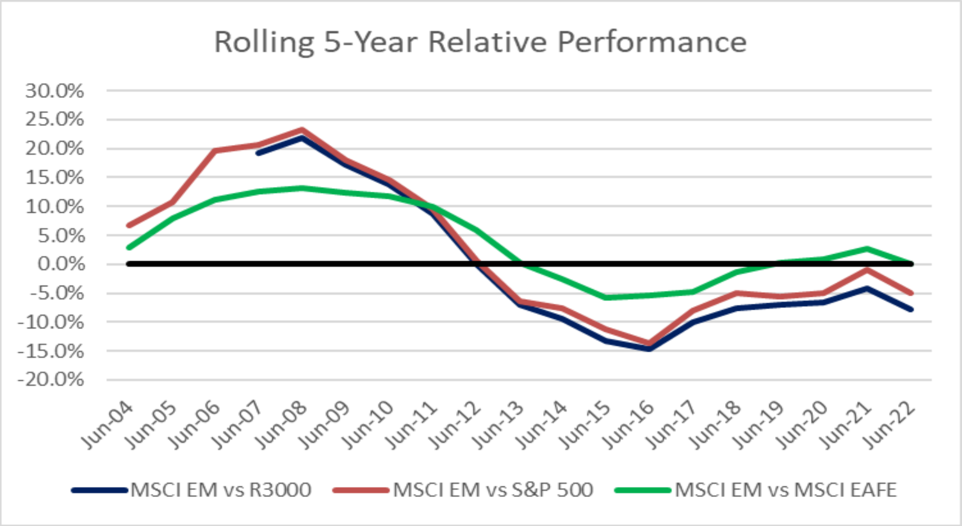
JUNE 2022 FRS ASSET ALLOCATION REVIEW

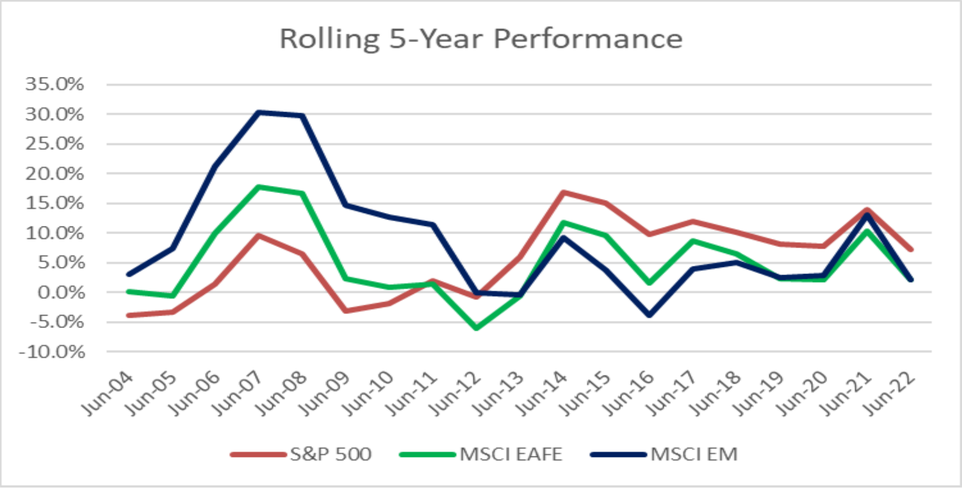




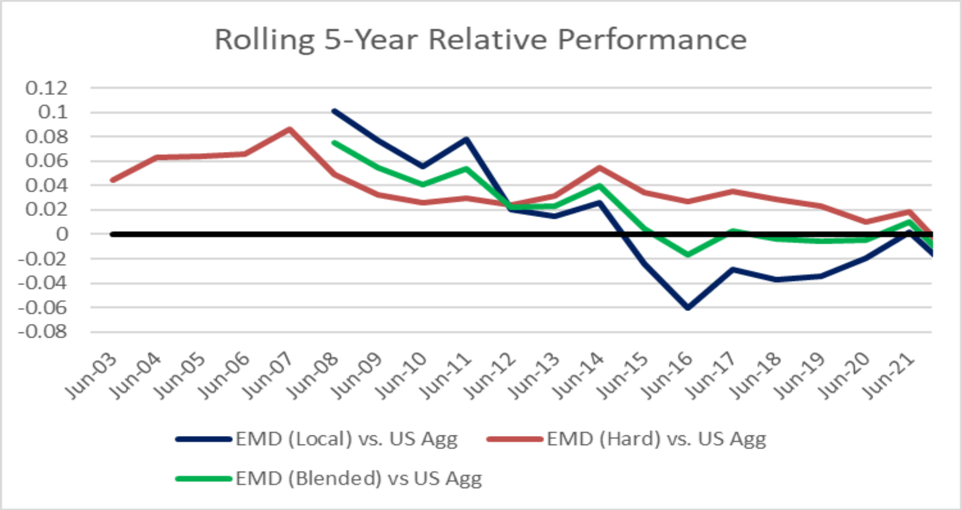
[1]Markets weights determined by MSCI ACWI IMI as of June 30, 2022.

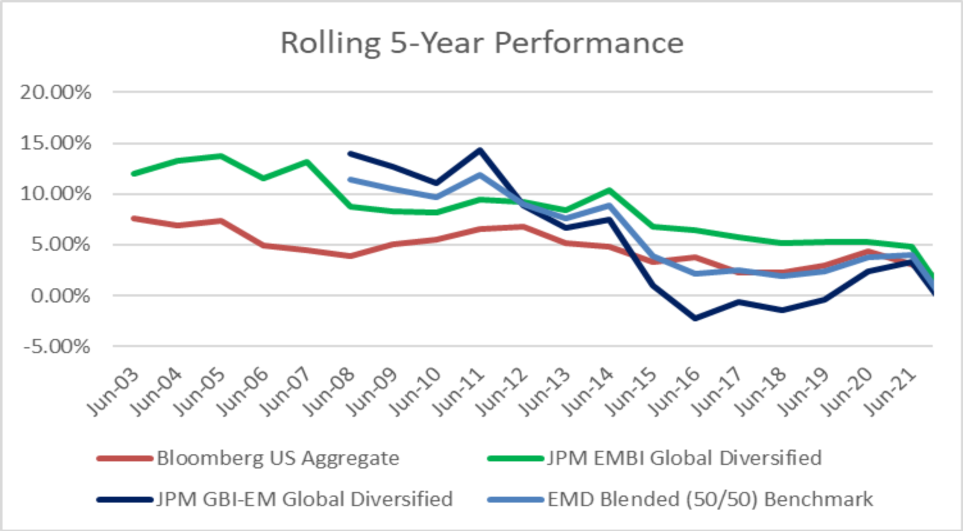
JUNE 2022 FRS ASSET ALLOCATION REVIEW





JUNE 2022 FRS ASSET ALLOCATION REVIEW





JUNE 2022 FRS FIXED INCOME REVIEW

Asset Class	FRS	MERS	MPERS	Parochial
Core Bonds	18.0%	20.0%	11.5%	6.2%
US TIPS	3.0%	7.0%	--	--
Emerging Market Debt	5.0%	--	4.5%	4.9%
High Yield	--	--	1.5%	--
Bank Loans	--	--	1.5%	--
Global Multi-Sector Fixed Income	--	11.0%	11.5%	13.6%
Asset-Backed SMA				4.0%
Total Fixed Income	**26.0%**	**38.0%**	**30.5%**	**28.7%**

JUNE 2022 FRS FIXED INCOME REVIEW

Asset Class	Current Policy Target	Mix A	Mix B
Core Bonds	69.2%	69.2%	69.2%
US TIPS	11.5%	11.5%	11.5%
Emerging Market Debt (Blended)	19.2%	9.6%	--
High Yield	--	--	4.8%
Bank Loans	--	--	4.8%
Global Multi-Sector Fixed Income	--	9.6%	9.6%
Total Fixed Income	**100%**	**100%**	**100%**
10 Year Expected Return	***4.5%***	***4.3%***	***4.3%***
30 Year Expected Return	***4.5%***	***4.4%***	***4.4%***
Standard Deviation	***5.8%***	***5.6%***	***5.2%***

[1]Emerging Market Debt (Blended) is modeled as 1/2 emerging markets debt (local), 1/2 emerging markets debt (external)

MACROECONOMIC

INFLATION ASSUMPTIONS

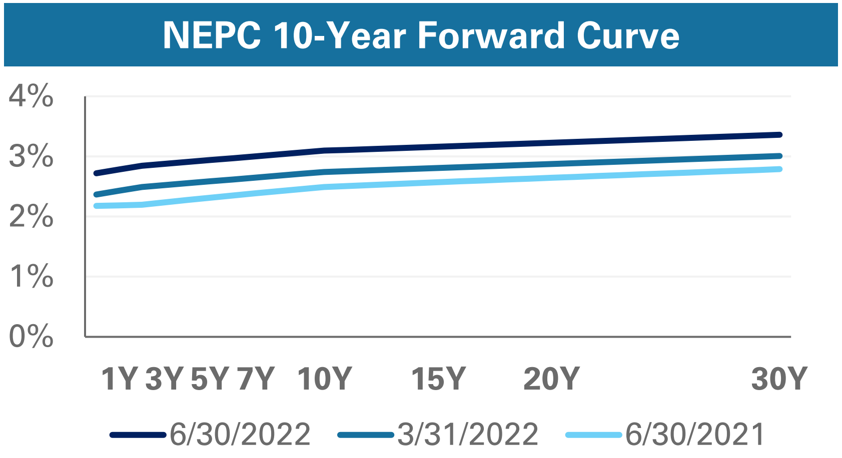
OVERVIEW

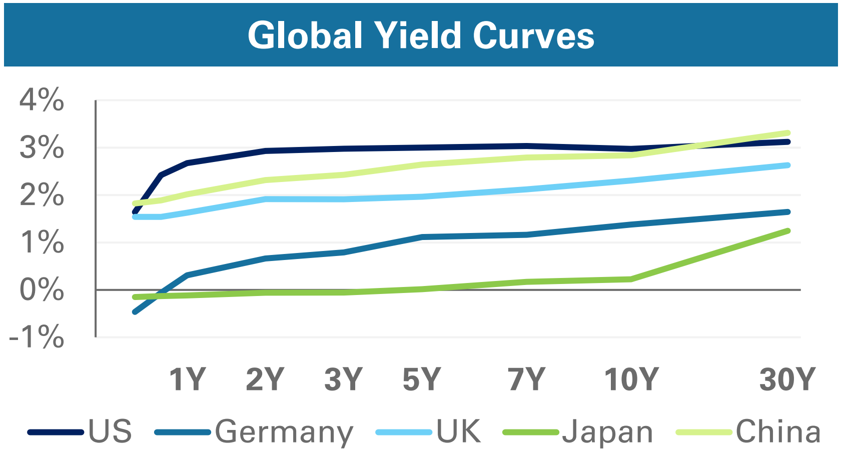
- **Inflation is a key building block to develop asset class assumptions**
- **Inflation assumptions are model-driven and informed by multiple inputs for both the U.S. and global assets**
  - Includes forecasts from international organizations (e.g. IMF), local consumer and producer price indices, global interest rate curves, and break-even inflation expectations
- **NEPC's U.S. expectations reflect stickier inflation over the near-term, but a stable inflation outlook over the long-term**
  - We anticipate continued volatility among inflation measures as market-based inflation expectations diverge from current consumer inflation metrics

Region	10-Year Inflation Assumption	30-Year Inflation Assumption
United States	2.4%	2.5%

GLOBAL INTEREST RATE
EXPECTATIONS

- **Real yields are materially higher, reflecting the transition to a tighter policy environment**
  - Higher real rates support returns for all assets in the long-term
- **The transition to tighter Fed policy has lifted bond yield forecasts**
- **The outlook is relatively poor for Non-U.S. developed markets due to the nominal yield differential**
- **Emerging market real rates and nominal interest rates are higher relative to the developed world**





Sources: FactSet, NEPC

PUBLIC EQUITY

PUBLIC EQUITY ASSUMPTIONS

OVERVIEW

- **Valuation multiples underlying the equity return assumptions have moved lower to reflect the increase in long-term interest rates**
- **Equity valuation multiples are sensitive to higher interest rates, though inflation can positively impact nominal revenue growth**
- **We recommend strategic asset allocation targets for emerging market equity reflect an overweight compared to the MSCI ACWI IMI**
  - The return assumption for emerging equity is highest among public equity and we recommend using non-U.S. developed equity as the funding source
- **NEPC encourages a strategic bias to small-cap with the use of active management relative to small-cap exposure in the MSCI ACWI IMI**

PUBLIC EQUITY ASSUMPTIONS

BUILDING BLOCKS

Illiquidity Premium	The return expected for assets with illiquidity risk
Valuation	Represents P/E multiple contraction or expansion relative to long-term trend
Inflation	Market-specific inflation based on country-level revenue exposure
Real Earnings Growth	Market-specific real growth based on a weighted-average of country revenue exposure and GDP growth
Dividend Yield	Income distributed to shareholders adjusted to reflect market trends

Asset Class	06/30/22 10-Yr Return	12-Month Change
U.S. Large-Cap Equity	5.8%	+0.9%
U.S. Small/Mid-Cap Equity	7.2%	+2.2%
U.S. Microcap Equity	8.0%	+2.7%
Non-U.S. Developed Equity	6.4%	+1.2%
Non-U.S. Developed Small-Cap Equity	7.4%	+2.1%
Emerging Market Equity	9.6%	+2.2%
Emerging Market Small-Cap Equity	9.3%	+1.5%
China Equity	9.4%	+2.2%
Hedge Fund - Equity	5.5%	+1.4%
Global Equity*	6.8%	+1.2%
Private Equity*	9.8%	+0.9%

Source: NEPC

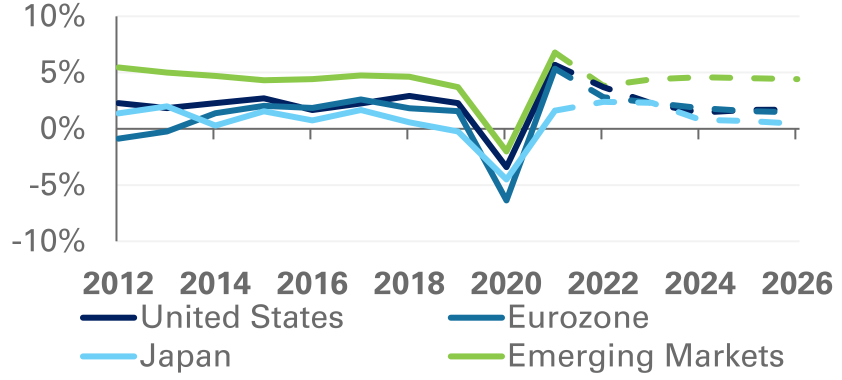
*Calculated as a blend of other asset classes

PUBLIC EQUITY

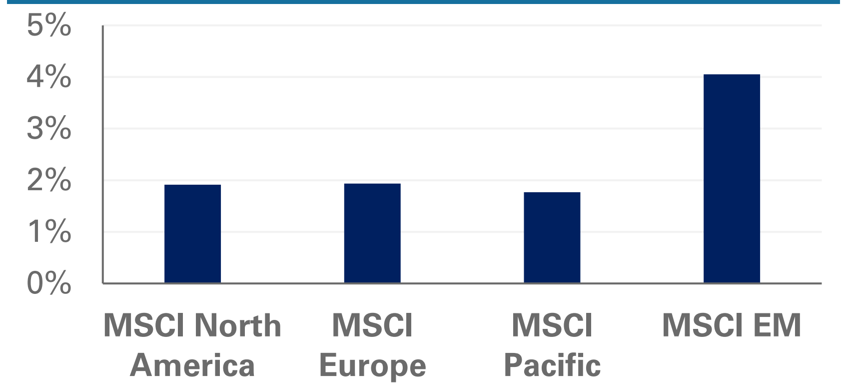
REAL EARNINGS GROWTH

- **Global growth rates have slowed from recent highs**
- **Regions reliant on revenue from emerging markets are forecasted to enjoy higher earnings growth**
  - Non-U.S. stocks benefit from a greater portion of revenue from EM than U.S. stocks
- **We expect elevated real earnings growth for small-caps over the long-term relative to large-cap**
  - Over the long-term we expect a forward-looking risk premium for small-cap and mid-cap equities relative to large-cap stocks

Real GDP Growth Projections

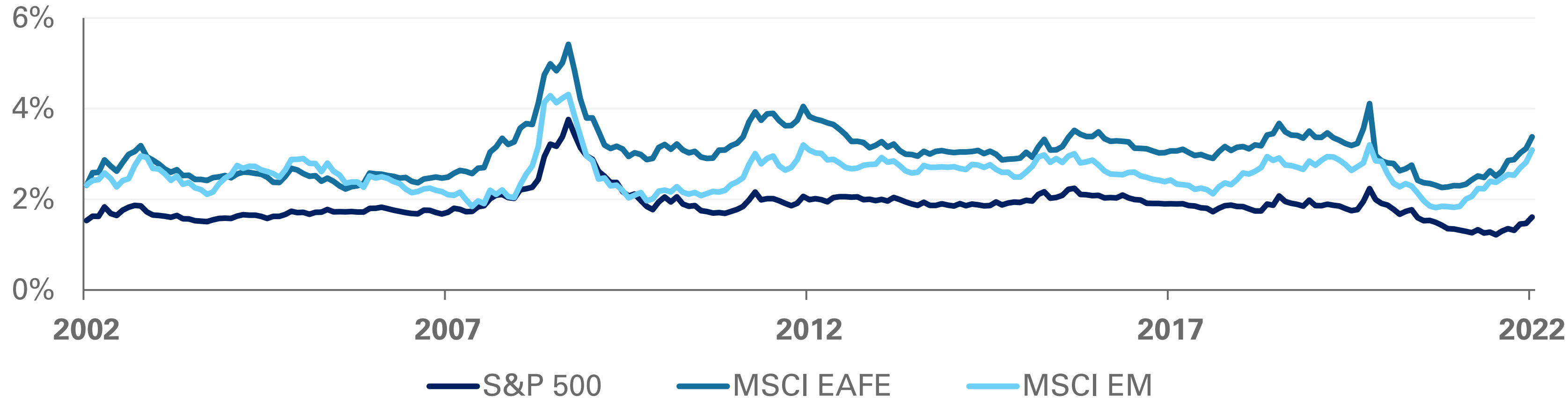


Expected 5-Year Real Growth

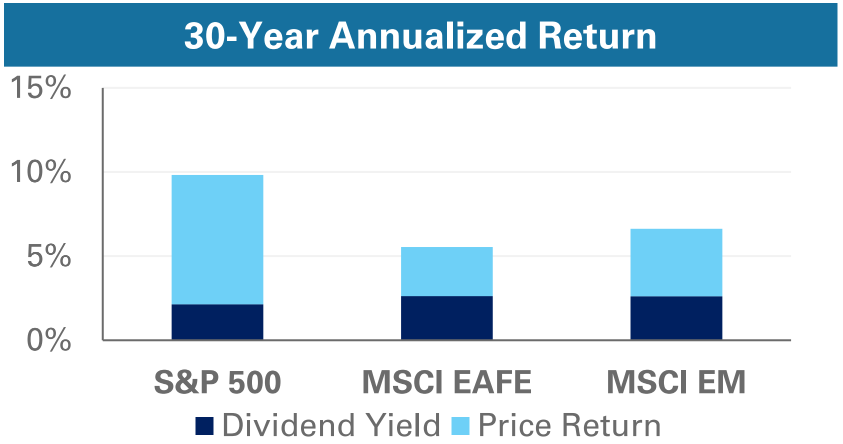


Sources: IMF, MSCI, FactSet, NEPC

PUBLIC EQUITY
DIVIDEND YIELD



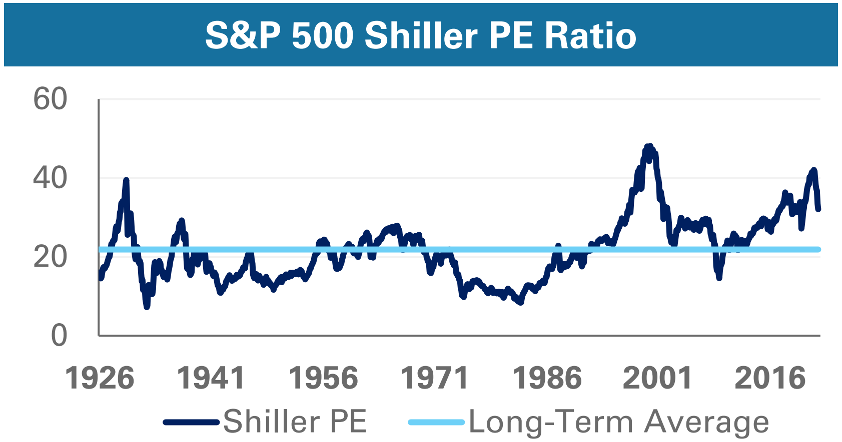
- **Non-U.S. equities provide higher dividend yields relative to the U.S. over the long-term**
  - Terminal value dividend yield inputs for MSCI EM and EAFE are 2.5% and 3.0%
  - Terminal value dividend yield input for S&P 500 is 2.50%

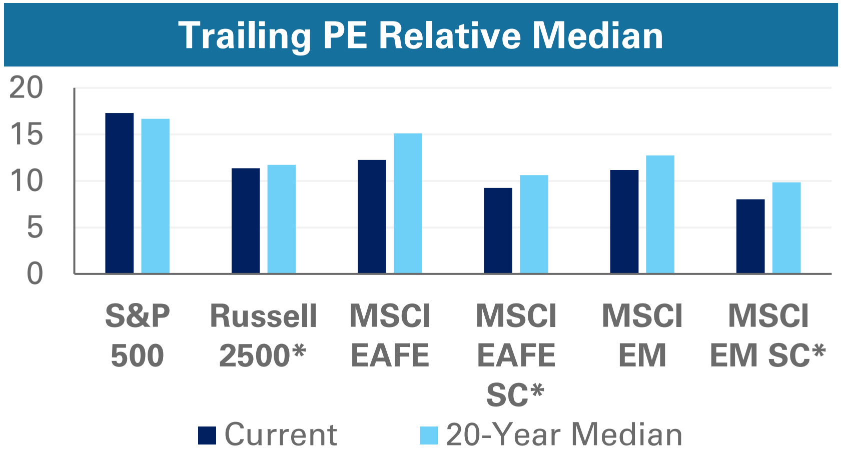


Sources: S&P, MSCI, FactSet

PUBLIC EQUITY
VALUATION

- **U.S. stock valuations are elevated relative to long-term averages**
- **P/E terminal value inputs have been adjusted lower to reflect the impact of higher nominal interest rates**
- **EAFE P/E inputs reflect more subdued market sentiment levels**
- **Emerging market stocks offer an elevated total return opportunity relative to developed markets**



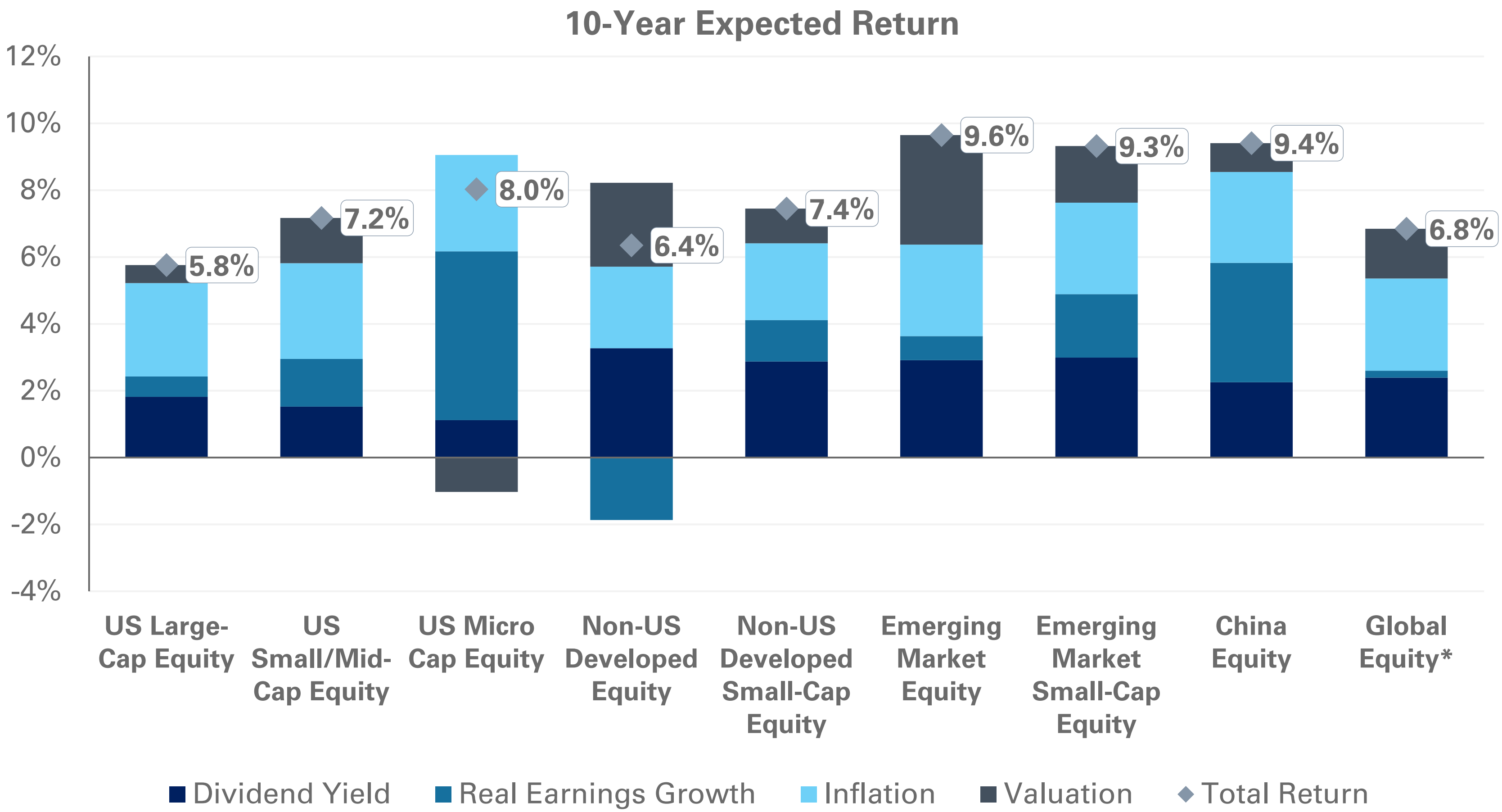


Sources: S&P, Shiller, Russell, MSCI, FactSet, NEPC; Shiller PE long-term average beginning in 1926

Note: *Small cap indices valuations based on EV/EBITDA multiples; MSCI EM Small Cap median calculated since 3/31/2003

PUBLIC EQUITY

BUILDING BLOCKS



Source: NEPC

*Calculated as a blend of other classes

FIXED INCOME

FIXED INCOME ASSUMPTIONS

OVERVIEW

- **Fixed income return assumptions reflect a transition to tighter monetary policy to offset ongoing inflationary pressures**

- **NEPC remains committed to a dedicated Treasury allocation given the upward movement in interest rates and return expectations**

- **Safe-haven fixed income exposure will differ by investor objective**
  - The fixed income asset-type and duration profile should reflect portfolio objectives, asset-liability glide path, and desire for capital efficiency

- **The use of return-seeking credit investments requires a more dynamic posture to manage shifts in credit spreads and market cycles**

FIXED INCOME ASSUMPTIONS

BUILDING BLOCKS

Illiquidity Premium	The return expected for assets with illiquidity risk
Government Rates Price Change	Change due to shifts in current yields relative to forecasted rates
Credit Deterioration	The average loss for credit assets due to defaults and recovery rates
Spread Price Change	Valuation change due to changes in credit spreads relative to long-term targets
Credit Spread	Yield premium provided by securities with credit risk
Government Rates	The yield attributed to sovereign bonds that do not have credit risk

Asset Class	06/30/22 10-Yr Return	12-Month Change
U.S. TIPS	3.0%	+1.5%
U.S. Treasury Bond	3.2%	+1.8%
U.S. Corporate Bond	5.2%	+2.6%
U.S. MBS	3.4%	+1.7%
U.S. High Yield Corporate	6.9%	+3.8%
U.S. Leveraged Loan	6.6%	+2.2%
EMD External Debt	7.3%	+3.6%
EMD Local Currency Debt	6.9%	+1.1%
Non-U.S. Govt. Bond	2.1%	+1.1%
U.S. Muni Bond (1-10 Year)	3.0%	+1.8%
U.S. High Yield Muni Bond	5.0%	+2.8%
Hedge Fund – Credit	6.5%	+2.4%
U.S. Aggregate Bond*	3.8%	+1.9%
Private Debt*	8.0%	+1.6%

Source: NEPC

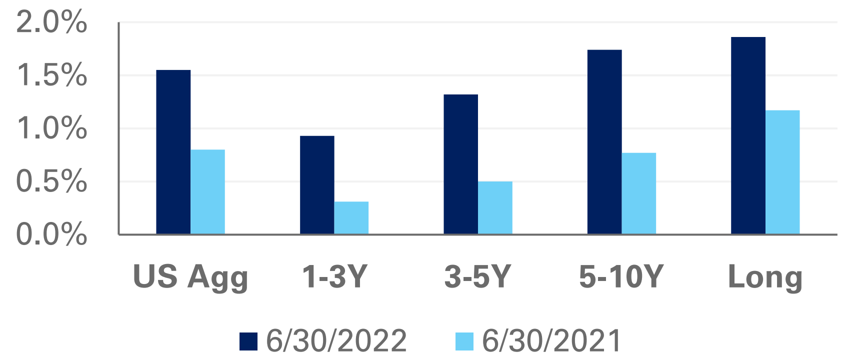
*Calculated as a blend of other asset classes

FIXED INCOME

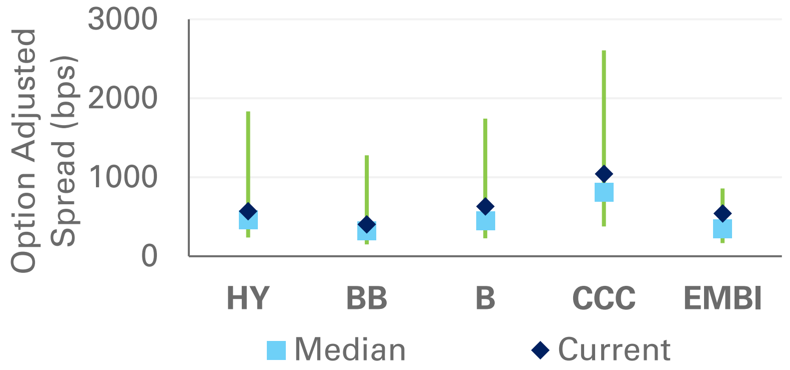
CREDIT SPREADS

- **Credit spreads have increased and are above median levels**
- **Higher credit spread levels raise future return expectations**
- **Credit spread assumptions reflect potential disruption**
  - With a record number of BBB-rated corporates, fallen angel downgrades are a greater risk
- **Default and recovery rates are informed by long-term history**

U.S. Corporate OAS by Maturity



Return-Seeking Credit Spreads

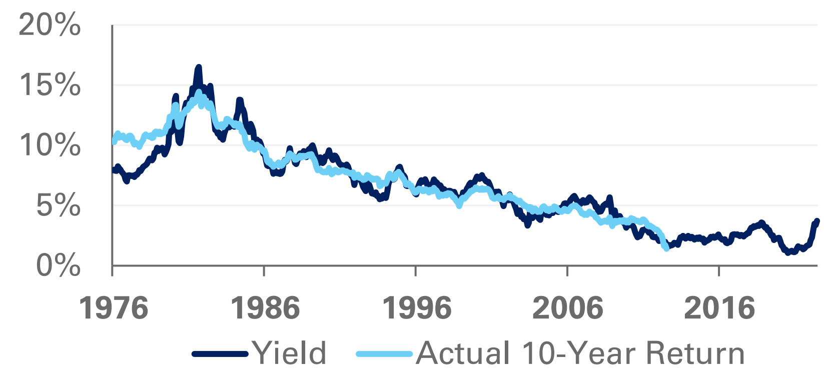


Sources: Barclays, JPM, FactSet, NEPC; Spread medians as of 12/31/2000

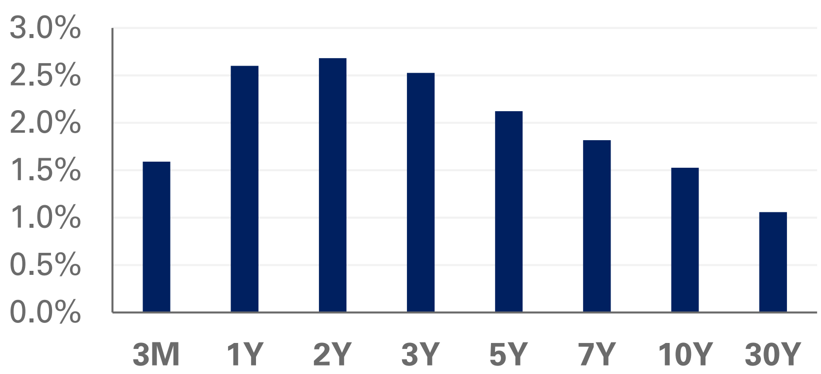
FIXED INCOME
GOVERNMENT RATES

- **Government rates price change reflects shifts in interest rates, the yield curve, and roll down**
  - Roll down refers to the price change due to the aging of a bond along the yield curve
- **Expectations for rising rates are a headwind for return expectations**
  - However, higher interest rates boost the long-term return due to the increased yield benefit
- **A steeper yield curve relative to forward interest rates can offer relief from rising rates**

Barclays U.S. Aggregate Bond

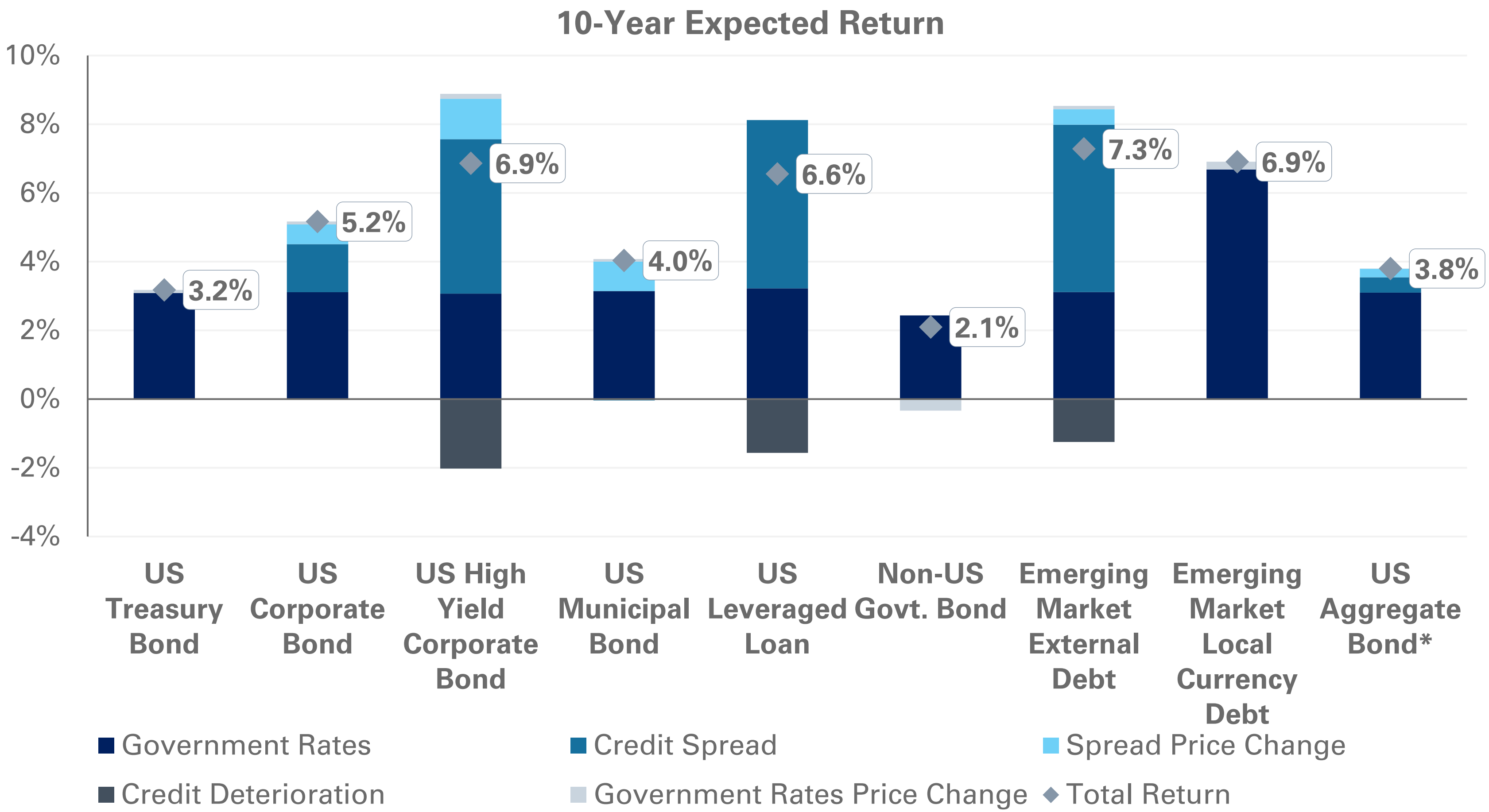


Annual Change in Treasury Yields



Sources: Barclays, FactSet, NEPC

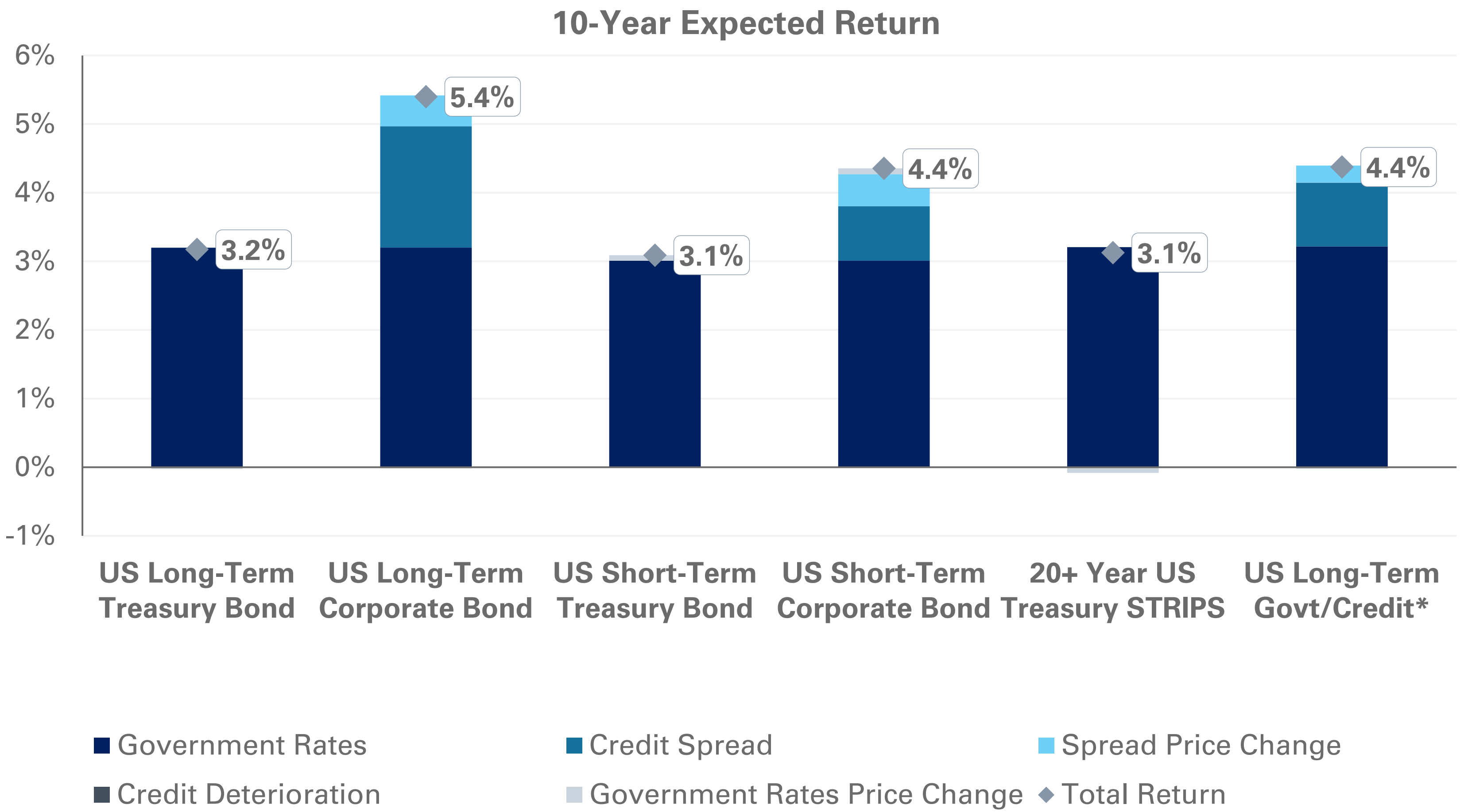
FIXED INCOME
BUILDING BLOCKS



Source: NEPC

*Calculated as a blend of other classes

FIXED INCOME
BUILDING BLOCKS



Source: NEPC
*Calculated as a blend of other classes

REAL ASSET

REAL ASSET ASSUMPTIONS

OVERVIEW

- **The strategic outlook for real assets reflects a high level of uncertainty due to the elevated near-term inflation environment**
- **Real assets offer a meaningful portfolio diversification benefit, but are sensitive to a wide range of potential inflation scenarios**
- **Real assets exhibit different betas to inflation and each asset class is exposed to various economic factors**
  - Diversification and correlation benefits are helpful to a portfolio but must be carefully considered relative to the expected risk premium
- **Inflation-sensitivity and portfolio objectives influence an investor's strategic allocation to real assets**
  - We recommend private markets to meet strategic real asset allocation targets
  - Relative to portfolio objectives, we prefer the use of public market strategies to mitigate short-term inflation risks

REAL ASSET ASSUMPTIONS

BUILDING BLOCKS

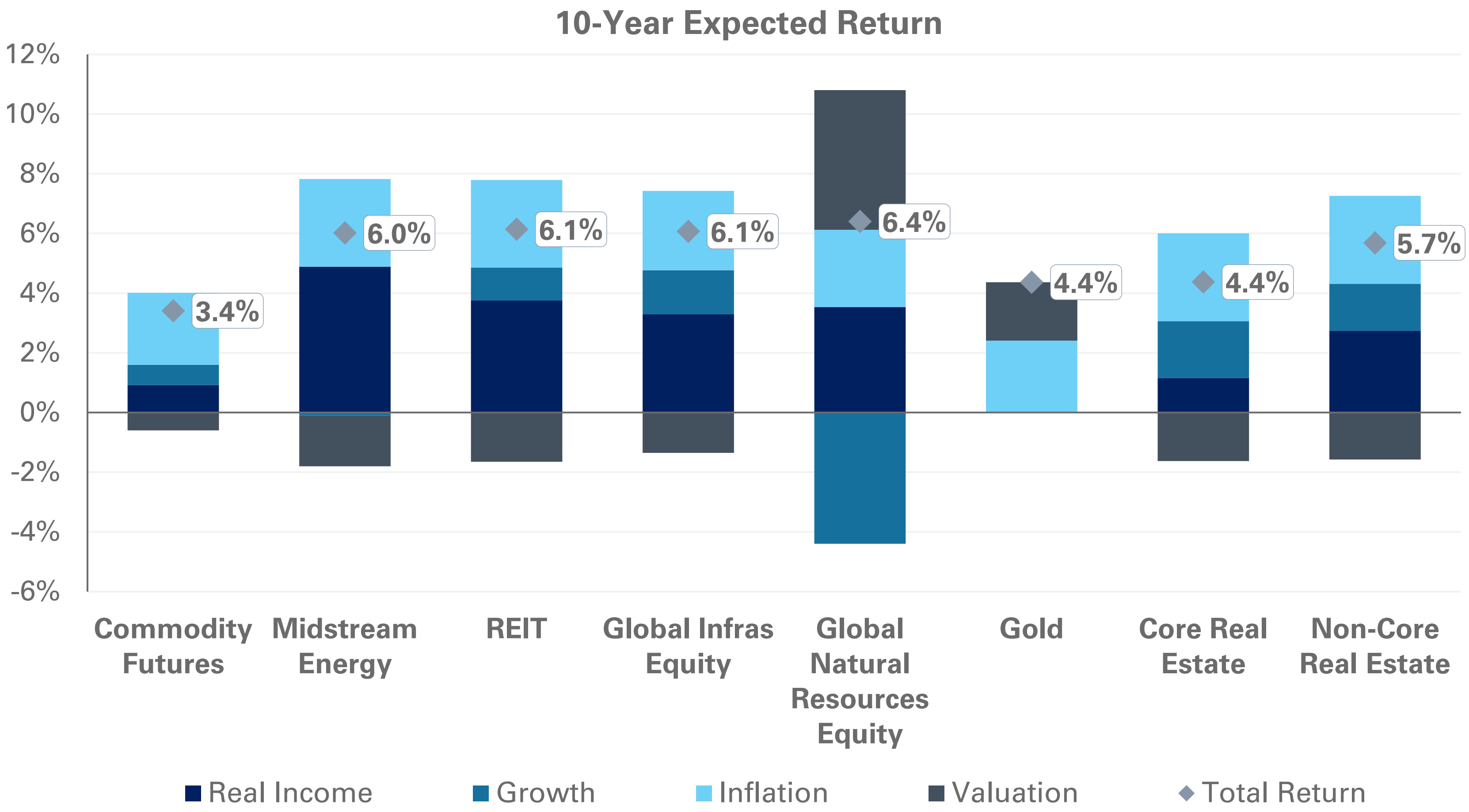
Illiquidity Premium	The return expected for assets with illiquidity risk
Valuation	The change in price of the asset moving to a terminal value or real average level
Inflation	Based on the inflation path as defined by breakeven-inflation rates and NEPC assumptions
Growth	Market-specific real growth based on a weighted-average of country-level revenue exposure and GDP growth
Real Income	The inflation-adjusted income produced by the asset

Asset Class	06/30/22 10-Yr Return	12-Month Change
Commodity Futures	3.4%	+2.1%
Midstream Energy	6.0%	-0.3%
REIT	6.1%	+1.4%
Global Infrastructure Equity	6.1%	+0.4%
Global Natural Resources Equity	6.4%	+1.0%
Gold	4.4%	+1.0%
Real Estate - Core	4.4%	-0.4%
Real Estate – Non-Core	5.7%	-0.3%
Private Debt - Real Estate	5.3%	+0.8%
Private Real Assets - Natural Resources	7.9%	+0.7%
Private Real Assets - Infrastructure	6.1%	+0.7%

Source: NEPC

*Calculated as a blend of other asset classes

REAL ASSET
BUILDING BLOCKS

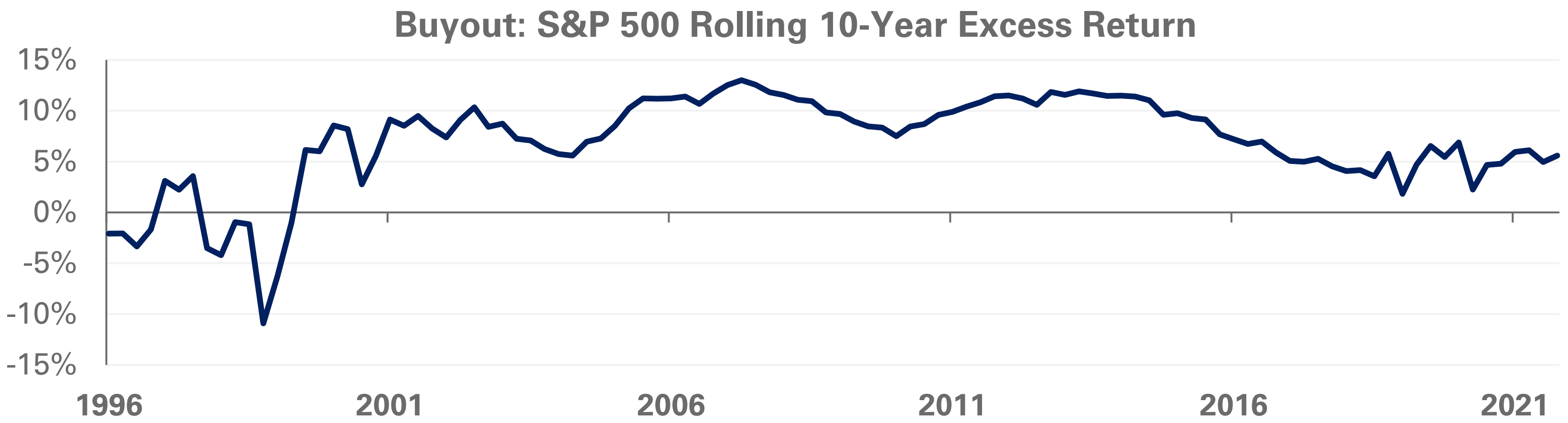


Source: NEPC

ALTERNATIVE ASSETS

ALTERNATIVE ASSETS

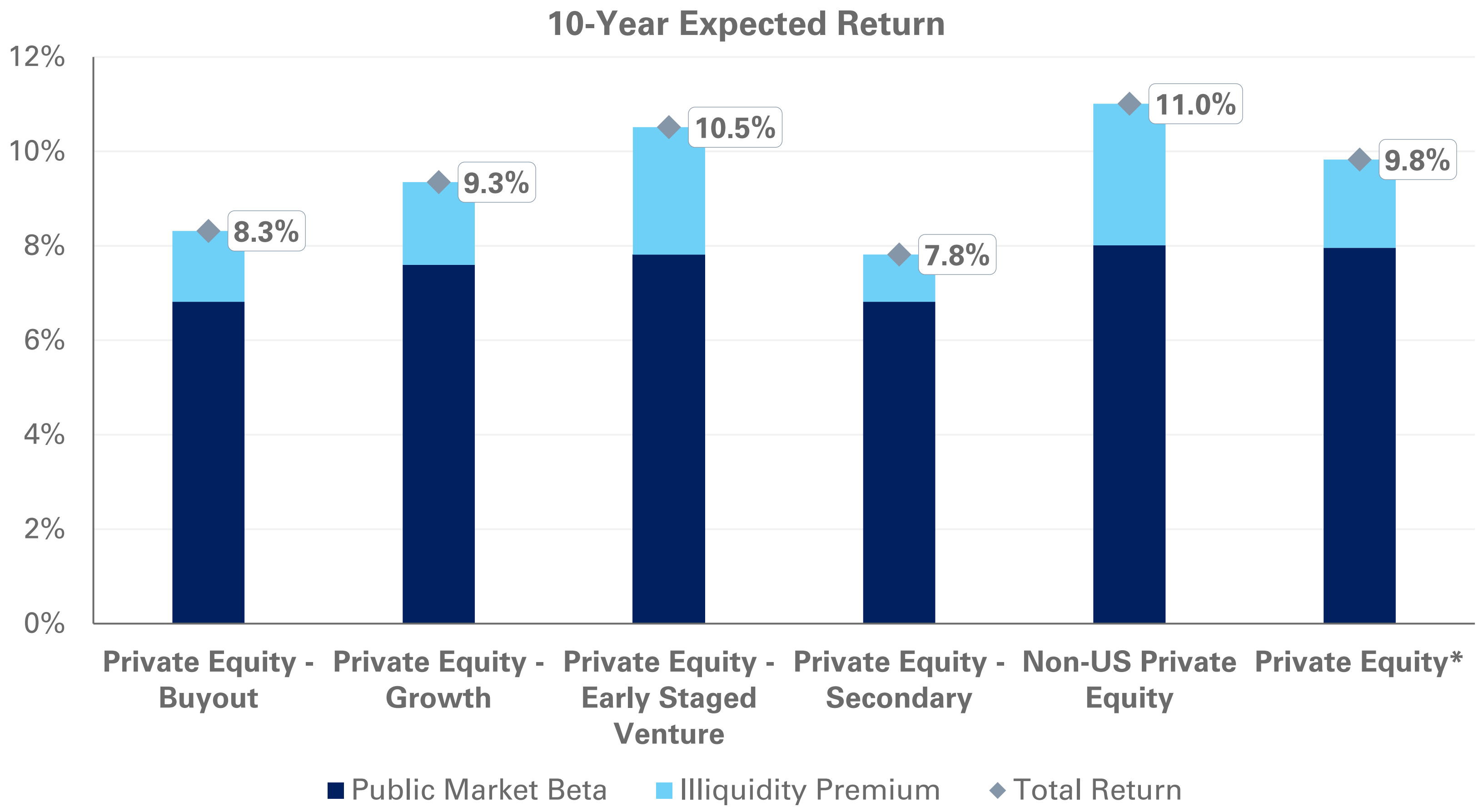
METHODOLOGY



- **Private market assumptions are constructed from betas to public markets with an added illiquidity premia**
  - Historically, the observed illiquidity premium has been a significant component driving private market returns

- **Hedge fund assumptions are constructed from betas to public markets with an added alpha assumption**

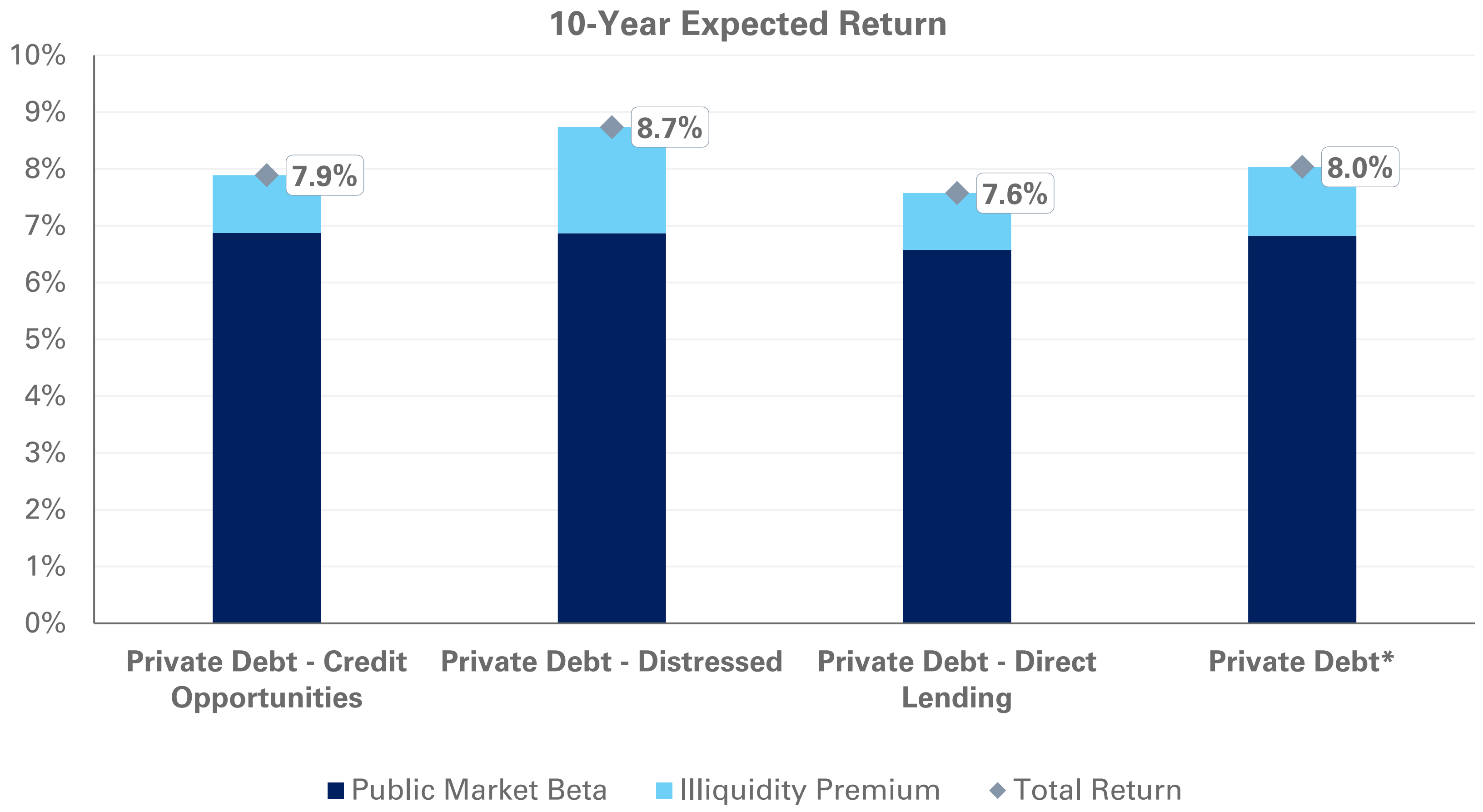
PRIVATE EQUITY
BUILDING BLOCKS



Source: NEPC

*Private Equity is a derived composite of 34% U.S. Buyout, 34% U.S. Growth, 8.5% U.S. Secondary, 8.5% U.S. Venture, 15% Non-U.S. PE

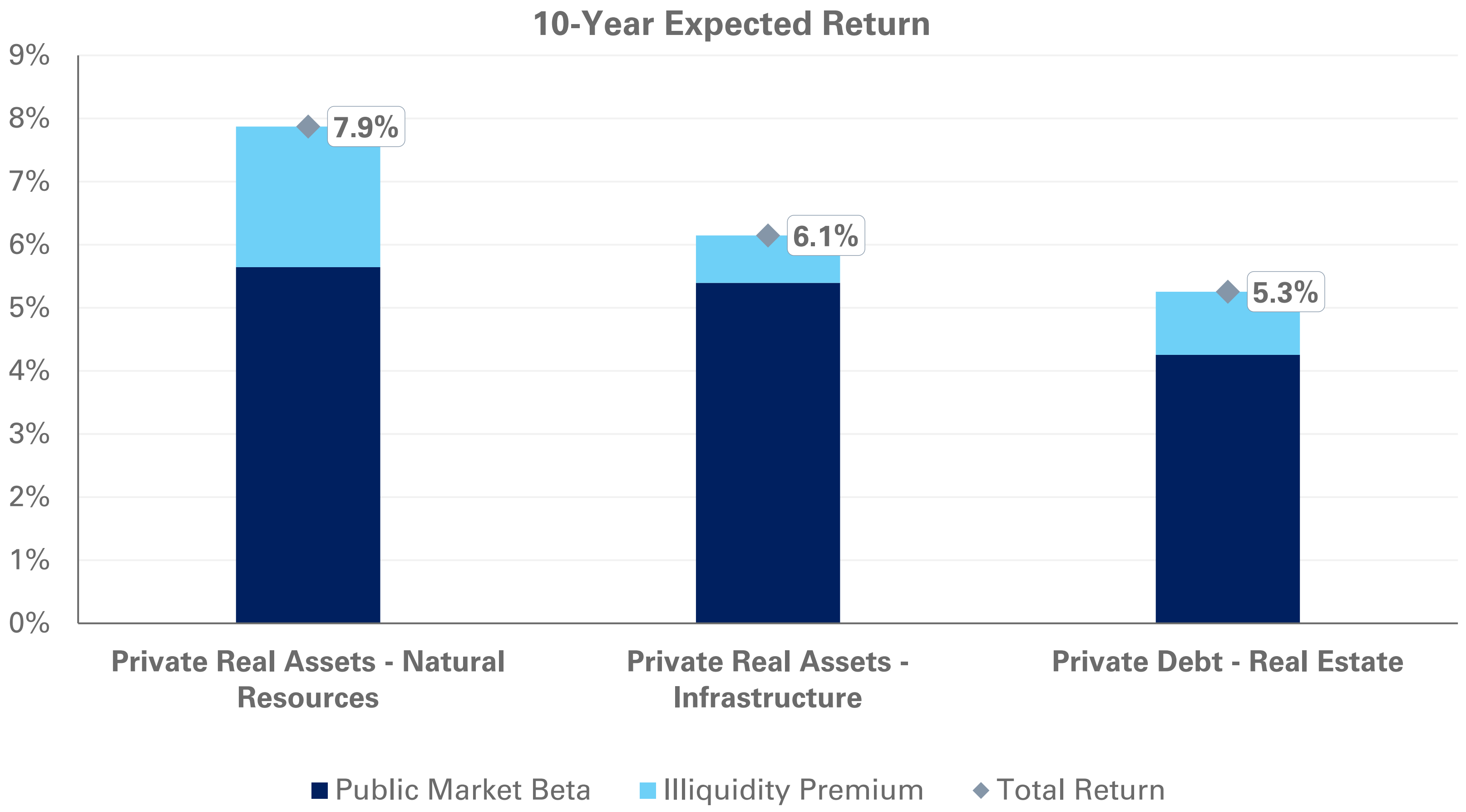
PRIVATE DEBT
BUILDING BLOCKS



Source: NEPC
*Private Debt is a derived composite of 25% Mezzanine, 25% Distressed, 50% Direct Lending

PRIVATE REAL ASSET

BUILDING BLOCKS



Source: NEPC

APPENDIX

10-YEAR RETURN FORECASTS

EQUITY

	Geometric Expected Return		
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
U.S. Large-Cap Equity	5.8%	4.9%	+0.9%
U.S. Small/Mid-Cap Equity	7.2%	5.0%	+2.2%
Non-U.S. Developed Equity	6.4%	5.2%	+1.2%
Non-U.S. Developed Equity (USD Hedge)	6.5%	5.4%	+1.1%
Non-U.S. Developed Small-Cap Equity	7.4%	5.3%	+2.1%
Emerging Market Equity	9.6%	7.4%	+2.2%
Emerging Market Small-Cap Equity	9.3%	7.8%	+1.5%
Hedge Fund - Equity	5.5%	4.1%	+1.4%
Private Equity - Buyout	8.3%	7.2%	+1.1%
Private Equity - Growth	9.3%	8.4%	+0.9%
Private Equity - Early Stage Venture	10.5%	9.8%	+0.7%
Private Equity - Secondary	7.8%	6.7%	+1.1%
Non-U.S. Private Equity	11.0%	10.3%	+0.7%
China Equity	9.4%	7.2%	+2.2%
U.S. Microcap Equity	8.0%	5.3%	+2.7%
Global Equity*	6.8%	5.6%	+1.2%
Private Equity*	9.8%	8.9%	+0.9%

*Calculated as a blend of other asset classes

10-YEAR RETURN FORECASTS

SAFE-HAVEN FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2022	06/30/2021	Delta
Cash	2.9%	1.2%	+1.7%
U.S. TIPS	3.0%	1.5%	+1.5%
U.S. Treasury Bond	3.2%	1.4%	+1.8%
U.S. Corporate Bond	5.2%	2.6%	+2.6%
U.S. Corporate Bond - AAA	4.3%	1.9%	+2.4%
U.S. Corporate Bond - AA	4.3%	2.1%	+2.2%
U.S. Corporate Bond - A	4.8%	2.4%	+2.4%
U.S. Corporate Bond - BBB	5.5%	2.8%	+2.7%
U.S. Mortgage-Backed Securities	3.4%	1.7%	+1.7%
U.S. Securitized Bond	4.1%	2.1%	+2.0%
U.S. Collateralized Loan Obligation	4.7%	2.9%	+1.8%
U.S. Municipal Bond	4.0%	1.5%	+2.5%
U.S. Municipal Bond (1-10 Year)	3.0%	1.2%	+1.8%
U.S. Taxable Municipal Bond	4.5%	1.9%	+2.6%

10-YEAR RETURN FORECASTS

SAFE-HAVEN FIXED INCOME

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
Non-US Government Bond	2.1%	1.0%	+1.1%
Non-US Government Bond (USD Hedge)	2.3%	1.2%	+1.1%
Non-US Inflation-Linked Bond (USD Hedge)	1.7%	0.6%	+1.1%
U.S. Short-Term TIPS (1-3 Year)	2.8%	1.2%	+1.6%
U.S. Short-Term Treasury Bond (1-3 Year)	3.1%	1.3%	+1.8%
U.S. Short-Term Corporate Bond (1-3 Year)	4.4%	2.2%	+2.2%
U.S. Intermediate-Term TIPS (3-10 Year)	3.1%	1.5%	+1.6%
U.S. Intermediate-Term Treasury Bond (3-10 Year)	3.2%	1.5%	+1.7%
U.S. Intermediate-Term Corporate Bond (3-10 Year)	5.3%	2.8%	+2.5%
U.S. Long-Term Treasury Bond (10-30 Year)	3.2%	1.4%	+1.8%
U.S. Long-Term TIPS (10-30 Year)	3.5%	1.6%	+1.9%
U.S. Long-Term Corporate Bond (10-30 Year)	5.4%	2.5%	+2.9%
20+ Year U.S. Treasury STRIPS	3.1%	1.1%	+2.0%
10 Year U.S. Treasury Bond	3.4%	1.7%	+1.7%
10 Year Non-U.S. Government Bond (USD Hedge)	1.4%	0.2%	+1.2%
U.S. Aggregate Bond*	3.8%	1.9%	+1.9%

*Calculated as a blend of other asset classes

10-YEAR RETURN FORECASTS

RETURN-SEEKING CREDIT

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
U.S. High Yield Corporate Bond	6.9%	3.1%	+3.8%
U.S. Corporate Bond - BB	7.2%	3.9%	+3.3%
U.S. Corporate Bond - B	7.4%	3.4%	+4.0%
U.S. Corporate Bond - CCC/Below	2.3%	-3.5%	+5.8%
U.S. Short-Term High Yield Corp Bond (1-3 Year)	5.5%	2.0%	+3.5%
U.S. Leveraged Loan	6.6%	4.4%	+2.2%
Emerging Market External Debt	7.3%	3.7%	+3.6%
Emerging Market Local Currency Debt	6.9%	5.8%	+1.1%
U.S. High Yield Securitized Bond	6.6%	3.0%	+3.6%
U.S. High Yield Collateralized Loan Obligation	7.3%	5.2%	+2.1%
U.S. High Yield Municipal Bond	5.0%	2.2%	+2.8%
Hedge Fund - Credit	6.5%	4.1%	+2.4%
Private Debt - Credit Opportunities	7.9%	6.3%	+1.6%
Private Debt - Distressed	8.7%	7.3%	+1.4%
Private Debt - Direct Lending	7.6%	5.9%	+1.7%
Private Debt*	8.0%	6.4%	+1.6%

*Calculated as a blend of other asset classes

10-YEAR RETURN FORECASTS

REAL ASSETS

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
Commodity Futures	3.4%	1.3%	+2.1%
Midstream Energy	6.0%	6.3%	-0.3%
REIT	6.1%	4.7%	+1.4%
Global Infrastructure Equity	6.1%	5.7%	+0.4%
Global Natural Resources Equity	6.4%	5.4%	+1.0%
Gold	4.4%	3.4%	+1.0%
Real Estate - Core	4.4%	4.8%	-0.4%
Real Estate - Non-Core	5.7%	6.0%	-0.3%
Private Debt - Real Estate	5.3%	4.5%	+0.8%
Private Real Assets - Natural Resources	7.9%	7.2%	+0.7%
Private Real Assets - Infrastructure	6.1%	5.4%	+0.7%

30-YEAR RETURN FORECASTS

EQUITY

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
U.S. Large-Cap Equity	6.9%	6.2%	+0.7%
U.S. Small/Mid-Cap Equity	7.5%	6.3%	+1.2%
Non-U.S. Developed Equity	7.0%	6.2%	+0.8%
Non-U.S. Developed Equity (USD Hedge)	7.2%	6.4%	+0.8%
Non-U.S. Developed Small-Cap Equity	7.8%	6.6%	+1.2%
Emerging Market Equity	9.5%	8.4%	+1.1%
Emerging Market Small-Cap Equity	9.6%	8.4%	+1.2%
Hedge Fund - Equity	5.9%	5.2%	+0.7%
Private Equity - Buyout	8.9%	8.4%	+0.5%
Private Equity - Growth	9.9%	9.6%	+0.3%
Private Equity - Early Stage Venture	10.7%	10.5%	+0.2%
Private Equity - Secondary	8.3%	7.9%	+0.4%
Non-U.S. Private Equity	11.0%	10.6%	+0.4%
China Equity	9.3%	7.9%	+1.4%
U.S. Microcap Equity	8.4%	7.0%	+1.4%
Global Equity*	7.7%	6.8%	+0.9%
Private Equity*	10.3%	9.9%	+0.4%

*Calculated as a blend of other asset classes

30-YEAR RETURN FORECASTS

SAFE-HAVEN FIXED INCOME

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
Cash	2.9%	2.3%	+0.6%
U.S. TIPS	3.6%	2.7%	+0.9%
U.S. Treasury Bond	3.4%	2.6%	+0.8%
U.S. Corporate Bond	5.3%	4.2%	+1.1%
U.S. Corporate Bond - AAA	4.4%	3.3%	+1.1%
U.S. Corporate Bond - AA	4.4%	3.4%	+1.0%
U.S. Corporate Bond - A	4.8%	3.8%	+1.0%
U.S. Corporate Bond - BBB	5.5%	4.3%	+1.2%
U.S. Mortgage-Backed Securities	3.7%	2.8%	+0.9%
U.S. Securitized Bond	4.5%	3.6%	+0.9%
U.S. Collateralized Loan Obligation	4.6%	4.0%	+0.6%
U.S. Municipal Bond	3.5%	2.5%	+1.0%
U.S. Municipal Bond (1-10 Year)	3.1%	2.4%	+0.7%
U.S. Taxable Municipal Bond	5.2%	3.6%	+1.6%

30-YEAR RETURN FORECASTS

SAFE-HAVEN FIXED INCOME

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
Non-US Government Bond	2.8%	1.9%	+0.9%
Non-US Government Bond (USD Hedge)	3.0%	2.2%	+0.8%
Non-US Inflation-Linked Bond (USD Hedge)	2.6%	1.5%	+1.1%
U.S. Short-Term TIPS (1-3 Year)	3.2%	2.5%	+0.7%
U.S. Short-Term Treasury Bond (1-3 Year)	3.2%	2.4%	+0.8%
U.S. Short-Term Corporate Bond (1-3 Year)	4.3%	3.4%	+0.9%
U.S. Intermediate-Term TIPS (3-10 Year)	3.7%	2.8%	+0.9%
U.S. Intermediate-Term Treasury Bond (3-10 Year)	3.6%	2.8%	+0.8%
U.S. Intermediate-Term Corporate Bond (3-10 Year)	5.4%	4.4%	+1.0%
U.S. Long-Term Treasury Bond (10-30 Year)	3.4%	2.5%	+0.9%
U.S. Long-Term TIPS (10-30 Year)	3.8%	2.5%	+1.3%
U.S. Long-Term Corporate Bond (10-30 Year)	5.5%	4.2%	+1.3%
20+ Year U.S. Treasury STRIPS	3.3%	2.2%	+1.1%
10 Year U.S. Treasury Bond	3.9%	3.1%	+0.8%
10 Year Non-U.S. Government Bond (USD Hedge)	2.5%	1.4%	+1.1%
U.S. Aggregate Bond*	4.0%	3.2%	+0.8%

*Calculated as a blend of other asset classes

30-YEAR RETURN FORECASTS

RETURN-SEEKING CREDIT

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
U.S. High Yield Corporate Bond	6.9%	5.4%	+1.5%
U.S. Corporate Bond - BB	7.3%	6.0%	+1.3%
U.S. Corporate Bond - B	7.0%	5.4%	+1.6%
U.S. Corporate Bond - CCC/Below	1.7%	-0.5%	+2.2%
U.S. Short-Term High Yield Corp Bond (1-3 Year)	5.0%	3.6%	+1.4%
U.S. Leveraged Loan	6.3%	5.5%	+0.8%
Emerging Market External Debt	6.5%	5.1%	+1.4%
Emerging Market Local Currency Debt	5.9%	5.4%	+0.5%
U.S. High Yield Securitized Bond	6.8%	5.3%	+1.5%
U.S. High Yield Collateralized Loan Obligation	7.1%	6.4%	+0.7%
U.S. High Yield Municipal Bond	5.2%	4.0%	+1.2%
Hedge Fund - Credit	6.6%	5.7%	+0.9%
Private Debt - Credit Opportunities	8.1%	7.2%	+0.9%
Private Debt - Distressed	9.1%	8.1%	+1.0%
Private Debt - Direct Lending	8.6%	7.8%	+0.8%
Private Debt*	8.7%	7.8%	+0.9%

*Calculated as a blend of other asset classes

30-YEAR RETURN FORECASTS

REAL ASSETS

Geometric Expected Return			
Asset Class	**06/30/2022**	**06/30/2021**	**Delta**
Commodity Futures	3.3%	3.5%	-0.2%
Midstream Energy	6.7%	6.5%	+0.2%
REIT	7.3%	6.5%	+0.8%
Global Infrastructure Equity	6.7%	6.4%	+0.3%
Global Natural Resources Equity	6.7%	6.5%	+0.2%
Gold	4.4%	4.1%	+0.3%
Real Estate - Core	5.2%	5.6%	-0.4%
Real Estate - Non-Core	6.7%	7.0%	-0.3%
Private Debt - Real Estate	5.7%	5.4%	+0.3%
Private Real Assets - Natural Resources	8.4%	8.1%	+0.3%
Private Real Assets - Infrastructure	6.8%	6.5%	+0.3%

PRIVATE MARKETS COMPOSITES

PUBLIC MARKET BETA INPUTS FOR PRIVATE MARKETS

PRIVATE EQUITY

Buyout: 25% U.S. Large Cap, 75% U.S. Small/Mid Cap

Secondary: 25% U.S. Large Cap, 75% U.S. Small/Mid Cap

Growth: 50% U.S. Small/Mid Cap, 50% U.S. Microcap

Early-Stage Venture: 25% U.S. Small/Mid Cap, 75% U.S. Microcap

Non-U.S.: 70% International Small Cap, 30% Emerging Small Cap

Composite: 34% Buyout, 34% Growth, 15 % Non-U.S., 8.5% Secondary, 8.5% Early Venture

PRIVATE DEBT

Direct Lending: 100% Bank Loans

Distressed: 20% U.S. Small/Mid Cap, 60% U.S. High Yield, 20% Bank Loans

Credit Opportunities: 34% U.S. SMID Cap, 33% U.S. High Yield, 33% Bank Loans

Composite: 50% Direct Lending, 25% Credit Opportunities, 25% Distressed

PRIVATE REAL ASSETS

Energy: 30% Comm., 35% Midstream, 35% Public Resource Equity

Infra/Land: 30% Commodities, 70% Public Infrastructure

Private Real Estate Debt: 50% CMBS, 50% Real Estate - Core

INFORMATION DISCLAIMER

Past performance is no guarantee of future results.

The goal of this report is to provide a basis for substantiating asset allocation recommendations. The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.

Information on market indices was provided by sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.

All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.

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