



# KEY MARKET THEMES AND ASSUMPTIONS

SAN BERNARDINO COUNTY  
EMPLOYEES' RETIREMENT  
ASSOCIATION

APRIL 11, 2024

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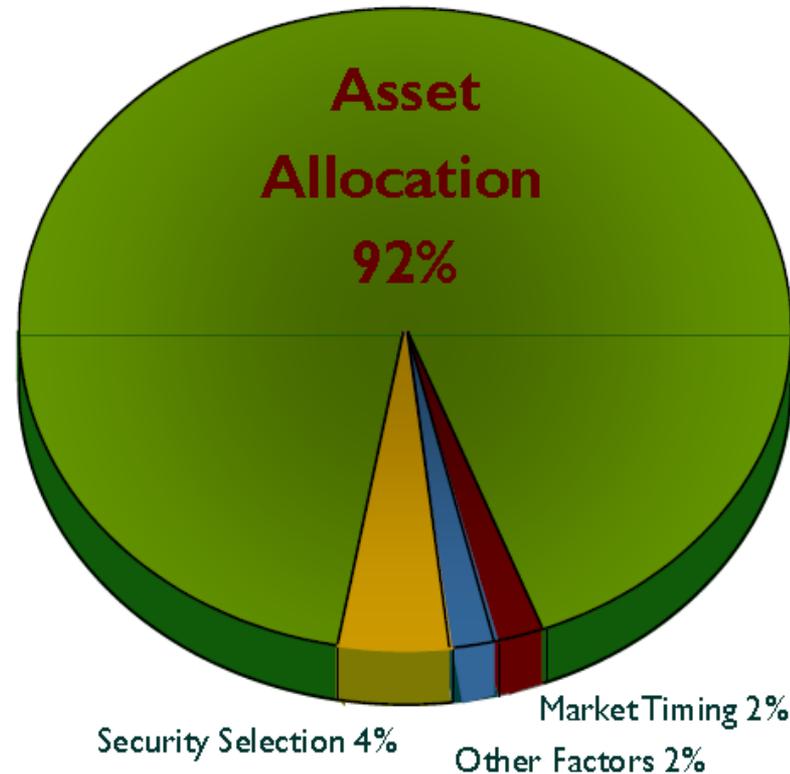


# TODAY'S AGENDA

- **Review of NEPC's asset class forecasting process**
- **Discussion of the Key Investment Themes that NEPC expects to impact capital markets**

# ASSET ALLOCATION: THE KEY INVESTMENT DECISION

## Determinants of Portfolio Performance



Source: *Determinants of Portfolio Performance II: An Update*, Brinson, et al, *Financial Analysts Journal*, May/June 1991, pp 40-48.

# ASSET CLASS ASSUMPTIONS

## OVERVIEW

- **NEPC's capital market assumptions are available each quarter and reflect December 31, 2023 market data**
- **Valuation expansion weighed on forward-looking return expectations for global equity markets**
- **Interest rate volatility persisted; forward rate and inflation expectations appear suppressed relative to the resilient U.S. economic backdrop**
- **NEPC remains biased to a higher interest rate and stickier inflation environment than current market pricing**

# 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 12/31/2023**
  - 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 15<sup>th</sup> 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	12/31/23 10-Year Return	12/31/22 10-Year Return	Delta
	Cash	3.9%	4.0%	-0.1%
	U.S. Inflation	2.6%	2.5%	+0.1%
Equity	U.S. Large-Cap Equity	4.4%	5.4%	-1.0%
	Non-U.S. Developed Equity	4.6%	5.6%	-1.0%
	Emerging Market Equity	8.6%	9.6%	-1.0%
	Global Equity*	5.4%	6.3%	-0.9%
	Private Equity*	9.0%	9.2%	-0.2%
Fixed Income	U.S. Treasury Bond	4.2%	4.2%	-
	U.S. Municipal Bond	3.5%	4.4%	-0.9%
	U.S. Aggregate Bond*	4.6%	4.8%	-0.2%
	U.S. TIPS	4.6%	4.4%	+0.2%
	U.S. High Yield Corporate Bond	6.1%	7.1%	-1.0%
	Private Debt*	8.3%	8.8%	-0.5%
Real Assets	Commodity Futures	4.6%	4.2%	+0.4%
	REIT	6.0%	6.2%	-0.2%
	Gold	4.9%	5.1%	-0.2%
	Real Estate - Core	5.4%	4.0%	+1.4%
	Private Real Assets - Infrastructure	6.8%	6.6%	+0.2%
Multi-Asset	60% S&P 500 & 40% U.S. Aggregate	4.8%	5.3%	-0.5%
	60% MSCI ACWI & 40% U.S. Agg.	5.4%	6.0%	-0.6%
	Hedge Fund*	6.1%	6.5%	-0.4%

\*Calculated as a blend of other asset classes

# U.S. 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
- NEPC's inflation assumption forecasts near-term paths for major Consumer Price Index (CPI) components including food, energy, core services, and shelter costs
  - CPI is expected to converge with breakeven inflation rates over the long-term
- A composite inflation assumption reflects a blend of NEPC's inflation forecast and market-implied breakeven inflation rates

Region	10-Year Inflation Assumption	12-Month Change	30-Year Inflation Assumption	12-Month Change
United States	2.6%	+0.1%	2.6%	-

# KEY INVESTMENT THEMES



# 2024 MARKET THEMES

## NEPC MARKET OUTLOOK

- **At the start of each year, we identify the Market Themes that we believe will impact the investment landscape over the next 12 months**
- **Market Themes represent essential factors for investors and are likely to exert significant influence on market pricing and investor sentiment**
- **Disruptions in these factors will reveal new investment opportunities and likely alter our understanding of market dynamics**



# ADJUSTING TO A “COST OF CAPITAL”

## 2024 MARKET THEMES



**Normalizing Higher Interest Rates**

**Economy is not acclimated to long-term interest rate environment of 4% or higher**



**Tighter Bank Lending Standards**

**Access to capital for entities needing to refinance will be a 2024 focus point**



**Benefits Accrue for Fixed Rate Borrowers**

**Fixed rate borrowers have time to adjust capital structure to the rate environment**



**Interest Income**

**Income flows to savers but drains availability of capital for the economy**



**M&A Dealmaking Complexity**

**Deal volume is more limited and pathway to finalize transactions are tighter**

# MAGNIFICENT SEVEN

## 2024 MARKET THEMES



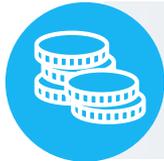
**Unprecedented Size**

**Massive Scale; Just 7 companies account for 28% of the S&P 500 Index**



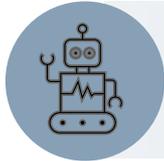
**Priced For Perfection**

**Sky-high earnings growth expectations offer limited upside at current valuations**



**Free Cash Flow Cows**

**Operating cash flows and revenue quality insulated names from higher rates**



**Tech Dominance**

**Pioneers of tech in their own right, but new tech advances can usurp them**



**Nifty Fifty Vibes**

**Historically, growth at this size becomes harder and darling stocks tend to fade**

# U.S. FISCAL DEBT PROFILE

## 2024 MARKET THEMES



### Interest Rate Implications

Fundamentals suggest perpetual deficit cycle requires higher interest rates



### Inflation Pressure

Money supply can absorb the debt but stoke demand and inflation



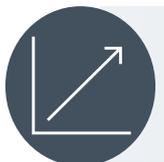
### Dollar Impact

The dollar still has no competitor for global reserve currency status



### Crowding Out Effect

Increasing supply of Treasuries will compete for credit vs. other investments



### Nominal Growth Needed

To maintain a healthy debt-to-GDP ratio, higher nominal GDP growth is needed

# ARTIFICIAL INTELLIGENCE

## 2024 MARKET THEMES



### AI as a Tool

Artificial Intelligence will be used with humans rather than replace humans



### Productivity Gains

Adoption of AI may boost real economic growth and enhance productivity



### Impact is Beyond Tech Sector

Current market has favored tech sector, broader industry effects remain unknown



### AI Proof Statement

Novel products and successful AI adoption will test valuations in 2024



### Geopolitics May Alter Adoption

Costs for semiconductors, data, regulation could slow adoption

# HEIGHTENED GEOPOLITICAL RISK

## 2024 MARKET THEMES



**Instant Transmission of (Mis)Information**

**The speed of information amplifies tail risks and introduces uncertainty**



**Market Impact of Geopolitics**

**Historically, geopolitics have a short-lived market impact following a flash point**



**The Balance of Power**

**Geopolitical alignments must be chosen by countries caught in the middle**



**2024 Global Election "Supercycle"**

**Elections increase the likelihood of geopolitical surprises for the market**



**Rebalance Opportunities**

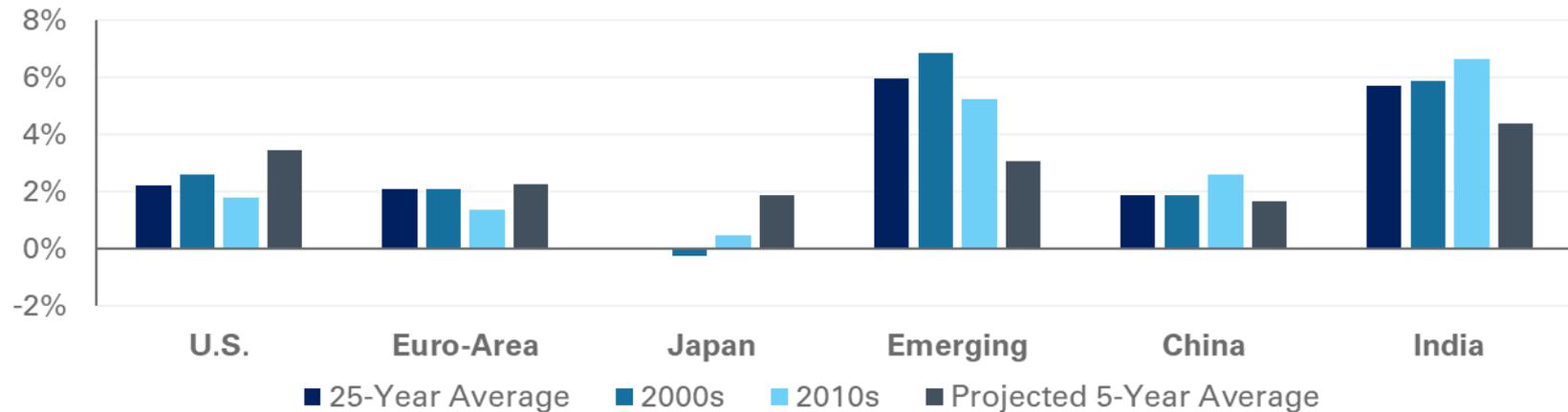
**Find opportunities amid volatility around geopolitical events and election outcomes**

# MACROECONOMIC



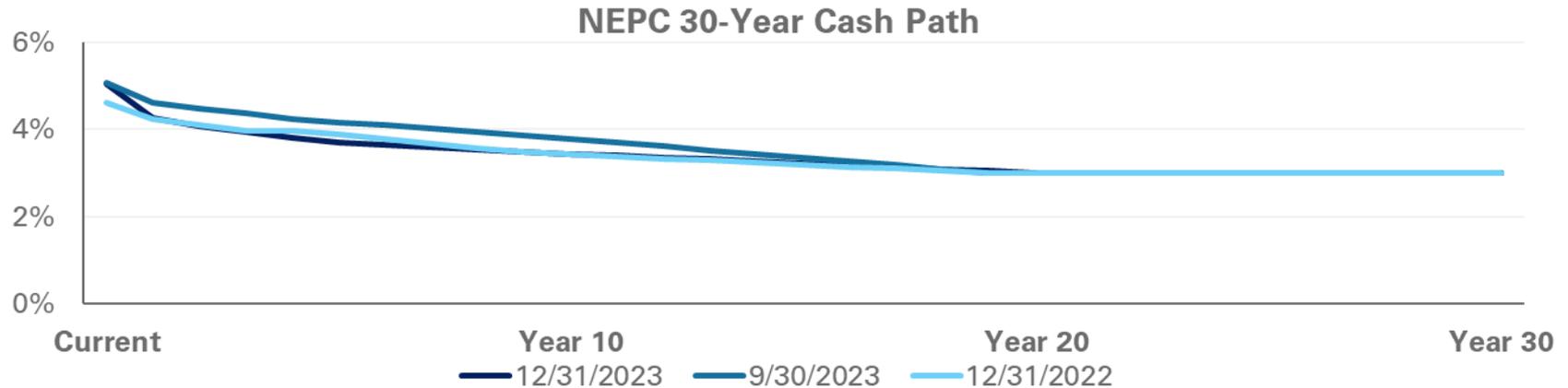
# GLOBAL INFLATION

## HISTORICAL INFLATION



- **Non-U.S. forecasts are guided by IMF forecasts, local consumer and producer price indices, and global interest rate curves**
- **Near-term inflation levels for developed markets are projected to be higher relative to history**
  - Long-term inflation assumptions reflect NEPC and central bank targets
  - The expected inflation differential between emerging and developed markets has narrowed significantly

# U.S. CASH EXPECTATIONS



- **Cash is a foundational input for all asset class return expectations**
  - Cash + risk premia is an input for long-term asset class return projections
- **Cash assumptions reflect inflation and real interest rates**
- **A composite cash assumption is built from a blend of NEPC’s cash forecast and market forward pricing of short-term interest rates**

10-Year Cash Assumption	30-Year Cash Assumption
3.9%	3.4%

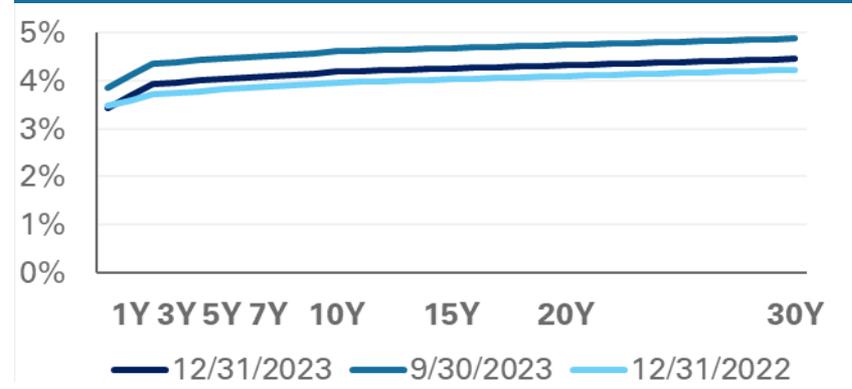


Sources: Bloomberg, FactSet, NEPC

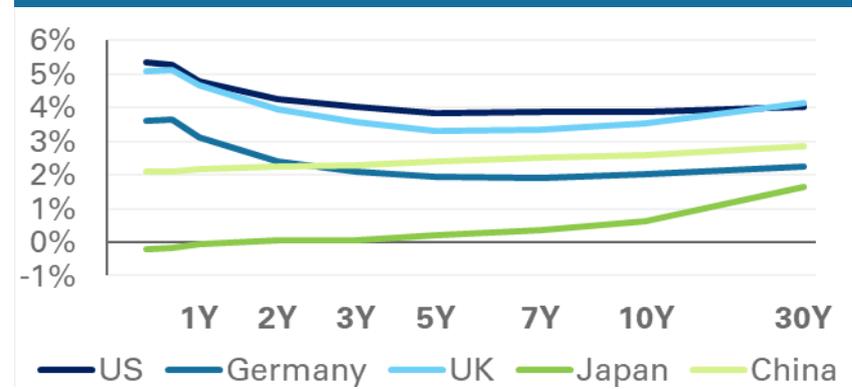
# GLOBAL INTEREST RATE EXPECTATIONS

- **Real yields have normalized, reflecting a tighter monetary policy environment**
  - Attractive real yields should signal a shift in risk posture for investors
- **Markets remain biased to a lower interest rate environment - diverging from Fed projections in the near-term**
- **The outlook is less attractive for non-U.S. developed markets due to the nominal yield differential relative to the U.S.**

**NEPC 10-Year Forward Curve**



**Global Yield Curves**



Sources: FactSet, NEPC

# PUBLIC EQUITY



# PUBLIC EQUITY ASSUMPTIONS

## OVERVIEW

- **Valuation expansion weighed on forward-looking return expectations**
  - U.S. mega-cap outperformance has driven U.S. large-cap index valuations above NEPC's terminal value, detracting from expected returns
- **Long-term valuation inputs are tied to NEPC's path for interest rates and inflation, reflecting valuation sensitivity to the macro environment**
- **Non-U.S. Developed Market assumptions reflect negative real earnings growth as current profit margins remain near cyclical highs**
- **Emerging market assumptions incorporate weaker market expectations for economic growth and earnings, reflecting uncertainty around China**
- **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

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

Asset Class	12/31/23 10-Yr Return	12-Month Change
U.S. Large-Cap Equity	4.4%	-1.0%
U.S. Small/Mid-Cap Equity	6.0%	-0.5%
Non-U.S. Developed Equity	4.6%	-1.0%
Non-U.S. Developed Small-Cap Equity	6.4%	-0.3%
Emerging Market Equity	8.6%	-1.0%
Emerging Market Small-Cap Equity	7.9%	-1.4%
China Equity	9.9%	+1.2%
Hedge Fund - Equity	5.5%	-0.5%
Global Equity*	5.4%	-0.9%
Private Equity*	9.0%	-0.2%

Source: NEPC

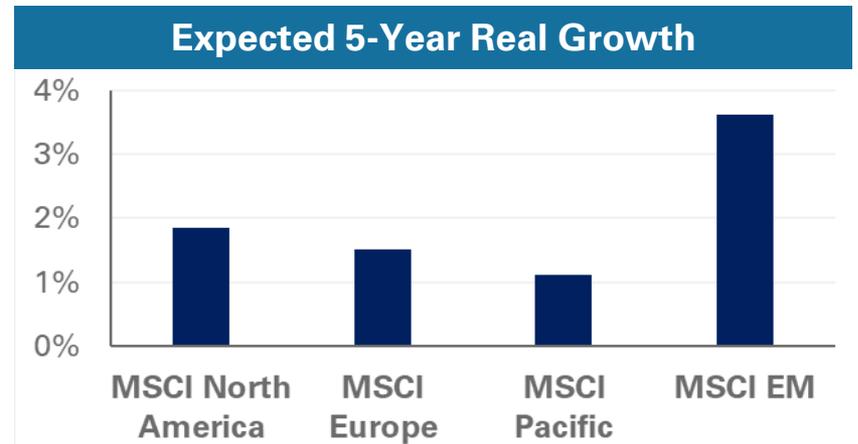
\*Calculated as a blend of other asset classes



# PUBLIC EQUITY

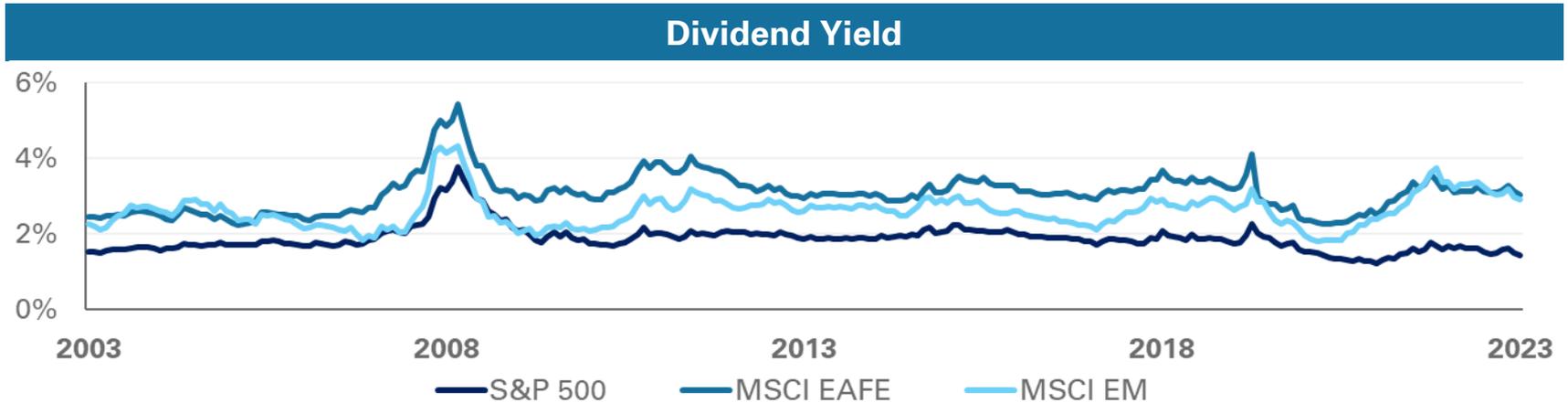
## REAL EARNINGS GROWTH

- **Equities with a greater share of revenue from emerging markets are forecasted to benefit from higher sales 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



# PUBLIC EQUITY DIVIDEND YIELD

## NON-U.S. EQUITY OFFERS HIGHER DIVIDEND YIELDS



Sources: S&P, MSCI, FactSet



# PUBLIC EQUITY

## VALUATION

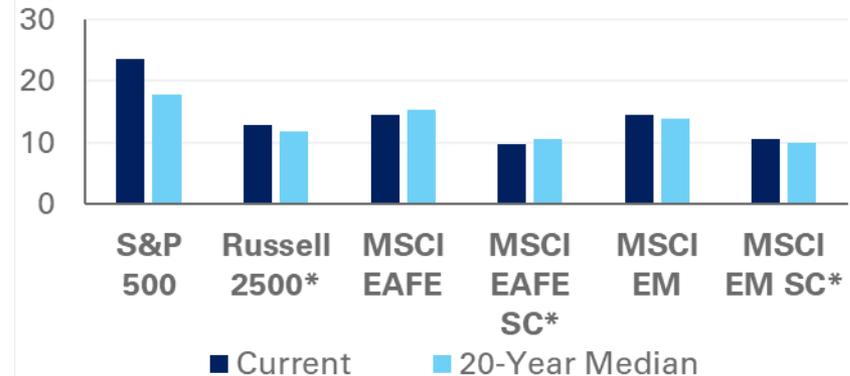
- **Valuations remain elevated relative to long-term averages**

  - U.S. large-cap valuations represent the largest drag on returns across the equity complex
  
- **EAFE valuation inputs are lower relative to the U.S. and reflect the economic growth profile**
  
- **Emerging markets offer an elevated total return opportunity relative to developed markets**

**S&P 500 Shiller PE Ratio**



**Trailing PE Relative Median**



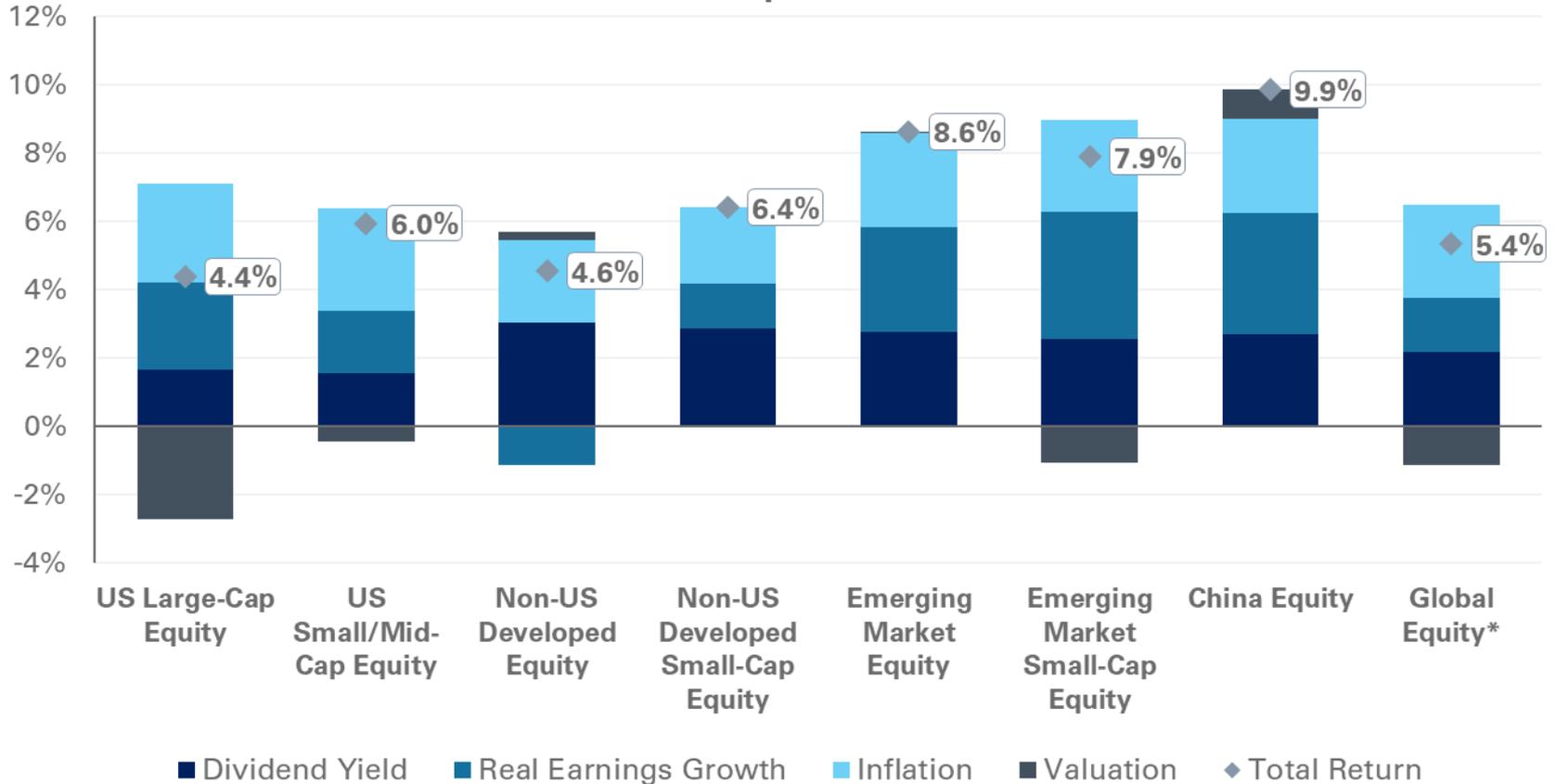
Sources: S&P, Shiller, Russell, MSCI, FactSet, NEPC; Shiller PE long-term average beginning in 1926  
 Note: \*Small cap indices valuations based on EV/EBITDA multiples



# PUBLIC EQUITY

## BUILDING BLOCKS

10-Year Expected Return



Source: NEPC  
 \*Calculated as a blend of other classes



# FIXED INCOME



# FIXED INCOME ASSUMPTIONS

## OVERVIEW

- **Despite elevated interest rate volatility, Treasury assumptions are unchanged year-over-year as yields round-tripped during 2023**
- **Credit spreads tightened to below median levels across investment grade and high yield bonds, leading to lower return expectations**
- **We encourage a dedicated safe-haven fixed income allocation to serve as a critical liquidity source for the portfolio**
  - Sizing of the safe-haven exposure is a strategic exercise and reflects investor return objectives, risk-tolerance, and private market pacing plan needs
- **We encourage the use of return-seeking credit investments, specifically high yield bonds, in a strategic asset allocation policy**

# FIXED INCOME ASSUMPTIONS

## BUILDING BLOCKS

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

Asset Class	12/31/23 10-Yr Return	12-Month Change
U.S. TIPS	4.6%	+0.2%
U.S. Treasury Bond	4.2%	-
U.S. Corporate Bond	5.3%	-0.6%
U.S. MBS	4.4%	-0.1%
U.S. High Yield Corporate	6.1%	-1.0%
U.S. Leveraged Loan	7.2%	-0.6%
EMD External Debt	7.1%	-
EMD Local Currency Debt	6.1%	-1.1%
Non-U.S. Govt. Bond	2.4%	-0.2%
U.S. Muni Bond (1-10 Year)	2.9%	-0.3%
U.S. High Yield Muni Bond	4.5%	-1.2%
Hedge Fund – Credit	6.6%	-0.5%
U.S. Aggregate Bond*	4.6%	-0.2%
Private Debt*	8.3%	-0.5%

Source: NEPC

\*Calculated as a blend of other asset classes

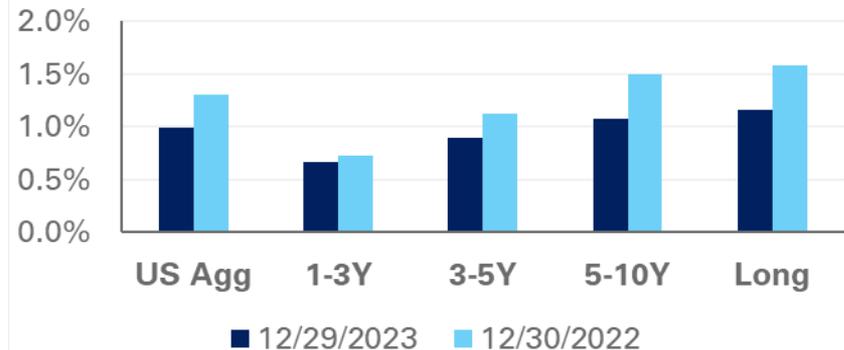


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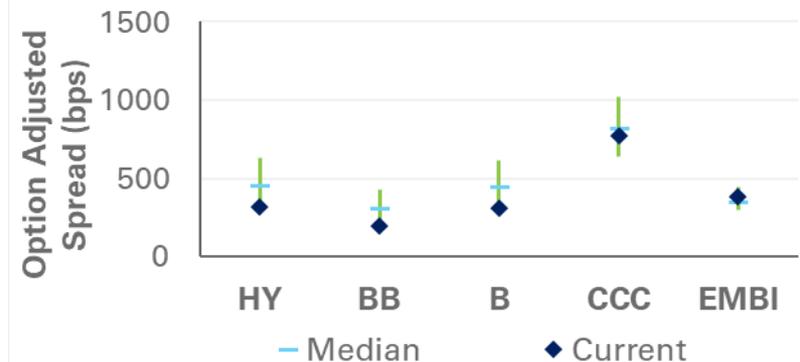
## CREDIT SPREADS

- Credit spreads have tightened and are broadly below median levels
- Lower spread levels weigh on future return expectations given less overall carry return
- Credit spread assumptions reflect a path towards long term median levels
- Default and recovery rate assumptions 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 and range represents 25<sup>th</sup> to 75<sup>th</sup> percentile

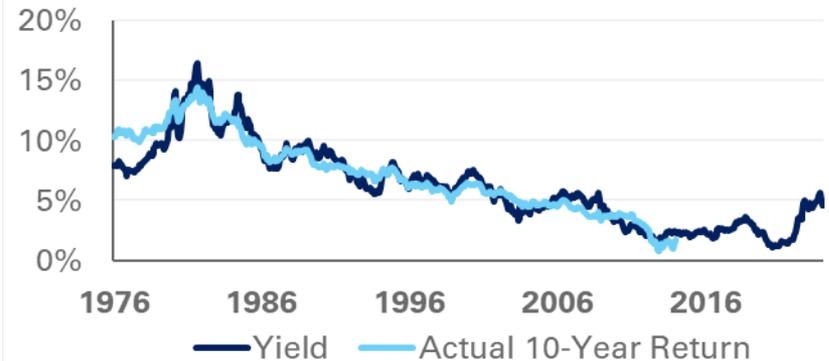


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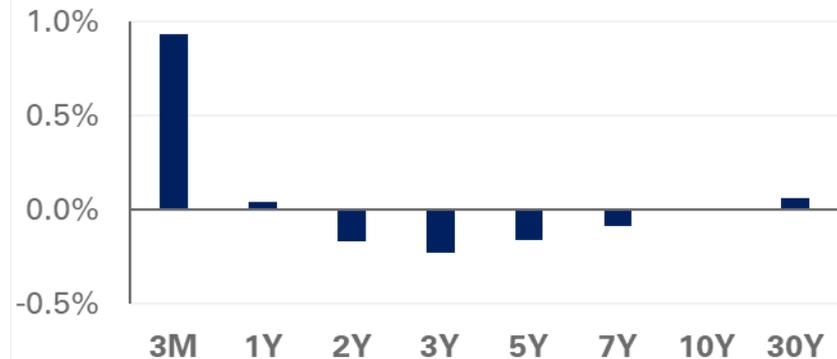
## GOVERNMENT RATES

- **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
- **Intermediate Treasury yields are near terminal values, even as long yields remain suppressed**
- **A normalization of yield curve steepness is a headwind to long duration fixed income**

**Barclays U.S. Aggregate Bond**



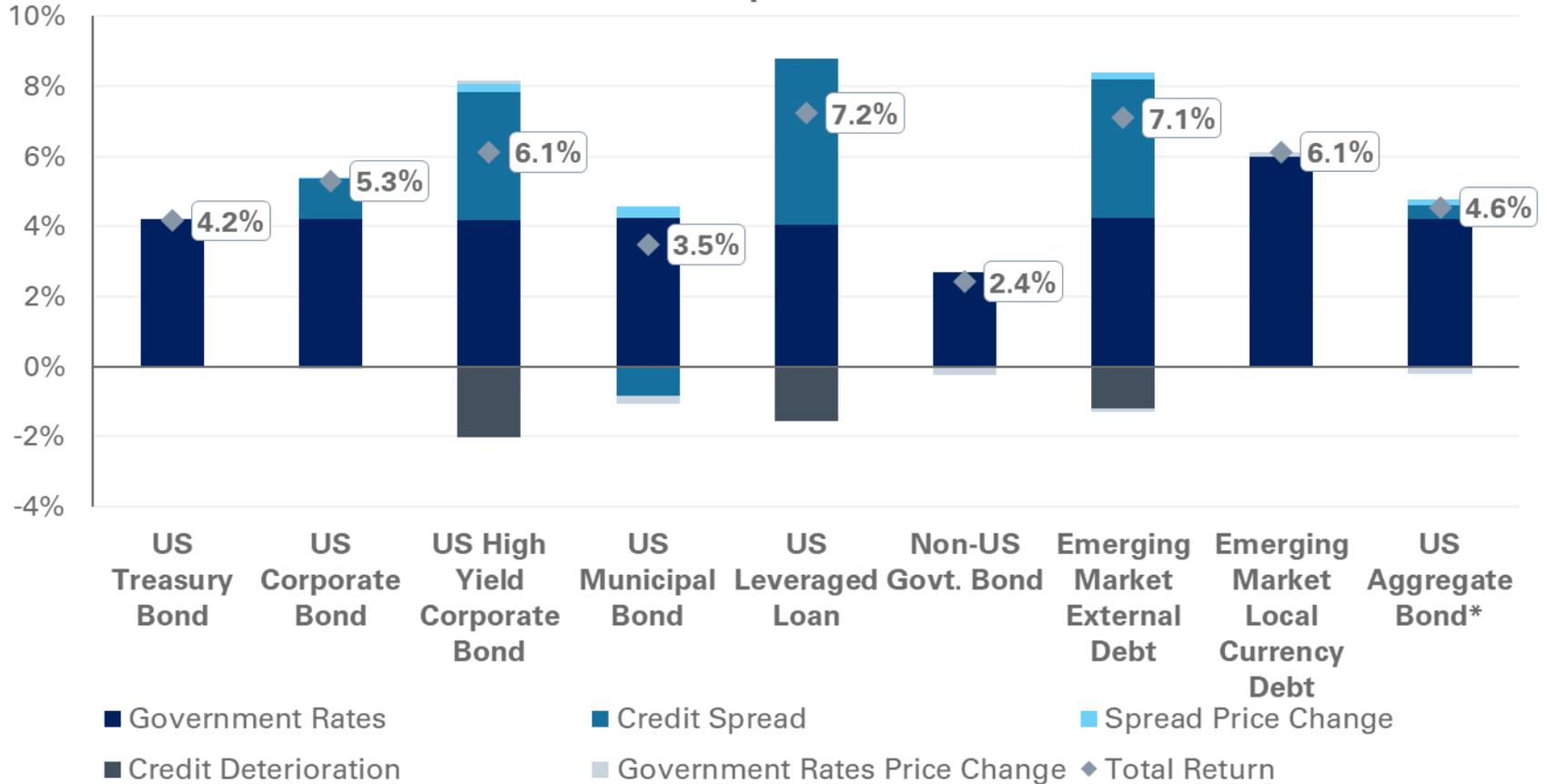
**Annual Change in Treasury Yields**



# FIXED INCOME

## BUILDING BLOCKS

10-Year Expected Return



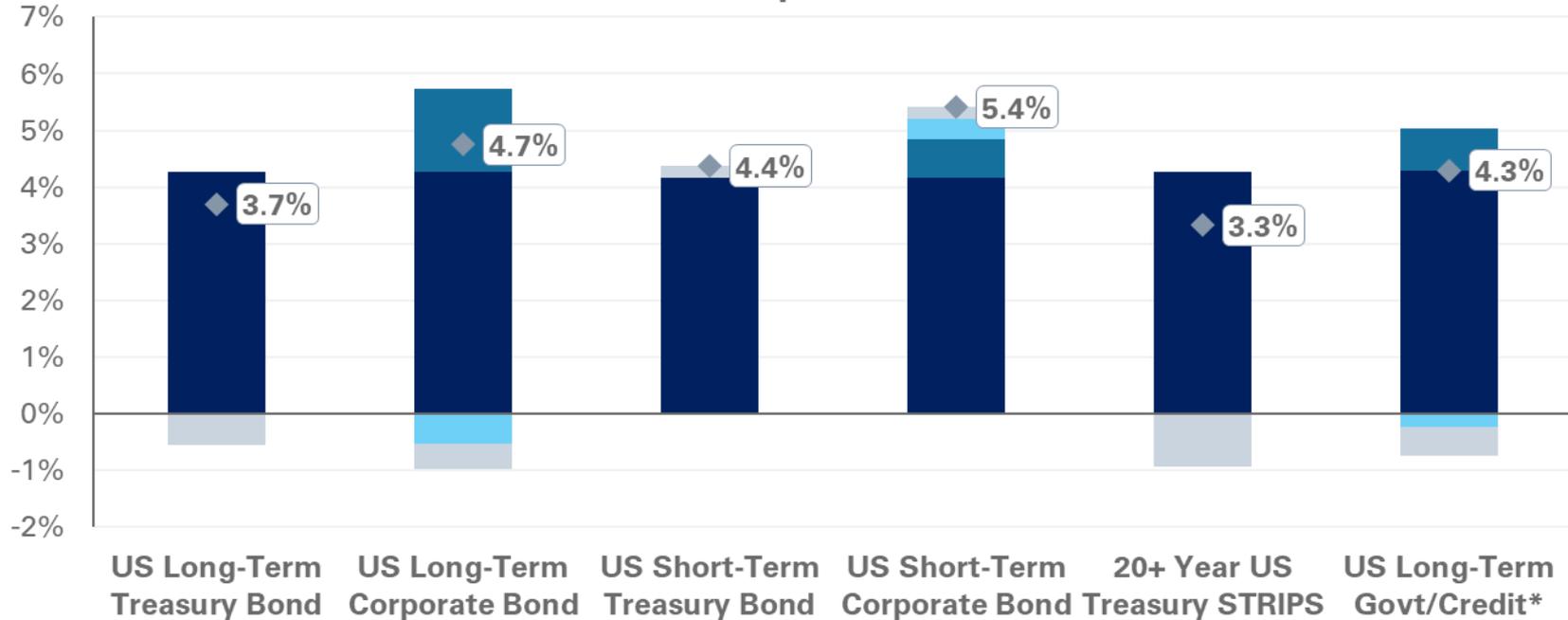
Source: NEPC  
 \*Calculated as a blend of other classes



# FIXED INCOME

## BUILDING BLOCKS

10-Year Expected Return



■ Government Rates  
■ Credit Deterioration

■ Credit Spread  
■ Government Rates Price Change

■ Spread Price Change  
◆ Total Return

Source: NEPC  
\*Calculated as a blend of other classes



# REAL ASSET



# REAL ASSET ASSUMPTIONS

## OVERVIEW

- **Real asset exposure can enhance risk-adjusted returns as markets undergo a secular shift toward higher interest rates and inflation levels**
  - Lagged real estate valuation data reflects a slow adjustment to these dynamics
- **Real assets provide exposure to inflation-sensitive asset classes and offer diversification benefits to the portfolio**
  - A diversifying blend of real assets provides an elevated beta to inflation relative to public equity and nominal bond exposure
- **We encourage investors to evaluate strategic real asset exposure relative to their long-term investment objectives and spending needs**
  - We believe building portfolio inflation sensitivity is a strategic exercise and public real assets serve as a complement to private market investments
- **NEPC recommends a strategic real assets target comprising an equal-weight blend to commodity futures, natural resource equity, public infrastructure equity, REITs, and gold**

# REAL ASSET ASSUMPTIONS

## BUILDING BLOCKS

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

Asset Class	12/31/23 10-Yr Return	12-Month Change
Commodity Futures	4.6%	+0.4%
Midstream Energy	5.5%	-0.5%
REIT	6.0%	-0.2%
Global Infrastructure Equity	6.6%	+1.0%
Global Natural Resources Equity	6.2%	+0.7%
Gold	4.9%	-0.2%
Real Estate - Core	5.4%	+1.4%
Real Estate – Non-Core	7.1%	+1.8%
Private Debt - Real Estate	6.3%	+0.5%
Private Real Assets - Natural Resources	8.2%	+0.1%
Private Real Assets - Infrastructure	6.8%	+0.2%

Source: NEPC

\*Calculated as a blend of other asset classes



# REAL ASSET

## REAL INCOME

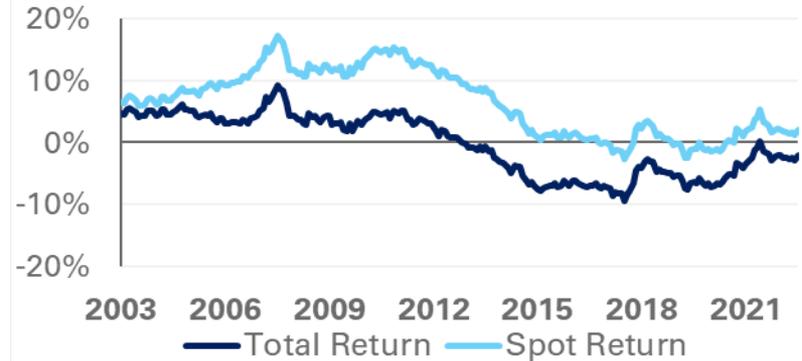
- **Equity: Real income is inflation-adjusted dividend yield**

  - Includes public infrastructure, REITS, midstream energy, and natural resource equity
  
- **Real Estate: Real income is net operating income (NOI)**

  - NOI growth tracks the business cycle and economic regimes
  
- **Commodity Futures: Real income reflects collateral return and the futures roll yield**

  - Collateral is based on a cash proxy over the time horizon and has increased in-line with cash rates

**Commodities Rolling 10-Year Returns**



**Real Assets Yields**

	12/31/23	12/31/22
Midstream Energy	5.6%	5.9%
Real Estate - Core	2.6%	2.6%
U.S. REITs	4.2%	4.4%
Global Infrastructure Equities	3.6%	3.2%
Natural Resource Equities	3.7%	3.8%
U.S. 10-Year Breakeven Inflation	2.2%	2.3%
Commodity Index Roll Yield	-0.9%	5.7%

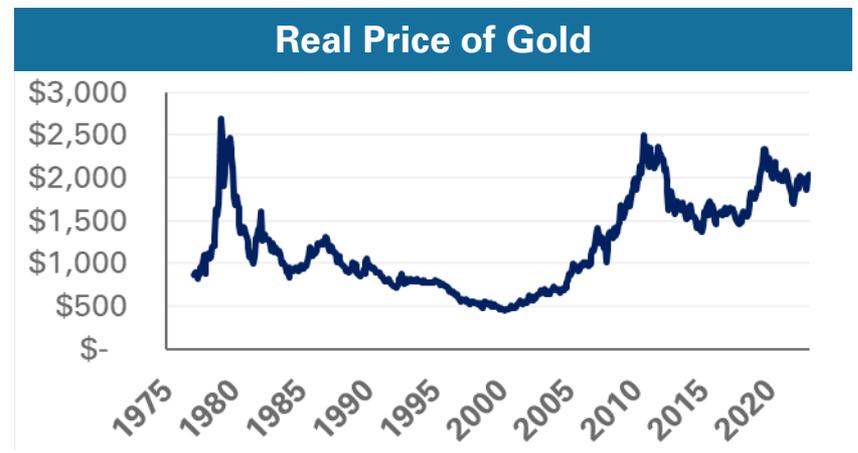
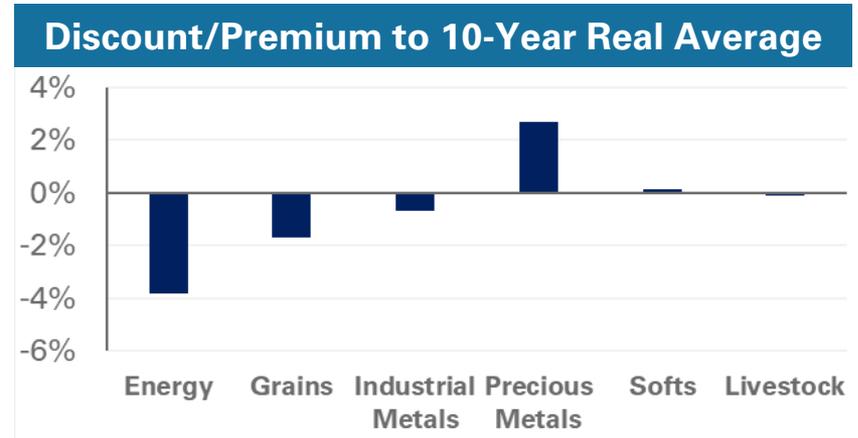
Sources: Bloomberg, NCREIF, Alerian, NAREIT, S&P, FactSet, NEPC

\*Commodity Index Roll Yield represents a proprietary calculation methodology



# REAL ASSET VALUATION

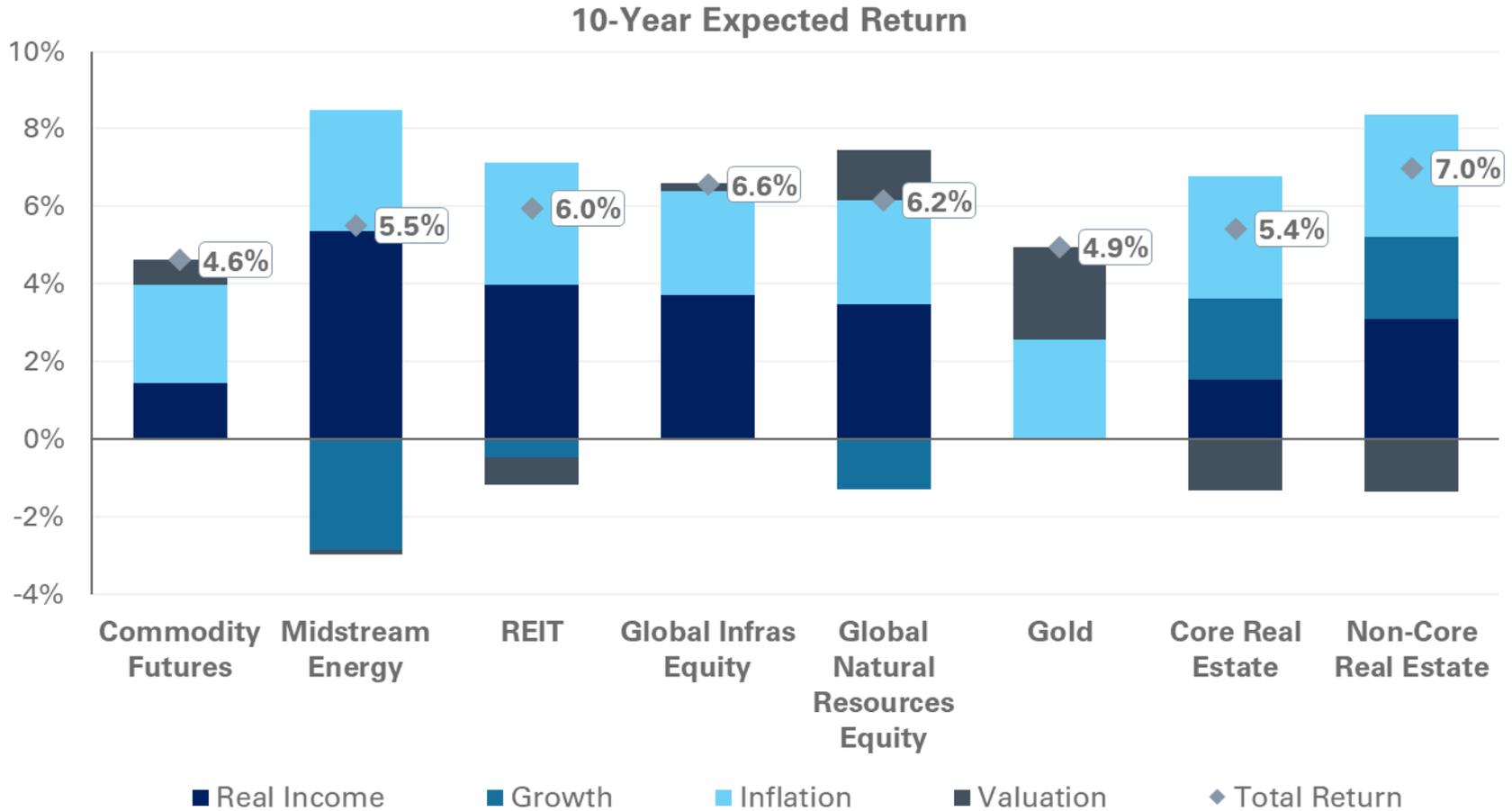
- **Commodity valuation inputs reflect the long-term average of spot prices**
  - Many areas of the commodity index are trading at a premium to long-term real averages
  
- **Valuation assumptions for other real assets are based on asset-specific valuation inputs**
  - Capitalization rates are used for core real estate, price-to-earnings for global infrastructure and global natural resources equity
  - Gold’s valuation incorporates the asset’s historical risk premia and the impact of the macroeconomic market regime



Sources: FactSet, NEPC



# REAL ASSET BUILDING BLOCKS



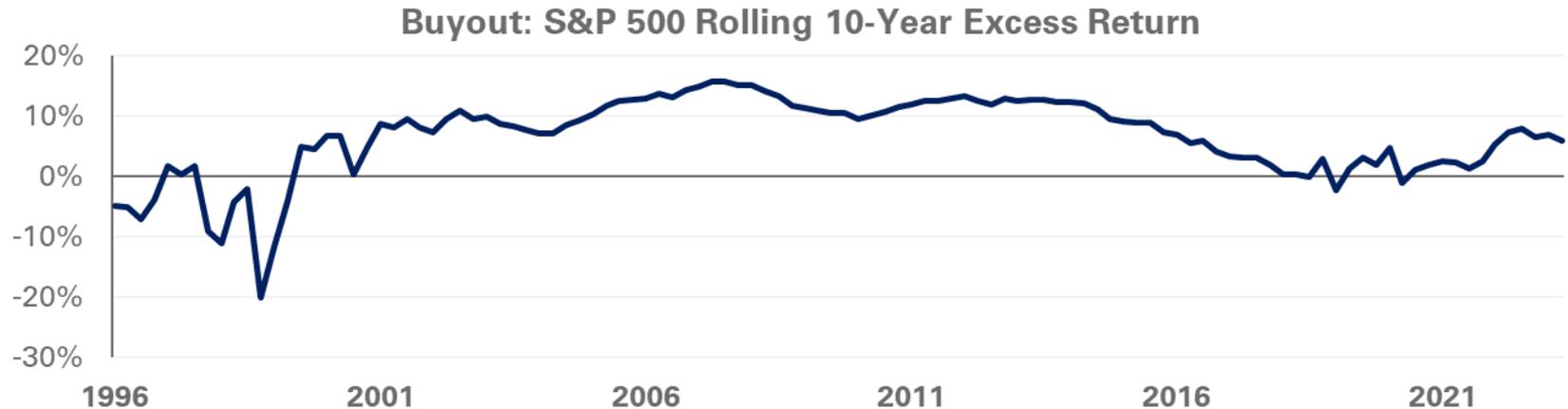
Source: NEPC

# ALTERNATIVE ASSETS



# ALTERNATIVE ASSETS

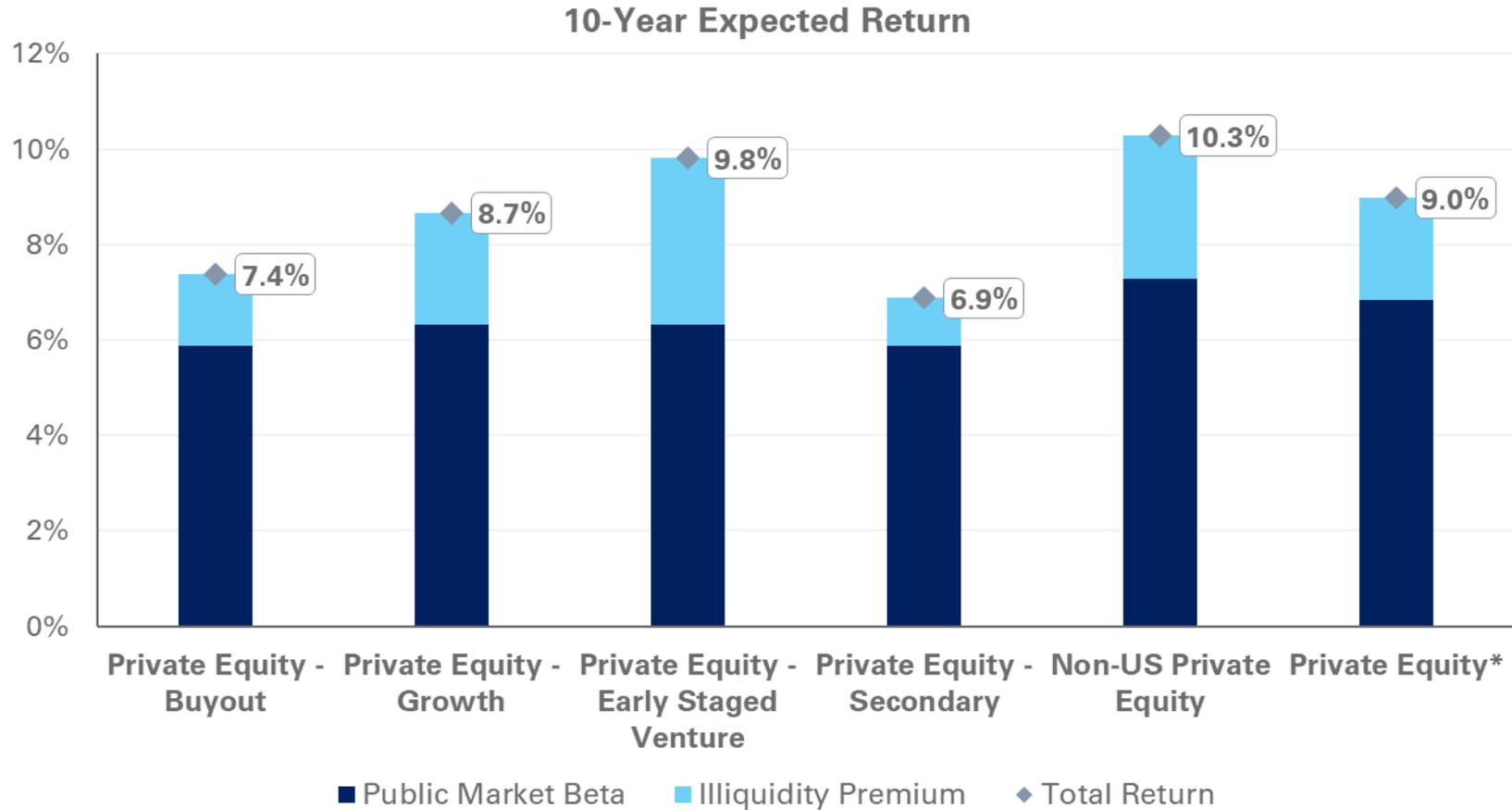
## METHODOLOGY



- **Private market assumptions are constructed from public market betas 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



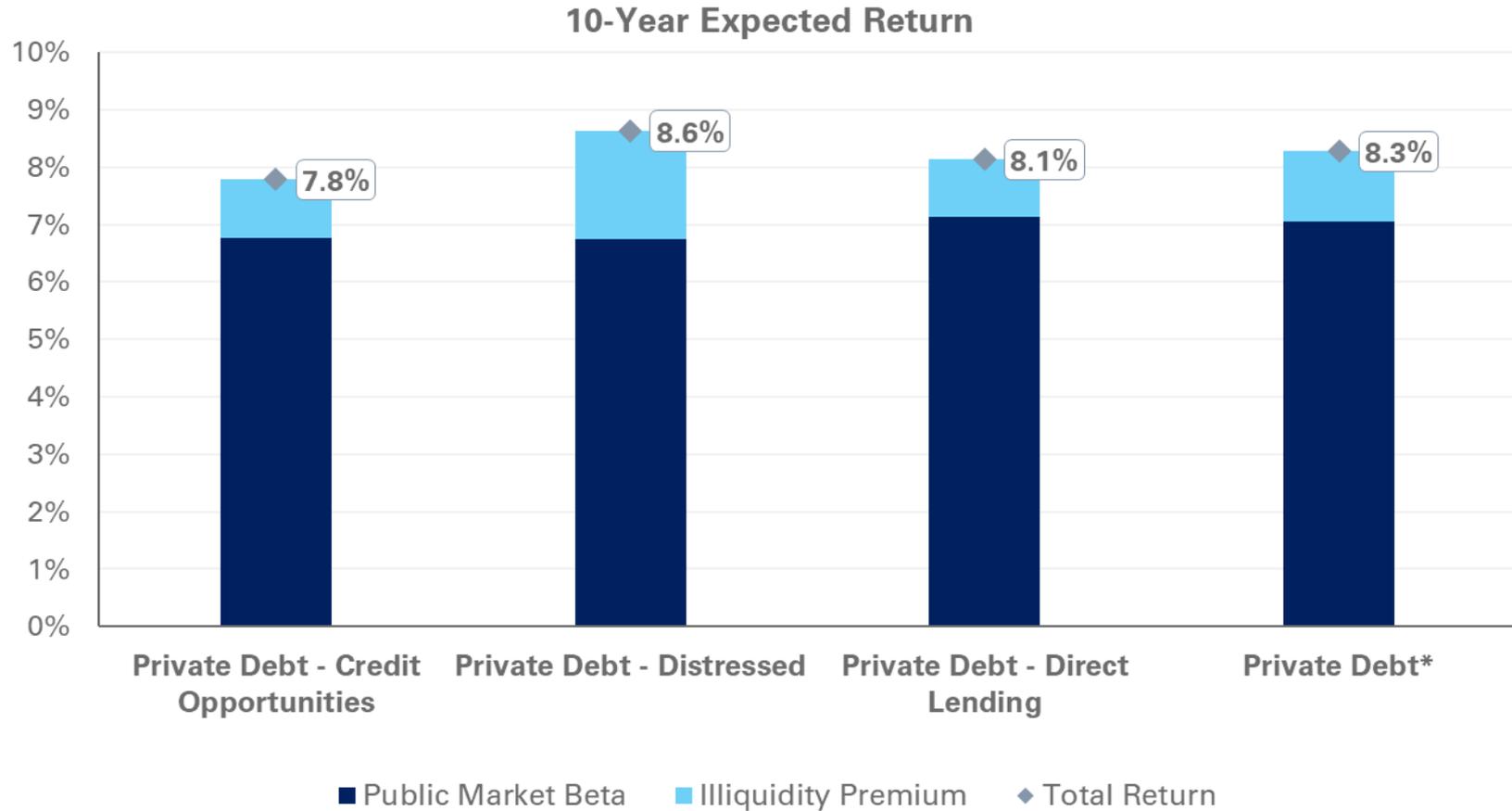
Source: NEPC

\*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

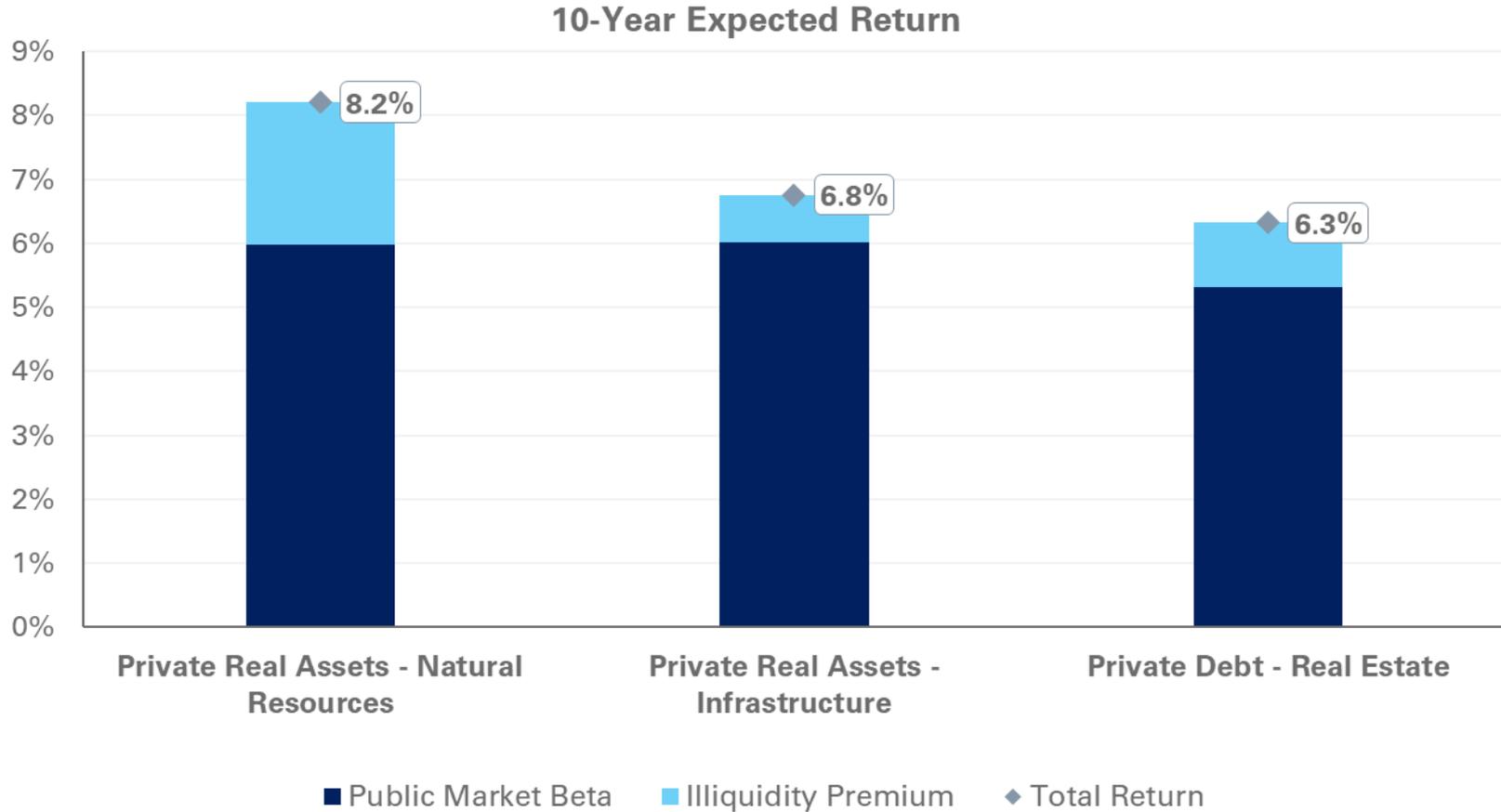


Source: NEPC

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

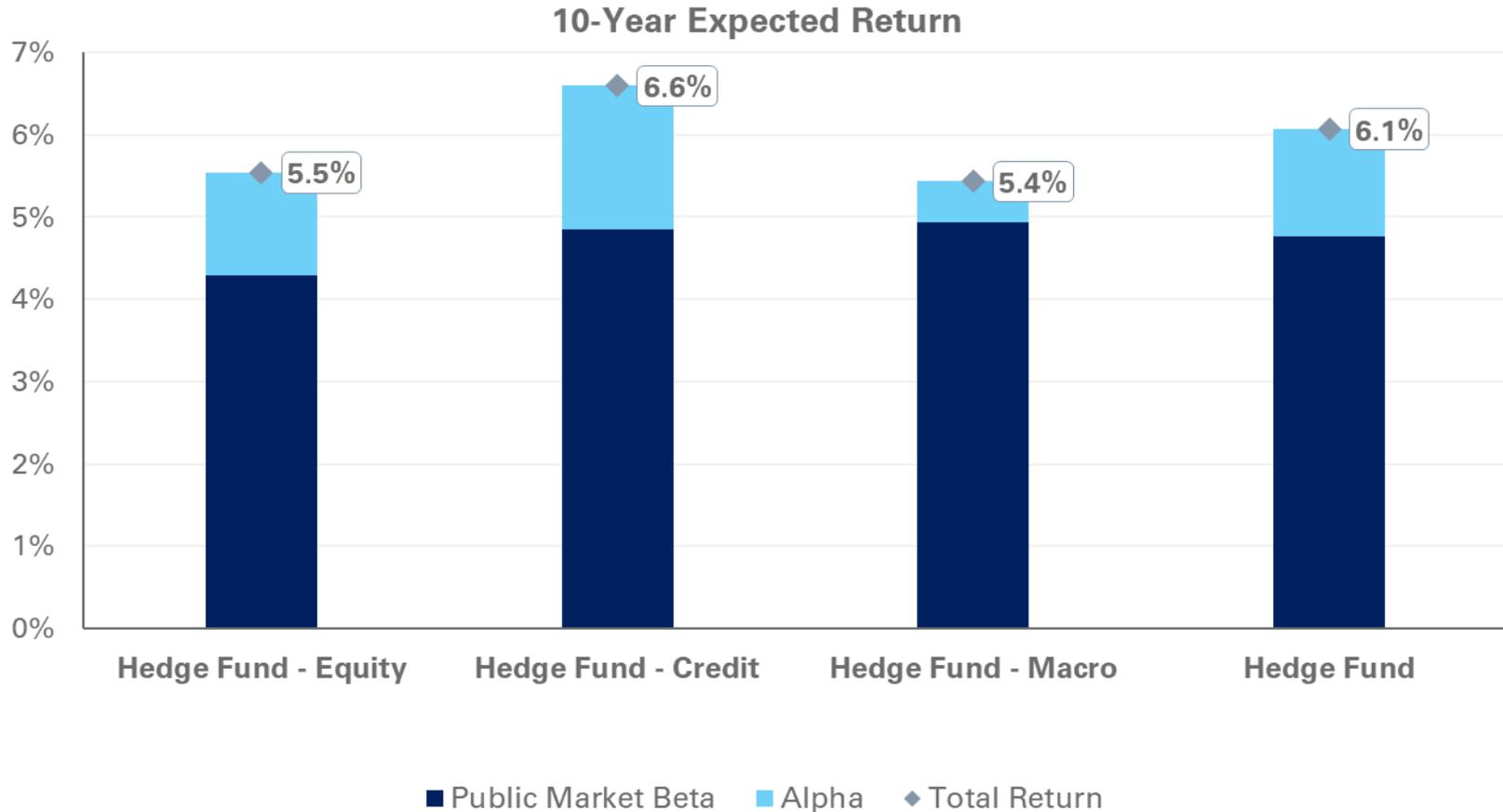


# PRIVATE REAL ASSET BUILDING BLOCKS



Source: NEPC

# HEDGE FUND BUILDING BLOCKS



Source: NEPC

\*Hedge Funds is a derived composite of 40% Long/Short, 40% Credit, 20% Macro



# APPENDIX



# 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:** 100% U.S. Small/Mid Cap

**Early-Stage Venture:** 100% U.S. Small/Mid Cap

**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

# 10-YEAR RETURN FORECASTS

## EQUITY

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
U.S. Large-Cap Equity	4.4%	5.4%	-1.0%
U.S. Small/Mid-Cap Equity	6.0%	6.5%	-0.5%
Non-U.S. Developed Equity	4.6%	5.6%	-1.0%
Non-U.S. Developed Equity (USD Hedge)	4.8%	5.8%	-1.0%
Non-U.S. Developed Small-Cap Equity	6.4%	6.7%	-0.3%
Emerging Market Equity	8.6%	9.6%	-1.0%
Emerging Market Small-Cap Equity	7.9%	9.3%	-1.4%
Hedge Fund - Equity	5.5%	6.0%	-0.5%
Private Equity - Buyout	7.4%	7.7%	-0.3%
Private Equity - Growth	8.7%	8.8%	-0.1%
Private Equity - Early Stage Venture	9.8%	10.0%	-0.2%
Private Equity - Secondary	6.9%	7.2%	-0.3%
Non-U.S. Private Equity	10.3%	10.4%	-0.1%
China Equity	9.9%	8.7%	+1.2%
Global Equity*	5.4%	6.3%	-0.9%
Private Equity*	9.0%	9.2%	-0.2%

\*Calculated as a blend of other asset classes



# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Cash	3.9%	4.0%	-0.1%
US TIPS	4.6%	4.4%	+0.2%
US Treasury Bond	4.2%	4.2%	-
US Corporate Bond	5.3%	5.9%	-0.6%
US Corporate Bond - AAA	4.4%	4.9%	-0.5%
US Corporate Bond - AA	4.6%	5.0%	-0.4%
US Corporate Bond - A	5.1%	5.6%	-0.5%
US Corporate Bond - BBB	5.6%	6.2%	-0.6%
US Mortgage-Backed Securities	4.4%	4.5%	-0.1%
US Securitized Bond	5.2%	5.2%	-
US Collateralized Loan Obligation	5.5%	5.8%	-0.3%
US Municipal Bond	3.5%	4.4%	-0.9%
US Municipal Bond (1-10 Year)	2.9%	3.2%	-0.3%
US Taxable Municipal Bond	5.3%	5.5%	-0.2%

# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Non-US Government Bond	2.4%	2.6%	-0.2%
Non-US Government Bond (USD Hedge)	2.6%	2.9%	-0.3%
Non-US Inflation-Linked Bond (USD Hedge)	3.2%	3.4%	-0.2%
US Short-Term TIPS (1-3 Year)	4.7%	4.3%	+0.4%
US Short-Term Treasury Bond (1-3 Year)	4.4%	4.2%	+0.2%
US Short-Term Corporate Bond (1-3 Year)	5.4%	5.4%	-
US Intermediate-Term TIPS (3-10 Year)	4.6%	4.4%	+0.2%
US Intermediate-Term Treasury Bond (3-10 Year)	4.2%	4.2%	-
US Intermediate-Term Corporate Bond (3-10 Year)	5.6%	6.1%	-0.5%
US Long-Term TIPS (10-30 Year)	4.5%	4.5%	-
US Long-Term Treasury Bond (10-30 Year)	3.7%	4.0%	-0.3%
US Long-Term Corporate Bond (10-30 Year)	4.7%	5.8%	-1.1%
20+ Year US Treasury STRIPS	3.3%	3.9%	-0.6%
10 Year US Treasury Bond	4.2%	4.3%	-0.1%
10 Year Non-US Government Bond (USD Hedge)	2.1%	2.2%	-0.1%
US Aggregate Bond*	4.6%	4.8%	-0.2%

\*Calculated as a blend of other asset classes



# 10-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
US High Yield Corporate Bond	6.1%	7.1%	-1.0%
US Corporate Bond - BB	6.8%	7.5%	-0.7%
US Corporate Bond - B	6.3%	7.5%	-1.2%
US Corporate Bond - CCC/Below	1.4%	2.9%	-1.5%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.5%	6.2%	-0.7%
US Leveraged Loan	7.2%	7.8%	-0.6%
Emerging Market Investment Grade External Debt	5.0%	-	-
Emerging Market High Yield External Debt	9.0%	-	-
Emerging Market Local Currency Debt	6.1%	7.2%	-1.1%
US High Yield Securitized Bond	8.7%	8.9%	-0.2%
US High Yield Collateralized Loan Obligation	7.8%	8.5%	-0.7%
US High Yield Municipal Bond	4.5%	5.7%	-1.2%
Hedge Fund - Credit	6.6%	7.1%	-0.5%
Private Debt - Credit Opportunities	7.8%	8.2%	-0.4%
Private Debt - Distressed	8.6%	9.0%	-0.4%
Private Debt - Direct Lending	8.1%	8.8%	-0.7%
Private Debt*	8.3%	8.8%	-0.5%

\*Calculated as a blend of other asset classes



# 10-YEAR RETURN FORECASTS

## REAL ASSETS

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Commodity Futures	4.6%	4.2%	+0.4%
Midstream Energy	5.5%	6.0%	-0.5%
REIT	6.0%	6.2%	-0.2%
Global Infrastructure Equity	6.6%	5.6%	+1.0%
Global Natural Resources Equity	6.2%	5.5%	+0.7%
Gold	4.9%	5.1%	-0.2%
Real Estate - Core	5.4%	4.0%	+1.4%
Real Estate – Value-Add	6.6%	5.8%	+0.8%
Real Estate - Opportunistic	7.6%	7.4%	+0.2%
Private Debt - Real Estate	6.3%	5.8%	+0.5%
Private Real Assets - Natural Resources	8.2%	8.1%	+0.1%
Private Real Assets - Infrastructure	6.8%	6.6%	+0.2%

# 30-YEAR RETURN FORECASTS

## EQUITY

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
U.S. Large-Cap Equity	6.7%	6.9%	-0.2%
U.S. Small/Mid-Cap Equity	7.4%	7.4%	-
Non-U.S. Developed Equity	6.4%	6.7%	-0.3%
Non-U.S. Developed Equity (USD Hedge)	6.6%	6.9%	-0.3%
Non-U.S. Developed Small-Cap Equity	7.5%	7.5%	-
Emerging Market Equity	9.2%	9.6%	-0.4%
Emerging Market Small-Cap Equity	9.1%	9.6%	-0.5%
Hedge Fund - Equity	6.0%	6.2%	-0.2%
Private Equity - Buyout	8.8%	8.8%	-
Private Equity - Growth	9.7%	9.8%	-0.1%
Private Equity - Early Stage Venture	10.6%	10.6%	-
Private Equity - Secondary	8.2%	8.2%	-
Non-U.S. Private Equity	10.8%	10.8%	-
China Equity	9.5%	9.1%	+0.4%
Global Equity*	7.3%	7.5%	-0.2%
Private Equity*	10.1%	10.1%	-



\*Calculated as a blend of other asset classes

# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Cash	3.4%	3.4%	-
US TIPS	4.7%	4.3%	+0.4%
US Treasury Bond	4.3%	4.1%	+0.2%
US Corporate Bond	5.9%	5.9%	-
US Corporate Bond - AAA	5.1%	5.1%	-
US Corporate Bond - AA	5.1%	5.0%	+0.1%
US Corporate Bond - A	5.5%	5.5%	-
US Corporate Bond - BBB	6.1%	6.1%	-
US Mortgage-Backed Securities	4.6%	4.4%	+0.2%
US Securitized Bond	5.4%	5.1%	+0.3%
US Collateralized Loan Obligation	4.9%	5.2%	-0.3%
US Municipal Bond	3.8%	3.9%	-0.1%
US Municipal Bond (1-10 Year)	3.5%	3.4%	+0.1%
US Taxable Municipal Bond	6.0%	5.8%	+0.2%

# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Non-US Government Bond	2.9%	3.2%	-0.3%
Non-US Government Bond (USD Hedge)	3.2%	3.4%	-0.2%
Non-US Inflation-Linked Bond (USD Hedge)	3.3%	3.6%	-0.3%
US Short-Term TIPS (1-3 Year)	4.4%	3.9%	+0.5%
US Short-Term Treasury Bond (1-3 Year)	4.2%	3.8%	+0.4%
US Short-Term Corporate Bond (1-3 Year)	5.2%	4.9%	+0.3%
US Intermediate-Term TIPS (3-10 Year)	4.7%	4.4%	+0.3%
US Intermediate-Term Treasury Bond (3-10 Year)	4.4%	4.2%	+0.2%
US Intermediate-Term Corporate Bond (3-10 Year)	6.0%	6.0%	-
US Long-Term TIPS (10-30 Year)	4.8%	4.6%	+0.2%
US Long-Term Treasury Bond (10-30 Year)	4.3%	4.3%	-
US Long-Term Corporate Bond (10-30 Year)	6.0%	6.2%	-0.2%
20+ Year US Treasury STRIPS	4.2%	4.3%	-0.1%
10 Year US Treasury Bond	4.8%	4.7%	+0.1%
10 Year Non-US Government Bond (USD Hedge)	2.8%	3.1%	-0.3%
US Aggregate Bond*	4.9%	4.7%	+0.2%

\*Calculated as a blend of other asset classes



# 30-YEAR RETURN FORECASTS

## FIXED INCOME

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
US High Yield Corporate Bond	7.1%	7.3%	-0.2%
US Corporate Bond - BB	7.7%	7.7%	-
US Corporate Bond - B	7.1%	7.2%	-0.1%
US Corporate Bond - CCC/Below	1.9%	2.1%	-0.2%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.6%	5.5%	+0.1%
US Leveraged Loan	6.6%	6.9%	-0.3%
Emerging Market Investment Grade External Debt	5.9%	-	-
Emerging Market High Yield External Debt	8.4%	-	-
Emerging Market Local Currency Debt	5.5%	6.1%	-0.6%
US High Yield Securitized Bond	8.3%	8.1%	+0.2%
US High Yield Collateralized Loan Obligation	7.3%	7.7%	-0.4%
US High Yield Municipal Bond	4.9%	5.7%	-0.8%
Hedge Fund - Credit	7.0%	7.1%	-0.1%
Private Debt - Credit Opportunities	8.4%	8.4%	-
Private Debt - Distressed	9.3%	9.4%	-0.1%
Private Debt - Direct Lending	8.9%	9.1%	-0.2%
Private Debt*	9.0%	9.1%	-0.1%

\*Calculated as a blend of other asset classes



# 30-YEAR RETURN FORECASTS

## REAL ASSETS

Geometric Expected Return			
Asset Class	12/31/2023	12/31/2022	Delta
Commodity Futures	3.9%	3.2%	+0.7%
Midstream Energy	6.6%	6.7%	-0.1%
REIT	7.3%	7.3%	-
Global Infrastructure Equity	7.0%	6.7%	+0.3%
Global Natural Resources Equity	7.1%	6.6%	+0.5%
Gold	4.8%	4.8%	-
Real Estate - Core	6.1%	5.1%	+1.0%
Real Estate – Value-Add	7.3%	6.9%	+0.4%
Real Estate - Opportunistic	8.2%	8.6%	-0.4%
Private Debt - Real Estate	6.6%	6.0%	+0.6%
Private Real Assets - Natural Resources	8.7%	8.4%	+0.3%
Private Real Assets - Infrastructure	7.1%	7.0%	+0.1%

# VOLATILITY FORECASTS

## EQUITY

Volatility			
Asset Class	12/31/2023	12/31/2022	Delta
U.S. Large-Cap Equity	17.2%	16.9%	+0.3%
U.S. Small/Mid-Cap Equity	21.0%	20.8%	+0.2%
Non-U.S. Developed Equity	19.7%	19.6%	+0.1%
Non-U.S. Developed Equity (USD Hedge)	17.7%	17.6%	+0.1%
Non-U.S. Developed Small-Cap Equity	24.2%	24.2%	-
Emerging Market Equity	28.1%	28.6%	-0.5%
Emerging Market Small-Cap Equity	31.4%	31.9%	-0.5%
Hedge Fund - Equity	11.0%	11.1%	-0.1%
Private Equity - Buyout	20.0%	20.0%	-
Private Equity - Growth	31.5%	31.4%	+0.1%
Private Equity - Early Stage Venture	46.5%	45.0%	+1.5%
Private Equity - Secondary	20.4%	21.0%	-0.6%
Non-U.S. Private Equity	32.0%	32.0%	-
China Equity	30.6%	30.7%	-0.1%
Global Equity*	18.2%	18.1%	+0.1%
Private Equity*	25.9%	25.7%	+0.2%



\*Calculated as a blend of other asset classes

# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2023	12/31/2022	Delta
Cash	0.6%	0.6%	-
US TIPS	6.0%	6.1%	-0.1%
US Treasury Bond	5.4%	5.4%	-
US Corporate Bond	7.7%	7.6%	+0.1%
US Corporate Bond - AAA	6.8%	6.5%	+0.3%
US Corporate Bond - AA	6.6%	6.4%	+0.2%
US Corporate Bond - A	7.6%	7.5%	+0.1%
US Corporate Bond - BBB	8.4%	8.4%	-
US Mortgage-Backed Securities	6.5%	6.5%	-
US Securitized Bond	8.0%	8.2%	-0.2%
US Collateralized Loan Obligation	7.7%	7.6%	+0.1%
US Municipal Bond	6.0%	6.0%	-
US Municipal Bond (1-10 Year)	4.5%	4.5%	-
US Taxable Municipal Bond	7.5%	7.5%	-

# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2023	12/31/2022	Delta
Non-US Government Bond	9.5%	9.5%	-
Non-US Government Bond (USD Hedge)	4.1%	4.1%	-
Non-US Inflation-Linked Bond (USD Hedge)	6.7%	6.6%	+0.1%
US Short-Term TIPS (1-3 Year)	3.3%	3.4%	-0.1%
US Short-Term Treasury Bond (1-3 Year)	2.3%	2.3%	-
US Short-Term Corporate Bond (1-3 Year)	2.8%	2.8%	-
US Intermediate-Term TIPS (3-10 Year)	6.0%	6.0%	-
US Intermediate-Term Treasury Bond (3-10 Year)	5.9%	5.9%	-
US Intermediate-Term Corporate Bond (3-10 Year)	7.1%	7.1%	-
US Long-Term TIPS (10-30 Year)	12.4%	12.4%	-
US Long-Term Treasury Bond (10-30 Year)	11.8%	11.8%	-
US Long-Term Corporate Bond (10-30 Year)	11.9%	12.1%	-0.2%
20+ Year US Treasury STRIPS	20.7%	20.7%	-
10 Year US Treasury Bond	7.5%	7.5%	-
10 Year Non-US Government Bond (USD Hedge)	5.0%	5.1%	-0.1%
US Aggregate Bond*	5.8%	5.8%	-

\*Calculated as a blend of other asset classes



# VOLATILITY FORECASTS

## FIXED INCOME

Volatility			
Asset Class	12/31/2023	12/31/2022	Delta
US High Yield Corporate Bond	11.2%	11.1%	+0.1%
US Corporate Bond - BB	9.7%	9.7%	-
US Corporate Bond - B	11.6%	11.7%	-0.1%
US Corporate Bond - CCC/Below	20.3%	20.3%	-
US Short-Term High Yield Corporate Bond (1-3 Year)	8.2%	8.5%	-0.3%
US Leveraged Loan	9.1%	9.1%	-
Emerging Market Investment Grade External Debt	8.7%	-	-
Emerging Market High Yield External Debt	17.5%	-	-
Emerging Market Local Currency Debt	12.7%	13.0%	-0.3%
US High Yield Securitized Bond	11.2%	11.1%	+0.1%
US High Yield Collateralized Loan Obligation	10.4%	10.4%	-
US High Yield Municipal Bond	12.0%	12.0%	-
Hedge Fund - Credit	9.9%	10.0%	-0.1%
Private Debt - Credit Opportunities	14.5%	14.8%	-0.3%
Private Debt - Distressed	14.4%	14.6%	-0.2%
Private Debt - Direct Lending	11.0%	11.0%	-
Private Debt*	11.8%	11.8%	-

\*Calculated as a blend of other asset classes



# VOLATILITY FORECASTS

## REAL ASSETS

Volatility			
Asset Class	12/31/2023	12/31/2022	Delta
Commodity Futures	18.5%	18.5%	-
Midstream Energy	28.2%	28.8%	-0.6%
REIT	21.8%	21.7%	+0.1%
Global Infrastructure Equity	19.4%	20.6%	-1.2%
Global Natural Resources Equity	23.3%	23.5%	-0.2%
Gold	16.4%	16.3%	+0.1%
Real Estate - Core	15.0%	15.0%	-
Real Estate – Value-Add	23.4%	20.4%	+3.0%
Real Estate - Opportunistic	25.8%	23.3%	+2.5%
Private Debt - Real Estate	11.9%	11.9%	-
Private Real Assets - Natural Resources	32.3%	32.5%	-0.2%
Private Real Assets - Infrastructure	12.4%	12.4%	-

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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.

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