CITY AND COUNTY OF SAN FRANCISCO
RETIREE HEALTH CARE TRUST FUND BOARD

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RETIREE HEALTH CARE TRUST FUND
BOARD CALENDAR SHEET

Special Board Meeting of February 9, 2026

TO: Retiree Health Care Trust Fund Board

FROM: Alo Martins, CFA
SFERS Director

DATE: February 9, 2026

Agenda Item

2026 Capital Market Expectations

Background

On an annual basis, Meketa updates their risk and return forecasts for each asset class. Meketa's assumptions are based on a variety of factors including interest rates, credit spreads, cap rates, and equity prices. Relative to 2025, Meketa's 10-year return expectations for 2026 have declined for all asset classes with the exception of the risk-free rate (cash).

Meketa will provide an overview of their 2026 capital market expectations, and a review of the sensitivity of both sub-trust portfolios to various market scenarios.

Recommendation

This is a discussion only item.

Attachments

Meketa Investment Group – 2026 Capital Market Expectations Update.

MEKETA

San Francisco Retiree Health Care Trust Fund

February 9, 2026

2026 Capital Market Expectations Update

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Executive Summary

- → Meketa releases new Capital Market Expectations (CME) each year in January.
- → This document presents the overview of the capital markets landscape, provides updated long-term (10 and 20-year) return expectations, risk measurements, and stressed scenario testing for SFRHCTF's two Sub-Trusts.
- → Since the previous year's CME study, both Sub-Trusts' long-term expectations for return and risk, and Sharpe Ratio decreased.
  - This is due to the decline in return expectations across all asset classes in the portfolio while risk-free rate (cash return) and standard deviation of most asset classes remained the same.

City & County Sub-Trust	2026 CME	2025 CME	Change
10-Year Expected Return	6.5	7.0	**-0.5**
20-Year Expected Return	7.8	8.3	**-0.5**
Risk (as Standard Deviation)	12.2	12.3	**-0.1**
10-Year Sharpe Ratio	0.30	0.34	**-0.04**

College District Sub-Trust	2026 CME	2025 CME	Change
10-Year Expected Return	7.5	8.1	**-0.6**
20-Year Expected Return	7.5	8.1	**-0.6**
Risk (as Standard Deviation)	12.3	12.5	**-0.2**
10-Year Sharpe Ratio	0.27	0.31	**-0.04**

10-Year Sharpe Ratio is calculated using the return expectation of Cash Equivalents (2.8%) as risk-free rate.

Overview of 2026 Capital Market Expectations

2026 Asset Study Summary

→ Changes in our capital markets expectations (CMEs) are driven by shifts in the capital markets, including factors such as interest rates, credit spreads, cap rates, and equity prices.

- Capital markets are dynamic, and regular updates help to ensure that assumptions accurately reflect the current market environment.

→ The return assumption decreased for ~80 of the asset classes over the 10-year horizon, and it decreased for nearly 90 of the asset classes over the 20-year horizon.

→ Our 10-year CMEs continue to be lower than our 20-year CMEs for every major asset class, largely due to the market projecting a higher “risk-free” rate in the future than today.

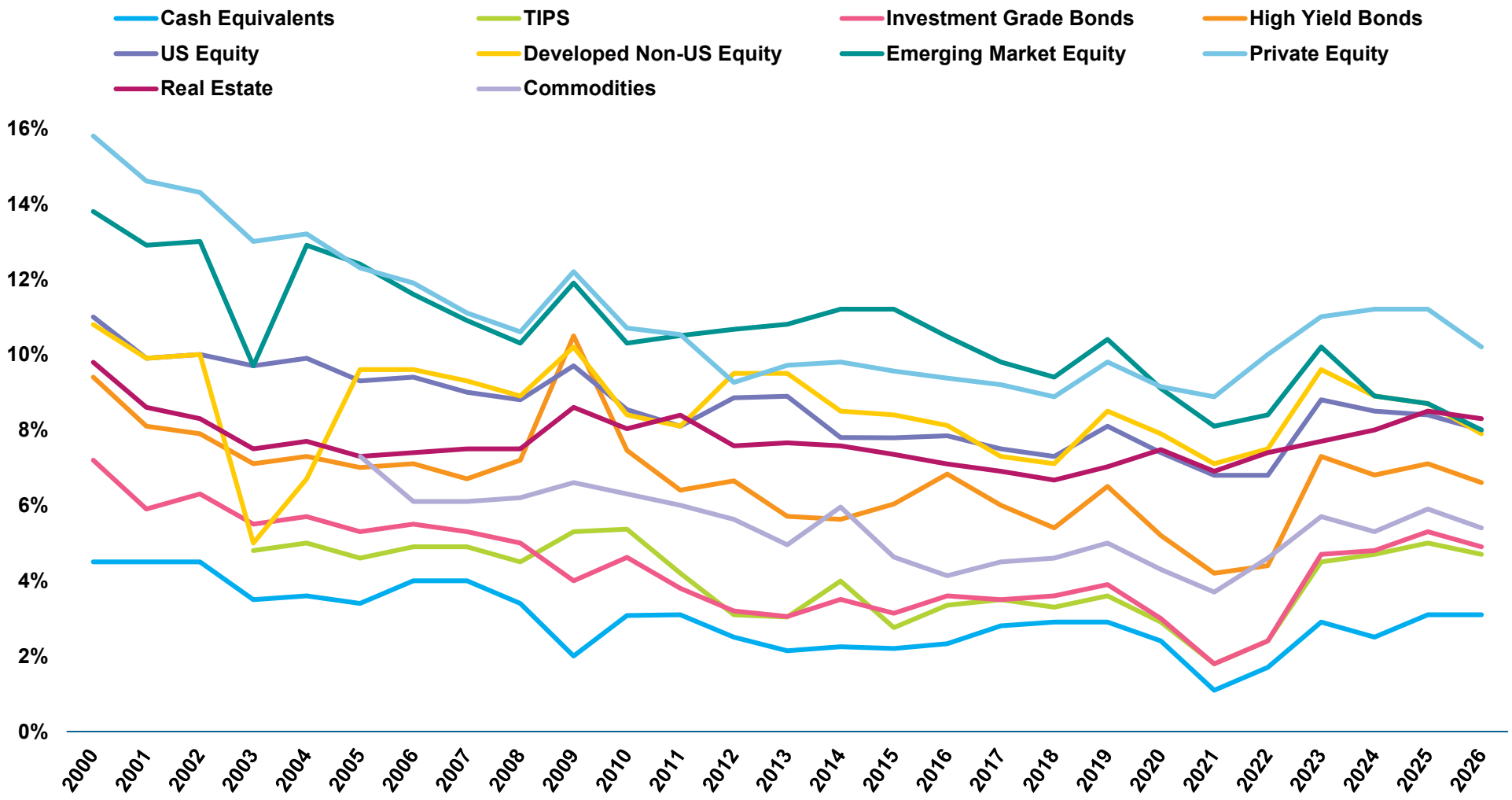
- Our lower return assumptions over the 10-year horizon implies that many investors might be well served by moderating their return expectations for the next ten years.

→ Please see Meketa’s “2026 Capital Markets Expectations” document for methodology and additional details.

Expected Return and Changes for Major Asset Classes

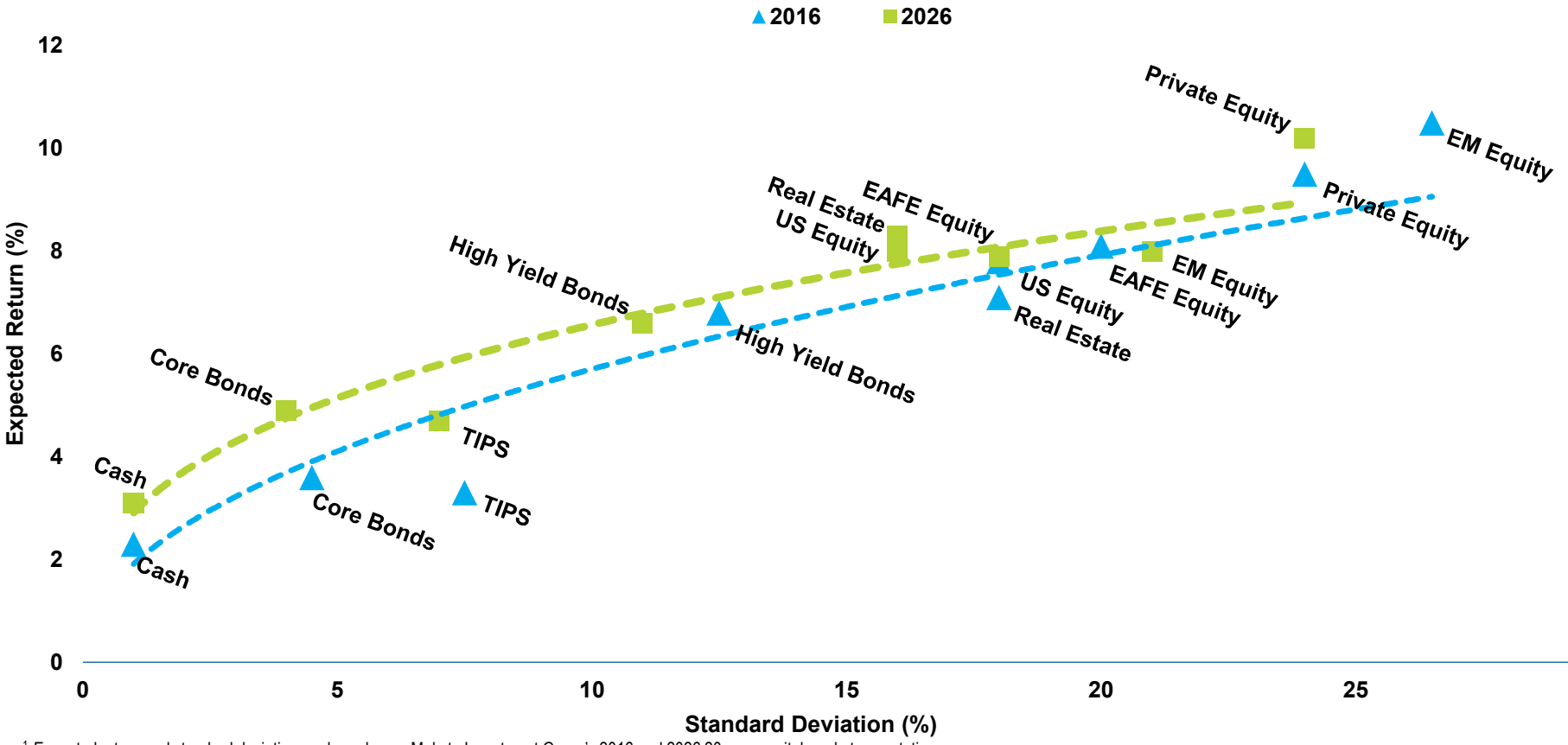
Asset Class	2026 10-year Expected Return (%)	Δ From 2025 (%)	2026 20-year Expected Return (%)	Δ From 2025 (%)
Cash Equivalents	2.8	0.0	3.1	0.0
Investment Grade Bonds	4.2	-0.7	4.9	-0.4
Long-term Government Bonds	4.5	-0.5	5.1	-0.6
TIPS	3.8	-0.5	4.7	-0.3
High Yield Bonds	5.4	-0.9	6.6	-0.5
Bank Loans	5.6	-0.7	6.4	-0.4
Emerging Market Debt	5.7	-0.6	6.4	-0.4
Private Debt	7.8	-0.9	8.2	-0.9
US Equity	6.3	-0.1	8.0	-0.4
Developed Non-US Equity	6.2	-1.0	7.9	-0.8
Emerging Non-US Equity	6.2	-0.9	8.0	-0.7
Global Equity	6.3	-0.3	8.0	-0.5
Private Equity	9.0	-0.8	10.2	-1.0
Real Estate	7.1	+0.2	8.3	-0.2
Infrastructure	7.4	+0.2	9.0	-0.2
Commodities	5.0	-0.5	5.4	-0.5
Hedge Funds	3.8	-0.4	5.7	-0.3
Inflation	2.3	0.0	2.7	0.0

Our 20-Year CMEs Since 2000



The Big Picture: Higher Return for Similar Risk[1]

- → The relationship between long-term return expectations and the level of risk accepted is not static.
- → The higher interest rates compared to a decade ago mean that many investors have greater flexibility in how they structure a portfolio to achieve their target returns.



[1] Expected return and standard deviation are based upon Meketa Investment Group's 2016 and 2026 20-year capital market expectations.

2026 Asset Class Risk-Return Expectations

10-Year Return Expectations by Asset Class

→ Return expectations decreased for most asset classes while inflation expectation was unchanged.

10-Year Expected Compound Return (%)	2026 CME	2025 CME	Change	City & County Targets (%)	College District Targets (%)
Equities				**50**	**68**
US Large Cap	6.3	6.4	-0.1	25	31
US Small Cap	7.2	7.9	-0.7	2	3
Developed Market Equity (non-US)	6.2	7.2	-1.0	13	18
Emerging Market Equity	6.2	7.1	-0.9	10	16
Credit				**6**	**9**
Multi-Sector Credit	5.5	6.3	-0.8	6	6
Emerging Market Bonds (major)	5.9	6.9	-1.0	---	3
Rate Sensitive				**12**	**23**
Investment Grade Bonds	4.2	4.9	-0.7	7	15
Short-term TIPS	3.7	3.9	-0.2	5	3
Long-term Government Bonds	4.5	5.0	-0.5	---	5
Private Markets				**22**	**---**
Private Equity Fund of Funds	7.9	8.7	-0.8	10	---
Private Debt	7.8	8.7	-0.9	5	---
Real Estate (Private)	7.2	7.1	0.1	5	---
Infrastructure (Private)	7.5	7.2	0.3	2	---
Risk Mitigating Strategies				**10**	**---**
RMS Aggregate	3.5	3.7	-0.2	10	---
Cash Equivalents / Risk-Free Rate	2.8	2.8	0.0	**---**	**---**
Inflation Expectation	2.3	2.3	0.0	**---**	**---**

20-Year Return Expectations by Asset Class

→ Return expectations decreased across the board while inflation expectation was unchanged.

20-Year Expected Compound Return (%)	2026 CME	2025 CME	Change	City & County Targets (%)	College District Targets (%)
Equities				**50**	**68**
US Large Cap	8.0	8.4	-0.4	25	31
US Small Cap	8.6	9.2	-0.6	2	3
Developed Market Equity (non-US)	7.9	8.7	-0.8	13	18
Emerging Market Equity	8.0	8.7	-0.7	10	16
Credit				**6**	**9**
Multi-Sector Credit	6.5	7.0	-0.5	6	6
Emerging Market Bonds (major)	6.6	7.1	-0.5	---	3
Rate Sensitive				**12**	**23**
Investment Grade Bonds	4.9	5.3	-0.4	7	15
Short-term TIPS	4.0	4.1	-0.1	5	3
Long-term Government Bonds	5.1	5.7	-0.6	---	5
Private Markets				**22**	**---**
Private Equity Fund of Funds	9.0	9.9	-0.9	10	---
Private Debt	8.2	9.1	-0.9	5	---
Real Estate (Private)	8.4	8.5	-0.1	5	---
Infrastructure (Private)	9.0	9.2	-0.2	2	---
Risk Mitigating Strategies				**10**	**---**
RMS Aggregate	4.6	4.8	-0.2	10	---
Cash Equivalents / Risk-Free Rate	3.1	3.1	0.0	**---**	**---**
Inflation Expectation	2.7	2.7	0.0	**---**	**---**

Year-over-Year Comparison of Standard Deviation by Asset Class

→ Standard deviation of almost all asset classes within the SFRHCTF Sub-Trusts has remained the same with decreases in Emerging Markets Equity and Private Equity classes.

Standard Deviation (%)	2026 CME	2025 CME	Change	City & County Targets (%)	College District Targets (%)
Equities				**50**	**68**
US Large Cap	16	16	0	25	31
US Small Cap	21	21	0	2	3
Developed Market Equity (non-US)	18	18	0	13	18
Emerging Market Equity	21	22	-1	10	16
Credit				**6**	**9**
Multi-Sector Credit	10	10	0	6	6
Emerging Market Bonds (major)	12	12	0	---	3
Rate Sensitive				**12**	**23**
Investment Grade Bonds	4	4	0	7	15
Short-term TIPS	5	5	0	5	3
Long-term Government Bonds	12	12	0	---	5
Private Markets				**22**	**---**
Private Equity Fund of Funds	26	26	0	10	---
Private Debt	14	15	-1	5	---
Real Estate (Private)	15	15	0	5	---
Infrastructure (Private)	18	18	0	2	---
Risk Mitigating Strategies				**10**	**---**
RMS Aggregate	7	7	0	10	---
Cash Equivalents / Risk-Free Rate	1	1	0	**---**	**---**

Asset Class Correlations

Asset Class	US Large Cap	US Small Cap	Dev. Non-US Equity	EM Equity	Multi-Sector Credit	EM Bonds (major)	IG Bonds	Short-term TIPS	Long Govt Bonds	Private Equity	Private Debt	Real Estate	Infra	RMS Agg
US Large Cap	1.00													
US Small Cap	0.89	1.00												
Developed non-US Equity	0.87	0.78	1.00											
Emerging Markets Equity	0.73	0.67	0.85	1.00										
Multi-Sector Credit	0.70	0.69	0.72	0.68	1.00									
Emerging Mkts Bonds (major)	0.61	0.54	0.71	0.72	0.74	1.00								
Investment Grade Bonds	0.24	0.16	0.28	0.26	0.22	0.61	1.00							
Short-term TIPS	0.38	0.29	0.43	0.43	0.53	0.63	0.54	1.00						
Long-term Government Bonds	-0.07	-0.14	-0.07	-0.06	-0.15	0.29	0.86	0.26	1.00					
Private Equity Fund of Funds	0.55	0.35	0.85	0.80	0.19	0.65	0.00	0.05	-0.10	1.00				
Private Debt	0.71	0.67	0.69	0.64	0.94	0.48	0.07	0.09	-0.35	0.93	1.00			
Real Estate (Private)	0.47	0.42	0.43	0.38	0.52	0.29	0.23	0.14	0.05	0.44	0.51	1.00		
Infrastructure (Private)	0.62	0.57	0.65	0.57	0.60	0.54	0.30	0.30	0.15	0.24	0.51	0.61	1.00	
RMS Aggregate	-0.02	-0.03	0.04	0.10	-0.11	-0.04	0.01	0.08	0.10	0.38	-0.13	-0.04	-0.03	1.00

Portfolio Stress Testing

Impact of Stressed Market Movements (Expected Return under Stressed Conditions)

The following presents the expected returns under stressed market conditions illustrating each target portfolio's sensitivity to four major risk factors: interest rates, credit spreads, currency fluctuations, and equity values.

→ The top of this chart focuses on the Sub-Trusts' sensitivity to interest rates rising. As you can see, this environment is modestly negative for both Sub-Trusts, once rates rise beyond 1% in a given year.

Scenario	City & County[1] (%)	College District[1] (%)
10-year Treasury Bond rates rise 100 basis points	4.0	4.0
10-year Treasury Bond rates rise 200 basis points	-1.3	-3.0
10-year Treasury Bond rates rise 300 basis points	-2.0	-3.0
Baa Spreads widen by 50 bps, High Yield by 200 basis points	-0.1	0.2
Baa Spreads widen by 300 bps, High Yield by 1000 basis points	-21.3	-24.5
Trade Weighted Dollar gains 10%	-4.7	-6.3
Trade Weighted Dollar gains 20%	-1.7	-2.8
US Equities decline 10%	-5.7	-6.6
US Equities decline 25%	-16.2	-17.8
US Equities decline 40%	-25.1	-28.9
Bull Steepener	1.3	2.3

[1] Current asset allocation policy for City & County of San Francisco Sub-Trust became effective in April 2023; that for Community College District Sub-Trust became effective in April 2021.

Impact of Positive Market Movements (Expected Return under Positive Conditions)

The following table presents the expected returns under positive market conditions

Note that we review a falling rate environment, which is considerably more positive for both Sub-Trusts, as it generally reflects a tailwind for risk assets.

Scenario	City & County[1] (%)	College District[1] (%)
10-year Treasury Bond rates drop 100 basis points	1.5	2.1
10-year Treasury Bond rates drop 200 basis points	9.4	13.5
10-year Treasury Bond rates drop 300 basis points	12.0	17.5
Baa Spreads narrow by 30 basis points, High Yield by 100 basis points	6.6	7.0
Baa Spreads narrow by 100 basis points, High Yield by 300 basis points	13.7	16.9
Trade Weighted Dollar drops 10%	7.7	9.0
Trade Weighted Dollar drops 20%	21.8	27.4
US Equities rise 10%	6.0	6.5
US Equities rise 30%	15.3	18.7
Bear Steepener	4.6	5.5

[1] Current asset allocation policy for City & County of San Francisco Sub-Trust became effective in April 2023; that for Community College District Sub-Trust became effective in April 2021.

Impact of Inflation

Scenario	City & County[1] (%)	College District[1] (%)
Positive Scenarios		
High Growth and Low Inflation	10.3	13.9
High Growth and Moderate Inflation	7.9	10.3
High Growth and High Inflation	5.4	6.6
Negative Scenarios		
Inflation slightly higher than expected	-0.2	-0.4
Inflation meaningfully higher than expected	-4.7	-6.7
Low Growth and Low Inflation	-6.8	-9.8
Low Growth and High Inflation	-10.4	-15.3
Brief, moderate inflation spike	-3.2	-5.0
Extended, moderate inflation spike	-6.0	-8.7
Brief, extreme inflation spike	-7.9	-11.1
Extended, extreme inflation spike	-10.3	-14.2

[1] Current asset allocation policy for City & County of San Francisco Sub-Trust became effective in April 2023; that for Community College District Sub-Trust became effective in April 2021.

Appendices

Stress Test Return Assumptions: Negative Scenarios[1]

Asset Class	10-year Treasury Bond rates rise 100 bps	10-year Treasury Bond rates rise 200 bps	10-year Treasury Bond rates rise 300 bps	Baa Spreads widen by 50 bps, High Yield by 200 bps	Baa Spreads widen by 300 bps, High Yield by 1000 bps	Trade Weighted Dollar gains 10%	Trade Weighted Dollar gains 20%	US Equities decline 10%	US Equities decline 25%	US Equities decline 40%	Bull Steepener
US Large Cap	5.7	-2.0	2.8	-1.2	-29.2	-4.0	-0.3	-9.4	-23.5	-37.6	2.1
US Small Cap	6.9	-4.7	10.6	-6.0	-30.9	-6.2	2.3	-11.1	-29.5	-47.6	1.6
Developed Market Eq (non-US)	8.4	0.1	-5.5	0.4	-34.6	-12.8	-8.6	-8.4	-22.2	-39.2	-2.7
Emerging Market Equity	9.1	1.4	0.1	-1.0	-41.9	-15.2	-14.4	-10.7	-28.3	-43.0	3.4
Multi-Sector Credit	1.9	-2.9	-4.4	-2.3	-21.9	-3.5	-0.6	-4.5	-14.3	-19.3	1.5
Emerging Market Bonds (major)	0.7	-6.5	-3.6	-0.1	-14.7	-2.6	-4.2	-4.4	-12.5	-15.4	5.0
Investment Grade Bonds	-3.8	-7.5	-10.5	3.9	-0.4	0.8	4.2	1.3	0.7	-1.0	5.0
Short-term TIPS	-2.7	-5.4	-7.9	1.5	-3.8	-2.7	-2.3	1.9	-2.1	-5.5	2.3
Long-term Government Bonds	-8.9	-16.2	-20.5	7.8	7.3	1.8	12.8	1.0	2.6	2.4	8.7
Private Equity Fund of Funds	5.0	-0.2	-6.1	-0.8	-22.4	-3.4	-7.4	-9.6	-22.4	-25.2	-1.0
Private Debt	2.3	-1.1	-6.2	-1.8	-15.8	-2.3	-4.2	-3.9	-12.8	-14.9	0.0
Real Estate (Private)	2.3	4.1	6.8	2.9	-11.6	4.7	9.4	0.9	-11.3	-18.6	1.2
Infrastructure (Private)	0.0	-9.4	-5.9	-0.5	-5.9	-4.7	-7.9	-2.8	-9.5	-14.2	-0.7
RMS Aggregate	0.4	1.7	-0.7	2.0	5.6	2.0	13.6	2.5	5.2	6.3	1.8
Cash Equivalents	-0.2	-0.4	-0.5	2.8	1.1	3.6	1.3	2.8	2.3	0.4	2.8

[1] Assumptions are based on performance for each asset class during historical periods that resembled these situations.

Stress Test Return Assumptions: Positive Scenarios[1]

Asset Class	10-year Treasury Bond rates drop 100 bps	10-year Treasury Bond rates drop 200 bps	10-year Treasury Bond rates drop 300 bps	Baa Spreads narrow by 30bps, High Yield by 100 bps	Baa Spreads narrow 100bps, High Yield by 300 bps	Trade Weighted Dollar drops 10%	Trade Weighted Dollar drops 20%	US Equities rise 10%	US Equities rise 30%	Bear Steepener
US Large Cap	3.1	13.5	16.8	9.7	16.1	7.2	23.5	9.4	27.9	7.6
US Small Cap	1.2	12.9	20.0	10.6	22.0	5.4	25.0	9.9	30.5	7.2
Developed Market Eq (non-US)	-2.3	16.3	18.0	9.2	18.2	13.1	47.3	6.1	18.5	9.0
Emerging Market Equity	0.7	17.6	22.9	8.7	34.1	19.7	46.9	8.6	26.8	11.4
Multi-Sector Credit	1.4	5.5	6.3	5.3	21.1	6.0	4.6	3.5	7.6	0.7
Emerging Market Bonds (major)	3.2	7.4	8.1	5.1	15.5	7.4	15.4	5.4	11.0	2.6
Investment Grade Bonds	4.1	8.5	13.3	0.9	3.9	2.5	9.4	1.8	3.5	-1.4
Short-term TIPS	2.8	5.6	8.5	0.6	7.1	2.4	2.6	0.0	-0.8	-4.7
Long-term Government Bonds	10.7	23.1	37.4	-0.2	-0.6	1.8	22.2	3.5	5.4	-5.1
Private Equity Fund of Funds	1.6	3.5	4.3	8.5	8.6	6.4	15.2	9.2	12.0	3.7
Private Debt	0.8	1.8	2.7	6.8	12.7	4.8	5.9	4.4	6.0	0.3
Real Estate (Private)	1.3	3.2	3.3	3.6	-3.4	1.4	7.3	3.6	4.4	2.0
Infrastructure (Private)	-0.7	-2.5	-1.2	5.1	4.0	3.5	5.4	2.7	3.6	-0.5
RMS Aggregate	1.7	1.7	2.9	-0.2	1.4	4.2	11.8	1.0	2.1	0.2
Cash Equivalents	0.2	0.4	0.5	0.9	0.2	2.0	4.5	2.3	3.1	4.2

[1] Assumptions are based on performance for each asset class during historical periods that resembled these situations.

Inflation Scenario Description

Scenario	Scenario Description
Inflation slightly higher than expected	Inflation is 0.05% above inflation expectation (i.e. surprise Inflation is 0.05%). 0.05% is the 25th percentile of positive, historical surprise inflation.
Inflation moderately higher than expected	Inflation is 0.12% above inflation expectation (i.e. surprise Inflation is 0.12%). 0.12% is the median of positive, historical surprise inflation.
Inflation meaningfully higher than expected	Inflation is 0.2% above inflation expectation (i.e. surprise Inflation is 0.2%). 0.2% is the 75th percentile of positive, historical surprise inflation.
High Growth and Low Inflation	The real GDP growth rate is 1.2% and Inflation is 0.1%. 1.2% GDP growth is the 75th percentile of historical GDP growth and 0.1% inflation is the 25th percentile of historical inflation.
High Growth and Moderate Inflation	The real GDP growth rate is 1.2% and Inflation is 0.27%. 1.2% GDP growth is the 75th percentile of historical GDP growth and 0.27% inflation is the median of historical inflation.
High Growth and High Inflation	The real GDP growth rate is 1.2% and Inflation is 0.43%. 1.2% GDP growth is the 75th percentile of historical GDP growth and 0.43% inflation is the 75th percentile of historical inflation.
Low Growth and Low Inflation	The real GDP growth rate is .3% and Inflation is 0.1%. 0.3% GDP growth is the 25th percentile of historical GDP growth and 0.1% inflation is the 25th percentile of historical inflation.
Low Growth and Moderate Inflation	The real GDP growth rate is .3% and Inflation is 0.27%. 0.3% GDP growth is the 25th percentile of historical GDP growth and 0.27% inflation is the median of historical inflation.
Low Growth and High Inflation	The real GDP growth rate is .3% and Inflation is 0.43%. 0.3% GDP growth is the 25th percentile of historical GDP growth and 0.43% inflation is the 75th percentile of historical inflation.
Brief, moderate inflation spike	Inflation is 0.45% and lasts for 4-8 months. 0.45% is the 75th percentile of historical inflation.
Extended, moderate inflation spike	Inflation is 0.45% and lasts for 12+ months. 0.45% is the 75th percentile of historical inflation.
Brief, extreme inflation spike	Inflation is 0.9% and lasts for 4-8 months. 0.9% is the 95th percentile of historical inflation.
Extended, extreme inflation spike	Inflation is 0.9% and lasts for 12+ months. 0.9% is the 95th percentile of historical inflation.

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Appendix: 2026 Capital Market Expectations

MEKETA

Meketa Investment Group

2026

2026 Capital Markets Expectations

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Executive Summary

Executive Summary

- → Changes in our capital markets expectations (CMEs) are driven by shifts in the capital markets, including factors such as interest rates, credit spreads, cap rates, and equity prices.
  - Capital markets are dynamic, and regular updates help to ensure that assumptions accurately reflect the current market environment.
- → The return assumption decreased for ~80% of the asset classes over the 10-year horizon, and it decreased for nearly 90% of the asset classes over the 20-year horizon.
- → Our 10-year CMEs continue to be lower than our 20-year CMEs for every major asset class, largely due to the market projecting a higher “risk-free” rate in the future than today.
  - Our lower return assumptions over the 10-year horizon implies that many investors might be well served by moderating their return expectations for the next ten years.

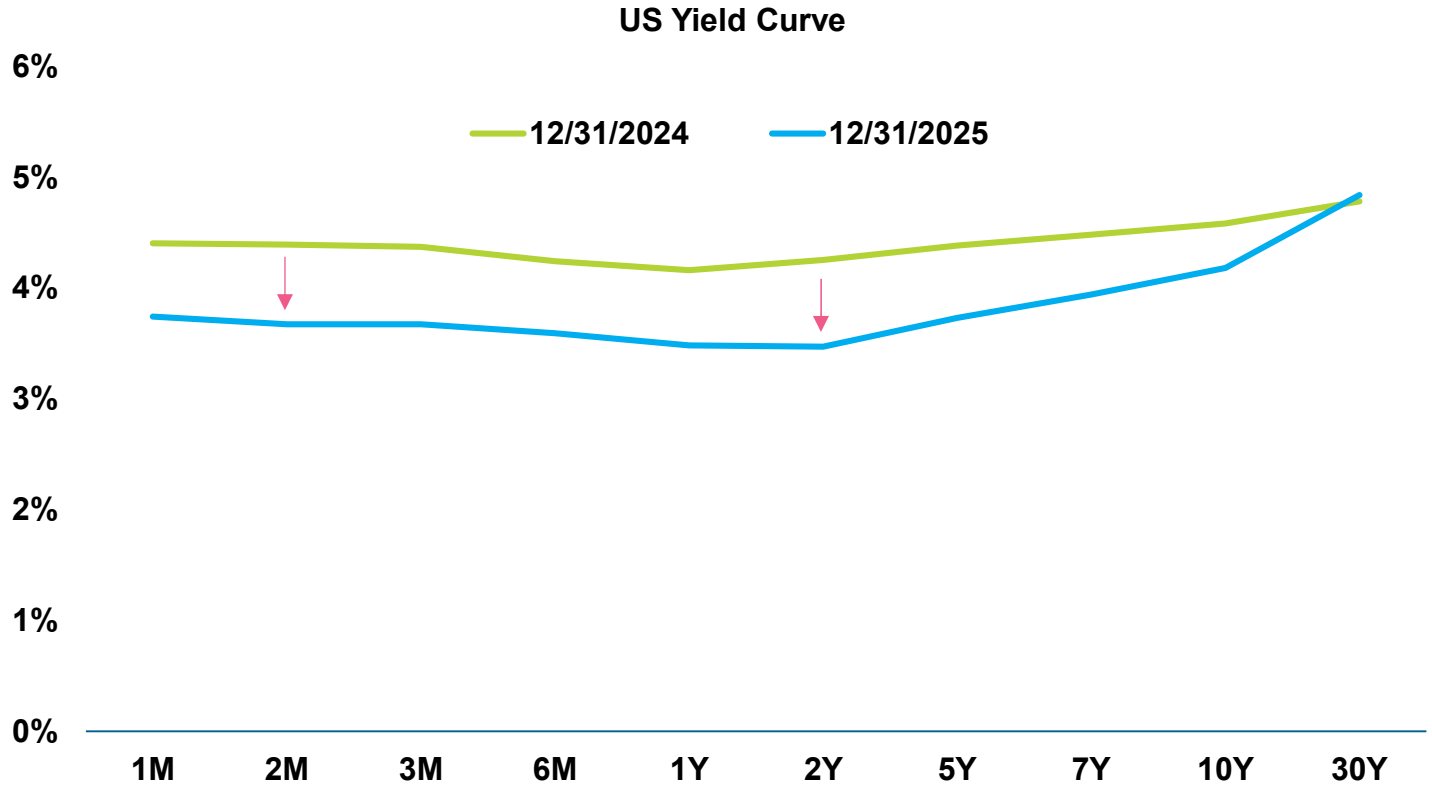
Expected Return and Changes for Major Asset Classes

Asset Class	2026 10-year Expected Return (%)	Δ From 2025 (%)	2026 20-year Expected Return (%)	Δ From 2025 (%)
Cash Equivalents	2.8	0.0	3.1	0.0
Investment Grade Bonds	4.2	-0.7	4.9	-0.4
Long-term Government Bonds	4.5	-0.5	5.1	-0.6
TIPS	3.8	-0.5	4.7	-0.3
High Yield Bonds	5.4	-0.9	6.6	-0.5
Bank Loans	5.6	-0.7	6.4	-0.4
Emerging Market Debt	5.7	-0.6	6.4	-0.4
Private Debt	7.8	-0.9	8.2	-0.9
US Equity	6.3	-0.1	8.0	-0.4
Developed Non-US Equity	6.2	-1.0	7.9	-0.8
Emerging Non-US Equity	6.2	-0.9	8.0	-0.7
Global Equity	6.3	-0.3	8.0	-0.5
Private Equity	9.0	-0.8	10.2	-1.0
Real Estate	7.1	+0.2	8.3	-0.2
Infrastructure	7.4	+0.2	9.0	-0.2
Commodities	5.0	-0.5	5.4	-0.5
Hedge Funds	3.8	-0.4	5.7	-0.3
Inflation	2.3	0.0	2.7	0.0

Market Overview

Falling Interest Rates

- → The short and intermediate portions of the yield curve moved down, driven by multiple Fed rate cuts.
- → The result was a shift away from the slightly "U"-shaped curve to a somewhat more traditional shape (i.e., upward sloping, at least beyond two years).

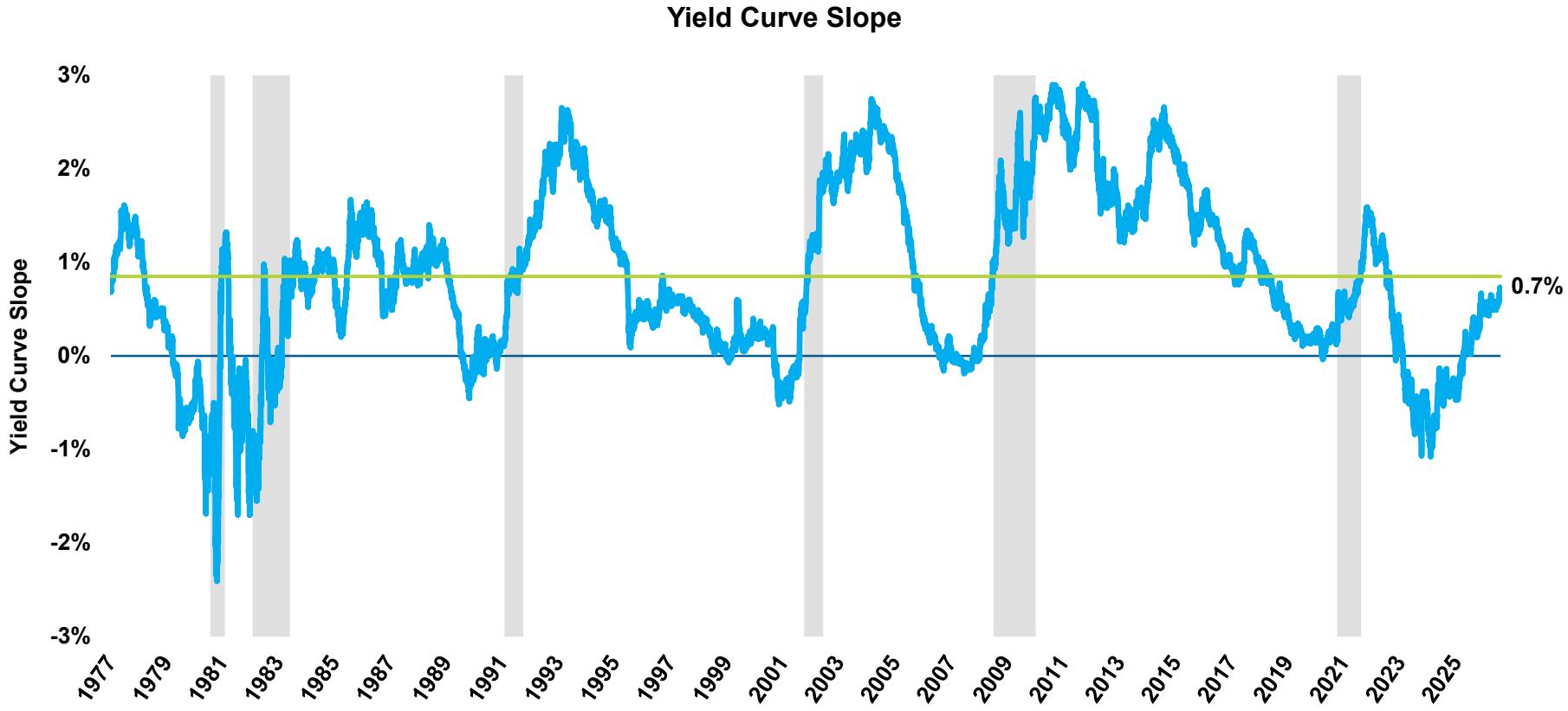


Source: Bloomberg. Data is as of December 31, 2025.

Normalizing Yield Curve

→ The yield curve began the year with a positive 2-10 spread but the curve was inverted in some other sections.

- The 2-10 spread moved closer to its long-term average during the year.

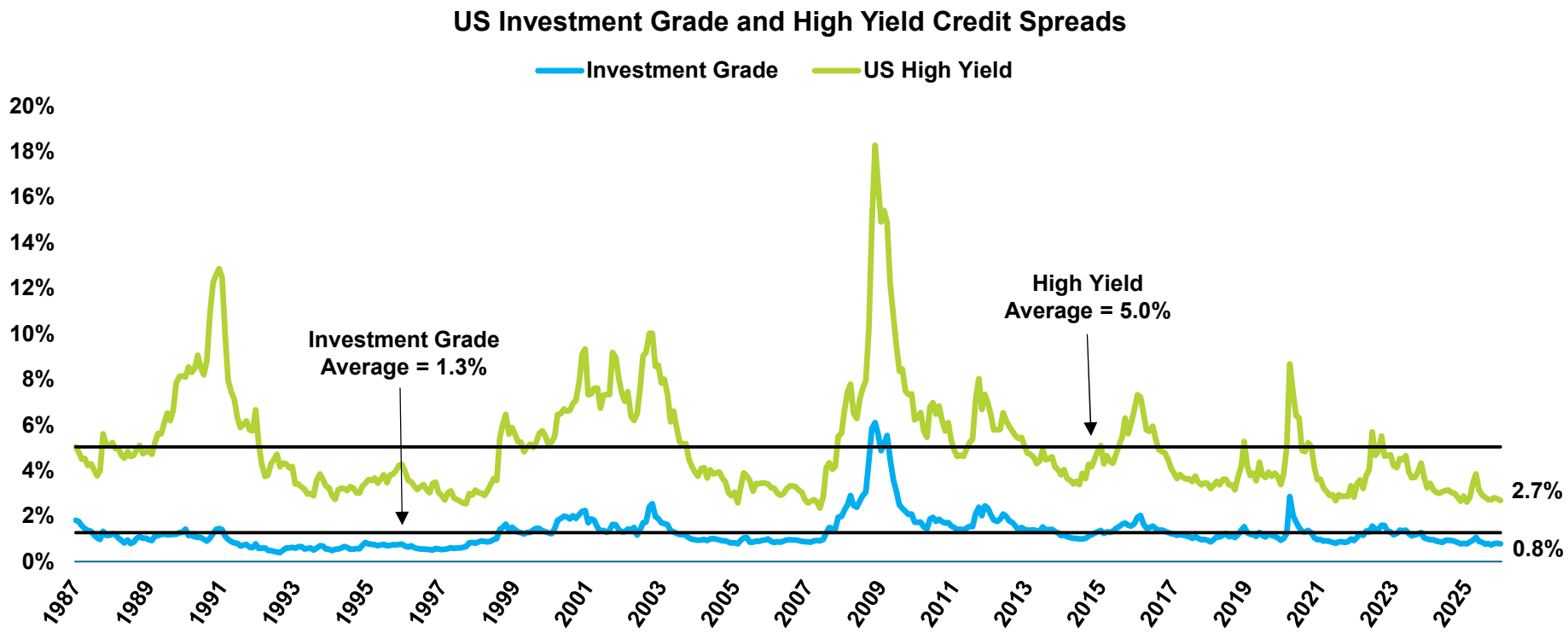


Source: FRED. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield. Data is as of December 31, 2025.

Slightly Narrower Credit Spreads

→ Credit spreads tightened slightly in 2025, moving further below their long-term averages.

- The spread for high yield bonds declined from 287 basis points to 266 basis points, while the spread for investment grade corporates declined from 80 basis points to 78 basis points.



Source: Bloomberg. High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US Treasury yield. Data is as of December 31, 2025.

Lower Yields

- → Short-term interest rates declined as the Fed cut its target rate, and the yield on the 10-year Treasury decreased.
- → Tighter credit spreads amplified the yield reduction in credit markets.

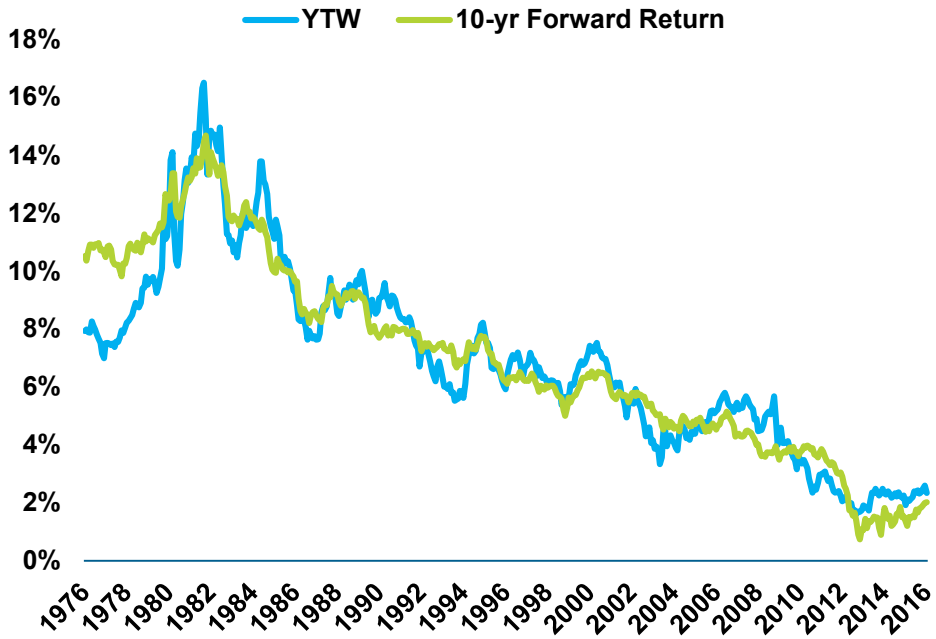
Index	Yield to Worst 12/31/25 (%)	Yield to Worst 12/31/24 (%)
Fed Funds Effective Rate	3.50 – 3.75	4.25 – 4.50
10-year Treasury	4.18	4.58
Bloomberg Aggregate	4.32	4.91
Bloomberg Corporate	4.81	5.33
Bloomberg Securitized	4.61	5.25
Bloomberg Global Aggregate	3.52	3.68
Bloomberg US Corporate High Yield	6.53	7.49

Source: Bloomberg. Data is as of December 31, 2024 and December 31, 2025.

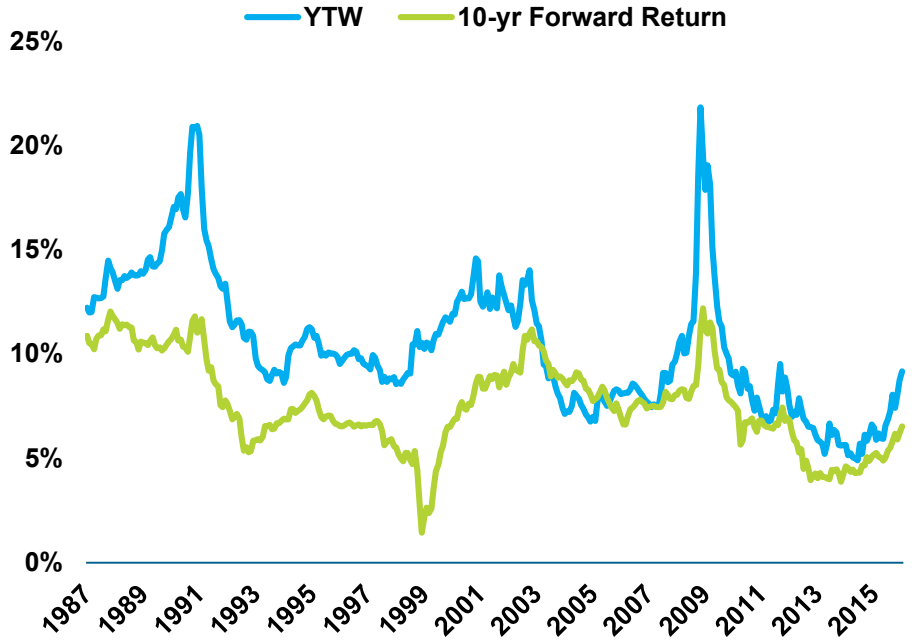
Yields Drive Future Returns

→ Changes in interest rates matter because yields are a very good predictor of future returns for bonds,[1] at least over a 10-year horizon.

YTW and Returns for Investment Grade Bonds



YTW and Returns for High Yield Bonds



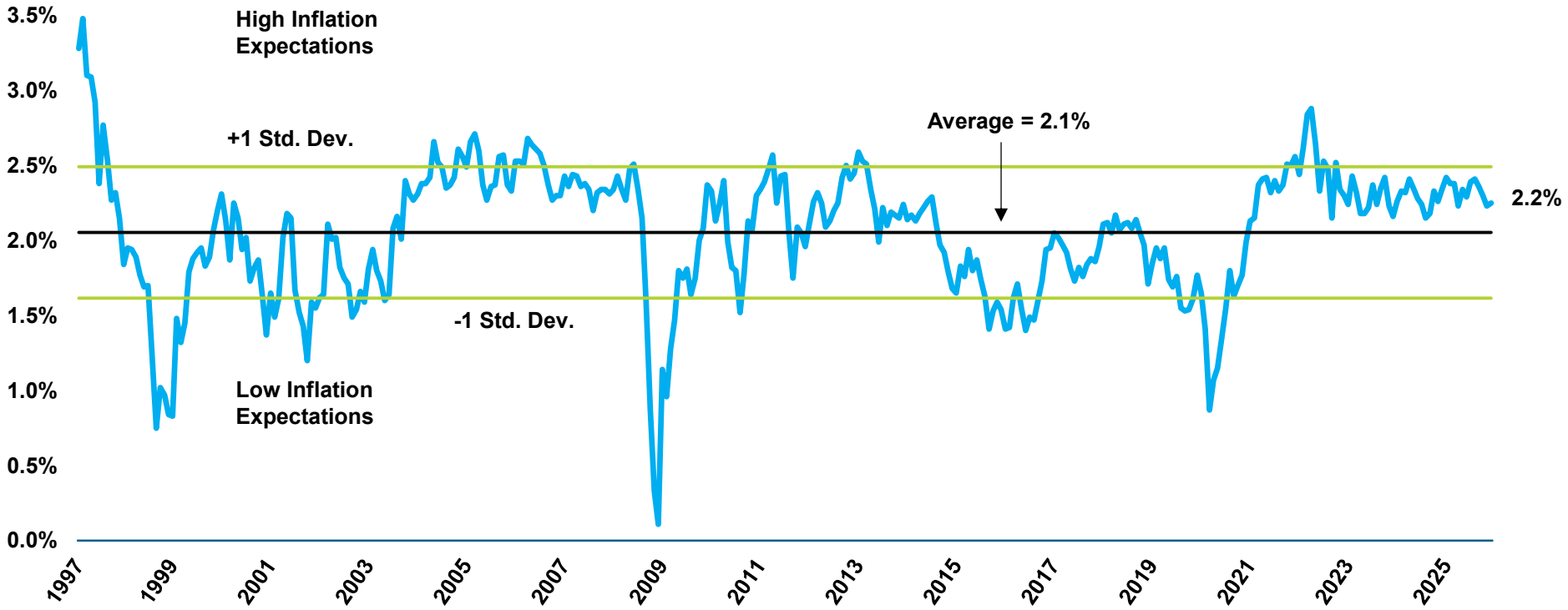
[1] When predicting returns for bonds, default risk should also be taken into account. For example, defaults are why the return for high yield bonds have generally been below the starting yield.
Source: Bloomberg Aggregate and Bloomberg High Yield indices. Data is as of December 31, 2025.

Similar Inflation Expectations

→ Despite many inflation-related headlines during the year, the market's expectations for inflation were little changed at the end of 2025.

- The 10-year breakeven inflation rate decreased slightly, from 2.3% to 2.2%.

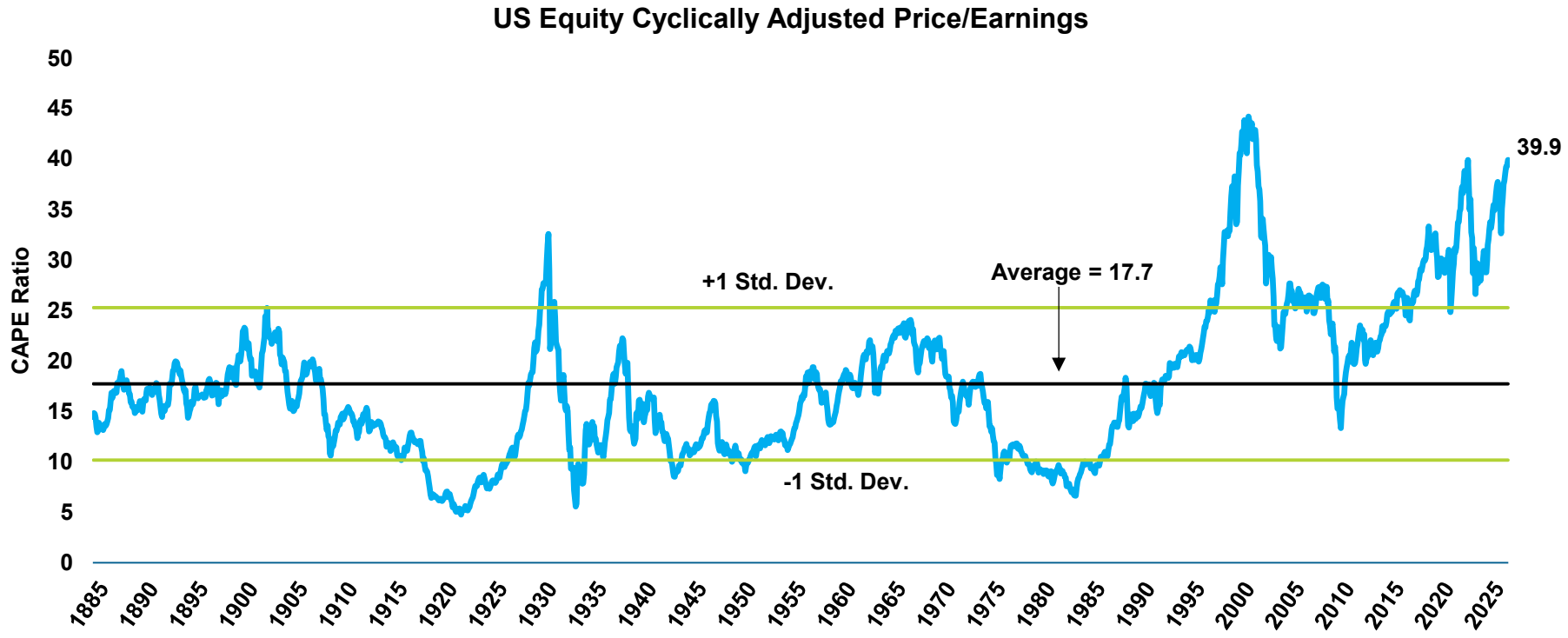
Ten-Year Breakeven Inflation



Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA). Data is as of December 31, 2025.

Surprisingly Little Change in US Equity Valuations

- → US stocks had another good year, with the S&P 500 index gaining 17.9%.
- → Valuations are higher than one year ago, with the CAPE moving from 38 to 39.9.
  - Still, valuations remain elevated relative to their long-term history.



Source: Robert Shiller, Yale University, and Meketa Investment Group. Data is as of December 31, 2025 for the S&P 500 Index.

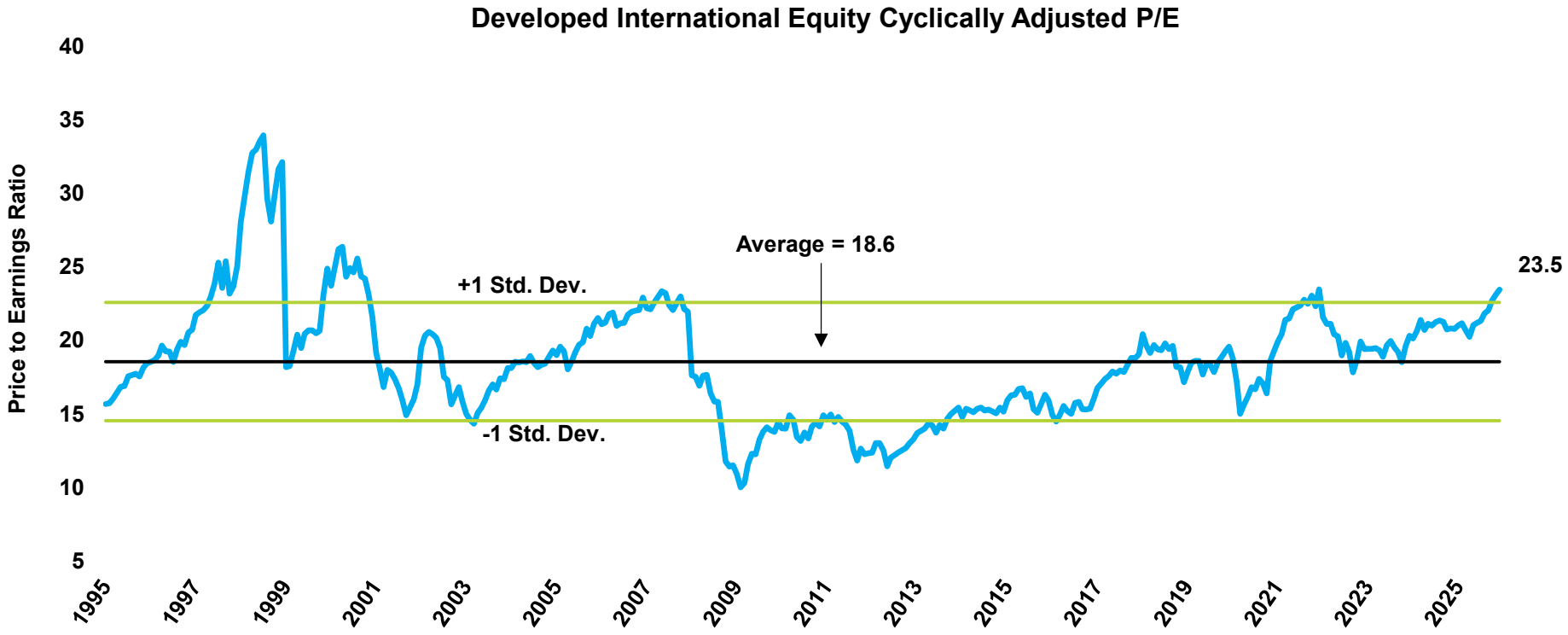
Higher Non-US Developed Equity Valuations

→ EAFE equities had a great year, posting a 31.2% gain for USD investors.

- A currency tailwind aided these gains, as EAFE posted a 20.6% return in local currency terms.

→ The gains also reflected higher valuations, with the price-earnings ratio going from 21 to 23.5.

- EAFE valuations are now above their historical average.

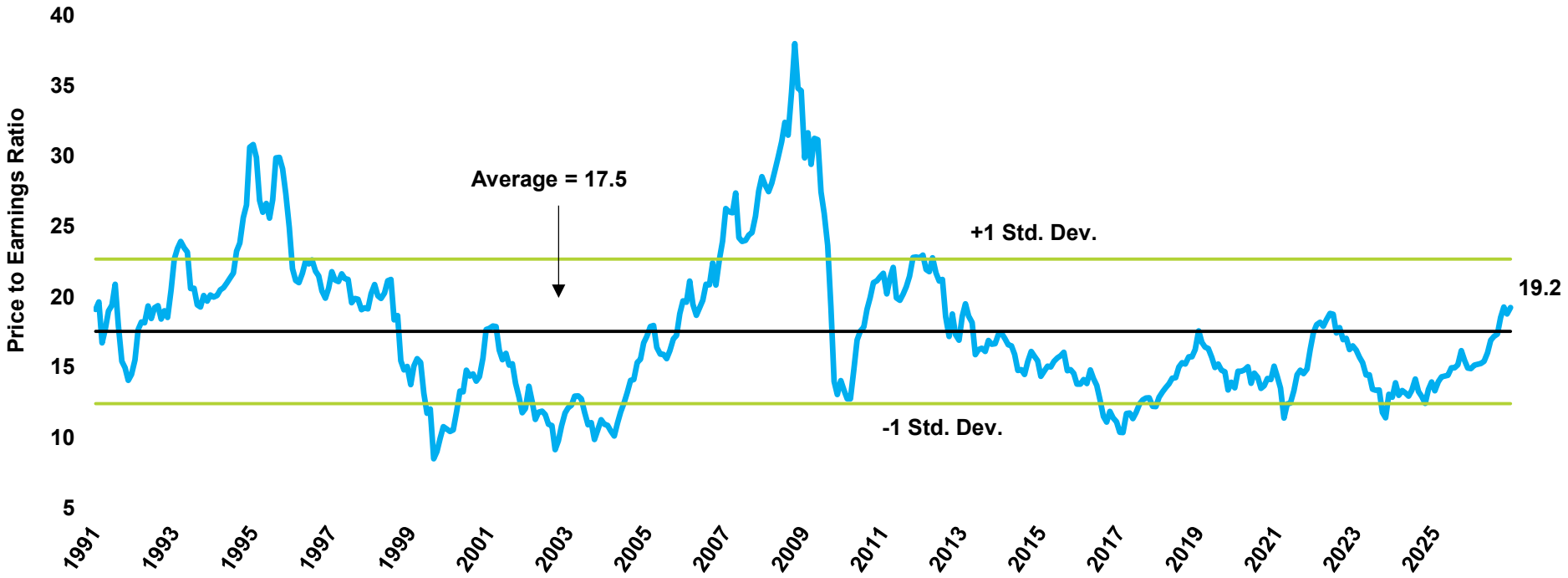


Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 31, 2025.

Higher Prices in Emerging Market Equities

- → Emerging market equities had a great year, gaining 33.5% for USD investors.
- → These gains were driven largely by higher valuations, with the price-earnings ratio going from 14.8 to 19.2.
  - As a result, EM equity valuations have moved above their long-term average, with the EM ex-China index continuing to trade at higher valuations than the China index.

Emerging Market Equity Cyclically Adjusted P/E

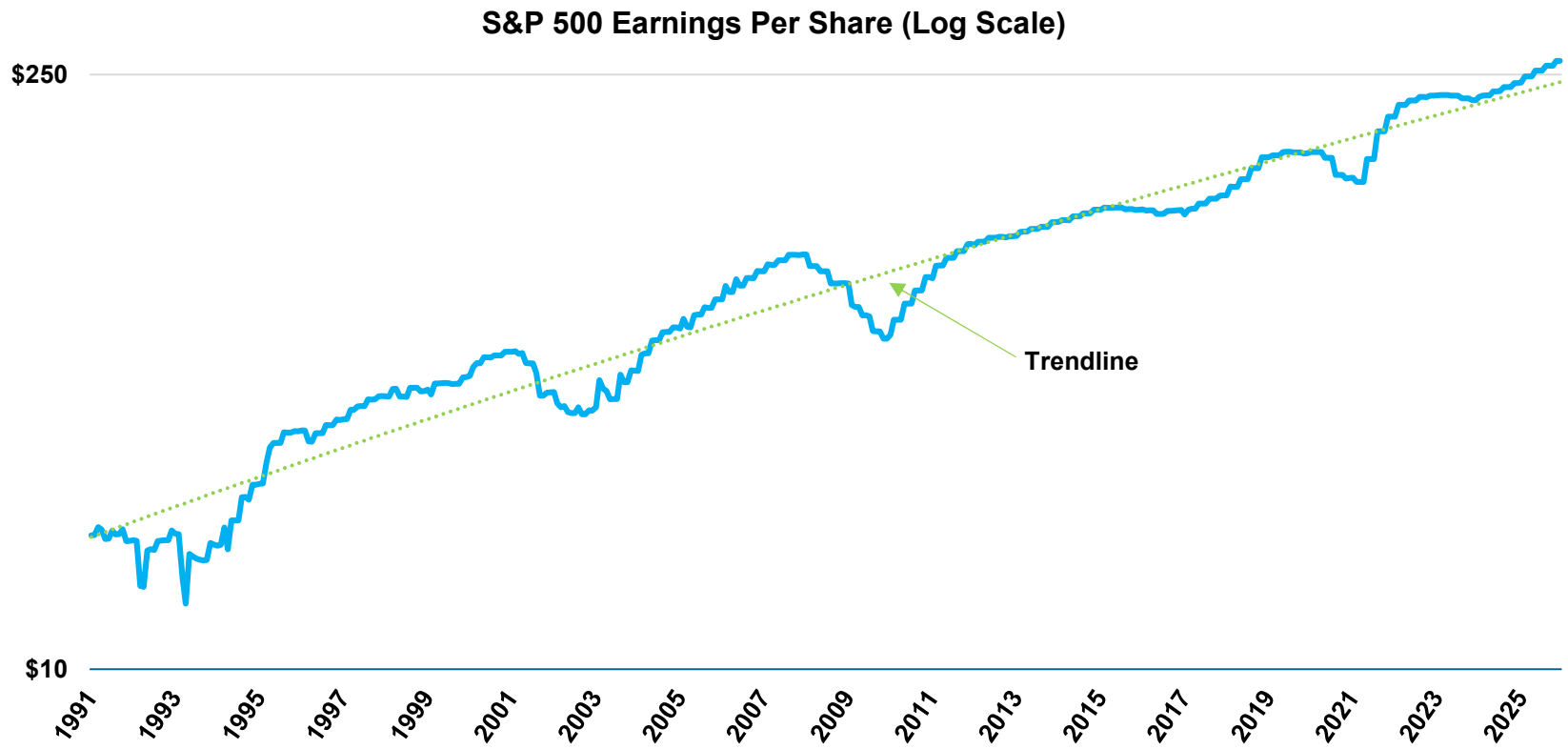


Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 31, 2025.

Strong US Earnings Growth

→ S&P 500 earnings (EPS) had a good year, growing by 13%.

- At year-end, estimates were that EPS had hit a new peak.

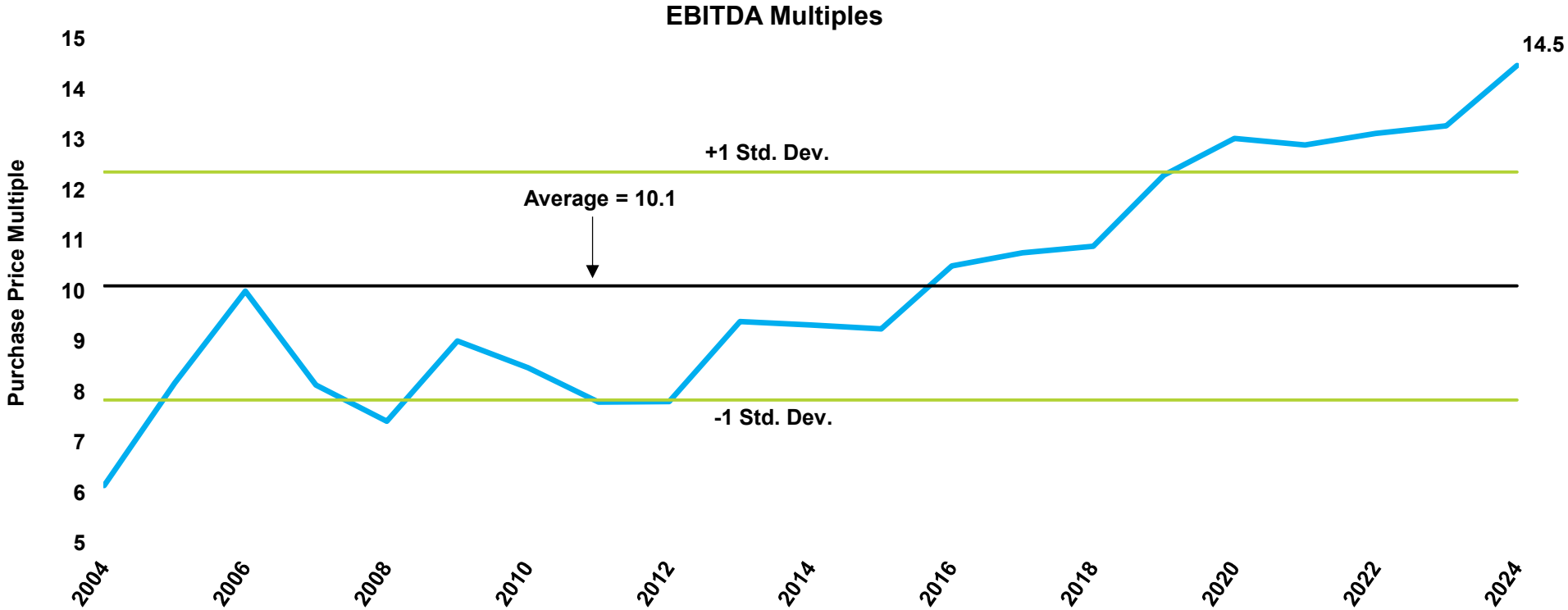


Source: S&P 500 Index data from Bloomberg. Represents trailing 12-month "as reported" earnings per share. Data is as of December 31, 2025.

Private Equity Prices Rebounding

→ EBITDA multiples for buyouts have risen substantially over the past ten years.

- Preliminary data for 2025 show a slight downtick in multiples, but that is based on a very small fraction of the anticipated number of deals (~15% of the number of deals from 2024).



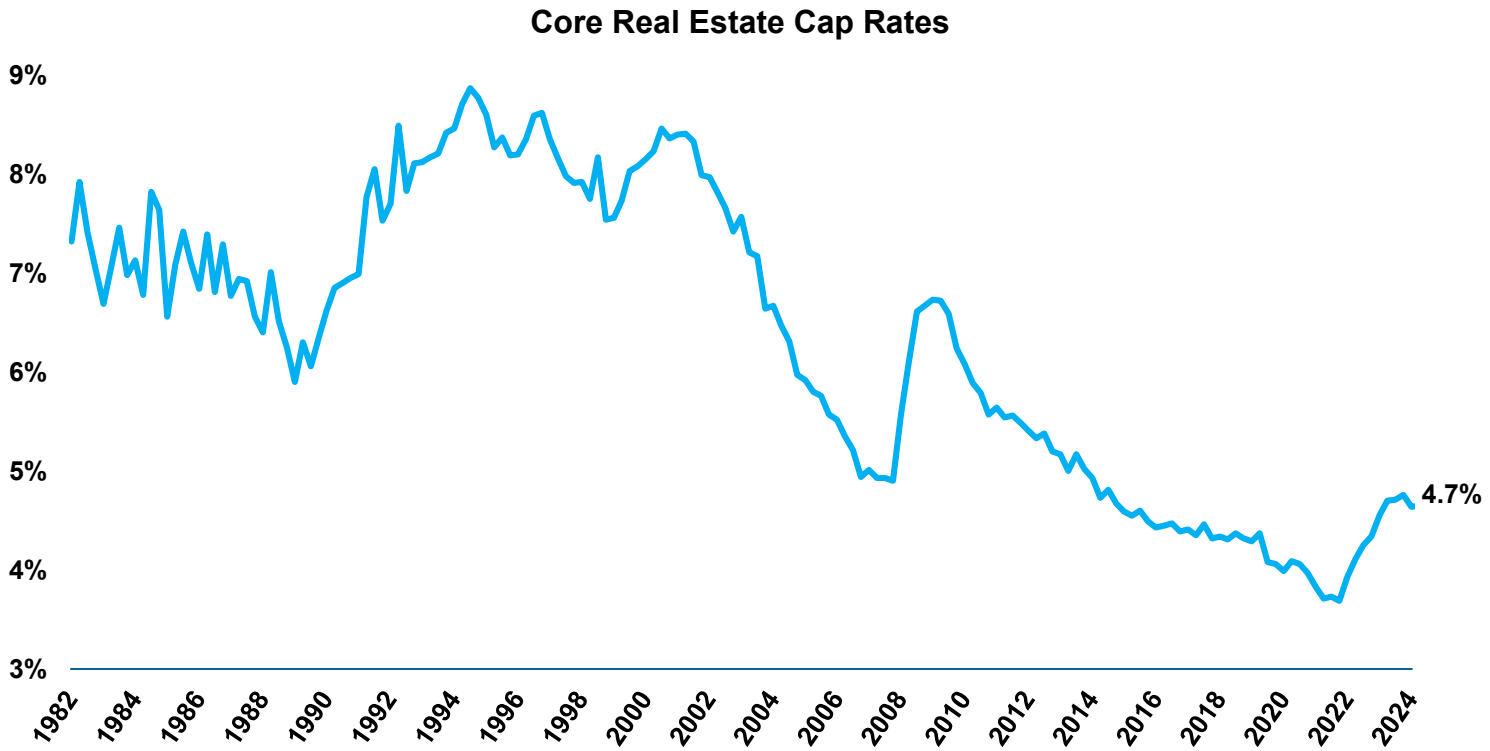
Source: Preqin Median EBITDA Multiples Paid in All LBOs. Data pulled as of 1/8/2025.

Real Estate Valuations Solidifying

→ Cap rates appeared to level off in 2025.

- This is likely welcomed by investors who have seen cap rates rise (and prices fall) for several years.

→ Still, cap rates remain below the trough experienced during the Global Financial Crisis (GFC).



Source: NCREIF NPI value-weighted cap rates. As of September 30, 2025.

Slightly Lower Projected Rates in the Future

→ As interest rates have declined, so have the market's predictions for future interest rates.

- The market is forecasting that the 10-year Treasury yield in ten years will be 5.30%, versus a prediction of 5.42% twelve months ago.

→ Lower future interest rates for "risk-free" assets implies lower expected returns for any forecasting model that includes a risk premium approach.

Market Projection for the 10-Year Treasury Yield in Ten Years



Source: FRED. Represents the Fitted Instantaneous Forward Rate 10 Years Hence, as of December 31, 2025.

Our Process

Setting Capital Market Expectations

- Capital markets expectations ("CMEs") are the inputs needed to determine the long-term risk and returns expectations for a portfolio.
  - They serve as the starting point for determining asset allocation.
- Consultants (including Meketa) generally set them once a year.
  - Our results are published in January and based on data as of December 31 for public markets and September 30 for private markets.
- Setting CMEs involves crafting long-term forecasts for:
  - Returns
  - Standard Deviation
  - Correlations (i.e., covariance)
- We do not assume any "alpha."
- For asset classes where there is no passive option (e.g., private markets) we include an assumption for estimated fees.
- Our process relies on both quantitative and qualitative methodologies.

Asset Class Definitions

- We identify asset classes and strategies that are both investable and appropriate for the long-term allocation of funds.
- Several considerations influence this process:
  - Unique return behavior
  - Observable historical track record
  - A robust market
  - Client requests
- We then make forecasts for each asset class.
  - We created inputs for 115 “asset classes” for our 2026 Capital Markets Expectations.

Building 10-Year Forecasts

→ Our first step is to develop 10-year forecasts based on fundamental models.

- Each model is based on the most important factors that drive returns for that asset class:

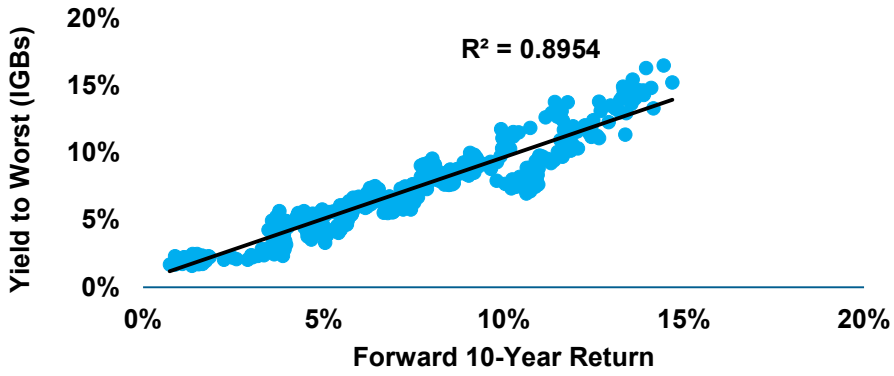
Asset Class Category	Major Factors
Equities	Dividend Yield, Earnings Growth, Valuation
Bonds	Yield to Worst, Default Rate, Recovery Rate
Commodities	Collateral Yield, Roll Yield, Inflation
Infrastructure	Public IS Valuation, Income, Growth, Leverage
Natural Resources	Price per Acre, Income, Public Market Valuation
Real Estate	Cap Rate, Yield, Growth, Leverage
Private Equity	EBITDA Multiple, Leverage, Public VC Valuation
Hedge Funds and Other	Leverage, Alternative Betas

→ The common components are income, growth, and valuation.

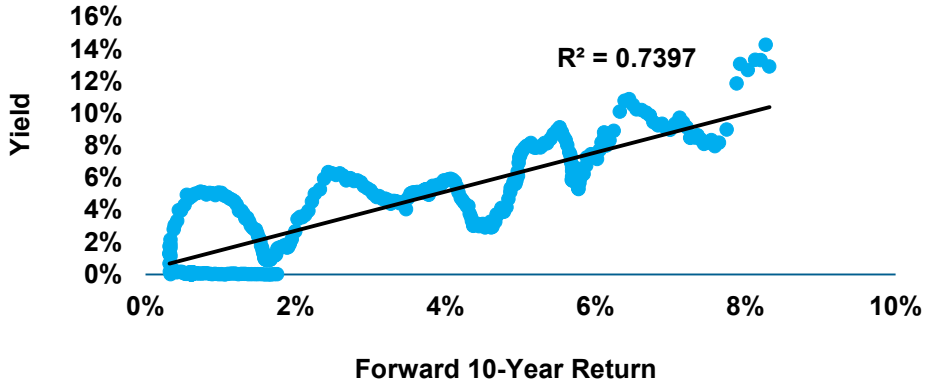
- Leverage and currency impact are also key factors for many strategies.

Some Factors are Naturally More Predictive Than Others

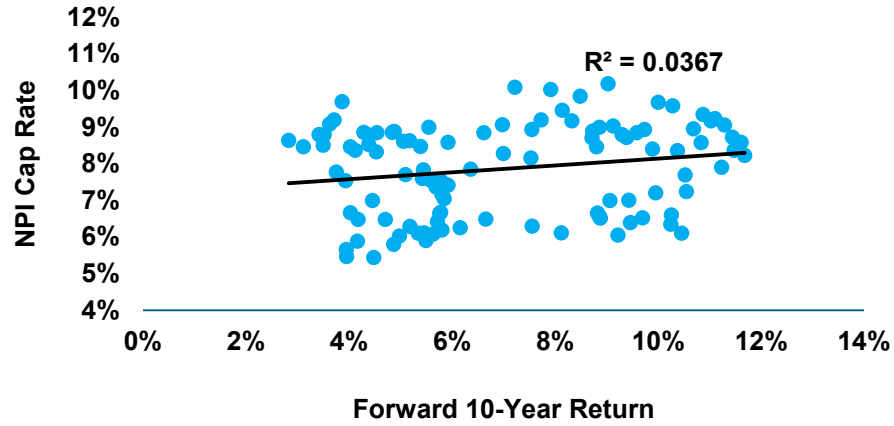
Investment Grade Bonds
Yield to Worst vs. Forward 10-Year Returns



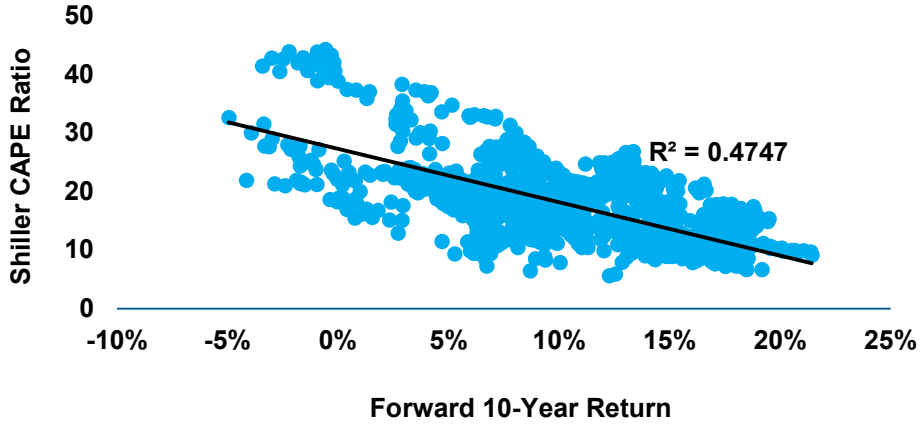
Cash (90-Day T-Bill)
Yield vs. Forward 10-Year Returns



Core Real Estate
Cap Rates vs. Forward 10-Year Returns



US Equities
Shiller CAPE vs. Forward 10-Year Returns



Sources: Bloomberg, FRED, NCREIF, S&P, Robert Shiller (Yale University), and Meketa Investment Group. As of December 31, 2024.

10-Year Model Example: Bonds

- The short version for investment grade bond models is:

$$E(R) = \text{Current YTW (yield to worst)}$$

- Our models assume that there is a reversion to the mean for spreads (though not yields).
- For TIPS, we add the real yield of the TIPS index to the breakeven inflation rate.
- As with equities, we make currency adjustments when necessary for foreign bonds.
- For bonds with credit risk, Meketa Investment Group estimates default rates and loss rates in order to project an expected return:

$$E(R) = YTW - (\text{Annual Default Rate} \times \text{Loss Rate})$$

10-Year Model Example: Equities

→ We use a fundamental model for equities that combines income and capital appreciation.

E(R) = Dividend Yield + Expected Earnings Growth + Valuation Effect + Currency Effect

→ Meketa evaluates historical data to develop expectations for dividend yield, earnings growth, the multiple effect, and currency effect.

- Earnings growth is a function of real GDP growth, inflation, and exposure to foreign revenue sources.
- We assume that long-term earnings growth is linked to economic growth.
- However, many factors can cause differences between economic growth and EPS growth.

→ Our models assume that there is a reversion toward mean pricing over this time frame.

Moving from 10-Year to 20-Year Forecasts

- Our next step is to combine our 10-year forecasts with projections for years 11-20 for each asset class.
- We use a risk premium approach to forecast 10-year returns in ten years (i.e., years 11-20).
  - We start with an assumption (market informed, specifically the projected 10-year forward rate) for what the risk-free rate will be in ten years.
  - We then add a risk premium for each asset class.
  - We use historical risk premia as a guide, but many asset classes will differ from this, especially if they have a shorter history.
  - We seek consistency with finance theory (i.e., riskier assets will have a higher risk premia assumption).
- Essentially, we assume mean-reversion over the first ten years (where appropriate), and consistency with CAPM thereafter.
- The final step is to make any qualitative adjustments.
  - The Investment Policy Committee reviews the output and may make adjustments.

The Other Inputs: Standard Deviation and Correlation

Standard Deviation:

→ We review the trailing twenty-year standard deviation, as well as skewness.

→ Historical standard deviation serves as the base for our assumptions.

→ If there is a negative skew, we increased the volatility assumption based on the size of the historical skewness.

→ We also adjust for private market asset classes with “smoothed” return streams.

Correlation:

→ We use trailing twenty-year correlations as our guide.

→ Again, we make adjustments for “smoothed” return streams.

→ Most of our adjustments are conservative in nature (i.e., they increase the standard deviation and correlation).

- Bitcoin is the current exception, where we have decreased volatility relative to its full history.

→ Note that we also offer CMEs that do not de-smooth private market return streams

[1] Note that we round our standard deviation assumptions to whole numbers.

FAQs

FAQs for 2026

How do these CMEs compare to prior years' assumptions?

- → To help evaluate this, we created a weighted average of expected returns for the asset classes that comprise a typical institutional portfolio.[1]
- → The value of the expected return for the portfolio is not a precise expected return (i.e., it has not been run via MPT), but the magnitude of the change is what is relevant.
- → In short, the 20-year expected return for a typical portfolio is 50 basis points lower than last January.

Year	Weighted Average Expected Return (%)	Change from Prior Year (%)
2026	7.6	-0.5
2025	8.1	+0.1
2024	8.0	-0.2
2023	8.2	+1.7
2022	6.5	+0.4
2021	6.1	-0.7
2020	6.8	-0.6
2019	7.4	+0.7

[1] The weights are as follows: 10% investment grade bonds, 3% LT government bonds, 4% TIPS, 3% high yield, 2% bank loans, 3% EM debt, 3% private debt, 25% US equity, 12% EAFE equity, 8% EM equity, 10% private equity, 10% real estate, 2% natural resources, 3% infrastructure, 2% hedge funds.

FAQs for 2026

What is driving the changes from last year?

- → Interest rates declined, decreasing yields and hence expected returns for higher quality bonds.
- → Credit spreads tightened slightly, further lowering yields for riskier fixed income assets.
- → Lower yields benefitted several asset classes that rely on leverage, particularly real estate and infrastructure.
- → Equity market valuations moved higher, especially outside the US, thus reducing their forward-looking returns.
- → Relative valuations for private equity, which are quite lagged, are acting as a headwind in that asset class.
- → Lower anticipated long-term interest rates serve to decrease our 20-year projections.
  - The bridge from 10 to 20 years is made via a risk premium being added to a (lower) future risk-free rate.
  - The market projection for the 10-year risk-free rate declined from 5.42% to 5.30%.

FAQs for 2026

How do Meketa's CMEs compare to peers?

- → Our CMEs are typically in the same ballpark as our peers.
- → While we expect be above or below the median for various asset classes, we tend not to be systematically above or below for the entire group.
- → We generally cite the survey conducted each year by Horizon Actuarial Services for making peer comparisons, as it is the most comprehensive survey of CMEs of which we are aware.
  - However, this survey is usually not published until July or August.
- → It is important to distinguish between intermediate-term assumptions (e.g., 7-10 years) and long-term assumptions (e.g., 20-30 years) when making these comparisons.
  - The average long-term return assumptions tend to be higher than the intermediate-term assumptions across the peer group, typically by 10 to 50 basis points.
  - In 2025, the difference tended to be larger for riskier asset classes.

FAQs for 2026

What model changes were made?

→ We reduced the equity risk premium we assume for years 11-20 by 50 basis points.

- The 5.5% historical average risk premium for US equities is based on a history that includes significant multiple expansion (e.g., increase in P-E ratio).
  - Using this same level of risk premium implies that we would assume multiple expansion in the future.
  - Therefore, we decided to use a lower risk premium of 4.5%.
- We are making this change not just for US equities, but for every equity/growth-oriented asset class.
  - We have observed valuation multiples expand over time for most of these asset classes where we have available metrics (e.g., EBITDA multiples, cap rates).

→ We *decreased* the percentage of GDP growth translating to earning growth for frontier markets.

- EPS growth over the last eight years has been just 2.3%, while nominal GDP growth has been more than double that level.
- In fact, EPS was below its level from 2008 until the end of 2025.

→ We *increased* the percentage of GDP growth translating to earnings growth for China.

- Recent CCP policies and signaling have us slightly more optimistic about Chinese equities, though less so on the economy.
- The level of GDP growth translating to earnings growth is still less than half that for the US.

FAQs for 2026

What model changes were made?

→ For our buyout model, we changed the premium over public equities to be focused solely on the difference in EV/ EBITDA between public markets and buyouts (and not relative to buyout's own history).

- We also added debt multiple data to get a better gauge of current levels of leverage.

→ We are assuming slightly higher defaults rates (of 4%) for direct lending, consistent with the data we have for their average since 2020.

- We also increased the default rate assumption for asset based lending (ABL), while increasing the expected recovery rate as well.

→ We changed the weightings in our private credit composite to better reflect the broader opportunity set.

- We increased direct lending from 35% to 45%, while decreasing ABL and special situations each by 5%.

→ We increased the premium we expect for opportunistic real estate due to data indicating cap rates were higher than previously anticipated.

→ We increased the property value growth assumptions for timberland and farmland in recognition that prices have grown at an average of 2-3% per year higher than the rate of inflation since the 1990s.

FAQs for 2026

What model changes were made?

→ We adjusted the amount of leverage and source of financing across an array of asset classed based on the evolution of credit markets.

- These partly reflect industry reaction to the higher interest rates of recent years.
- They may also reflect changes to portfolio construction by GPs.

Asset Class	Leverage Direction	Leverage Range	Change in Financing
Buyouts	Down	1.2x – 1.35x	More private credit
Core Real Estate	None	1.2x – 1.3x	More fixed rate
Value Add Real Estate	Down	2.1x – 2.3x	More floating rate
Opportunistic Real Estate	None	2.8x – 3.2x	More floating rate
Core Infrastructure	Down	1.5x – 1.6x	More fixed rate
Non-core Infrastructure	Up	2.1x – 2.3x	More private credit
Timberland	Down	1.1x – 1.2x	More fixed rate
Farmland	Down	1.4x – 1.6x	More fixed rate

Sources include: Preqin, Pitchbook, Macquarie, IFM, S&P Global, NCREIF, CRE, and Meketa observations.

FAQs for 2026

What model changes were made?

→ We changed our model for gold to incorporate the Kaufmann & Winters gold price model.

- The model incorporates inflation, real interest rates, US dollar strength, financial stress, oil prices, and gold price persistence.
- It is a structural, macro-based valuation framework rather than a short-term trading model.
- It is more robust than our previous model which focused on real yields.

→ We reduced the "diversification return" assumption for commodities futures portfolios as correlations have risen over time.

- The diversification return reflects the impact of rebalancing among imperfectly correlated assets (i.e., buying low and selling high).

→ We increased the return assumption for Bitcoin to reflect its behavior as the asset class has matured.

- Since 2020, Bitcoin's returns resemble that of a high beta stock.
- We blend our traditional regime-shifting model with a CAPM approach that assigns Bitcoin a beta of 1.6.

FAQs for 2026

What "asset classes" were added in 2026?

→ Structured Notes

- We based the model on income notes as we believe they are the most commonly used among our client base.
- They are designed to provide very high income (typical coupon ~10%), so long as an underlying index (e.g., S&P 500) stays above a certain level.
- Investors earn the coupon unless markets crash, in which case they participate in the losses.
- Hence, we model the probability and outcome under two different regimes, based on history:
  - Normal regime, where the coupon is earned.
  - Alternative regime, where the floor (of a 30% loss) is breached.

→ Art and Collectibles

- We based it on the Artprice.com contemporary art index.
- We use a CAPM approach.
  - We compare the beta versus interest rates, the bond market, and stock market.
  - Each provides roughly the same result. We then average the three.

FAQs for 2026

Did volatility expectations change?

→ Not systematically; there were very few changes, and most were +/- 1%.

- Our methodology uses a 20-year look back, which includes the volatile years of 2022, 2020, and 2008.

→ The biggest change was a manual adjustment for Bitcoin, decreasing it from 75% to 50%.

- This is consistent with Bitcoin's volatility since 2020.
  - It reflects the growing institutionalization of the asset class (e.g., with bitcoin ETFs being introduced).
- Similarly, we used Bitcoin's *correlations* since 2020 as opposed to our standard 20-year look back.

Were there any qualitative adjustments?

→ We made a small manual adjustment to the 10-year US small cap equity return given "noise" in the pricing data.

→ The number of qualitative adjustments have grown fewer over the years as we have refined our models.

FAQs for 2026

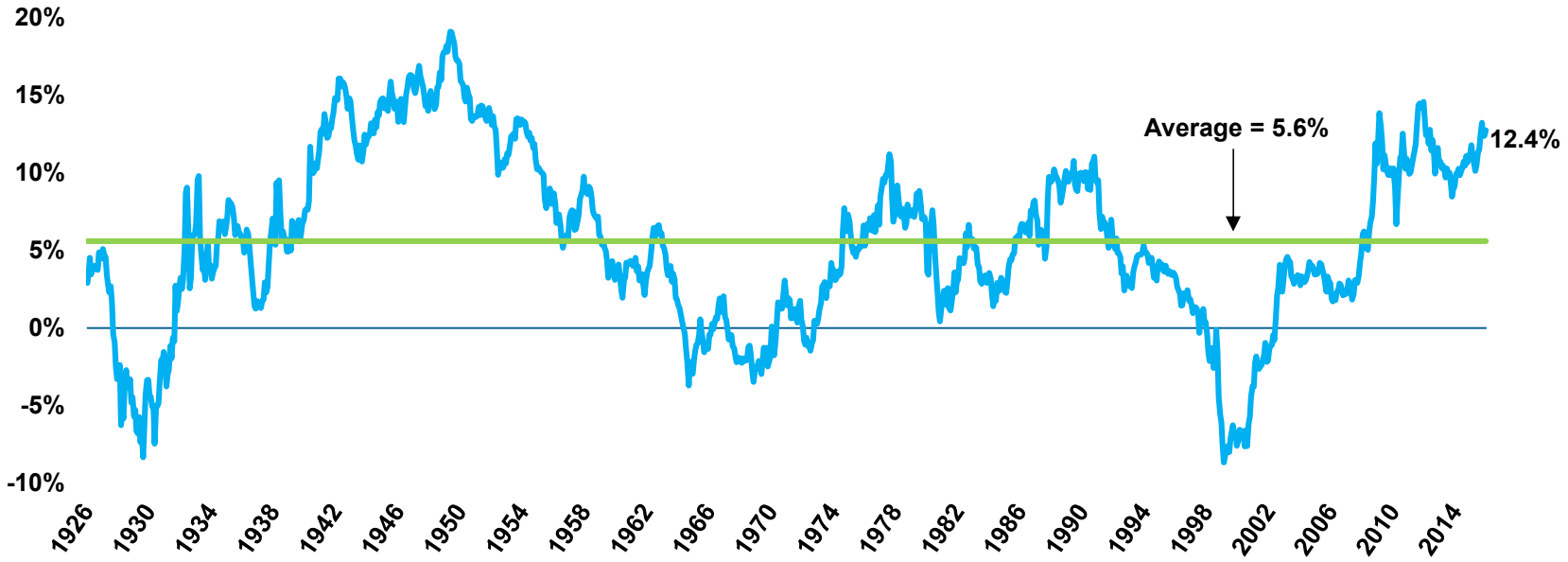
What is the equity risk premium implied by the CMEs?

→ We assume a long-term risk premium of 4.5% for US equities over 10-year Treasuries in our model.

- However, our 10-year assumptions imply an equity risk premium of ~2.1%.
- This averages out to a 20-year implied equity risk premium of ~3.3%.

→ Historically, the risk premium for the S&P 500 over the yield for the 10-year Treasury has averaged 5.6%, though the range has varied considerably.

US Equity Risk Premium over 10-year Treasury[1]



[1] Represents the ten-year risk premium for the S&P 500 index over the 10-year Treasury yield at the start of the period. Data is through December 31, 2025.

FAQs for 2026

Is Meketa assuming that interest rates will go up or down?

- → We use the market's projections for future rates, based on what was priced in at the time of our analysis.
- → For example, the market is projecting that the ten-year Treasury will be yielding approximately 5.3% in ten years, versus the actual yield of 4.14% at the end of December 2025.
- → By contrast, the FOMC is expecting the fed funds rate to fall to ~3.1% by 2027, implying a normally shaped (and steeper) yield curve.

What is the steepness of the yield curve you imply?

- → Just as our equity models assume mean reversion in pricing, our bond models assume a kind of mean reversion in the shape of the yield curve over the next ten years.
  - The yield on the 10-year Treasury has averaged 147 basis points over that for T-bills since 1934.
  - The 2-10 spread has averaged 85 basis points since 1976.
- → This is consistent with the market's projections for short-term and longer-term rates noted above.

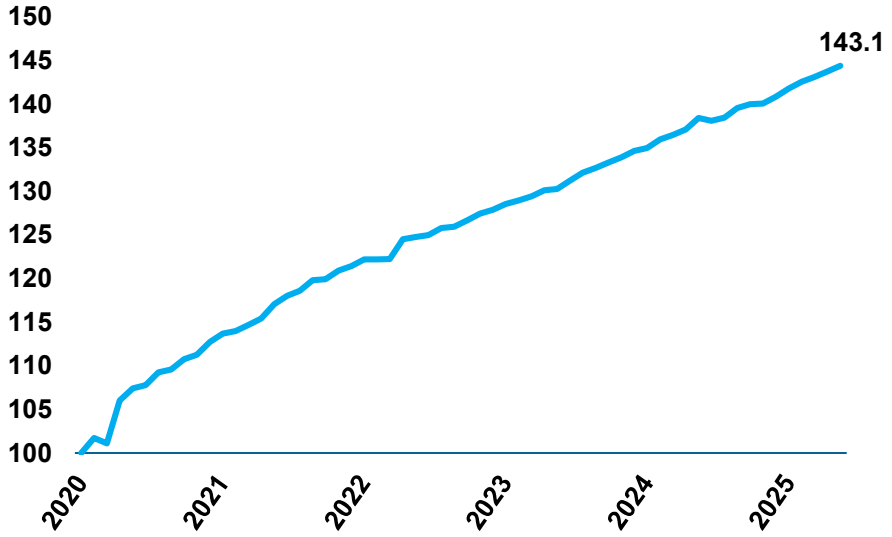
Source: FRED. 3-Month Treasury Bill Secondary Market Rate, Market Yield on US Treasury Securities at 10-Year Constant Maturity, 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity.

FAQs for 2026

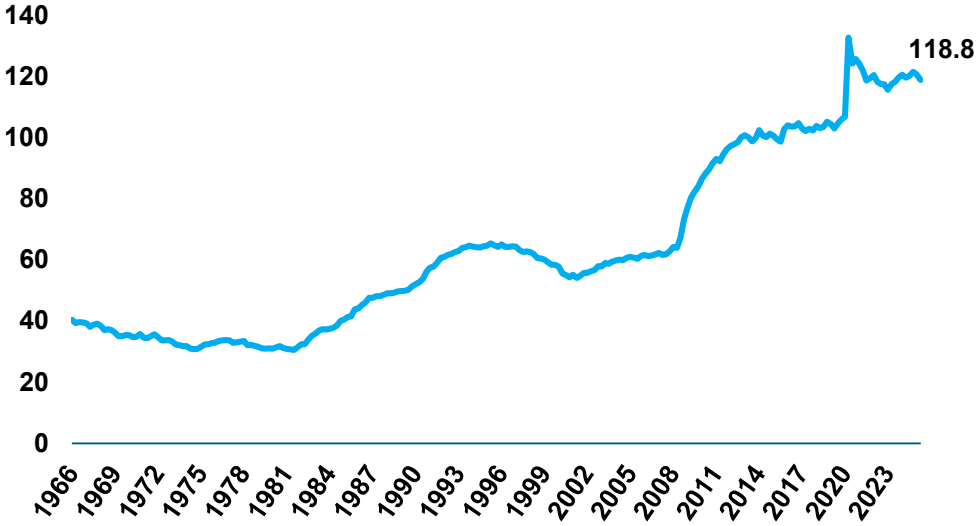
Why is the market projecting 10-year Treasury yields will be higher in ten years?

- → Expectations of higher inflation (or inflation uncertainty) could necessitate a demand by investors for higher nominal yields to compensation them for the loss of purchasing power.
- → Likewise, expectations of a widening government deficit that will be filled with additional borrowing could be perceived as increasing the credit risk of Treasury issuance, thereby increasing the yield investors seek to compensate them for this new, higher level of risk.
- → The market may also be pricing a partial normalization of the term premium.

Cumulative PCE Inflation Since December 2020



Federal Debt as a % of GDP



Source: FRED. Personal Consumption Expenditures indexed to 100 on December 2020. Federal Debt: Total Public Debt as Percent of Gross Domestic Product, Percent of GDP, Seasonally Adjusted.

FAQs for 2026

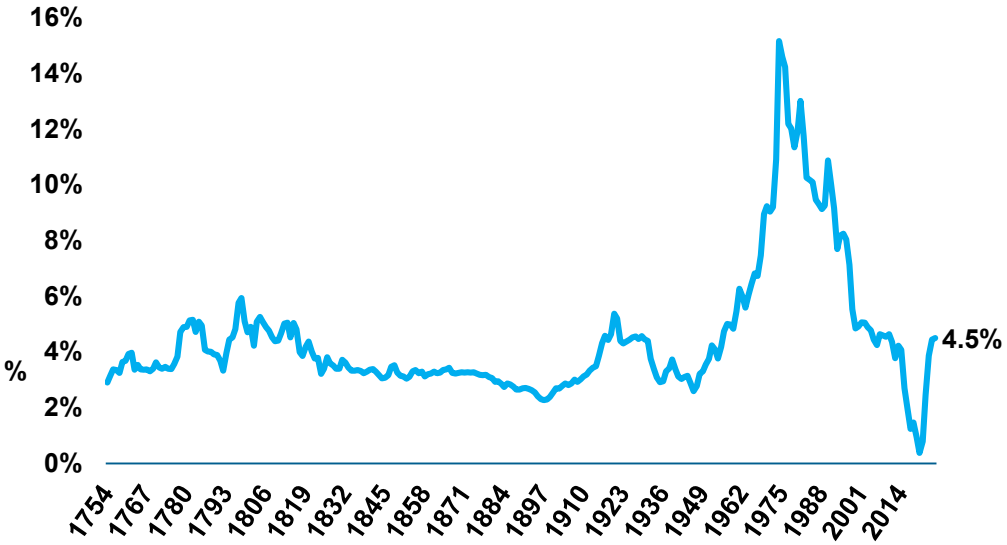
Is it reasonable to believe that Treasury yields will be that high (5.3%) in ten years?

- → Looking back, a 5.3% rate on the 10-year Treasury is not unreasonable, as the 10-year has spent roughly half of the past 62 years at that level or higher.
- → However, when viewed over a (much) longer timeframe, the period from the late 1960s to the late 1990s appears to be a bit of an outlier.
  - From this viewpoint, a 5.3% yield on the debt issuance of the world's (perceived) safest government bonds would typically be associated with an unusually high bout of inflation.

Yield on 10-Year US Treasury Bonds Since 1962



Long-Term Bond Yields in the UK Since 1754



Source: FRED. Market Yield on US Treasury Securities at 10-Year Constant Maturity 1962-2025. Consol (Long-Term Bond) Yields in the United Kingdom 1754-2016, UK Long-Term (10-Year) Government Bond Yields 2017-2025.

FAQs for 2026

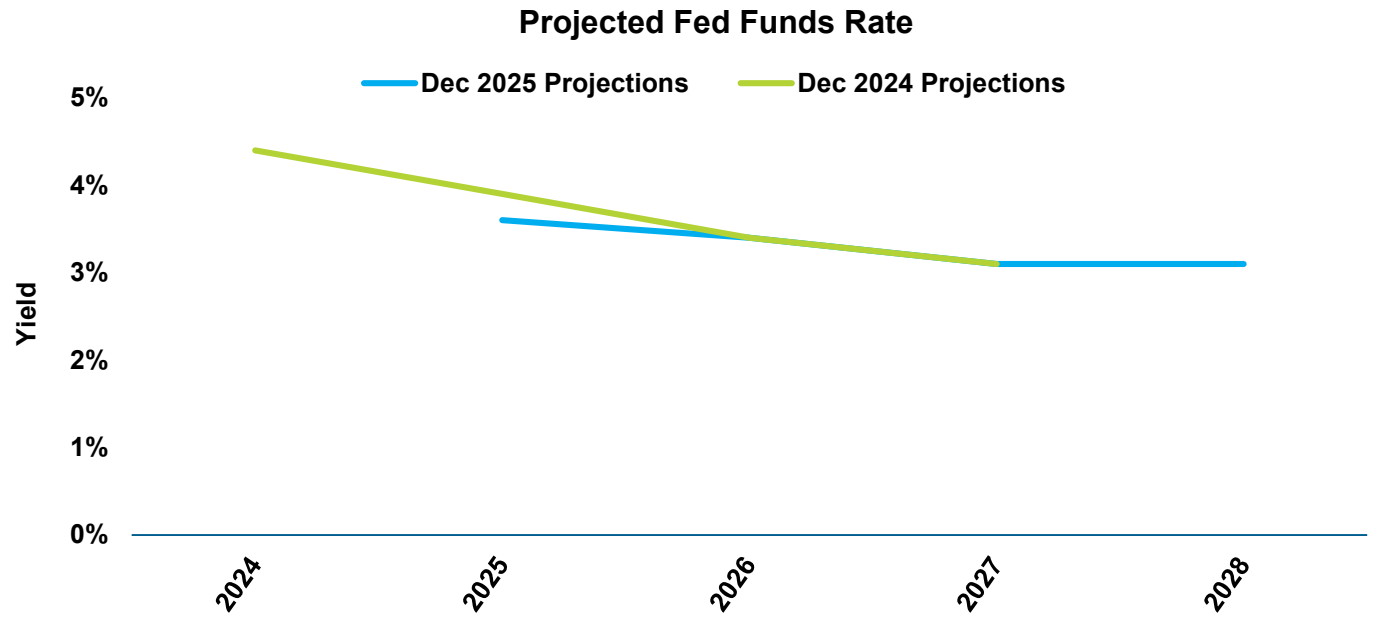
Why is the expected return for cash flat when short-term rates decreased during 2025?

→ Our expected returns are long-term projections, reflecting where we expect interest rates to settle in (i.e., the new "normal" rate).

→ Many economists (including the FOMC) and futures markets were previously predicting the path that rates followed in 2025.

→ They expect short-term rates to settle in at roughly the same place as they were anticipating a year ago.

- Most of the horizon will be at these rates that are projected to be the same as they were one year ago.



Source: FRED. FOMC Summary of Economic Projections for the Fed Funds Rate, Median.

FAQs for 2026

How does Meketa arrive at its inflation assumption?

→ Most of our economic projections come from the IMF's World Economic Outlook.

- They are projecting inflation of 2.4% for the US in 2026, followed by slightly lower levels (of 2.2%) thereafter.

→ We combine the five-year average for the US with the 5-year-5 inflation swap (i.e., what the market is projecting 5-year inflation will be five years from now), to arrive at our 10-year number of 2.3% for the US.

Inflation Estimates

	2026 (%)	2027 (%)	2028 (%)	2029 (%)	2030 (%)	5-Year Average (%)	5-Year-5 Inflation Swap (%)	10-Year Inflation Estimate (%)
US	2.4	2.2	2.2	2.2	2.2	2.2	2.4	2.3
Euro Area	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1
UK	2.5	2.0	2.0	2.0	2.0	2.1	2.9	2.5
Japan	2.1	2.0	2.0	2.0	2.0	2.0	NA	1.7
China	0.7	1.4	1.8	1.9	2.0	1.6	NA	2.5

Sources: IMF World Economic Outlook, October 2025; Bloomberg.

FAQs for 2026

What are your GDP projections?

→ Our GDP projections come from the IMF's World Economic Outlook and Oxford Economics.

- They are projecting Real GDP growth of 2.4% for the US in 2026, followed by slightly lower levels thereafter, averaging 2.0% over ten years.

→ Similar to recent years, China has higher growth expectations, while Europe and Japan have lower growth projections.

Real GDP Estimates

	2026 (%)	2027 (%)	2028 (%)	2029 (%)	2030 (%)	2031 (%)	2032 (%)	2033 (%)	2034 (%)	2035 (%)	10-Year Average (%)
US	2.4	2.2	2.2	2.1	2.0	1.9	1.9	1.8	1.8	1.8	2.0
Euro Area	1.5	1.3	1.5	1.5	1.4	1.4	1.2	1.1	1.0	1.0	1.3
UK	1.5	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.5
Japan	0.7	0.6	0.6	0.4	0.3	0.0	0.0	0.0	0.0	-0.1	0.2
China	4.1	4.3	4.2	3.8	3.7	3.9	3.7	3.5	3.3	3.2	3.8

Sources: IMF World Economic Outlook, October 2025; Oxford Economics.

FAQs for 2026

Are US earnings expected to grow faster than the broad economy?

→ The companies in the US market have grown their earnings much faster than the broad market since the 1990s.

→ We assume this trend will continue, based on structural advantages enjoyed by the US market, including:

- A global footprint that provides access to potentially faster growth overseas economies.
- A different sector composition than the broader economy that favors faster growing sectors (e.g., IT).
- Stable pricing power as exhibited by steady profit margins.
- Favorable societal norms (e.g., a culture that values risk-taking and innovation).

How does the growth of S&P 500 earnings compare to your forward EPS growth projections?

→ Our long-term US EPS growth projections are 6.4%.

- This is reasonably consistent with the 6.7% average EPS growth rate observed for the past twenty years.
- However, it is conservative in comparison to the 7.6% rate since 1991 and the 9.9% rate observed since 2010.

Is trailing 20 years the right period to use to look at mean reversion for equities? Why not use the longest period possible for each asset class?

→ We use 20 years because we are trying to do apples-to-apples comparisons across similar asset classes.

→ While we have a long history of data for US equities, the available history (especially of earnings) is much shorter for non-US markets.

Source: S&P 500 Index data from Bloomberg. Represents trailing 12-month "as reported" earnings per share. Data is as of December 31, 2025. 1991 represents the earliest period for which we have data available.

FAQs for 2026

Do we believe US companies will continue to be net buyers of their stock, and why does that matter?

- → We believe US companies will continue to be net buyers of their shares over the next decade, though to a lesser extent than they have for the past decade.
  - In the past year, several large technology firms have shifted to using cash for investment, primarily related to AI, data centers, and power generation.
- → Investors have generally rewarded US-based companies who have decided that the best use of their "excess" cash is to repurchase shares.
  - So long as markets continue to support this decision, and so long as companies continue to generate sufficient cash to make buybacks, they are likely to continue to do so.
- → Moreover, a mature and active venture capital market in the US allows companies to fund significant growth while they are still private, thereby not diluting public market shareholders.
- → The buyback assumption matters in our models because it impacts EPS growth.
  - If companies are more profitable and they are buying back shares, this will be much more beneficial to EPS than if companies are less profitable and are diluting their shares (e.g., via new issuance).
  - That is, buybacks will be a net tailwind to EPS and thus expected returns.
- → We expect non-US markets to be net issuers of shares (i.e., this will be dilutive to shareholder wealth).
  - This is most pronounced in emerging markets, due to their anticipated economic growth.

FAQs for 2026

How sensitive is your equities model to EPS growth expectations?

→ EPS growth is the primary driver of equity returns, even more so than valuations.

- For example, 10% EPS growth for US equities (consistent with the average since 2010) would imply a 10-year expected return of at least 10%.

How do you account for the percentage of earnings/revenues that companies derive from foreign countries?

→ Many large corporations operate internationally, allowing them to generate significant revenues and profits from overseas markets.

→ Hence, exposure to faster-growing economies could help profits to grow faster than domestic economic growth alone would allow.

→ Therefore, when estimating earnings growth for a market, we adjust for the geographic revenue source.

Revenue Source by Market

	Revenues from US (%)	Revenues from EAFE (%)	Revenues from EM (%)	Revenues from Frontier (%)
MSCI USA	60.9	18.2	19.4	1.5
MSCI EAFE	26.4	50.5	21.2	1.9
MSCI Emerging Markets	17.8	7.9	73.1	1.2

Source: MSCI Economic Exposure indices for USA, EAFE, Emerging Markets, and Frontier Markets as of December 31, 2025.

FAQs for 2026

How is your outlook on China affecting your expected returns?

→ Our outlook for China has declined in recent years due to a number of factors, including:

- The persistent and slow-moving real estate and debt crisis.
- The increasing economic imbalances driving dependence on dumping low-cost exports on trade partners.
  - Delayed rebalancing of economy to support domestic demand and increase domestic consumption.
- Determined and expanding support for the Russian military and economy in defiance of international norms.
- Currency and trade manipulation and irregular interventions in financial markets.
- President Xi's consolidation of personal power and promoting of Marxist-Leninist ideology.
- While the US and China have temporarily suspended the trade war, trade tensions are continuing to grow.

→ As a result, we place a significant discount on Chinese (and hence, emerging market) growth translating to EPS growth.

- However, over the past 12-24 months, the CCP has signaled a greater openness to the role of foreign capital in the economy.
  - For example, it developed two action plans designed to stabilize/attract foreign direct investment.
- We reduced the size of the discount as a result, though it is still sizable.

→ This serves as a drag on expected returns for EM and Chinese equities.

- It is also consistent with Chinese EPS growth substantially lagging GDP growth over the past twenty years.

FAQs for 2026

Why did the spread for private equity over public equity decrease?

→ The switch to EV/EBITDA for comparing public and private equity valuations was less favorable for private equity relative to our prior approach.

- The prior approach that also compared buyout valuations to their own history was highly subjective to changes in the historical data (which, alas, have happened with unnerving regularity in private equity).

→ Of note, the private equity data for the most recent year is typically lagged by one or two quarters and represents only a small percentage of deals expected to be completed during the year.

- Hence we look at the average of valuations for the last two years to provide a somewhat more robust, though lagged, data set.

How does Meketa look at valuations for venture capital?

→ Venture capital tends to be focused on a smaller part of the broad economy, concentrating mostly on a few sectors such as technology (SAS and AI) and healthcare.

→ To get a feel for how VC is currently priced, we create a proxy composed of public market indices that focus on these sectors.

- The composition and weightings have changed over time.
- The proxy is currently composed of: the NASDAQ; Pharma, Biotech & Life Sciences; IT Services; financial technology; AI; and Clean Tech/Environment.

→ That said, we take our VC model with a large grain of salt, as there is very little private market data available.

FAQs for 2026

Do we consider inflation when building expected returns for real assets like real estate, infrastructure, and natural resources?

→ Yes, for the vast majority of real assets, inflation is generally linked with either income or growth in our models.

Why did the expected return for foreign debt and global ILBS increase when it decreased for most other fixed income asset classes?

→ Countries and central banks outside the US may have different monetary policy priorities.

→ Monetary policy for many central banks has diverged from that in the US.

- As a result, yields for non-US government bonds moved higher, on average.

FAQs for 2026

How are you accounting for the non-linear return profile of Long Vol?

- → We assume that the payoff of a long vol strategy is significantly and positively skewed during periods of poor equity market returns (e.g., when equity markets increase or decrease by 10%).
- → However, the average return in most years is driven by the effective “insurance premium” investors pay for this strategy.
  - We acknowledge that MVO is not ideal for modeling assets with such non-linear payoff profiles (structured notes also fall into this category).

How much confidence do you have in your model for Bitcoin?

- → We have perhaps the lowest amount of confidence in our projections for Bitcoin.
- → First, there is a short return history for the asset class on which to make observations.
- → Moreover, the asset class has evolved such that the early years may not be representative of what investors can expect n the future.
- → In addition, the lack of associated cash flows makes the asset class challenging to model relative to most other financial assets, as does their sensitivity to government policy changes.
- → See the appendix for additional considerations and observations.

2026 Expected Returns and Changes from Prior Years

10-year Geometric Expected Returns
Rate Sensitive

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Cash Equivalents	2.8	2.8	0.0	lower yields offset by steady target rates
Short-term Investment Grade Bonds	3.7	4.2	-0.5	lower yields
Investment Grade (Core) Bonds	4.2	4.9	-0.7	lower yields
Long-term Government Bonds	4.5	5.0	-0.5	lower yields
Long-term Corporate Bonds	5.1	5.9	-0.8	lower yields
Short-term TIPS	3.7	3.9	-0.2	lower real yields
TIPS	3.8	4.3	-0.5	lower real yields
Long-term TIPS	4.5	5.0	-0.5	price impact from higher expected real yields
Global ILBs	4.7	4.2	+0.5	higher global inflation, currency tailwind, and higher yields
Foreign Bonds	3.0	2.4	+0.6	currency tailwind and higher yields
US Inflation	*2.3*	*2.3*	*0.0*	

10-year Geometric Expected Returns
Credit

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
High Yield Bonds	5.4	6.3	-0.9	tighter spreads
Bank Loans	5.6	6.3	-0.7	tighter spreads
Multi-Sector Credit	5.5	6.3	-0.8	tighter spreads
Collateralized Loan Obligations (CLOs)	5.8	6.9	-1.1	lower yields
Emerging Market Bonds (major)	5.9	6.9	-1.0	lower yields
Emerging Market Bonds (local)	6.0	6.5	-0.5	lower yields
Emerging Market Corporate Bonds	5.1	5.6	-0.5	lower yields
Private Debt	7.8	8.7	-0.9	lower yields, changed weightings to be closer to broad opportunity set
Direct Lending	*7.0*	*7.6*	*-0.6*	*tighter spreads, increased our default rate assumption*
Asset Based Lending	*7.9*	*9.3*	*-1.4*	*lower yields (also changed assumptions for default & recovery)*
Special Situations Lending	*8.9*	*9.4*	*-0.5*	*lower yields (also higher assumptions for default & loss rate)*

10-year Geometric Expected Returns
Equities

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
US Equity	6.3	6.4	-0.1	higher prices partly offset by earnings growth
Developed Non-US (EAFE) Equity	6.2	7.2	-1.0	higher prices
Emerging Market Equity	6.2	7.1	-0.9	much higher prices partly offset by earnings growth
Emerging Market ex-China	*6.0*	*7.5*	*-1.5*	*higher prices*
China Equity	*5.9*	*6.0*	*-0.1*	*higher prices partly offset by higher projected earnings growth*
Frontier Market Equity	6.1	8.9	-2.8	much higher prices (and lower EPS growth assumption)
Global Equity	6.3	6.6	-0.3	higher prices partly offset by earnings growth
Private Equity	9.0	9.8	-0.8	lagged impact of pricing
Buyouts	*8.6*	*9.5*	*-0.9*	*lagged impact of pricing, less leverage, cost of debt*
Growth Equity	*9.4*	*10.1*	*-0.7*	*lagged impact of pricing*
Venture Capital	*9.8*	*10.4*	*-0.6*	*lagged impact of pricing*

10-year Geometric Expected Returns
Real Estate and Infrastructure

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Real Estate	7.1	6.9	+0.2	lower borrowing costs
US REITs	*5.9*	*5.3*	*+0.6*	*higher yields*
Core Private Real Estate	*5.8*	*5.5*	*+0.3*	*lower borrowing costs*
Value-Added Real Estate	*8.7*	*8.4*	*+0.3*	*lower borrowing costs*
Opportunistic Real Estate	*9.8*	*9.5*	*+0.3*	*lower borrowing costs & higher cap rates assumption*
Infrastructure	7.4	7.2	+0.2	lower cost of debt partly offset by lower income
Infrastructure (Public)	*7.5*	*7.6*	*-0.1*	*mixed valuation impact*
Infrastructure (Core Private)	*6.5*	*6.2*	*+0.3*	*lower cost of debt partly offset by lower income*
Infrastructure (Non-Core Private)	*8.4*	*8.2*	*+0.2*	*higher leverage assumption partly offset by higher cost of debt assumption*

10-year Geometric Expected Returns
Natural Resources and Commodities

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Natural Resources	7.1	7.4	-0.3	higher prices
Natural Resources (Public)	7.3	7.8	-0.5	higher prices
Natural Resources (Private)	7.1	7.4	-0.3	higher prices
Energy	*8.1*	*8.8*	*-0.7*	*higher prices*
Mining	*6.1*	*8.3*	*-2.2*	*much higher prices*
Timberland	*5.3*	*5.3*	*0.0*	*higher growth assumptions offset by higher prices*
Farmland	*6.1*	*3.6*	*+2.5*	*higher growth assumptions*
Sustainability	*8.0*	*8.6*	*-0.6*	*higher prices*
MLPs	6.1	5.7	+0.4	slightly higher yields
Gold Mining	5.3	7.9	-2.6	much higher prices
Gold (Metal)	4.8	2.3	+2.5	switched from real yield model to Kaufmann & Winters gold price model
Commodities	5.0	5.5	-0.5	assuming lower diversification return (higher correlations)

10-year Geometric Expected Returns
Hedge Funds and Miscellaneous

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Hedge Funds	3.8	4.2	-0.4	higher prices & lower yields
Long-Short	*2.9*	*3.1*	*-0.2*	*higher prices*
Event Driven	*5.0*	*5.1*	*-0.1*	*higher prices & lower yields*
Global Macro	*4.4*	*4.5*	*-0.1*	
Trend Following	*3.5*	*3.4*	*+0.1*	
Fixed Income/L-S Credit	*4.1*	*4.9*	*-0.8*	*lower yields and tighter spreads*
Relative Value/Arbitrage	*4.0*	*4.9*	*-0.9*	*tighter spreads*
RMS Aggregate	3.5	3.7	-0.2	
Long Vol	0.5	0.7	-0.2	
Insurance Linked Strategies	3.8	4.8	-1.0	lower yields
Alternative Risk Premia	5.2	5.2	0.0	
Bitcoin	5.7	2.9	+2.8	changed model to include CAPM approach in addition to tail model

20-year Geometric Expected Returns
Rate Sensitive

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Cash Equivalents	3.1	3.1	0.0	
Short-term Investment Grade Bonds	4.0	4.3	-0.3	lower yields
Investment Grade (Core) Bonds	4.9	5.3	-0.4	lower yields
Long-term Government Bonds	5.1	5.7	-0.6	lower yields
Long-term Corporate Bonds	6.0	6.7	-0.7	lower yields
Short-term TIPS	4.0	4.1	-0.1	lower real yields
TIPS	4.7	5.0	-0.3	lower real yields
Long-term TIPS	5.1	5.7	-0.6	Lower long-term yields
Global ILBs	5.2	5.0	+2.0	higher global inflation, currency tailwind, and higher yields
Foreign Bonds	4.1	3.9	+2.0	currency tailwind and higher yields
US Inflation	*2.7*	*2.7*	*0.0*	

20-year Geometric Expected Returns
Credit

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
High Yield Bonds	6.6	7.1	-0.5	tighter spreads
Bank Loans	6.4	6.8	-0.4	tighter spreads
Multi-Sector Credit	6.5	7.0	-0.5	tighter spreads
Collateralized Loan Obligations (CLOs)	6.4	7.0	-0.6	lower yields
Emerging Market Bonds (major)	6.6	7.1	-0.5	lower yields
Emerging Market Bonds (local)	6.4	6.7	-0.3	lower yields
Emerging Market Corporate Bonds	6.2	6.5	-0.3	lower yields
Private Debt	8.2	9.1	-0.9	lower yields, changed weightings to be closer to broad opportunity set
Direct Lending	*7.4*	*8.2*	*-0.8*	*tighter spreads, increased our default rate assumption*
Asset Based Lending	*8.4*	*9.3*	*-0.9*	*lower yields (also changed assumptions for default & recovery)*
Special Situations Lending	*9.4*	*9.9*	*-0.5*	*lower yields (also higher assumptions for default & loss rate)*

20-year Geometric Expected Returns
Equities

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
US Equity	8.0	8.4	-0.4	higher prices partly offset by earnings growth
Developed Non-US (EAFE) Equity	7.9	8.7	-0.8	higher prices
Emerging Market Equity	8.0	8.7	-0.7	much higher prices partly offset by earnings growth
Emerging Market ex-China	*7.9*	*9.0*	*-1.1*	*higher prices*
China Equity	*7.8*	*8.1*	*-0.3*	*higher prices partly offset by higher projected earnings growth*
Frontier Market Equity	8.1	9.8	-1.7	much higher prices (and lower EPS growth assumption)
Global Equity	8.0	8.5	-0.5	higher prices partly offset by earnings growth
Private Equity	10.2	11.2	-1.0	lagged impact of pricing
Buyouts	*9.9*	*10.9*	*-1.0*	*lagged impact of pricing, less leverage, cost of debt*
Growth Equity	*10.6*	*11.4*	*-0.8*	*lagged impact of pricing*
Venture Capital	*11.0*	*11.9*	*-0.9*	*lagged impact of pricing*

20-year Geometric Expected Returns
Real Estate and Infrastructure

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Real Estate	8.3	8.5	-0.2	
US REITs	*7.8*	*7.8*	*0.0*	
Core Private Real Estate	*7.3*	*7.4*	*-0.1*	
Value-Added Real Estate	*9.5*	*9.6*	*-0.1*	
Opportunistic Real Estate	*10.8*	*10.9*	*-0.1*	
Infrastructure	9.0	9.2	-0.2	
Infrastructure (Public)	*8.6*	*9.0*	*-0.4*	
Infrastructure (Core Private)	*7.9*	*8.0*	*-0.1*	
Infrastructure (Non-Core Private)	*10.1*	*10.3*	*-0.2*	

20-year Geometric Expected Returns
Natural Resources and Commodities

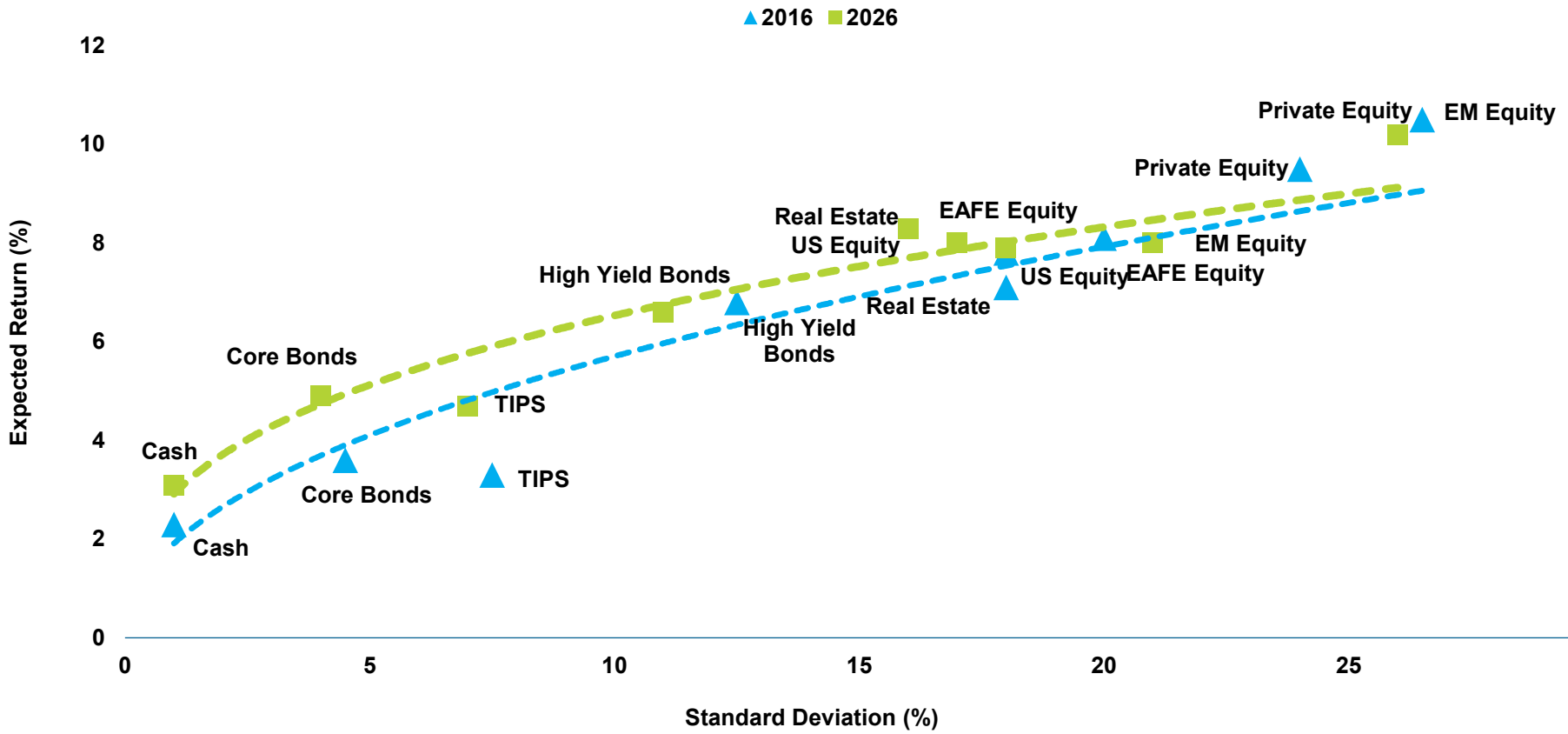
	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Natural Resources	8.6	9.2	-0.6	higher prices
Natural Resources (Public)	8.5	9.1	-0.6	higher prices
Natural Resources (Private)	8.6	9.2	-0.6	higher prices
Energy	*9.4*	*10.3*	*-0.9*	*higher prices*
Mining	*8.4*	*9.8*	*-1.4*	*much higher prices*
Timberland	*7.0*	*7.3*	*-0.3*	*higher growth assumptions offset by higher prices*
Farmland	*7.4*	*6.5*	*+0.9*	*higher growth assumptions*
Sustainability	*9.4*	*10.2*	*-0.8*	*higher prices*
MLPs	7.9	8.0	-0.1	
Gold Mining	7.9	9.5	-1.6	much higher prices
Gold (Metal)	4.8	3.6	+1.2	switched from real yield model to Kaufmann & Winters gold price model
Commodities	5.4	5.9	-0.5	assuming lower diversification return

20-year Geometric Expected Returns
Hedge Funds and Miscellaneous

	2026 E(R) (%)	2025 E(R) (%)	Δ From 2025 (%)	Notes
Hedge Funds	5.7	6.0	-0.3	higher prices & lower yields
Long-Short	*5.2*	*5.5*	*-0.3*	*higher prices*
Event Driven	*6.5*	*6.7*	*-0.2*	*higher prices & lower yields*
Global Macro	*5.8*	*5.9*	*-0.1*	
Trend Following	*4.9*	*4.9*	*0.0*	
Fixed Income/L-S Credit	*5.9*	*6.4*	*-0.5*	*lower yields and tighter spreads*
Relative Value/Arbitrage	*6.0*	*6.5*	*-0.5*	*tighter spreads*
RMS Aggregate	4.6	4.8	-0.2	
Long Vol	1.4	1.5	-0.1	
Insurance Linked Strategies	5.8	6.3	-0.5	lower yields
Alternative Risk Premia	5.8	5.8	0.0	
Bitcoin	6.0	4.1	+1.9	changed model to include CAPM approach in addition to tail model

The Big Picture: Higher Return for Similar Risk[1]

- → The relationship between long-term return expectations and the level of risk accepted is not static.
- → The higher interest rates compared to a decade ago mean that many investors have greater flexibility in how they structure a portfolio to achieve their target returns.



[1] Expected return and standard deviation are based upon Meketa Investment Group's 2016 and 2026 20-year capital market expectations.

Summary Data and Track Record

Return and Risk Data

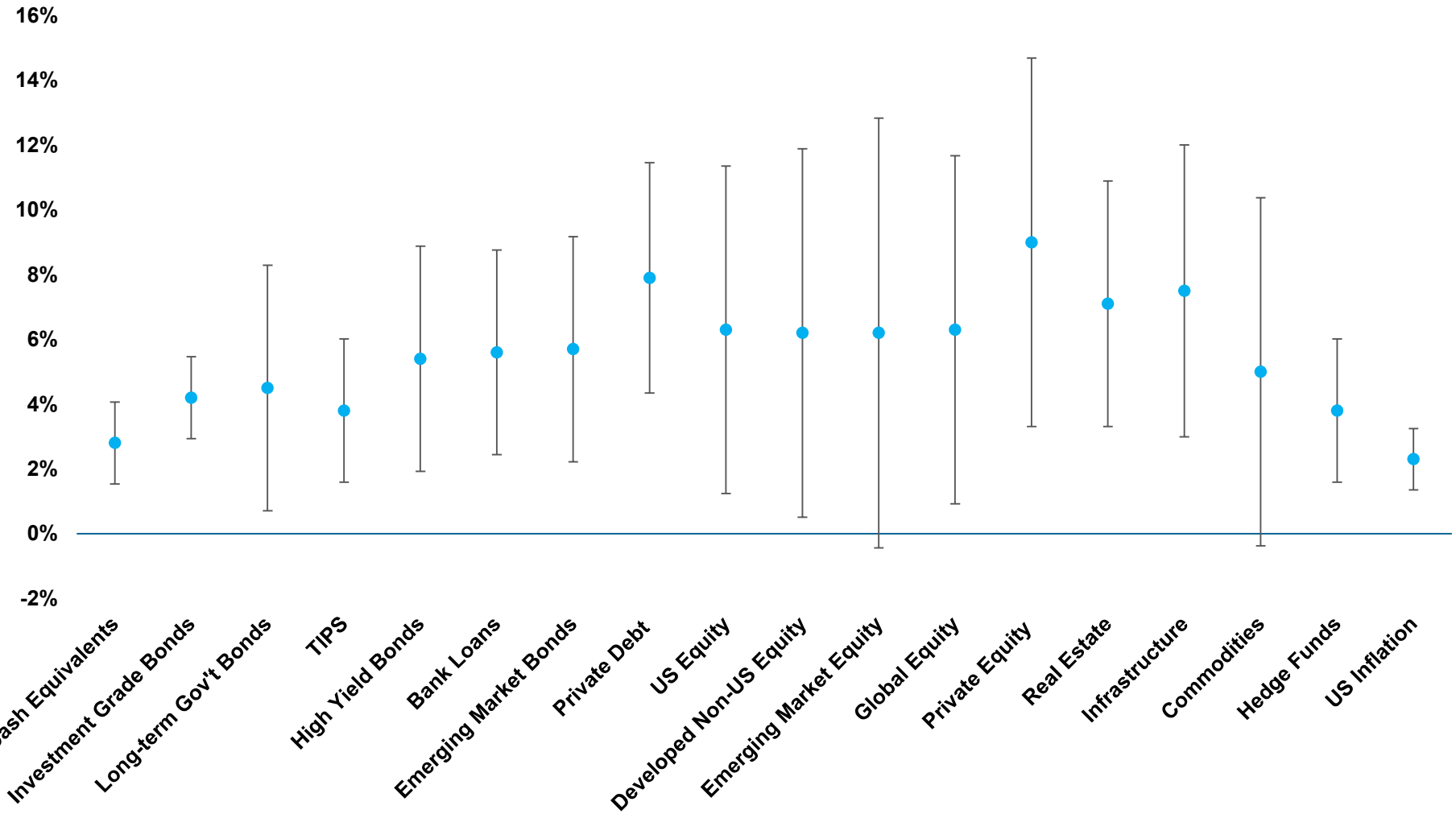
Asset Class	10-year Expected Return (%)	20-year Expected Return (%)	Standard Deviation (%)	Years 11-20 Risk Premium[1] (%)
Cash Equivalents	2.8	3.1	1.0	-2.0
Investment Grade Bonds	4.2	4.9	4.0	0.4
Long-term Government Bonds	4.5	5.1	12.0	0.5
TIPS	3.8	4.7	7.0	0.4
High Yield Bonds	5.4	6.6	11.0	2.5
Bank Loans	5.6	6.4	10.0	2.0
Emerging Market Debt	5.7	6.4	11.0	1.8
Private Debt	7.9	8.4	15.0	3.5
US Equity	6.3	8.0	17.0	4.5
Developed Non-US Equity	6.2	7.9	18.0	4.4
Emerging Non-US Equity	6.2	8.0	21.0	4.5
Global Equity	6.3	8.0	17.0	4.5
Private Equity	9.0	10.2	26.0	6.3
Real Estate	7.1	8.3	16.0	4.3
Infrastructure	7.5	9.0	19.0	5.2
Commodities	5.0	5.4	17.0	0.5
Hedge Funds	3.8	5.7	7.0	2.3
Inflation	2.3	2.7	NA	NA

[1] Risk premia are calculated relative to the market's projection for the yield on the 10-year Treasury in ten years..

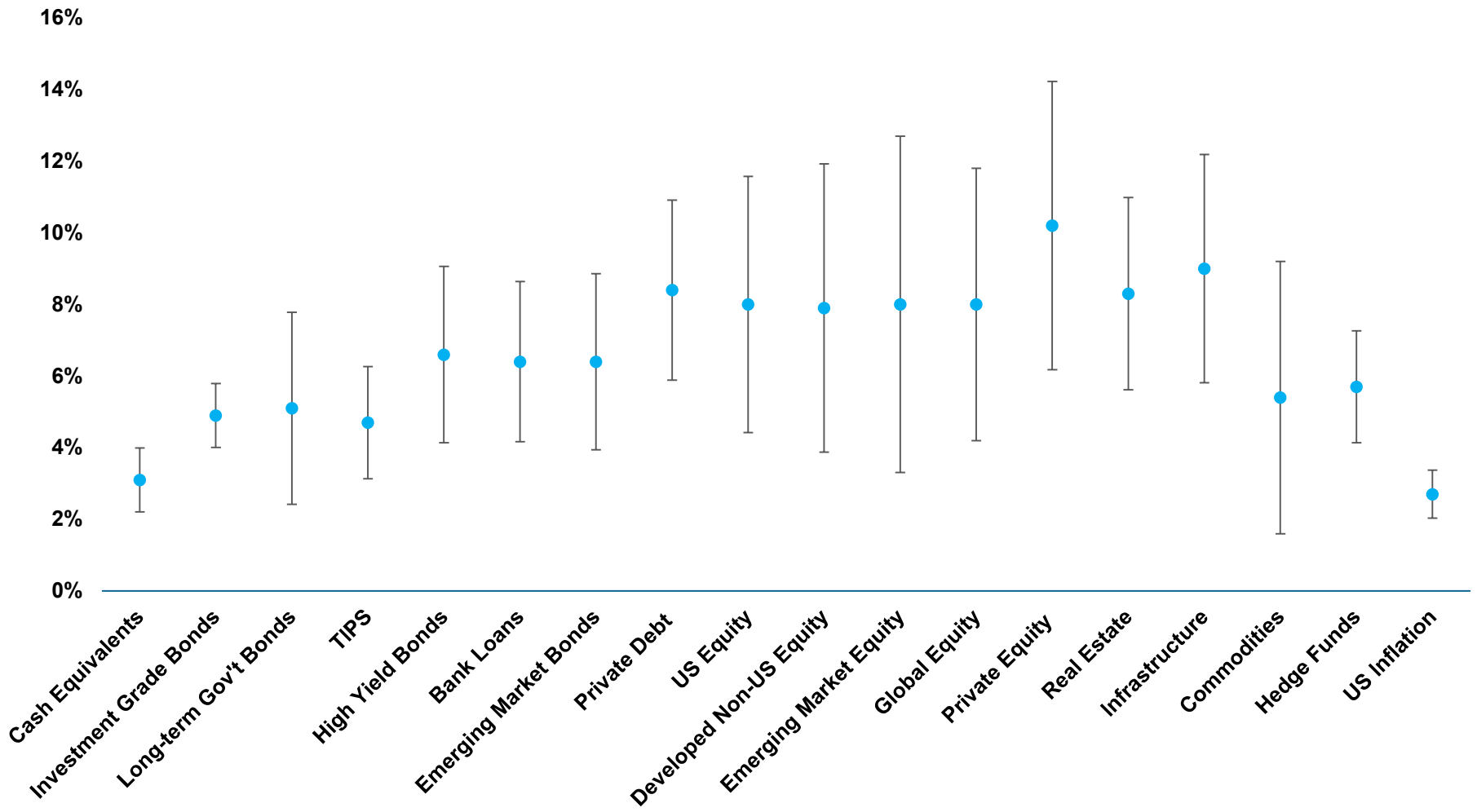
Correlation Data

	Inv. Grade Bonds	Long-Term Gov't Bonds	TIPS	High Yield Bonds	US Equity	Dev. Non-US Equity	Em. Market Equity	Private Equity	Real Estate	Commod.	Infra.	Hedge Funds
Investment Grade Bonds	**1.00**											
Long-Term Government Bonds	0.86	**1.00**										
TIPS	0.77	0.61	**1.00**									
High Yield Bonds	0.35	-0.03	0.48	**1.00**								
US Equity	0.24	-0.07	0.31	0.76	**1.00**							
Developed Non-US Equity	0.29	-0.06	0.35	0.77	0.86	**1.00**						
Emerging Market Equity	0.27	-0.05	0.36	0.73	0.74	0.85	**1.00**					
Private Equity	0.00	-0.10	0.03	0.66	0.90	0.83	0.79	**1.00**				
Real Estate	0.26	0.07	0.17	0.56	0.53	0.49	0.42	0.48	**1.00**			
Commodities	0.01	-0.23	0.29	0.49	0.46	0.55	0.59	0.23	0.15	**1.00**		
Infrastructure	0.31	0.14	0.32	0.65	0.64	0.68	0.59	0.51	0.61	0.41	**1.00**	
Hedge Funds	0.16	-0.16	0.31	0.79	0.81	0.82	0.80	0.53	0.47	0.64	0.61	**1.00**

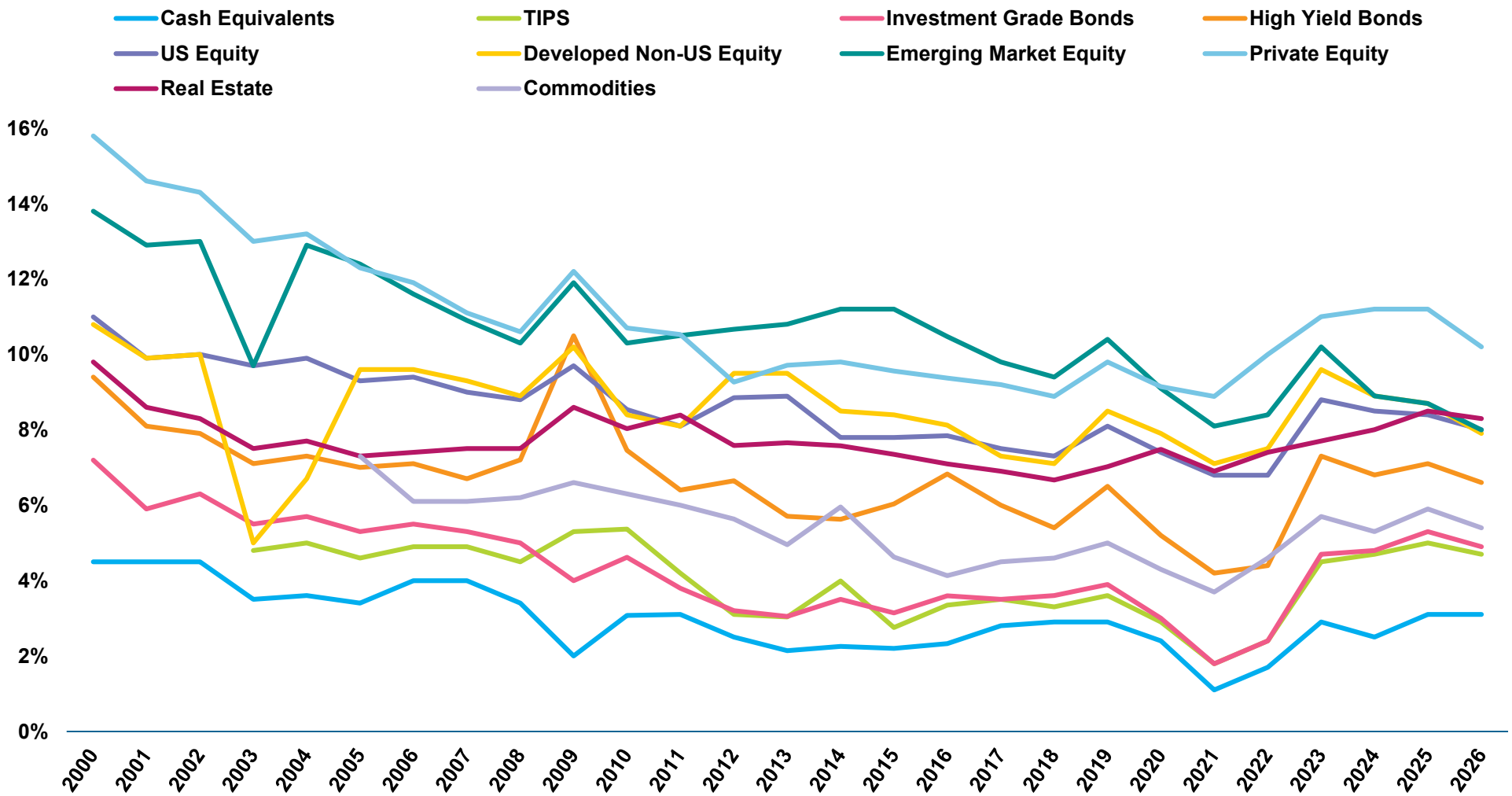
10-Year Return Forecasts and Likely Range



20-Year Return Forecasts and Likely Range

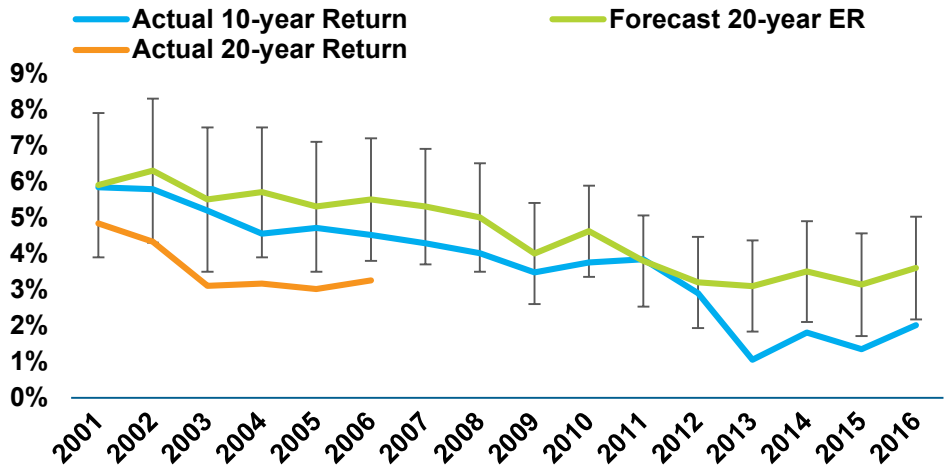


Our 20-Year CMEs Since 2000

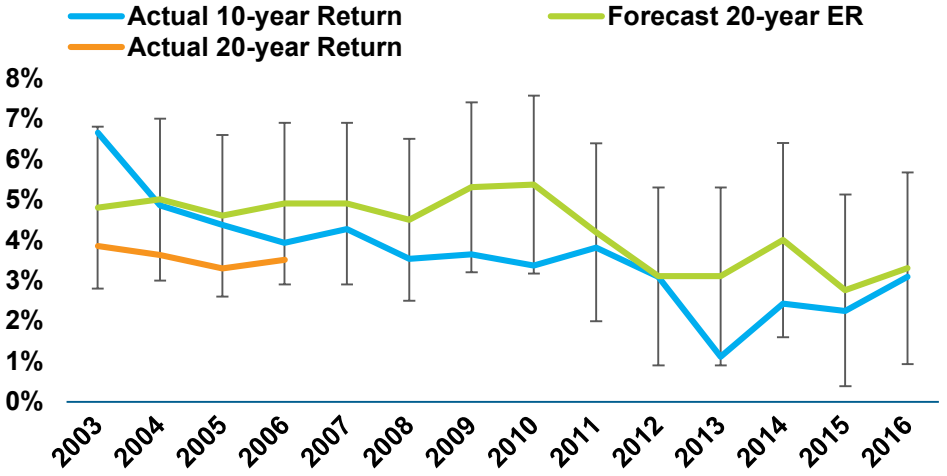


Our Track Record

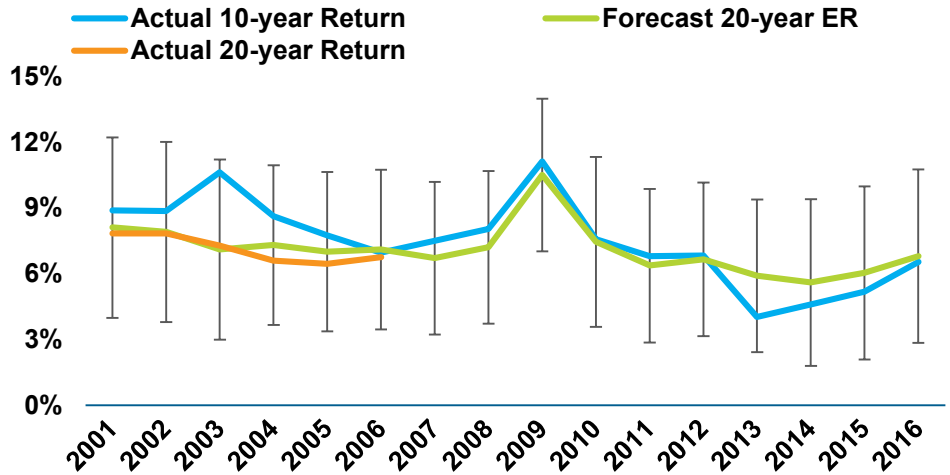
Investment Grade Bonds



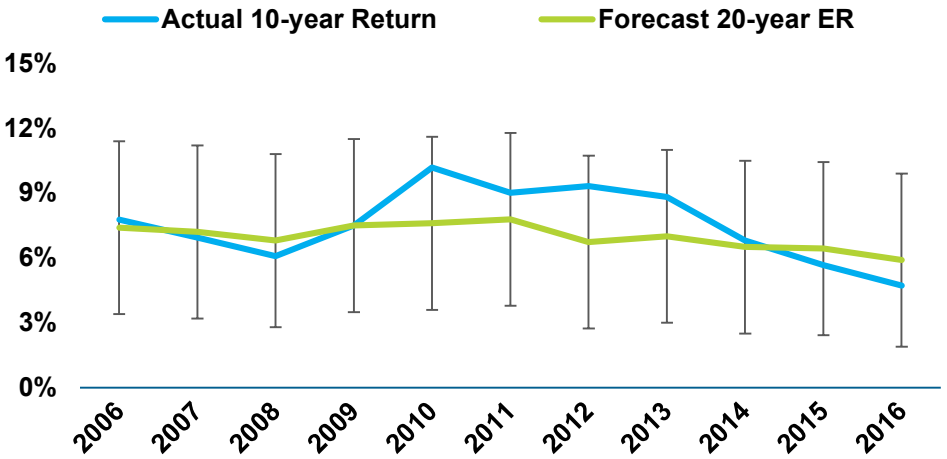
TIPS



High Yield Bonds

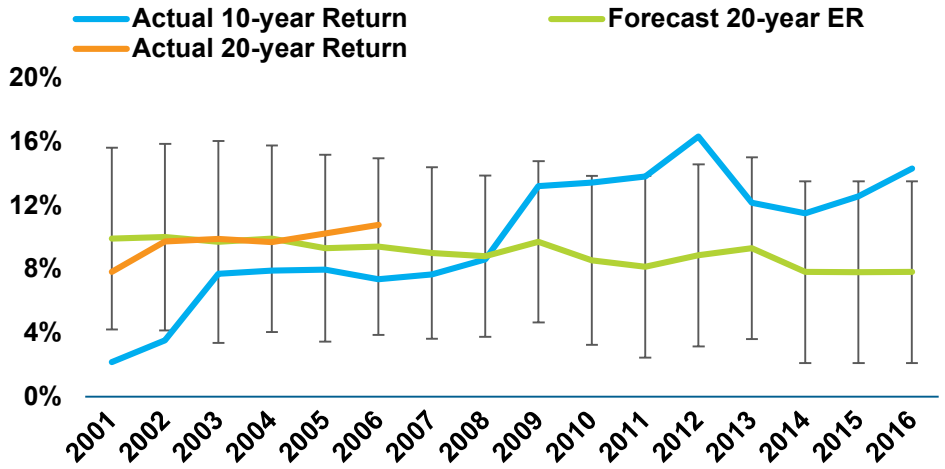


Core Real Estate

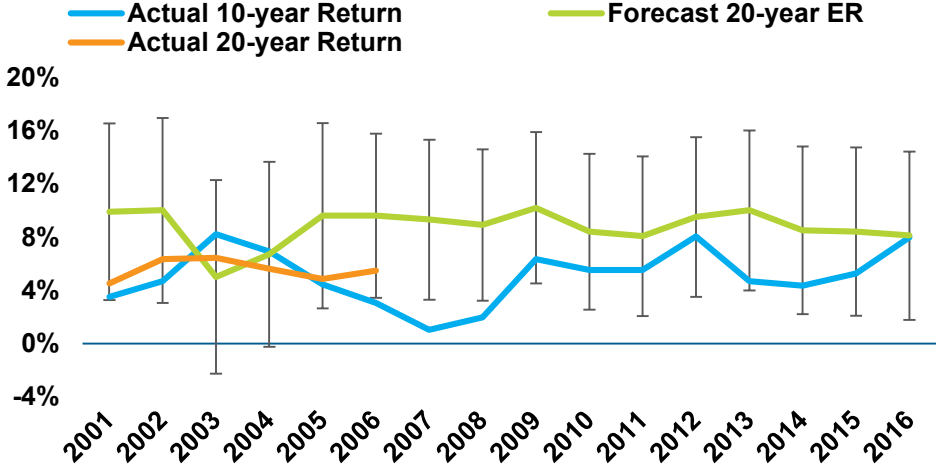


Our Track Record (continued)

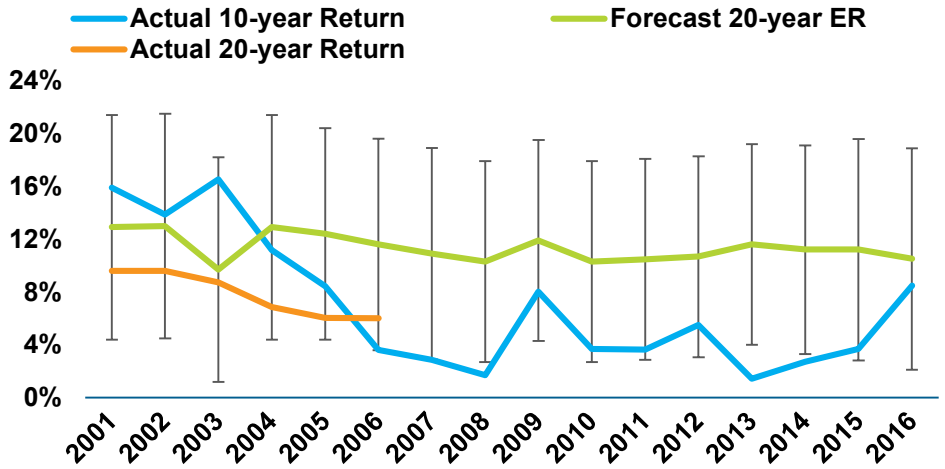
US Equity



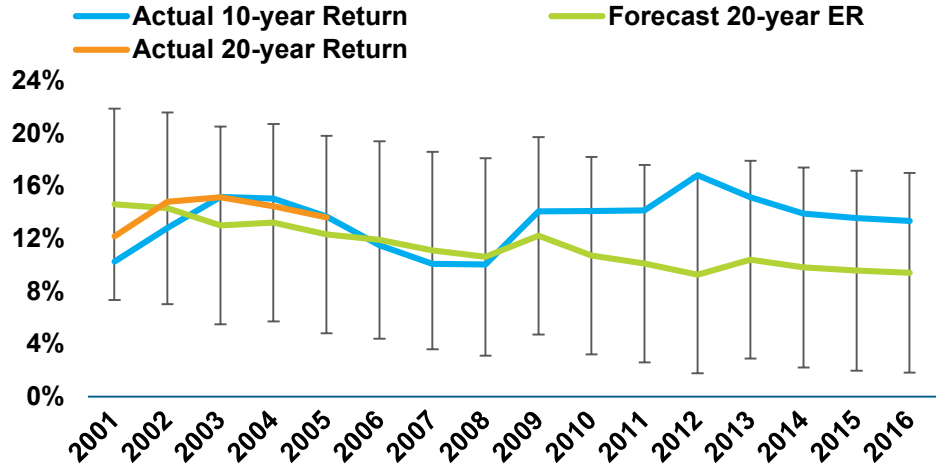
EAFE Equity



Emerging Markets Equity



Private Equity



2025 Peer Survey

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.[1]
- The Horizon survey is a useful tool to determine whether a consultant's expectations for returns (and risk) are reasonable.

Asset Class	Horizon 10-Year Average (%)	Meketa 10-Year (%)	Horizon 20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	3.6	2.8	3.6	3.1
TIPS	4.4	4.3	4.4	5.0
US Core Bonds	5.0	4.9	5.1	5.3
US High Yield Bonds	6.0	6.3	6.3	7.1
Emerging Market Debt	6.0	6.3	6.3	6.8
Private Debt	7.9	8.7	8.1	9.1
US Equity (large cap)	6.4	6.4	7.0	8.4
Developed Non-US Equity	7.0	7.2	7.4	8.7
Emerging Non-US Equity	7.4	7.1	7.9	8.7
Private Equity	9.1	9.8	9.6	11.2
Real Estate	6.2	6.9	6.4	8.5
Infrastructure	7.2	7.2	7.5	9.2
Commodities	4.7	5.5	4.8	5.9
Hedge Funds	5.9	4.2	6.2	6.0
Inflation	2.4	2.3	2.4	2.7

[1] The 10-year horizon included all 41 respondents to the survey, and the 20-year horizon included 27 respondents. Figures are based on Meketa's 2025 CMEs. The survey is typically published in August.

Asset Class Models

Equities

- We use a fundamental model for equities that combine income and capital appreciation:

$$E(R) = Dividend\ Yield + Price\ Return + Currency\ Effect$$

$$Price\ Return = Earnings\ Growth + Multiple\ Effect$$

- We use the current dividend yield on the respective index.[1]
- Our basis for earnings growth is a combination of real GDP growth, inflation, and exposure to foreign revenue sources.
  - We adjust this using an estimate of what percentage of economic growth will translate to earnings growth.
- We use a combination of valuation metrics to calculate the multiple effect.
  - These include PE, PE10, and a form of the dividend discount model.
- The models assume reversion to the mean or fair value.
- We arrive at our preliminary 10-year assumption (in local currency).

US Equity $E(R)$ = 1.2% + [(1 + 6.4%) x (1 - 1.1%) – 1] = 6.3%

- For non-US equities, we add the expected currency effect vs. the US Dollar to the local expected return.

[1] The source for dividend yields is S&P 500 for the US and MSCI for non-US equities. Note that in multiple places in this presentation, we display rounded values in the inputs, which may result in minor discrepancies in the results.

Equities: Earnings Growth

- For projected earnings growth, we add expected real GDP and expected inflation to arrive at nominal GDP.[1]
  - The model is based on the theory that a region's companies will grow at roughly the same rate as its economy, as defined by GDP, over the long term.
- However, the amount of economic growth that translates to EPS growth has been quite different among markets historically.
  - This is due to a variety of factors, including the global footprint of companies, market composition, profitability, the level of interest rates, government policies, societal norms, and net issuance of shares.
- Therefore, we use an estimate of the percentage of GDP growth that will translate to EPS growth for each market.

	US	EAFE	EM	China	ACWI
Estimated % of Growth Translating to EPS	130	85	73	60	109

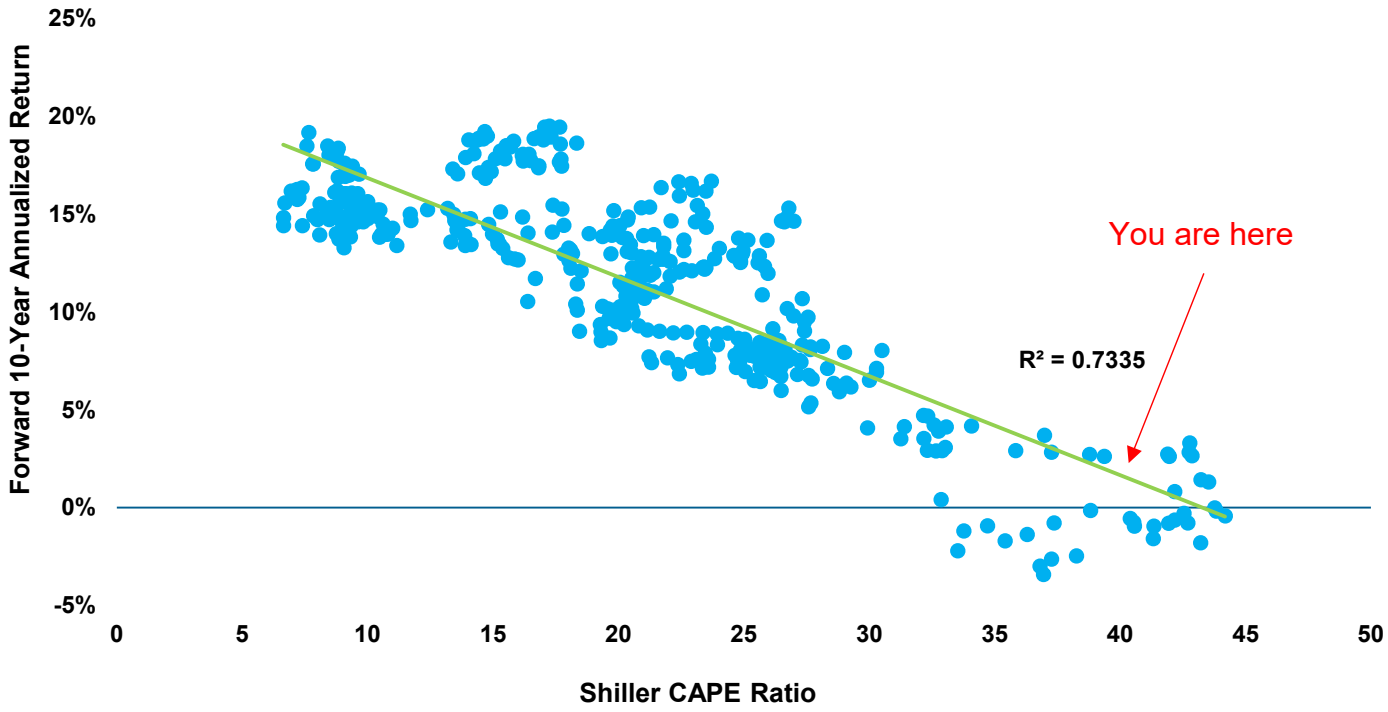
[1] We constructed 5-year GDP based on the IMF World Economic Outlook as of October 2025 and Oxford Economics projections, and then use Oxford Economics projections for the remaining five years to arrive at a ten-year forecast for each. We constructed inflation projections based on the IMF World Economic Outlook as of October 2025, historical averages and 5-year Inflation swaps maturing 5 years from now where available (e.g., US, Euro Area, UK).

Equities: Impact of Prices on Returns

→ Valuations have mattered, historically. Relative prices have been indicative of future equity returns.

- Higher prices have led to lower future returns, and vice versa.

US Equities: Shiller CAPE vs. Forward 10-Year Returns



Source: Robert Shiller, Yale University, and Meketa Investment Group. Data is based on monthly returns and Cyclically Adjusted P/E ratio on S&P 500 Index for the period from January 1980 through December 2025.

Equities: Valuation Model 1

→ We use several models with different lenses on valuations for public equities.

→ In model one, to calculate the price return, we estimate the fair value of the index in ten years.

- We first calculate future earnings per share (EPS) by compounding current EPS[1] at our projected earnings growth rate.
- We average the next ten years of projected EPS to arrive at an EPS 10 in ten years.

Index	US	EAFE	EM	EAFE Sm	EM Small	Frontier
Average EPS10 in 10 years	*384.3*	*205.6*	*109.7*	*22.2*	*94.0*	*71.6*

→ We multiply EPS10 by our projected PE10 ratio to arrive at a ten-year price target.

- We assume investors will pay slightly different ratios for earnings in different regions.[1]

US Price Target = 3843 × 28.3 = 10,861

→ We divide this future price by the current price and then annualize the price change.

US Price Return = (10861 ÷ 6846) ^ 1/10 – 1 = 4.7%

→ We subtract the projected earnings growth from the price change to arrive at the multiple effect.

$Multiple\ Effect_{Model\ 1}$ *= 4.7% – 6.4% = -1.7%*

[1] We assume that PE10 reverts 75% of the way back to its historical median. We use the median PE10 for the trailing 20 years. Throughout this document, numbers may not sum due to rounding.

Equities: Valuation Model 2

- In model 2, to calculate the price return, we estimate the fair value of the index in ten years.
- We first calculate future EPS by multiplying current EPS by projected earnings growth.

$$US\ EPS = 269.3 \times (1 + 6.4\%)\ \hat{}\ 10 = 499.7$$

- We multiply EPS by our projected PE ratio[1] to arrive at a ten-year price target.[2]

$$US\ Price\ Target = 499.7 \times 19.4 = 9{,}699$$

- We divide this future price by the current price and then annualize the price change.

$$US\ Price\ Return = (9699 \div 6846)\ \hat{}\ 1/10 - 1 = 3.5\%$$

- We subtract the projected earnings growth from the US price return to arrive at the multiple effect.

$$Multiple\ Effect_{Model\ 2} = 3.5\% - 6.4\% = -2.8\%$$

[1] We assume that PE reverts 75% of the way back to its historical median. We use a historical PE (trailing twelve months) that is consistent with the median for the past twenty years.
[2] Throughout this document, numbers may not sum due to rounding.

Equities: Valuation Models 3 and 4

- Our third and fourth equity models use a form of the dividend discount model (DDM).
- This is based on the premise that the level of interest rates affect current valuations when discounting future cash flows (or earnings).
- This time value of money concept can be quantified by using the DDM.
  - The DDM calculates a present value for the stock market based on interest rates.
- First, we determine what the implied cost of equity (i.e., discount rate) has been historically.
  - This is based on historical interest rates, growth rates, inflation, and prices.
- We then turn that into a “premium” over government bond rates that can be applied to the current level of interest rates to arrive at a new discount rate.

Equities: Valuation Models 3 and 4 (continued)

→ To calculate fair value, we use the Dividend Discount Model.

$$Fair\ Value = E \times (1 + G) \div (D - G)$$

- For earnings (E), we use EPS10 for model 3 and current EPS for model 4.
- For the growth rate (G), we use our projected earnings growth rate.
- For the discount rate (D), we add the current level of short-term interest rates to an expected premium over this rate.[1]

$$\text{US Implied Discount Rate} = 3.7\% + 5.5\% = 9.2\%$$

→ The fair value can be calculated as:

$$Fair\ ValueModel_3 = 179.5 \times (1 + 6.4\%) \div (9.2\% - 6.4\%) = 6{,}840$$

$$Fair\ ValueModel_4 = 269.3 \times (1 + 6.4\%) \div (9.2\% - 6.4\%) = 10{,}259$$

→ We find the difference between fair value and current value, and we assume 75% reversion to fair value is achieved over a ten-year period.

$$Multiplier\ Effect_{Model\ 3} = 0.75 \times [(1 + (6839 - 6846) \div 6846)\ \hat{}\ (1/10) - 1] = 0.0\%$$

$$Multiplier\ Effect_{Model\ 4} = 0.75 \times [(1 + (10259 - 6846) \div 6846)\ \hat{}\ (1/10) - 1] = 3.1\%$$

[1] We use the historical discount rate as a starting point, but projected discount rates can vary. For example, in 2026 we are using discount rates slightly below the historical average with the exception of China.

Equities: Combined Impact of Equity Valuations

→ Looking at multiple valuation metrics increases the confidence we have in our models.

- This is especially true when different models point in opposing directions.

→ Combining the four approaches also smooths out the changes from year to year.

Average Multiple Effect Based on the Valuation Models (per annum)

US Equities (%)	EAFE Equities (%)	EM Equities (%)	Global Equities (%)	China Equities (%)
-1.1	-0.7	-1.7	-1.0	-1.3

Source: Meketa analysis of MSCI and Bloomberg data.

Currency Effect

→ For non-US equities (and all assets with non-USD exposure), we calculate an adjustment for the expected impact of currency movements.

- We use a two-factor model that is based on PPP theory and IRP theory.
  - PPP posits that money will flow to the currency with lower cost of goods and services.[1]
  - IRP posits that money will flow to the currency with the higher interest rate.[2]
- For developed markets, we put 60% weight on IRP and 40% on PPP.
- For emerging markets, we put 75% weight on PPP and 25% on IRP.

→ We cap the currency adjustment at +/- 0.5% per annum, given the unpredictable nature of currency markets.

Market	PPP Impact (%)	IRP Impact (%)	Net Effect (%)	Capped Net Effect (%)
EAFE	2.3	-1.1	0.2	0.2
EM	7.0	0.7	5.4	0.5
Global	1.3	-0.2	0.2	0.2
China	3.5	-0.7	2.5	0.5

[1] Sources for PPP data: World Bank (PPP Conversion Factor) and The Economist (Big Mac Index).
[2] We use the central bank discount rate or equivalent for the major countries of each region (source: FRED).

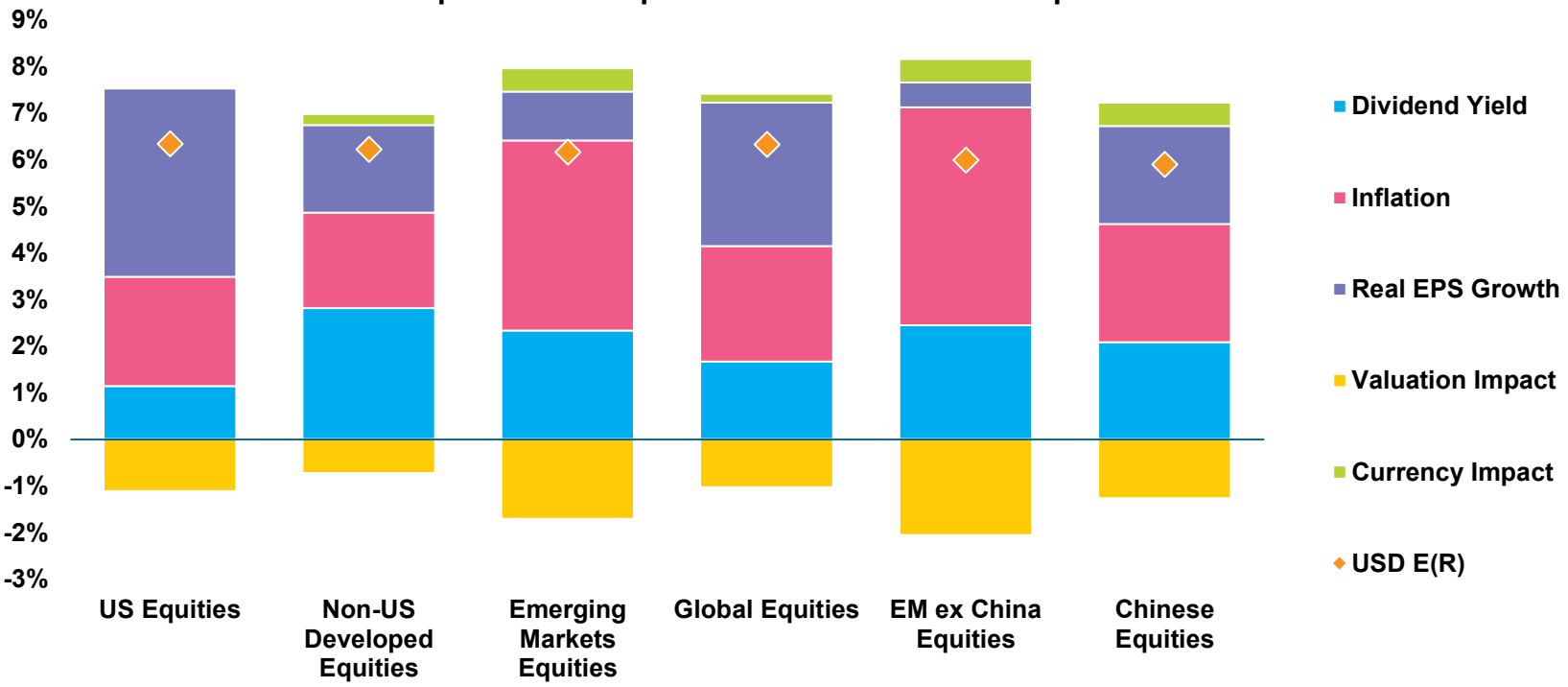
Equities: Comparing Drivers of Expected Return

→ Real EPS growth is the main driver of expected return for US equities.

- Despite relatively low anticipated inflation, US equities also have the highest nominal EPS growth.

→ The valuation headwind is expected to be the largest for emerging markets and EM ex-China.

Decomposition of Expected Returns for Public Equities



Source: Meketa analysis of MSCI and Bloomberg data.

Equities: US Mid, Small, and Micro

- → The models smaller cap stocks are similar to that used for the overall equity model.
- → To calculate the price return, we estimate the fair value of the index in ten years. We do this using both price-earnings and price-book ratios.
- → We calculate future EPS by looking at a similar ratio of historical earnings growth for each index vs. the Russell 1000 index.
  - We assume earnings will grow at the same rate for midcap, at 0.95x for small cap, and 0.9x for microcap (this is subjective and reflects have smaller stocks have switched from out-earning to under-earning large cap).
  - We multiply EPS by our projected PE ratio[1] to arrive at a ten-year price target.
- → We take a similar approach for price-book, comparing current ratios to historical ratios.
  - Price-book can be particularly helpful for small and micro cap, as short-term earnings volatility can distort PE comparisons.
- → We divide the future price by the current price and then annualize the price change.
- → We add the price change to the dividend yield to arrive at the expected return.

[1] For the US, we use the median PE (trailing twelve months) for the longest available period. We assume a higher PE for mid, small, and micro that is consistent with their historical valuations relative to large cap. We assume reversion 75% back toward the historical median.

Bonds

- The short version for most investment grade bond models is: E(R) = current yield to worst.
- The longer version accounts for the expected term structure in the future, as well as credit risk.
  - If the average duration is roughly five years, we calculate the expected yield in five years.
  - The net effect tends to be minimal; for example, if rates rise, higher income in years 5 to 10 is offset by price declines in years 1 to 5.
- For cash, we use an average of the current rate and the rate suggested by the Taylor Rule (inputs are current and potential GDP, current and desired inflation).
- For TIPS, we add the real yield for the TIPS index to the expected Inflation rate.
- As with equities, we also make currency adjustments when necessary.
  - This impacts foreign and EM local currency debt.

Bonds: Credit

→ For anything with credit risk, we take into account our expected default and recovery rates.

	Inv. Grade Corporate (%)	Long Term Corporate (%)	Foreign Debt (%)	EM Debt (major) (%)	EM Debt (local) (%)	High Yield (%)	Bank Loans (%)
Default Rate	0.08	0.08	0.09	1.72	0.36	2.50	2.50
Loss Rate	50	50	50	50	50	45	40

→ As a guide, we use historical global default and recovery data for each asset class.

- When the composition of an asset class changes over time (e.g., for emerging market debt), we look at each rating bucket as it is currently weighted.

Private Credit

→ For direct lending and asset based lending, we use a building blocks approach that is based on income and loss thereof.

- For income, we use the most recent yield and spread data available for the Lincoln Senior Debt Index.
- We add an upfront fee (paid by the borrower) or original issue discount if applicable.
  - This usually ranges between 1% and 3%.
- We incorporate default and recovery rates.
  - We use a default rate that is 1-2% higher than for bank loans.
  - While the data that is available on direct lending supports this level, we do not have access to long-term data on private credit defaults (e.g., that incorporates major default events like the GFC).
- Where applicable, we add leverage and subtract the cost of borrowing.
- We add an equity kicker (more applicable in asset based lending), adjusted for defaults.
  - Managers expect 2.5% to 5% return from warrants, co-invests or other equity structures.
- We subtract estimated management fees and carried interest.

Private Credit: Aggregate

→ For Special Situations Lending, we use a combination of models for capital solutions and more traditional distressed debt.

- The capital solutions model resembles that for direct lending, but with higher equity kickers, coupons, and default rates.
- The distressed debt model resembles that for public high yield bonds and is based on data for the Bloomberg US CCC and Ca-D indices.
  - It uses a much higher default rate than high yield bonds (often in the range of 20-35%).
- We subtract estimated management fees and carried interest.

→ For aggregate private credit, we take a weighted average based on a mix of the broad opportunity set and a typical client allocation to private debt.

Component	Weight (%)	10-Year E(R) (%)
Direct Lending	45	7.0
Asset Based Lending	30	7.9
Special Situations	25	8.9
Private Debt Composite	NA	7.8

Private Equity: Buyouts

- For Buyouts, we start with public equity expected returns.
- We add a premium or discount based on the pricing of buyouts relative to stocks.
  - We use the most recently available EV/EBITDA multiples from Preqin to provide an indication of valuations.
- We add a premium for control (e.g., for greater operational efficiencies) and leverage.
  - We assume leverage of 1.25x - 1.35x.
- We subtract borrowing costs and estimated fees, including carry.
  - We assume borrowing costs are consistent with the yield on bank loans.
- We also look at how closely valuations compared to price changes occurring in the public markets, noting that buyouts pricing often lags that of public equities.

Private Equity: VC and Growth Equity

→ For Venture Capital ("VC"), we create a public market proxy that we can compare through time.

- This composite is composed of: traditional technology, biotech, pharmaceuticals, life sciences, IT services, internet, AI, and clean tech and environmental stocks.
  - The weighting to each sector varies through time.
  - The data is an imperfect proxy and the correlation with future returns is not high.
  - Still, this proxy provides some indication of pricing relative to the broader market.
- We also note any lag we observe between VC valuations and price changes for public markets.
- We use this to make an assessment of what size the return premium should be relative to public markets.

→ For Growth Equity, we infer a return that is between that of buyouts and venture capital.

- The relative weightings place the return closer to that of VC than buyouts.

→ For VC and growth equity, we subtract estimated fees, including carry.

Private Equity: Aggregate

→ For aggregate private equity, we take a weighted average based on a mix of the broad opportunity set and a typical client allocation to private equity.

Component	Weight (%)	10-Year E(R) (%)
Buyouts	65	8.6
Growth Equity	10	9.4
Venture Capital	25	9.8
Private Equity Composite	NA	9.0

Real Estate: Core

→ For Core Real Estate (RE), we use two models.

- The first model adds a premium to the most recently available value-weighted cap rate from NCREIF.
  - Core RE has historically returned approximately 1.3% more than its value-weighted cap rate at the start of the period over the subsequent ten years.
- The second model combines income with capital appreciation potential.
  - The income for core RE has historically been the cap rate minus 2-3% (for Cap Ex).
  - We assume income (NOI) grows at the rate of inflation.
  - We assume there is some measure of fair value for cap rates relative to bond yields.
    - We make a price adjustment based on the forward yield curve.
- We adjust for leverage, borrowing costs, and estimated fees.

Real Estate: Non-Core

- For non-core real estate, we start with historical premiums versus core RE.
  - This includes the effect of greater control, development, buying at distress, etc.
- We add a non-US component (e.g., premium for lower cap rates) and a currency effect.
  - We assume 10% to 30% of non-core commitments will be ex-US (with the majority in Europe).
- We lever the portfolio and then subtract the cost of borrowing.
  - We assume value-added leverage ranges 50-60% while opportunistic ranges 60-75%.
  - The cost of debt is higher for value added than core, and higher still for opportunistic.
- Finally, we subtract estimated management fees and carried interest.
- For high yield real estate debt, we use our high yield bond model.
  - We use the YTW on the Bloomberg CMBS BBB index and then add a “high yield” spread on top of this.
  - Data is sparse on default rates and spreads.
    - We are using a higher default rate than for high yield bonds.
  - We adjust for leverage, borrowing costs, and estimated fees.

Real Estate: REITs

→ For REITs, we focus on historical pricing and yields.

- We first look at current REIT Yields from FTSE NAREIT.
  - REITs have historically returned 2.6% more per year than their yield at the start of the period over the subsequent ten years.
- We next look at spreads versus Treasuries and Baa corporates.
  - We evaluate how they compare to periods where rates have been withing +/- 50 basis point of the current level of rates and spreads since 1990.
- We also look at the price change required for REITs to return to the REIT yield spread implied in 5 years.

REIT Yield (%)	Price Change implied by spread vs 5-year Treasury Yield (%)	Price Change implied by spread vs Baa Yield (%)
4.1	-1.3	-1.3

- We average the impact of these pricing factors and then add this to the yield and projected income growth.
  - We use our inflation projections as the estimated income growth rate.

→ For global REITs, we take a similar approach using the FTSE NARIET Global REIT index.

- We also make a currency adjustment based on the % of non-USD exposure in the index.

Real Estate: Aggregate

→ To arrive at the aggregate private real estate assumption, we take a weighted average of our expectations for each of the four components.

- These reflect the weights of a typical client portfolio, balanced with the market opportunity set.

Component	Weight (%)	10-Year E(R) (%)
Core Private RE	55	5.8
Value-added RE	25	8.7
Opportunistic RE	10	9.8
High Yield RE Debt	10	8.5
Private Real Estate	NA	7.2

→ The aggregate real estate composite is 90% private real estate and 10% REITs.

Infrastructure: Public

→ For public infrastructure, we first take the weighted average of the regional public equity expected returns.

- We use an equal weight of the MSCI World Core Infrastructure index and the S&P Global Infrastructure index to derive the regional weights.

→ We then look at the P-E ratios of four major public infrastructure indices vs. the global equity market to derive a signal as to how discounted or expensive infrastructure stocks may be.[1]

- We assume reversion in pricing to half the difference between the two.

	MSCI World Core Infrastructure	S&P Global Infrastructure	DJ Brookfield Global Infrastructure	MSCI World Infrastructure	MSCI World
P-E Ratio	19.6	19.7	18.8	15.5	23.9
Price Adjustment	9.0%	8.7%	10.7%	17.5%	NA

→ Finally, we add the average of the price adjustments (per annum) to the expected equity return to arrive at our preliminary expected return for public IS.

$$E(R) = 6.3\% + 1.2\% = 7.5\%$$

[1] We use four different indices because the public infrastructure indices tend to be composed of meaningfully different sectors and weights.

Infrastructure: Core and Non-Core

- For private infrastructure, our model combines income and capital appreciation.
- For income, we use our best estimate of expected yield based on the funds that we track.
  - We assume a range of 4-5% for core and 2-4% for non-core.
- We assume asset prices grow at the rate of inflation or GDP growth, whichever is greater.
  - Inflation-linked assets often can pass along their costs, even if it may be at a lag.
- We add a premium or discount based on the pricing of unlisted infrastructure.
  - We use the most recently available EV/EBITDA transaction multiples from Macquarie to provide an indication of relative valuations.
- We add a control premium for non-core IS (as these more closely resemble buyouts).
- We lever the portfolios and then subtract the cost of borrowing.
  - We assume core is levered at 30%-45%, and non-core at 40%-65%.
  - We assume the cost of debt for non-core is much higher than for core, though below that for buyouts.
- Finally, we add any currency effect and subtract estimated management fees and carry.

Infrastructure: Aggregate

→ To arrive at the aggregate private infrastructure assumption, we take a weighted average of our expectations for each of the two components.

- These reflect the weights of a typical client portfolio, balanced with the market opportunity set.

Component	Weight (%)	10-Year E(R) (%)
Core Infrastructure	50	6.5
Non-Core Infrastructure	50	8.4
Private Infrastructure	NA	7.4

→ The aggregate infrastructure composite is 90% private infrastructure and 10% public infrastructure.

Natural Resources: Public

→ For public Natural Resources (NR), we first take the weighted average of the regional public equity expected returns.

- We use an equal weight of the S&P Global Natural Resources index and the S&P North American Natural Resources index to derive the regional weights.

→ We then look at the P/E, P/B and EV/EBITDA ratios of two NR indices vs. the global and US equity markets to derive a signal as to how discounted or expensive NR stocks may be.

- We assume reversion in pricing between the two to half of the historical difference.

Price Adjustment	P/E (%)	EV/EBITDA (%)	P/B (%)
S&P Global NR vs. S&P Global BMI	14	37	46
S&P North American NR vs S&P 500	17	44	72

→ We add the price adjustment (per annum) to the expected equity return to arrive at our preliminary expected return for public NR.

- We cap the price adjustment at +/- 1% per annum.

Natural Resources: Mining

→ Most “private” mining partnerships consist of investments in “junior” mining stocks.

- We take the weighted average of the regional public equity markets and mining stocks.
  - We use a 50/50 split between TSX and Australian mining indices.
- We then look at a combination of valuation metrics to derive a signal on relative valuations.

	Current P/E	Avg. P/E	Current P/B	Avg. P/B	Current EV/EBITDA	Avg. EV/EBITDA
MSCI Australia Small Met/ Min	19.9	13.2	2.8	2.3	8.6	6.3
S&P TSX Diversified Met /Min	33.1	23.9	1.7	1.1	14.3	8.9

- We add a control premium (as these partly resemble buyouts) and subtract estimated fees and carry.

Natural Resources: Energy and Sustainability

→ For Energy, we seek to estimate a return premium relative to the broad equity market.

- We take the weighted average of the regional public equity returns.
  - 80% in US/Canada, 15% EAFE, and 5% EM.
- We then look at the relative pricing of large and small cap energy stocks as a proxy.

Index	MSCI USA Energy (%)	MSCI ACWI IMI Efficient Energy (%)	Russell 2000 Oilwell Equip. & Services (%)	Russell 2000 Oil Refining & Marketing (%)	Russell 2000 Crude Producers (%)
Weight	45	25	5	5	20

- We add a control premium and subtract estimated management fees and carry.

→ For Sustainability, we take a similar approach.

- We again take the weighted average of the regional public equity returns.
  - 90% in US/Canada and 10% EAFE
- We then look at the relative pricing of sustainability stocks as well as prices in the sector.

Index	DJ US Renewable Energy Equipment (%)	MSCI ACWI IMI Clean Energy Infrastructure (%)	US Renewable Energy Consumption Producer Prices (%)
Weight	30	30	40

- We add a control premium and subtract estimated management fees and carry.

Natural Resources: Timberland

- For Timberland, we combine land pricing with income potential.
- We examine the average price per acre of timberland transactions since 1995 based on data from RISI and NCREIF.
  - We then adjust these prices for inflation and derive a long-term average.

Current Price/Acre	Inflation-Adjusted Average	Price Adjustment
$2,225	$1,758	-10.5%

  - We assume that prices move halfway back toward their historical inflation-adjusted average.
- We assume that property values grow in the future at the rate of inflation plus 2%
- We assume that income will be consistent with its trailing 10-year average of 2.6%.
- We add a non-US component (with a premium) and a currency effect.
  - We assume ~20% ex-US exposure (e.g., Latin America and Australasia).
- We assume the average portfolio is leveraged at 1.15:1 and then subtract the cost of borrowing.
- Finally, we subtract estimated management fees and carried interest.

Natural Resources: Farmland

- For Farmland, we use essentially the same model as Timberland.
- We look at the average price per acre of farmland and cropland based on data from RISI and USDA.[1]
  - We then adjusted these prices for inflation and derived a long-term average.

	Current Price/Acre ($)	Inflation-Adjusted Average ($)	Price Adjustment (%)
Farmland	4,350	2,685	-13
Cropland	5,830	4,292	-11

  - We assume that prices move halfway back toward their historical inflation-adjusted average.
- We again assume that property values grow in the future at the rate of inflation plus 2%.
- We assume that income will be consistent with its trailing 10-year average of 3.3%.
- We add a non-US component (premium for lower cap rates) and a currency effect.
  - We assume ~20% of exposure will be ex-US (e.g., Latin America and Australasia).
- We assume the average portfolio is leveraged at 1.5:1 and then subtract the cost of borrowing.
- Finally, we subtract estimated management fees and carried interest.

[1] Farmland includes dwellings on properties as well as pastureland.

Natural Resources: Aggregate

→ To arrive at the aggregate NR assumption, we take a weighted average of our expectations for each of the five components.

Component	Weight (%)	10-Year E(R) (%)
Timberland	15	5.3
Farmland	15	6.1
Sustainability	20	8.0
Energy	35	8.1
Mining	15	6.1
Aggregate Private Natural Resources	**NA**	**7.1**

→ The aggregate natural resources composite is 90% private NR and 10% public NR.

Throughout this document, numbers may not sum due to rounding.

Gold and Gold Mining

- For Gold, we assume an investment would most likely be made via futures.
  - Holding physical gold would likely incur additional security and storage costs.
- Gold does not offer a yield or cash flow of any kind; however, it has a very long history of preserving purchasing power.
  - Therefore, our model is anchored to inflation, along with long-term supply and demand factors.
- We use two approaches for gold.
  - The first model adds real yields to expected inflation.
  - The other approach uses the Kaufmann & Winters gold price model.
    - This incorporates inflation, real interest rates, US dollar strength, financial stress, oil prices, and gold price persistence.
    - It is a structural, macro-based valuation framework rather than a short-term trading model.
- Our model for gold mining starts with our expected return for the broader mining category.
  - We then add or subtract a premium depending on the pricing of gold mining stocks relative to the broader mining category.

Commodities

→ For a traditional (or naïve) portfolio, we use the following model:

$$E(R) = Collateral\ Yield + Roll\ Return + Spot\ Return + Diversification\ Return$$

- The collateral yield represents our expected return from cash.
- The roll return should vary based on how backwardated or contagoed the market is.
  - However, this state could change quickly, so our assumption is anchored near zero.
- For the spot return, we use the market's expectation for inflation minus average productivity growth for advanced economies.
- The diversification return is the result of regular rebalancing between commodity futures.
  - The diversification return rises as the average variance of the securities in a portfolio rises, as the average correlation in the portfolio falls, and as the number of securities in the portfolio rises.
  - However, we use a lower number than the historical average because correlations among commodities have risen since the academic research was originally conducted.[1]

$$E(R) = 2.8\% + 0.1\% + 0.7\% + 1.5\% = 5.0\%$$

[1] De Chiara and Raab (2002) documented a 2.8% diversification return for the rebalanced Dow Jones AIG Commodities index during the time period 1991 to 2001. Gorton and Rouwenhorst suggested a diversification return of between 3.0% and 4.5% for an equally-weighted basket of commodity futures (this paper was updated in 2015).

Commodities: Risk Parity and Real Return

- In addition, we have models for several more complex strategies, specifically risk parity and real return.
- For Commodities Risk Parity, we use a strategy with a target volatility of 15%.
  - The basic inputs are the same as for a naïve portfolio, except we assume a higher diversification return (of 1.8%) as risk parity strategies tend to be more broadly diversified.
  - We assume the portfolio is leveraged at 1.5:1, which is in line with the average for managers using this strategy.
  - We then subtract the cost of borrowing as well as estimated management fees.
- For Commodities Real Return, we use a "portable alpha" approach.
  - We add the return of TIPS on top of the return for the naïve commodities portfolio.
  - We then subtract the cost of borrowing as well as estimated management fees.

Hedge Funds

→ To construct the hedge fund models, we use a variety of traditional and alternative betas:[1]

- Traditional betas include:
  - Equities, distressed debt, credit, commodities, bonds
- Alternative betas include :
  - Carry trade, convert arb, currency, momentum

→ We also add leverage (where appropriate) and subtract the cost of debt and estimated fees.

→ For example, our long-short equity model is fairly straight forward.

- We assume the average fund is 50-60% net long and has an equivalent beta to the global stock market.
- We multiply this beta times our expected return for global equities, then add this to our cash expected return for the portion that is not invested.

$$\text{Gross } \mathrm{E}(R) = 0.6 * 6.3\% + 0.4 * 2.8\% = 4.9\%$$

- We then subtract estimated management fees and carried interest to arrive at a net return.

[1] Note that we do not assume "alpha" for hedge funds nor any other asset class.

Hedge Funds: Aggregate

- To arrive at the aggregate Hedge Fund assumption, we take a weighted average of our expectations for each of six components.
- The weightings are occasionally revised based on the approximate allocation of each category in the broad hedge fund universe.

Component	Weight (%)	10-Year E(R) (%)
Long-Short	32	2.9
Event-Driven	11	5.0
Global Macro	16	4.4
CTAs	7	3.5
Fixed Income/L-S Credit	24	4.1
Relative Value/Arbitrage	10	4.0
Aggregate Hedge Funds (net)	NA	3.8

Throughout this document, numbers may not sum due to rounding.

Alternative Risk Premia

- We model Alternative Risk Premia (ARP) using a build-up method of individual premia which assumes a one-third risk weighting to single stock premia and two-third risk weighting to macro asset class premia.
  - Single stock premia is modeled with an equal risk weight to value, cross-sectional momentum, and defensive risk premia.
  - Macro asset class premia is modeled with an equal risk weight to equity indices, fixed income indices, currencies, and commodities.
    - Each asset class has an equal weight to value, carry, and momentum risk premia.
- We use conservative estimates for the Sharpe ratios for individual premia that are approximately one-third that of 10-year global equity risk premia.
- Correlation assumptions across the premia are also adjusted to be more conservative, particularly for those premia that historically have had significant negative correlations.
- The target volatility is assumed to be 10%, which is in-line with core manager offerings.
- We subtract estimated management / transaction fees as there is no passive option.

Insurance Linked Strategies

- For insurance linked strategies (“ILS”), we focus on the catastrophe bond market.
  - The model resembles that for high yield bonds, given the possibility of default.
- We use the most recently available expected loss rates and spread from Artemis.
  - The loss rates are similar to default rates for traditional bonds, but with no recovery.
- We subtract the expected loss from the expected coupon to arrive at a return.

Risk Mitigating Strategies

→ We include expectations for a Risk Mitigating Strategies (RMS) aggregate as well as for one of the potential underlying categories, RMS Diversifiers.

→ The RMS Aggregate is composed of three categories that we refer to as first responders, second responders, and diversifiers.[1]

- The composition represents a typical client weight, though many clients use different allocations.

Composite	Long-Term Government Bonds	Long Volatility	CTAs (trend following)	RMS Diversifiers
RMS Aggregate	1/6th	1/6th	1/3rd	1/3rd

→ The RMS Diversifiers Aggregate is composed of strategies that are designed to have a modestly positive expected return without being highly correlated with a broader (growth-driven) portfolio.

- Again, the composition represents a typical client weight.

Composite	Global Macro (%)	Alternative Risk Premia (%)	Market Neutral (%)	Insurance Linked Strategies (%)	Relative Value (%)	Event Driven (%)
RMS Diversifiers	30	40	10	10	5	5

[1] Note that we combine long-term government bonds and long volatility strategies to form the "first responders" category.

Digital Currencies: Bitcoin

- → This model is quite different than our others, as Bitcoin does not derive value from income, some future stream of cash flows, or a risk premium.
- → We use two different models to evaluate Bitcoin.
- → The first model is a scenario-based approach that assumes that Bitcoin garners it value from taking advantage of speculative asset pricing.
  - Using the price and volume of Bitcoin, we create two regimes, with separate sets of expected buy and sell values for scenarios.
    - We consider a possibility whereby speculative behavior during a bubble is beneficial as well as a possibility where it is harmful.
  - These expected gains and losses are averaged and spread across ten years to create a 10-year horizon expected outcome.
- → The second model reflects the behavior of Bitcoin as the asset class has matured.
  - We take a CAPM approach to modeling the asset class.

$$\text{Expected Return} = R_f + \beta \times (R_m - R_f)$$

  - We assign Bitcoin a beta versus US equities consistent with that experienced since 2020 (of 1.6).
    - This approach essentially treats Bitcoin like a high-beta stock.

Risk Parity

→ To build our risk parity model we use the five most common risk parity betas.

- We weight each factor such that their contribution to risk (volatility) is equal.
- This requires optimization (due to correlations being less than one).

→ We leverage the group (at ~1.4:1) such that the aggregate standard deviation is at the target (10%).

Component	Weight (%)	Contribution to Levered E(R) (%)	Std Dev (%)
Equities	14	1.2	17
Credit	29	1.9	8
Commodities	14	0.9	17
Currencies	20	0.8	12
Interest Rates	23	1.4	10
Aggregate Risk Parity (gross)	**NA**	**6.2**	**NA**

→ We subtract estimated management fees to arrive at a net return.

Throughout this document, numbers may not sum due to rounding.

Tactical Asset Allocation

→ To build our model, we use a compilation of many common traditional betas.

- The weightings reflect a rough average of the Tactical Asset Allocation ("TAA") managers employed by our clients.

Component	Weight (%)	10-Year E(R) (%)
US Equities	30	6.3
EAFE Equities	12	6.2
EM Equities	8	6.2
Commodities	5	5.0
Cash	5	2.8
Investment Grade Bonds	15	4.2
TIPS	5	3.8
Foreign Bonds	5	3.0
EM Debt	5	5.7
High Yield	5	5.4
Bank Loans	5	5.6
Aggregate TAA (gross)	**NA**	**5.3**

→ We subtract estimated management fees to arrive at a net return.

Throughout this document, numbers may not sum due to rounding.

Long-Term Theme:
Comparing Public and Private Equity Valuations

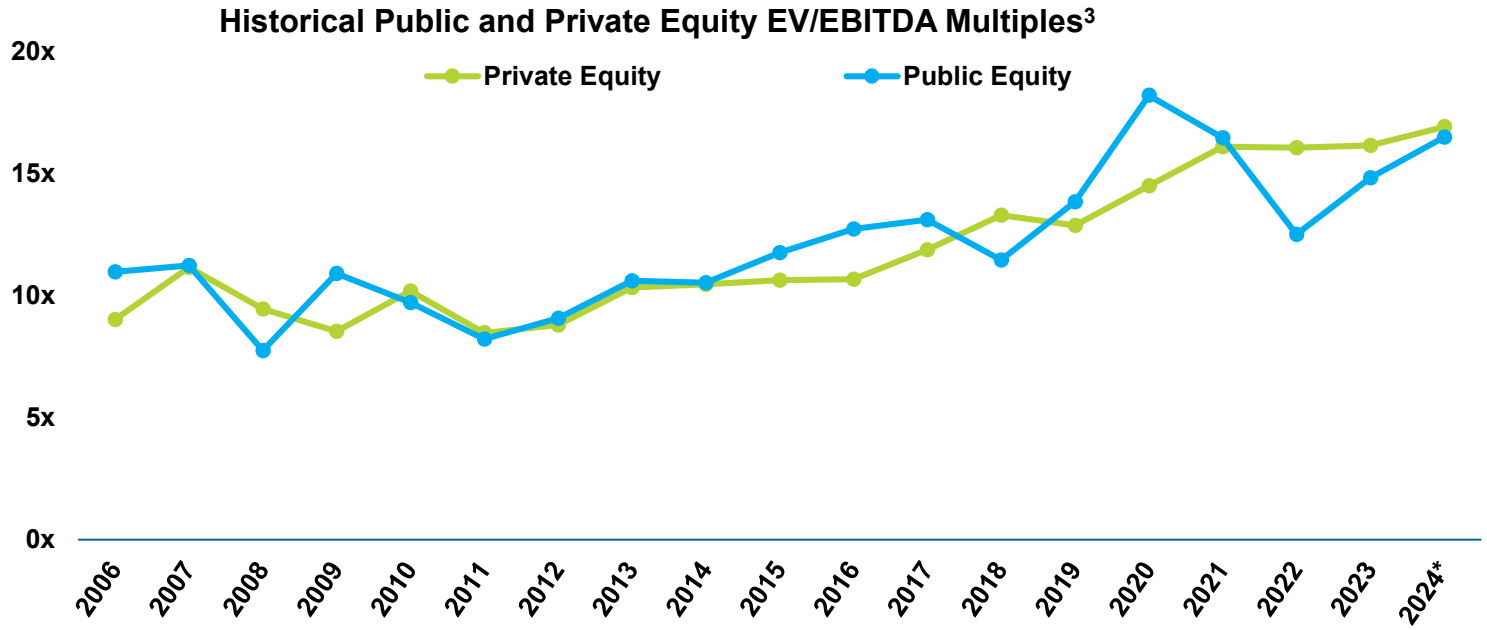
Public versus Private Equity Valuation Data

- → Comparing valuations across public and private equity markets includes a number of structural challenges.
  - The primary challenge is private equity's shorter history and limited dataset.
- → Another challenge is choosing a metric that is comparable across both public and private markets.
  - Common public market valuation metrics such as the p/e and p/b ratios are not available in private markets.
- → The EV/EBITDA multiple, however, is available for both private and public equity data sets.[1]
  - EV/EBITDA = Enterprise Value of a company / Earnings Before Interest, Taxes, Depreciation, and Amortization)[2]
- → By incorporating measures of price and earnings, it serves as a reasonable metric for comparisons.

[1] EV/EBITDA is among the most common valuation metrics to be reported publicly or made available to data providers on private company transactions. This metrics is often viewed as the most relevant valuation metrics in buyout deals.
[2] EBITDA is fairly straight-forward accounting measure that is generally applied the same for both public and private markets. However, the definition of enterprise value is more elastic. See the Appendix for more information.

Historical Valuations

- → Historically, the valuations for public and private equity have tended to move tightly together.
- → Gaps tend to occur during significant market events such as the GFC and COVID Pandemic.
  - Valuations for buyouts followed a similar pattern as stocks, but on a lagged and smoother basis.[1]
- → The gap between public and private equity valuations peaked during the rate hiking cycle of 2022.[2]
  - They appear to have since evened out again.



[1] The GPs who own the companies typically do not mark their valuations down or up as quickly as can happen in the stock market. Price changes in private equity tend to be reflected on a lagged basis in reporting, sometimes taking as long as three quarters to reflect equivalent changes in public securities. The result is a "smoothing" of the returns experienced by private equity investors. Source: Meketa, "Private Equity Primer" 2022.

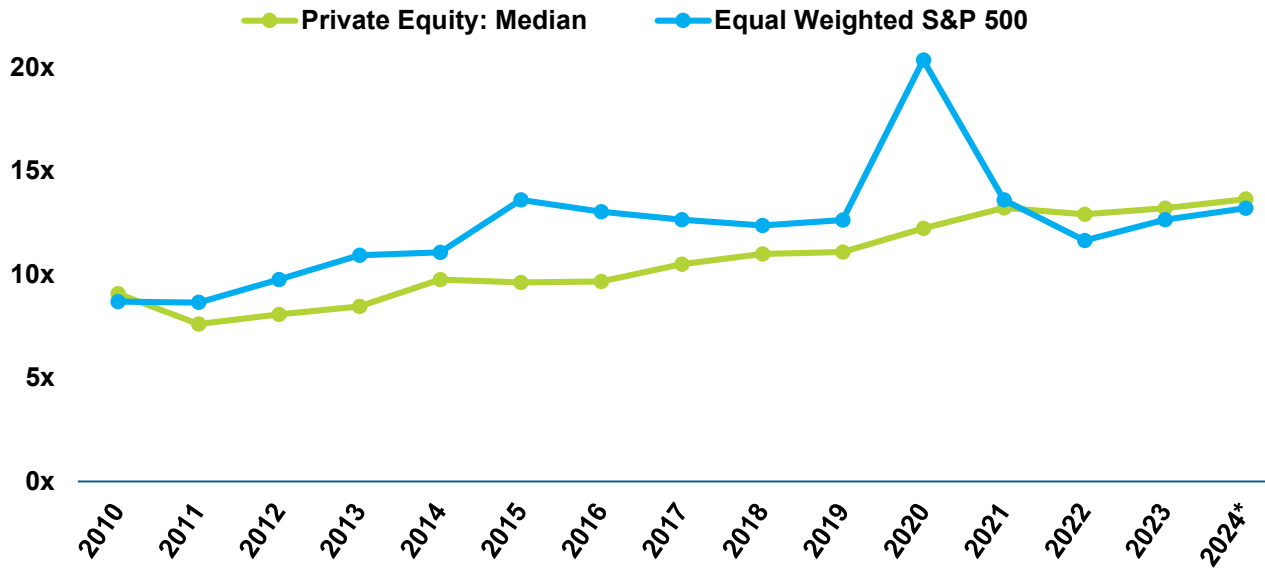
[2] Another factor that may partly explain the gaps between public and private market valuations during periods of market volatility is the fact that the private equity valuations reflect the mean over the course of the year, not a year-end metric.

[3] Sources: Bloomberg as of 12//31/2024. Preqin as of 9/30/2024, pulled in March 2025. Public equity valuation is the S&P 500's Current EV/Trailing 12-month EBITDA. Private equity valuation is the North American Buyout mean EV/EBITDA.

Historical Valuations (continued)

- → Because mean valuations naturally weigh higher value stocks/deals more heavily, it may be helpful to analyze the data in a way that mitigates this skew.
- → This chart compares the equal-weighted S&P 500 to private equity's median EV/EBITDA.
- → As expected, valuations for both public and private equity are lower.
- → Importantly, the data points to a similar conclusion as when comparing mean valuation metrics.
  - Namely, valuations diverged during the pandemic and rate hike cycle, but appear to have since evened out.

Equal Weighted S&P 500 & Median Private Equity Valuations[1]



[1] Sources: Bloomberg as of 12//31/2024. Preqin as of 9/30/2024, pulled in March 2025. Public equity valuation is the equal-weighted S&P 500's Current EV/Trailing 12-month EBITDA. Private equity valuation is the North American Buyout median EV/EBITDA. Note: 2024* indicates that public equity is as of 12/31/2024 and private equity is as of 9/30/2024.

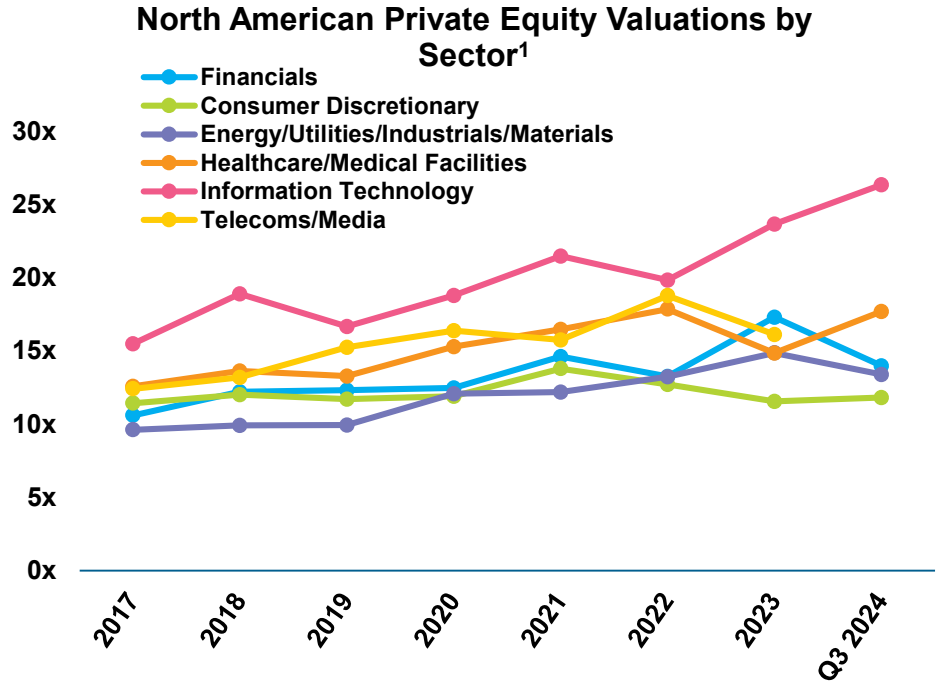
What is Driving Differences in Valuations?

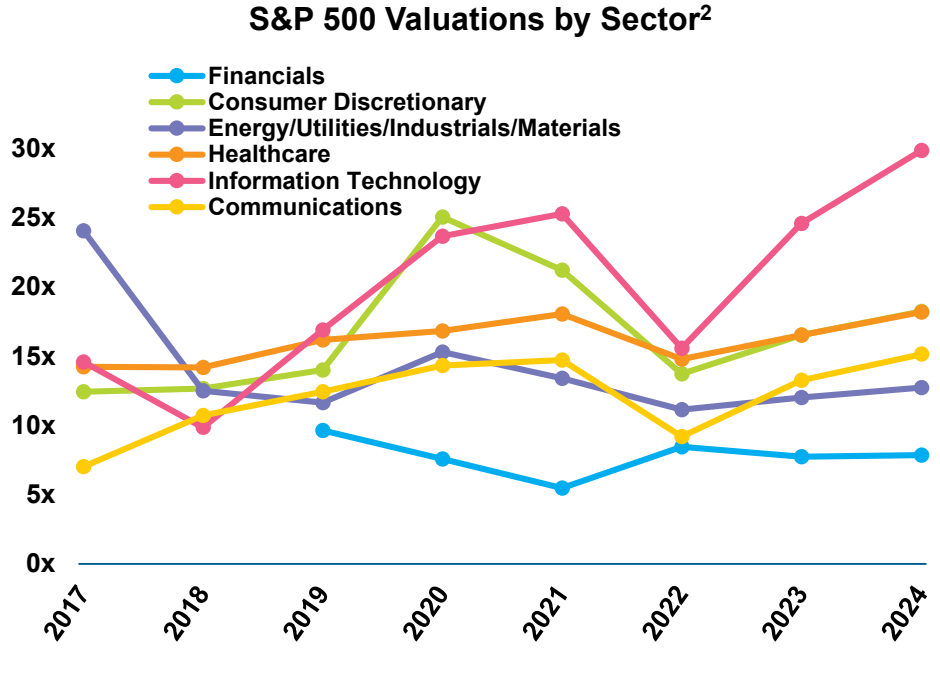
→ There might be valid reasons for disparities in valuations between public and private market companies.

→ One such difference is industry/sector composition as different sectors often warrant different valuations.

→ The information technology sector has had one of the highest valuations among both public and private equity.

- This has consistently been the case in private markets, and less so in the (more fickle) public markets.





[1] Source: Preqin, as of 9/30/2024, pulled in March 2025, North American Buyout mean EV/EBITDA. Throughout this paper, sectors are defined by the vendors who provide the data, and some sectors have been combined or names shortened. For private markets, the sectors include: Business Services/ Financials/ Insurance Services, Consumer Discretionary, Energy/ Utilities/ Industrials/ Materials/ Natural Resources/ Waste Management, Healthcare/ Medical Facilities, Information Technology, Telecommunications/ Telecoms/ Media.

[2] Source: Bloomberg, as of 12//31/2024, S&P 500's Current EV/ Trailing 12-month EBITDA. Public markets sectors include: Financials, Consumer Discretionary, Industrials, Energy, Utilities, Materials, Healthcare, Information Technology, Communications. Note that the Energy/Utilities/Industrials/Materials valuation is an average of the four underlying sectors' valuations.

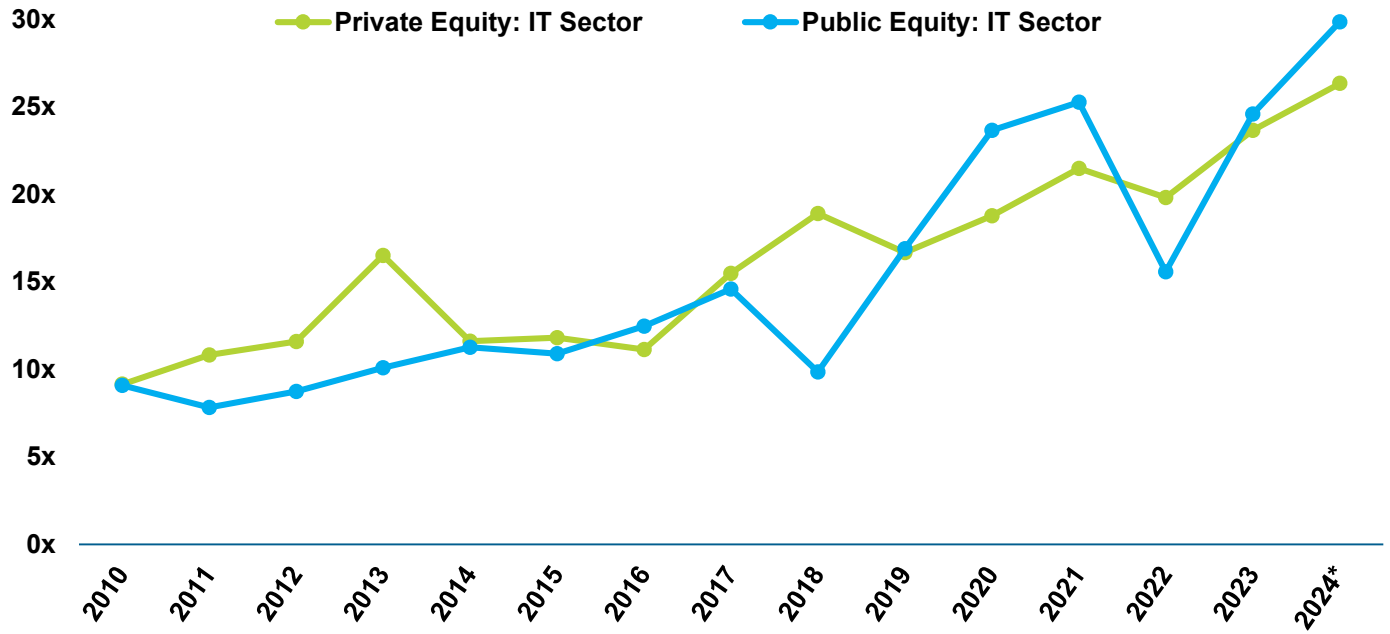
IT Sector Valuations

→ Information Technology (IT) is the most prevalent sector for comparing private and public equity valuations.
- Neither public nor private markets has been consistently more expensive/cheaper relative to the other.

→ IT valuations increased from an EV/EBITDA multiple of less than 10x in 2010 to more than 25x in 2024 for both.

→ Moreover, the IT sector is largely responsible for driving up broader public and private market valuations.

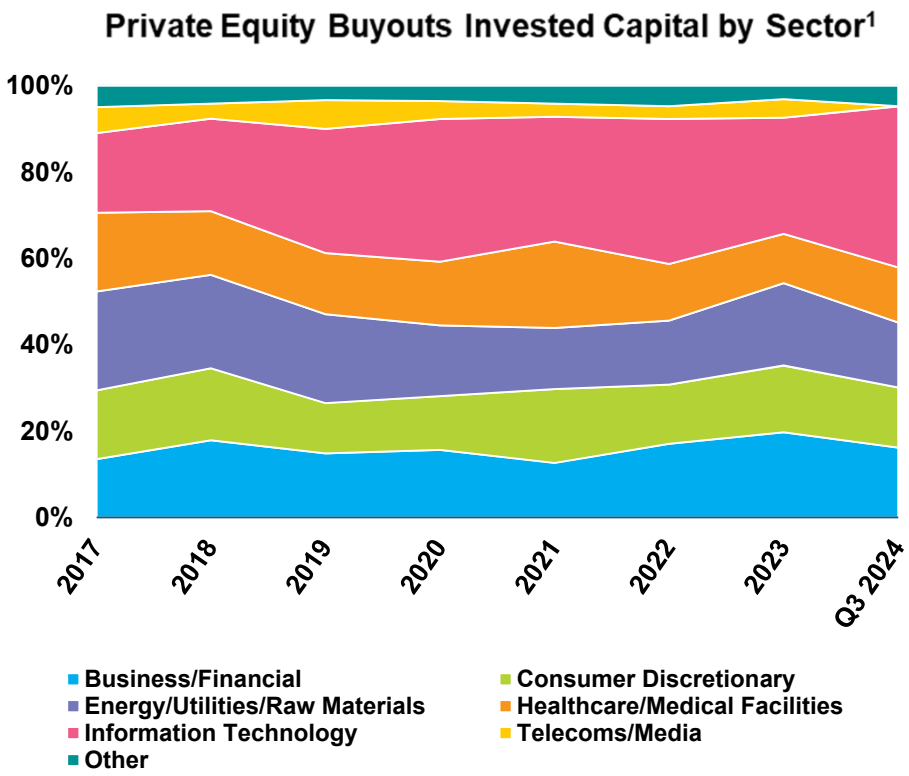
Public and Private Equity IT Sector Valuations [1]

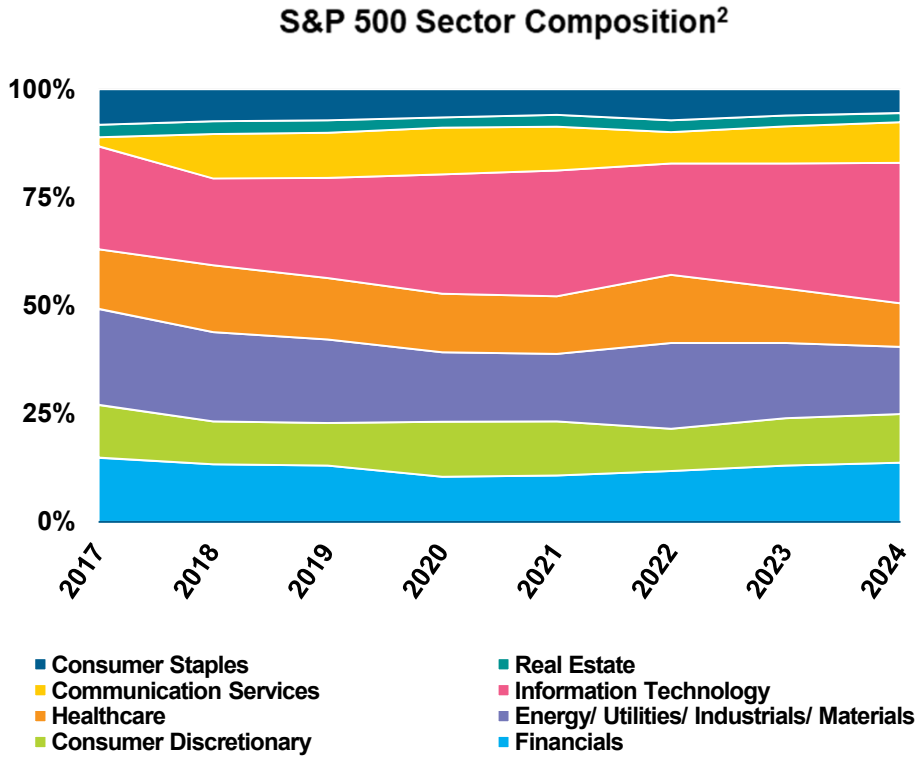


[1] Sources: Bloomberg as of 12//31/2024. Preqin as of 9/30/2024, pulled in March 2025. Public equity valuation is the equal-weighted S&P 500's Current EV/Trailing 12-month EBITDA. Private equity valuation is the North American Buyout median EV/EBITDA. Note: 2024* indicates that public equity is as of 12/31/2024 and private equity is as of 9/30/2024.

Sector Composition

- → The IT sector has had the most invested capital of any buyout sector in recent years.
- → Similarly, IT has comprised the largest portion of any sector in public equity over the same period.
- → Hence, IT has been the single biggest source in driving valuations higher in both markets.





[1] Source: Preqin, as of 9//30/2024, pulled in March 2025, North American Buyout Invested Capital. "Other" includes the following sectors: Unspecified, Education Facilities, Government Buildings, Hotels, Logistics, Mixed Use, Niche, Office, Real Estate, Residential, Retail, Transport.

[2] Source: Bloomberg, as of 12//31/2024, S&P 500 Sector Composition.

Conclusion

- → Differing valuation methodologies, data availability, and definitions of enterprise value creates challenges when making direct comparisons between public and private equity valuations.
  - However, we have aimed to provide a reasonable and impartial representation of the valuation trends.
- → Over the long run, public and private equity market valuations have tended to coincide with each other.
  - This implies that private equity valuations are generally reasonable relative to public equity valuations.
- → There have been divergences in valuations, primarily associated with major market events.
  - The most recent divergence appears to have diminished, and the two are again trading at similar valuations.
- → To some extent, the disparities in valuations can be attributed to differences in industry and sector compositions.
  - The major sectors generally exhibit similar valuations for both private and public markets.
- → Notably, the IT sector has been a significant driving force behind higher valuations in both markets.

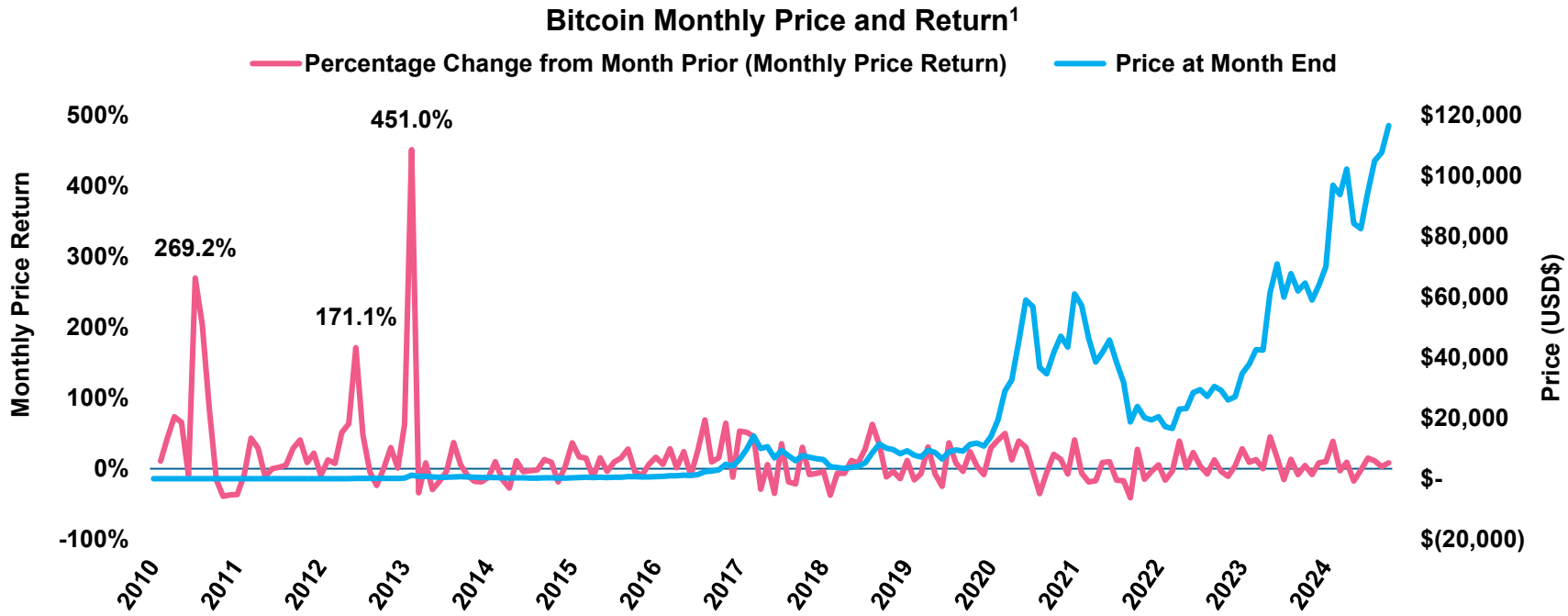
Long-Term Theme:
The Impact of Assumptions for Bitcoin

Learning From History?

Learning from history is prudent, but investors should be cautious when analyzing Bitcoin's history.

→ Bitcoin's history may be less representative of its future than is the case for other asset classes.

- The first five years of Bitcoin's history were characterized by shockingly large price swings.
- Eight of Bitcoin's ten largest month-over-month percentage changes occurred prior to 2014.



[1] Source: Bloomberg as of July 31, 2025. Indices Used: Bitcoin-USD Cross. While Bitcoin was created in 2008 and launched in 2009, the earliest for which we have access to price data began in October 2010. This should not meaningfully impact the analysis since, as described in the first section of the paper, we start the analysis post-2013.

How Much History to Consider?

History shows that newly investable assets often exhibit a high-return, high-volatility "frontier" period, followed by a moderation as they mature.

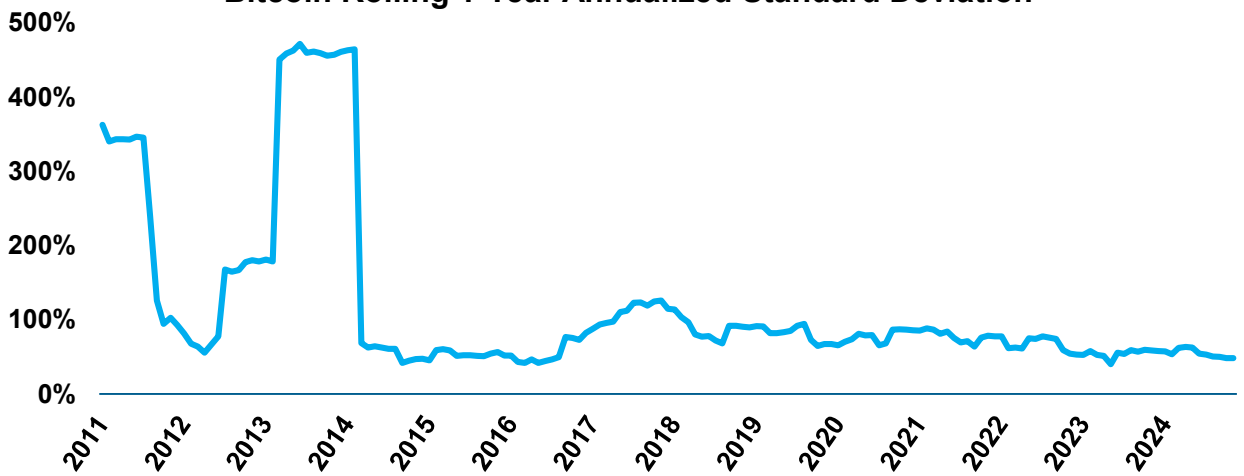
Substantial price swings were common in Bitcoin's earlier years as the depth and liquidity of the market was low.

→ This has gradually changed as trading volumes increased, new exchanges were established, regulated Bitcoin futures were launched, and Bitcoin ETFs were created.

Bitcoin's volatility over the full period was 178%, but it dropped to less than half of that (75%) post-2013.

→ In recent years, it has been closer to 50%.

Bitcoin Rolling 1-Year Annualized Standard Deviation[1]



[1] Source: Bloomberg as of July 31, 2025. Indices Used: Bitcoin-USD Cross.

What is Bitcoin Like?

Bitcoin's performance is not generally attributable to traditional asset class return drivers.

- → Unlike financial assets, Bitcoin does not derive its value from claims on current and future cash flows.
- → Unlike real assets, Bitcoin does not represent ownership of a physical asset.

Given that Bitcoin was designed to be an alternative to fiat currencies, it may be more relevant to examine the return drivers of traditional currencies.

- → However, since one of Bitcoin's core principles is to be *decentralized,* it should not be expected to behave like traditional fiat (i.e., government-issued) currencies.

Gold shares some core attributes with Bitcoin that may make it relevant to examine in this context.

- → Both gold and Bitcoin have a limited supply, are not tied to a central bank, are globally accessible, and neither is ideal for exchanging most goods and services.
- → Conversely, Bitcoin is not universally considered a "safe" store of value like gold (yet), has exhibited significantly more price volatility, and does not have a proven history of serving as a diversifier or inflation hedge.

For better or worse, Bitcoin presents a new and unique case where its return drivers cannot easily be attributed to those of an already-established asset class.

Short- vs Long-Term Return Drivers

Academic and institutional research has generally found Bitcoin's short-term returns to be dominated by speculation, sentiment, and liquidity conditions.

- → Attention and momentum have fueled a self-reinforcing feedback loop of demand where rising prices attract more buyers, driven by media coverage and the lure of extraordinary gains, which in turn pushes prices even higher.[1]
  - In other words, Bitcoin's valuation is largely dependent on the collective belief that its price will continue to rise.
- → Similarly, global liquidity has a strong influence as Bitcoin's price tends to move in tandem with equities and other risk assets during high liquidity periods and expansionary monetary policy.[2]
  - This is consistent with Bitcoin serving as a high-beta, sentiment-driven asset (like risky equity assets), rather than as a stable store of value like gold or a means of exchange like fiat currencies.

Structural elements play a role in driving long-term trends rather than short-term price swings.

- → Bitcoin's fixed supply schedule and halving events support narratives of digital scarcity.
- → Network adoption and institutional integration help broaden access and credibility.
- → These factors may represent genuine fundamental value and could be increasingly important as a determinant of Bitcoin's long-term performance.

[1] Sources: Raphael Auer, Giulio Cornelli, and Jon Frost, *Crypto Trading and Bitcoin Prices: Evidence from a New Database of Retail Adoption*, BIS Working Paper No. 1049, Basel: Bank for International Settlements, November 13, 2022. Paola Di Casola, Maurizio Michael Habib, and David Tercero-Lucas, *Global and Local Drivers of Bitcoin Trading vis-à-vis Fiat Currencies*, ECB Working Paper No. 2868, Frankfurt: European Central Bank, 2023. Tito Nícias Teixeira da Silva Filho, *Curb Your Enthusiasm: The Fintech Hype Meets Reality in the Remittances Market*, IMF Working Paper WP/22/233: International Monetary Fund, December 2022.

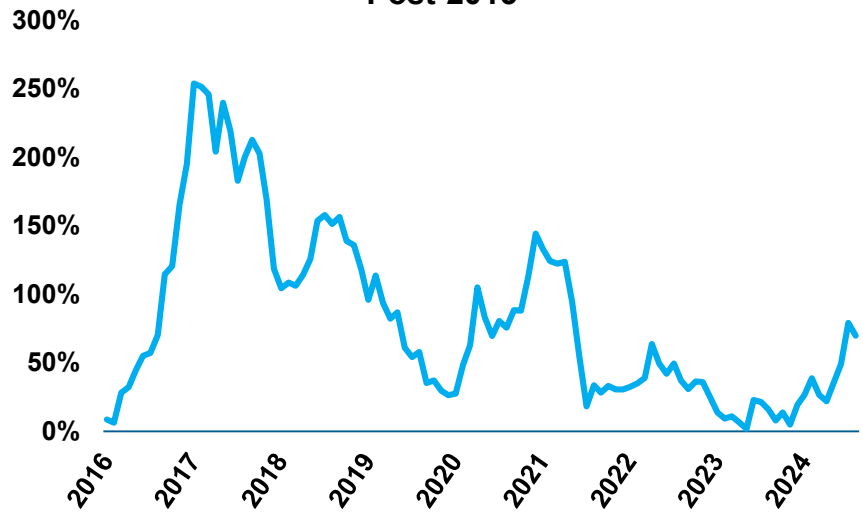
[2] Sources: Paola Di Casola, Maurizio Michael Habib, and David Tercero-Lucas, *Global and Local Drivers of Bitcoin Trading vis-à-vis Fiat Currencies*, ECB Working Paper No. 2868, Frankfurt: European Central Bank, 2023. Tobias Adrian, Tara Iyer, and Mahvash S. Qureshi, *Crypto Prices Move More in Sync With Stocks, Posing New Risks*, IMF Blog, January 11, 2022.

Creating Assumptions: Historical Performance

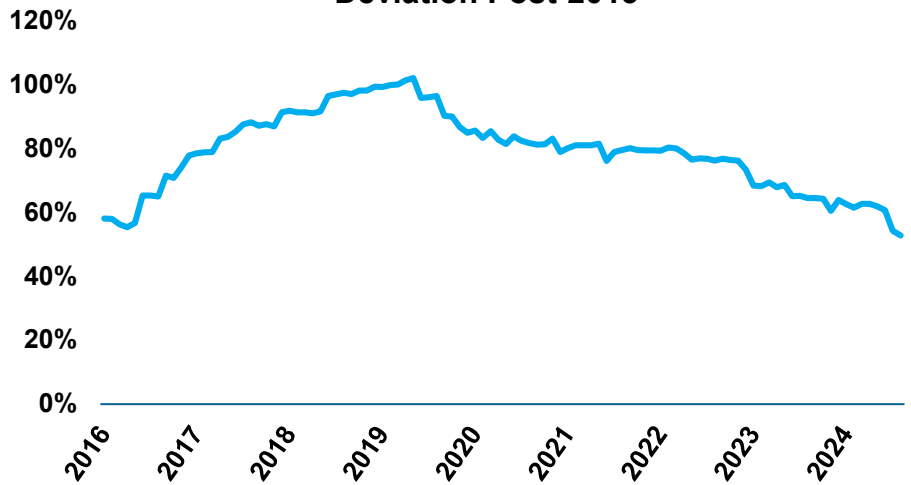
Bitcoin returns have exhibited considerably large peaks and valleys, though the amplitude of both has declined over the last decade.

- → Since 2014, Bitcoin's average annualized return and standard deviation have been 54.6% and 75.0%, respectively.[1]
- → Volatility declined considerably after 2014 and descended further post-2020 (closer to 50%).

Bitcoin Rolling 3-Year Annualized Return Post-2013[1]



Bitcoin Rolling 3-Year Annualized Standard Deviation Post-2013[1]



Source: Bloomberg as of July 31, 2025. Indices Used: Bitcoin-USD Cross. For the period January 1, 2014, to July 31, 2025.

Creating Assumptions: Historical Correlations

Bitcoin's returns are not necessarily uncorrelated with traditional markets.

→ Bitcoin's correlation with investment grade bonds has remained fairly steady and low.

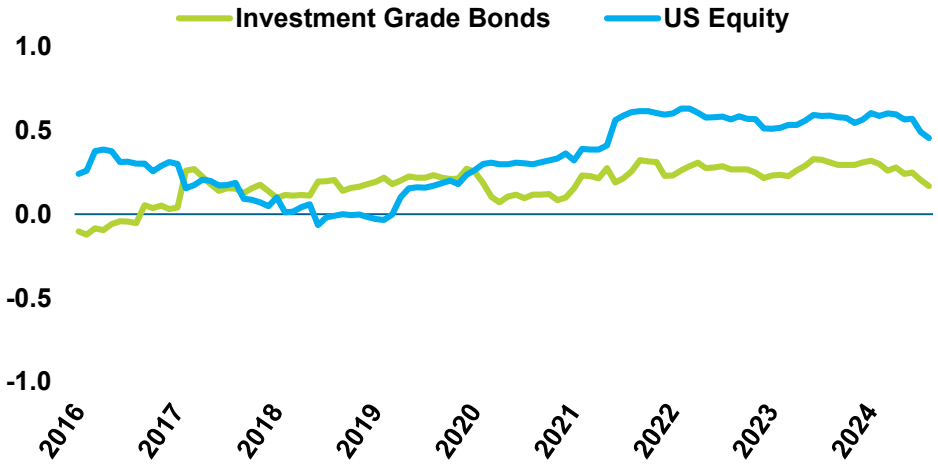
→ However, the correlation with US equities has increased to a substantially positive relationship.

- This higher correlation implies that Bitcoin was acting more like a high-volatility equity proxy during this period.

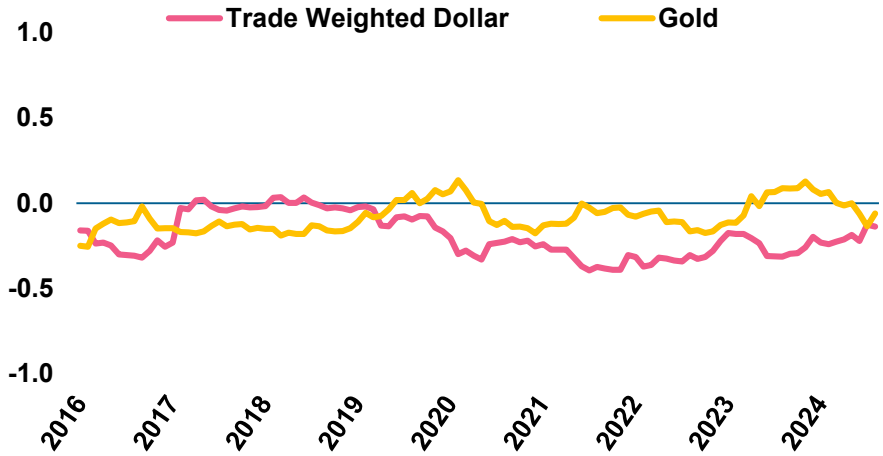
→ Despite Bitcoin offering similar traits as gold, the two assets have been uncorrelated.

- Bitcoin has also mostly been uncorrelated to modestly negatively correlated with the US dollar.

Rolling 3-Year Correlation to Bitcoin for US Stocks and Bonds[1]



Rolling 3-Year Correlation to Bitcoin for Gold and the Dollar[2]



[1] Source: Bloomberg and InvMetrics, as of July 31, 2025. Indices: Russell 3000, Bitcoin-USD Cross, Bloomberg Aggregate.
[2] Source: Bloomberg, FRED, and InvMetrics, as of July 31, 2025. Indices: Bitcoin-USD Cross, LBMA Precious Metal Prices: Gold USD.

Adding Bitcoin to a Portfolio

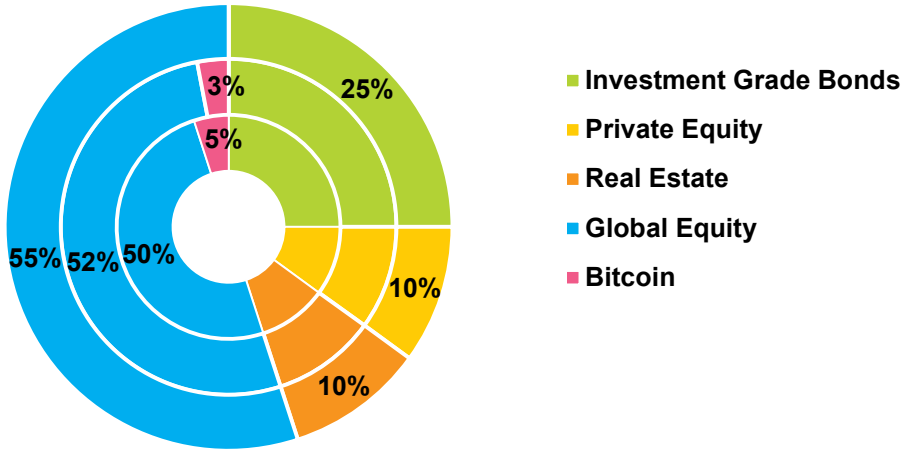
While the assumptions used for Bitcoin are important, they may not matter in a way that is intuitive to most investors.

To evaluate Bitcoin's potential impact on a portfolio, we compared three theoretical diversified portfolios with varying allocations to Bitcoin: no Bitcoin, 3% Bitcoin, and 5% Bitcoin.

→ Despite Bitcoin's lower expected return and significantly higher standard deviation than global equity (the allocation it reduces in this example),[1] the overall portfolio's risk-adjusted return profile improved when Bitcoin was added.

- The Sharpe ratio increases from 0.321 for the no Bitcoin portfolio, to 0.339 for the 3% Bitcoin portfolio, and to 0.344 for the 5% Bitcoin portfolio.

Asset Allocation Breakdown of Three Theoretical Portfolios:
No Bitcoin (Outer), 3% Bitcoin (Middle), and 5% Bitcoin (Inner)[2]



[1] Based on Meketa's 2025 Asset Allocation Tool, Bitcoin's expected 10-year return is 2.9 % and standard deviation is 75%. Global equity's expected 10-year return is 6.7% and standard deviation is 17%.
[2] Source: Meketa's Asset Allocation Tool. Meketa uses our expected return for cash as the risk-free rate when calculating expected Sharpe ratio.

Adding Bitcoin to a Portfolio: The Impact of Volatility

While the assumptions used for Bitcoin are important, they may not matter in a way that is intuitive to most investors.

→ Traditional diversification benefits from uncorrelated assets.

- Investors can build portfolios with better expected risk-return tradeoffs by adding assets (even riskier ones) that are not highly correlated with the primary assets in a portfolio.

→ The counter-intuitive impact of high volatility (this warrants explanation):

- The (MVO) math that calculates portfolio-level returns uses arithmetic expected returns.
- A higher expected volatility will contribute to a higher arithmetic return.
  - For example, using our 2025 CMEs, Bitcoin's expected standard deviation of 75% expands a 2.9% *geometric* expected return into a 19.5% expected *arithmetic* return.
- Despite Bitcoin's expected standard deviation being by far the largest in our CMEs, the optimization algorithm will tend to favor Bitcoin's high expected arithmetic return.
- So long as Bitcoin remains a relatively volatile asset, it will likely find a home along the efficient frontier.

Adding Bitcoin to a Portfolio: Assumptions

MVO is highly sensitive to the asset class assumptions it is provided.

→ To understand how Bitcoin's assumptions could influence the MVO model, we created eight different efficient frontiers that use varying assumptions.

The baseline case uses our 2025 10-year CMEs for each asset class included.

→ Each additional frontier then varies one or more of the assumptions for Bitcoin:

1. Increase the geometric expected return from 2.9% to 9.2% (applying a beta of 1.64 for Bitcoin – its average from 2014 to 2025 – to our 10-year expected returns for equities and cash)
2. Decrease the standard deviation from 75% to 50% (the approximate trailing one-year standard deviation as of mid-2025)
3. Increase the correlation with equities from 0.33 to 0.58 (the average correlation with US equities since 2020)[1]

[1] We minimized the number of asset classes and included constraints so as to focus the analysis on Bitcoin. We conducted the analysis using our asset allocation tool. See the appendix for more information around this analysis, including assumptions and constraints.

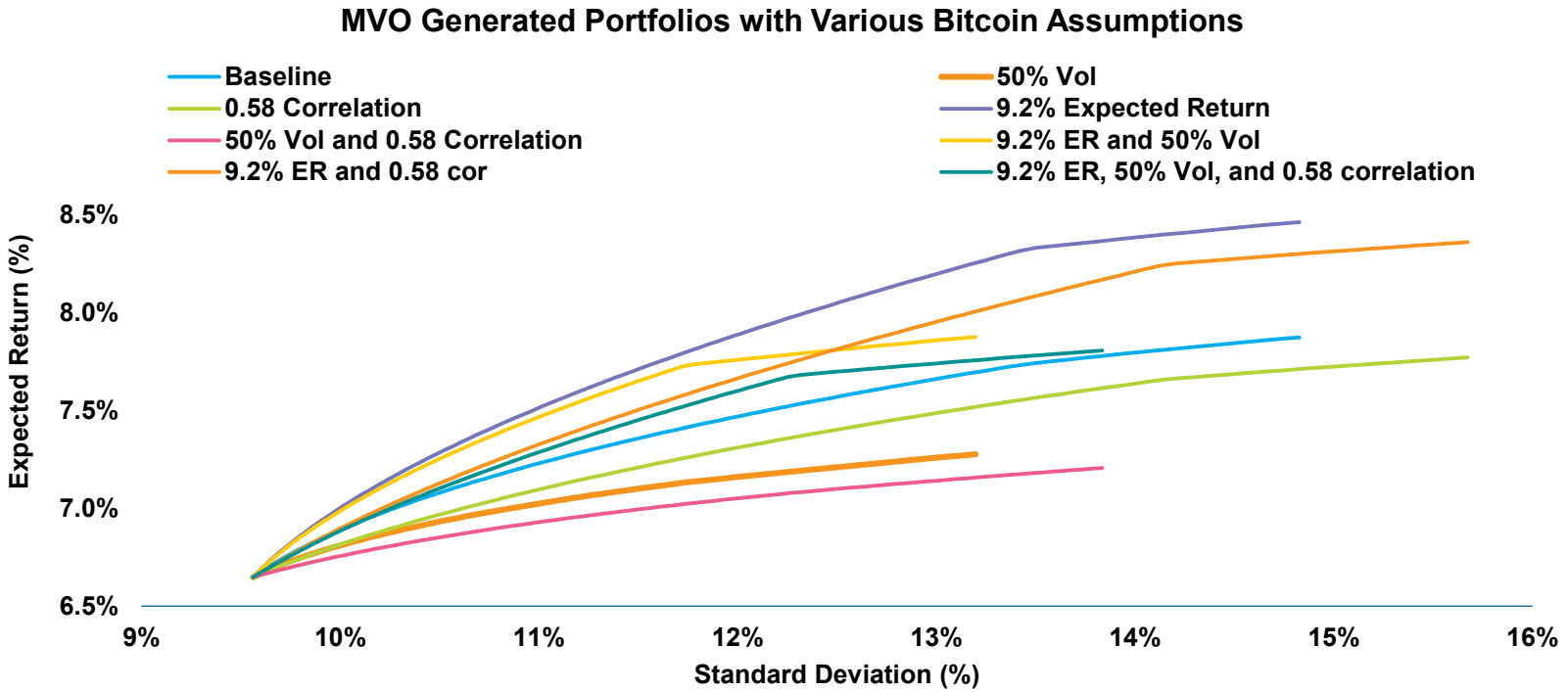
Adding Bitcoin to a Portfolio: Efficient Frontiers

The analysis shows a higher return assumption for Bitcoin unsurprisingly moves the efficient frontier up and to the left.

Conversely, a higher correlation assumption or lower volatility assumption moved the frontier down and to the right.

In each frontier, Bitcoin has a 0% allocation at the bottom left and maxes out at the 10% constraint we imposed.[1]

→ The curve tends to flatten after the max Bitcoin allocation is reached, implying diminishing efficiency thereafter.



[1] It is hard to overstate the important of the high level of the volatility assumption for Bitcoin. If volatility is reduced to 20%, the expected geometric return needs to increase to ~4.2% or correlation with equities need to be cut to ~-0.25 for Bitcoin to have more than a 2% allocation somewhere along the efficient frontier.

Adding Bitcoin to a Portfolio: Allocations

The chart below plots the Sharpe ratio and the allocation to Bitcoin of each of these MVO-generated portfolios at the point where it hits a 7.0% expected return.

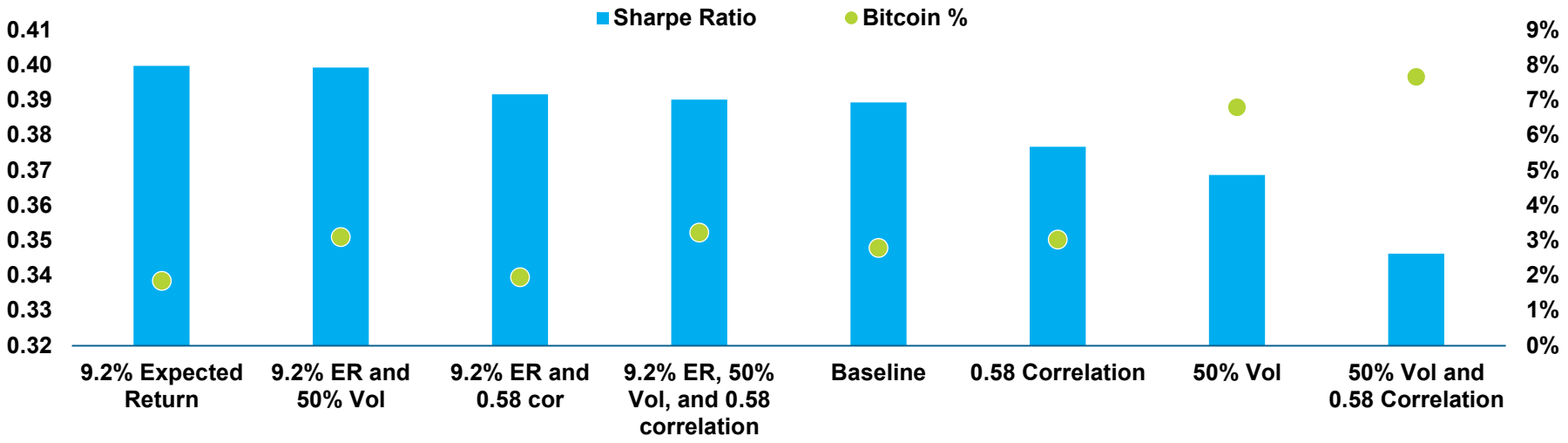
→ The portfolios with the higher return assumption for Bitcoin exhibit the highest expected Sharpe ratio.

- These portfolios require a lower allocation to Bitcoin to hit a 7% target return.

→ A lower volatility assumption leads to a higher allocation to Bitcoin at the 7% target.

- This is for the counter-intuitive reason that lower volatility decreases the arithmetic expected return for the asset.

Sharpe Ratio and Bitcoin Allocation at 7.0% Expected Return



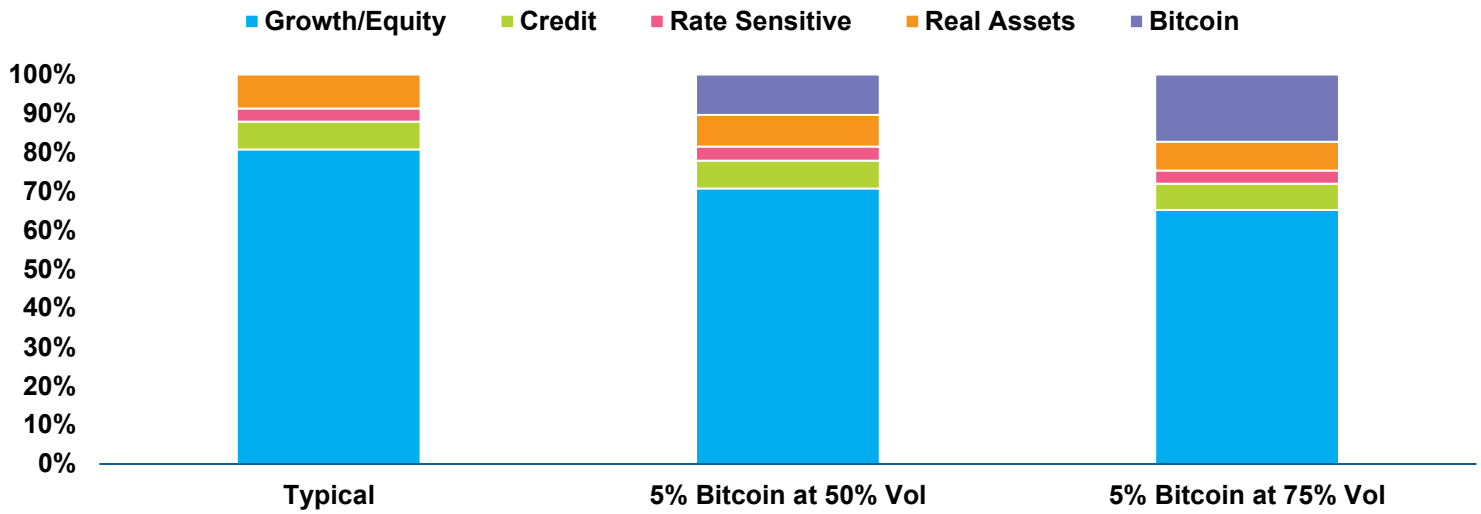
Risk Contribution

Investors may want to consider their Bitcoin allocation from a risk budgeting standpoint.

Given Bitcoin's high volatility, it is likely to contribute an outsized portion to portfolio volatility.

- → A 5% allocation results in it contributing 19% of portfolio volatility when using a 75% volatility assumption.
- → At 50% volatility, a 5% allocation drops to 11.4% contribution to portfolio volatility.
- → It is reasonable that long-term investors may want to cap their allocation at a level where they are comfortable with its contribution to overall portfolio volatility.

Estimated Contribution to Risk from Adding Bitcoin[1]



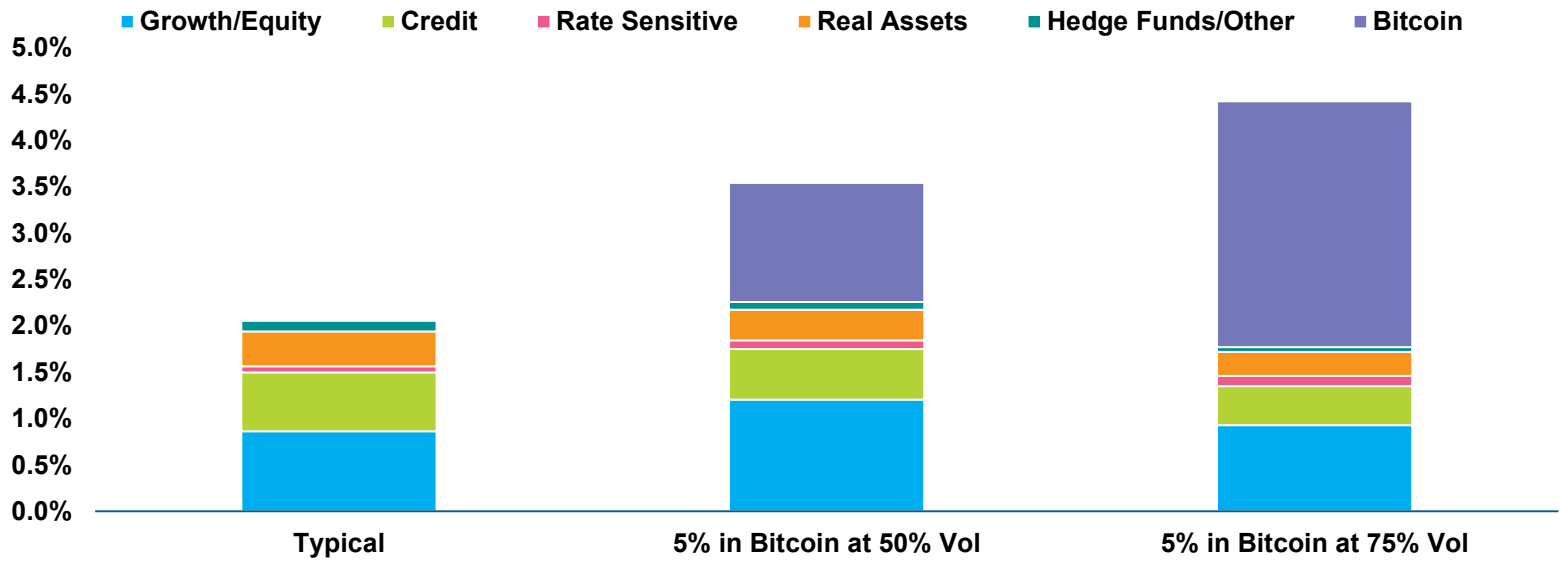
[1] The allocation for the "typical plan" is 30% investment grade bonds, 10% credit, 40% global equity, 10% private equity, and 10% real estate. Meketa's 2025 10-year capital markets assumptions are used, unless otherwise stated. Note that decreasing the volatility assumption for Bitcoin will decrease its estimated contribution to risk. Likewise, decreasing the correlation with equities will decrease the estimated contribution to risk.

Tracking Error

Bitcoin may introduce tracking error to most investors' portfolios.

- → A 5% allocation to Bitcoin (taken from global equity) would add between 130 basis points and 265 basis points of tracking error relative to a peer average of large public pension funds.
- → Likewise, Bitcoin could add meaningful tracking error for investors relative to their policy index if Bitcoin is not part of their policy benchmark.

Estimated Tracking Error when Adding Bitcoin[1]



[1] We chose the public pension peer average to illustrate the tracking error comparison because asset allocation data is available via annual reports for many large public pension plans and Meketa tracks and calculates this on an annual basis. The allocation for the "typical plan" is 30% investment grade bonds, 10% credit, 40% global equity, 10% private equity, and 10% real estate. Meketa's 2025 10-year capital markets assumptions are used, unless otherwise stated. Note that decreasing the volatility assumption for Bitcoin will decrease the tracking error estimate. Likewise, increasing the correlation with equities will decrease the tracking error estimate (assuming the allocation to Bitcoin comes primarily from equities).

Summary

Bitcoin's early years were defined by extreme volatility and illiquidity, but the market is growing more liquid.

- → Bitcoin's evolution makes it challenging to extrapolate expectations for the future based on past performance.

Bitcoin's price movements are not tied to traditional drivers such as GDP growth, interest rates, or corporate earnings.

- → Its short-term price movements have largely been driven by speculation, sentiment, and liquidity conditions rather than intrinsic fundamentals, though network adoption will likely be a key long-term return driver.
- → Bitcoin has often behaved like a high-beta equity asset and is often correlated with "risk-on" assets.

Bitcoin can potentially improve portfolio efficiency, though the extent of this is dependent on the assumptions used.

- → Bitcoin may improve risk-adjusted returns in portfolios via its low correlation with most assets and a non-intuitive boost to potential return from its high level of volatility.
- → However, it poses systemic and regulatory tail risks that are not easily accounted for in traditional risk frameworks.

Even small allocations to Bitcoin can heavily influence total portfolio risk and tracking error.

What We Are Watching in 2026:
Key Themes Shaping Markets and Portfolios

What We Are Watching in 2026

As we enter 2026, our global macro team is focused on four themes that we believe will shape portfolio outcomes:

- → The outlook and state of the US economy.
- → The Federal Reserve's policy path.
- → A global monetary-policy divergence.
- → The Artificial Intelligence (AI)-driven concentration in US equities.

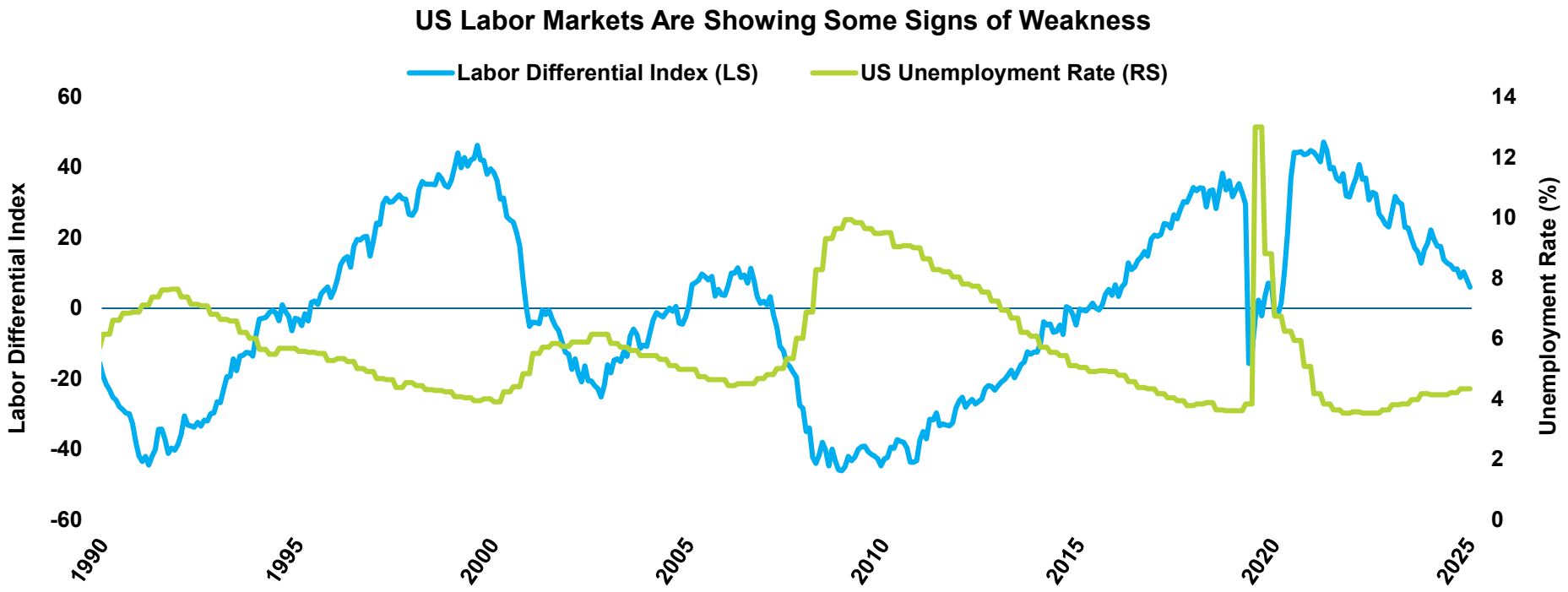
Taken together, these themes provide the lens through which we frame our expectations and our risks for the year ahead.

US Growth: Resilient but Uneven

As we enter 2026, the economy has a lot more underlying momentum than many expected just a year ago.

A key driver of the resilient growth has been consumer spending as wages continue to rise, household balance sheets that remain healthy, and wealth effects from rising equity and housing markets.

Despite some recent signs of weakness, the labor market is still relatively stable further supporting consumption.



Source: Bloomberg as of January 20, 2026. The labor differential index is produced by the Conference Board. Is a survey of consumers measuring difference between those who find jobs easy to find and those who find jobs hard to find.

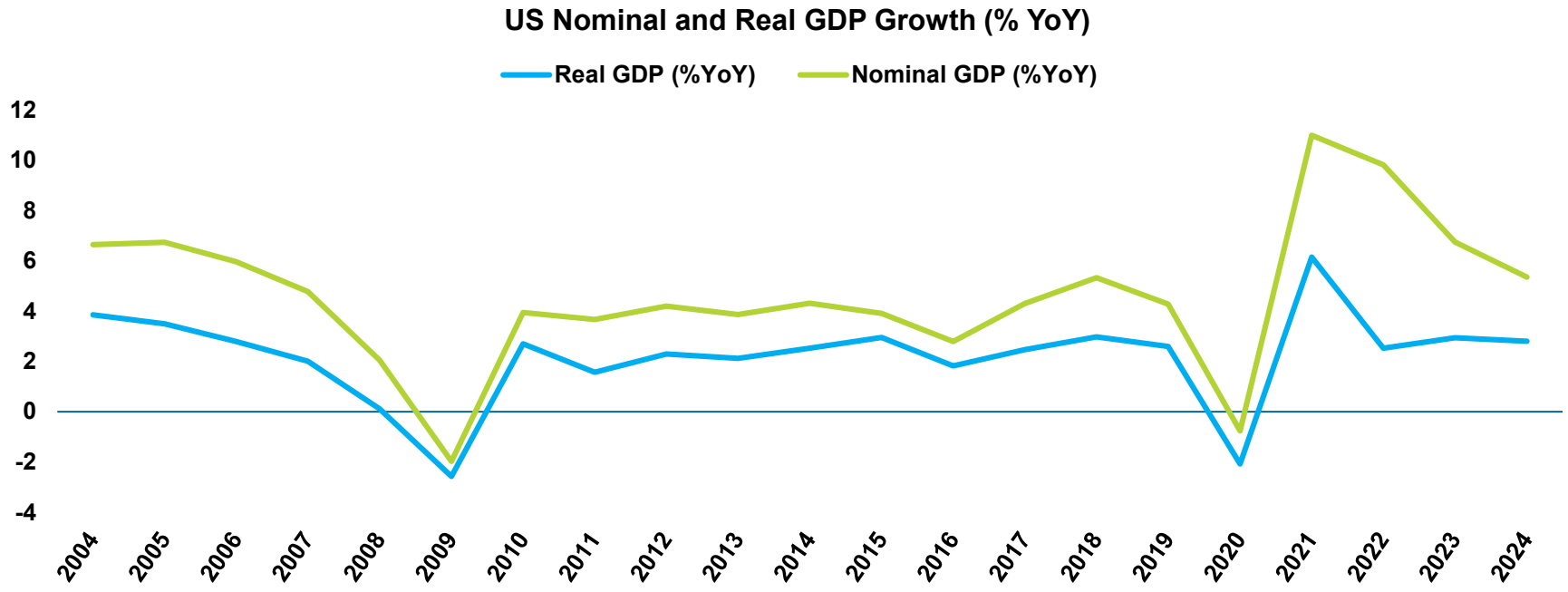
US Growth: Resilient but Uneven

Spending related to the buildout of AI infrastructure has emerged as an increasingly important engine of growth.

Expectations for GDP growth this year range from around 1.5% to slightly over 2.5%.

Stronger-than-expected productivity gains from AI and tech investment could also lift potential growth.

Fiscal stimulus, the potential for additional interest rate cuts, and the chance for tariff easing and improved global trade could all act as further tailwinds to the US economy.



Source: FRED as of January 2026. Annual GDP data for the full year of 2025 is not yet available.

US Growth Risks We Are Monitoring

This outlook does not come without risks though. Tariff-related or supply-driven inflation could reaccelerate.

- → Energy and housing dynamics may tighten conditions further.
- → A pullback in AI infrastructure spending would remove a key support.
- → AI-related capital investment remains a significant incremental driver.
- → GDP expectations center around 1.5%–2.5%.
- → Fiscal initiatives and productivity gains could add upside risk.

We will be watching the durability of both consumer strength and AI-led investment.

- → Consumer spending trends, as well as sentiment.
- → Credit card, auto loan, and student loan delinquencies.
- → Labor market slack at the margin, such as JOLTS, quit rates, hires, initial/continuing jobless claims, and prime-age labor force participation.
- → AI-related capital expenditure and productivity signals (e.g., hyperscaler capex guidance, semiconductor equipment orders, output per hour in AI-exposed sectors).

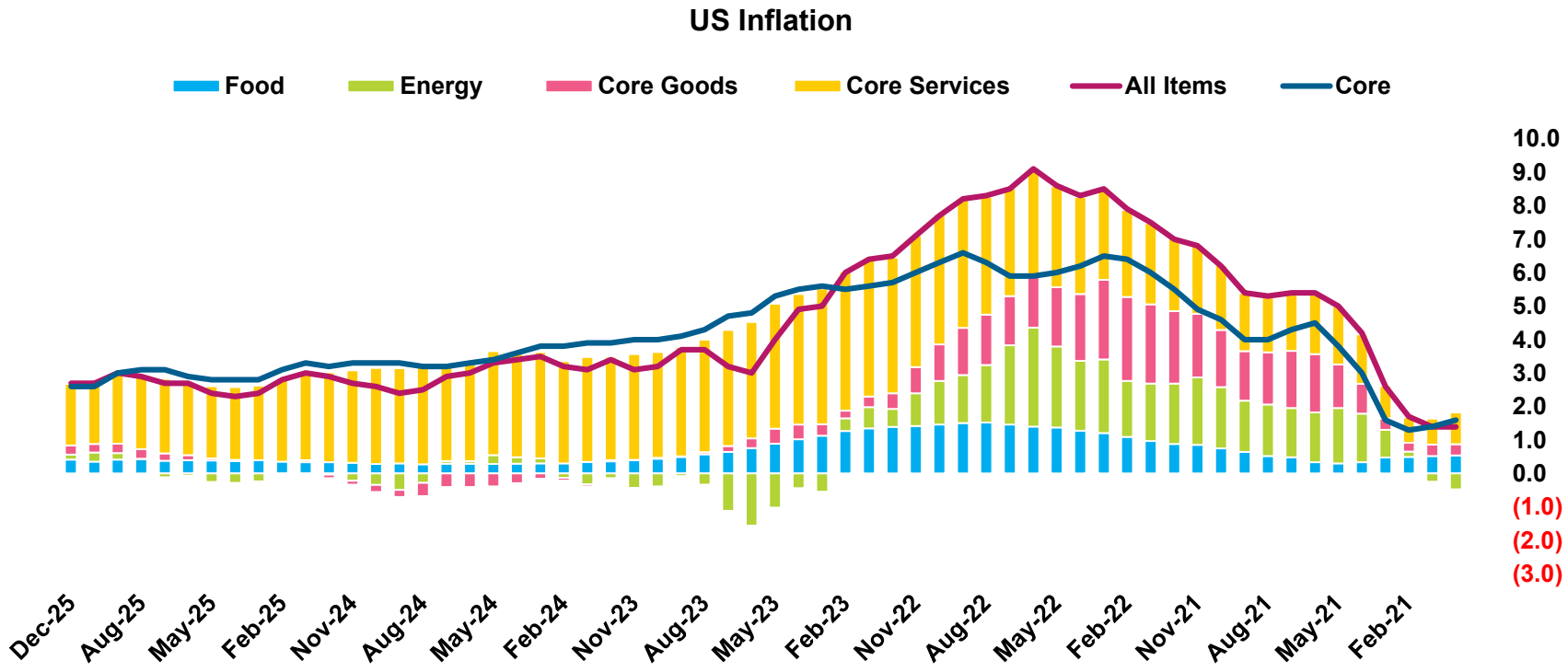
Federal Reserve: the Dual Mandate and New Fed Chair Dynamics

The dual mandate increasingly presents a true trade-off rather than a sequencing exercise.

→ Inflation has moderated but is not yet fully back to target, while labor market conditions are gradually cooling.

That balance raises the likelihood of a stop-start easing cycle.

→ The Fed may ease policy, pause to reassess progress, and adjust again.



Source: FRED. Data is as of December 31, 2025. This represents the latest inflation data. The October report was canceled given the government shutdown. Core services includes: non-energy service categories like rent/owners equivalent rent, medical care services, transportation services, education, recreation, insurance and tuition.

Federal Reserve: the Dual Mandate and New Fed Chair Dynamics

Complicating this policy calculus further is the pending end to Chair Powell's term as Fed Chair.

→ The transition may introduce communication uncertainty, such as changes in forward guidance or tone.

Politically-motivated actions have heightened scrutiny around governance and institutional independence.

→ For investors, the risk is less about near-term policy results and more about confidence in the Fed.

What we will be watching:

→ Inflation and labor "surprises" versus the Summary of Economic Projections baseline.

→ Tariff commentary in Beige Book and FOMC communications.

→ Fed Chair nomination headlines and market reaction (rates, breakevens, the dollar).

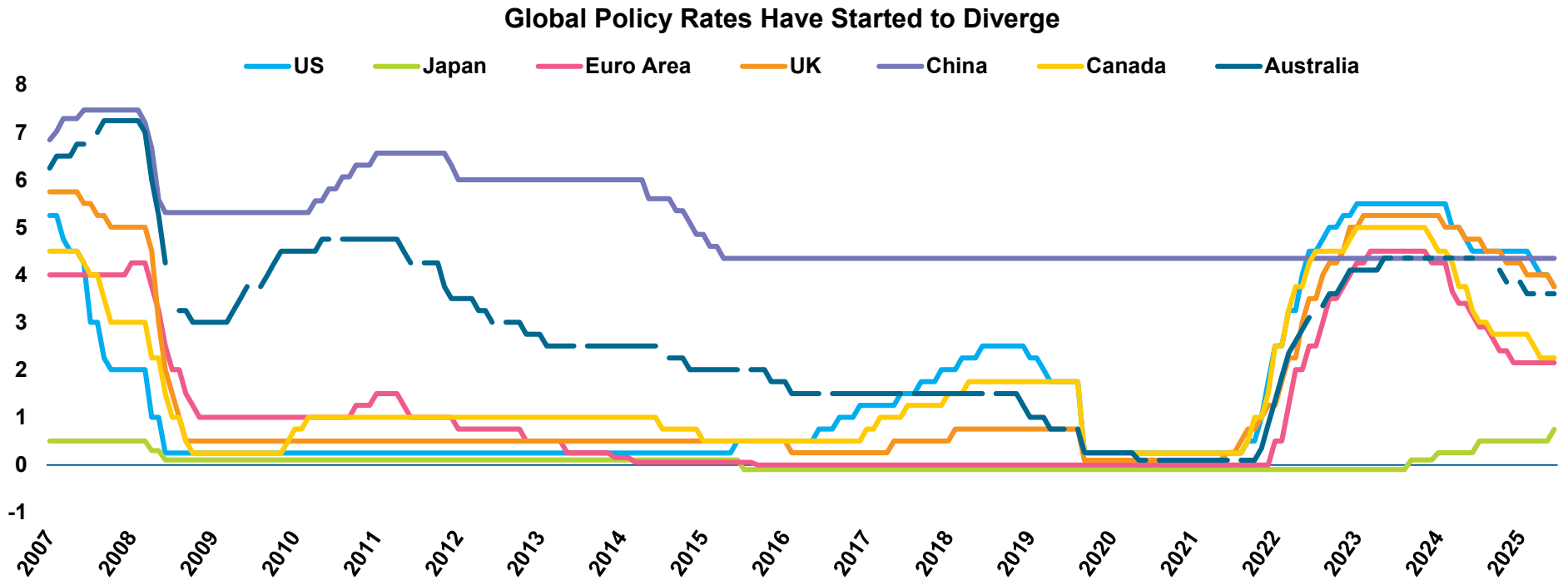
Global Policy Divergence

Major central banks are no longer moving in sync.

→ The current environment reflects differing growth trajectories, inflation dynamics, and political constraints.

Euro-area policymakers appear comfortable pausing further easing.

As a result, euro-area rates have become more anchored, reducing volatility at the front end of the curve.



Source: Bloomberg. Data is as of December 31, 2025, except China which is as of February 28, 2025. United States rate is the mid-point of the Federal Funds Target Rate range. Eurozone rate is the ECB Deposit Facility Announcement Rate. Japan rate is the Bank of Japan Unsecured Overnight Call Rate Expected. China rate is the China Central Bank 1-Year Medium Term Interest Rate. UK rate is the UK Bank of England Official Bank Rate.

Global Policy Divergence

Japan stands at the opposite end of the policy spectrum and is debating additional hikes as wage trends firm.

→ While rates are low by global standards, any tightening would represent a structural shift after decades of ultra-easy policy.

China is leaning more heavily on fiscal stimulus aimed at stabilizing growth and supporting consumption.

→ This underscores the limits of monetary easing as well as China's continued reliance on policy-driven demand rather than organic private-sector momentum.

Policy divergence tends to express itself first through foreign exchange markets.

→ Interest rate differentials influence hedging costs, carry strategies, and cross-border flows.

What we will be watching:

→ USD trend and global FX volatility as a barometer of financial conditions.

→ BOJ communication, wage dynamics, and yen behavior.

→ Euro-area wage growth and negotiated wage trends heading into 2026.

→ China's fiscal/credit impulse and whether stimulus translates into domestic-demand stabilization.

AI and Equity Market Leadership

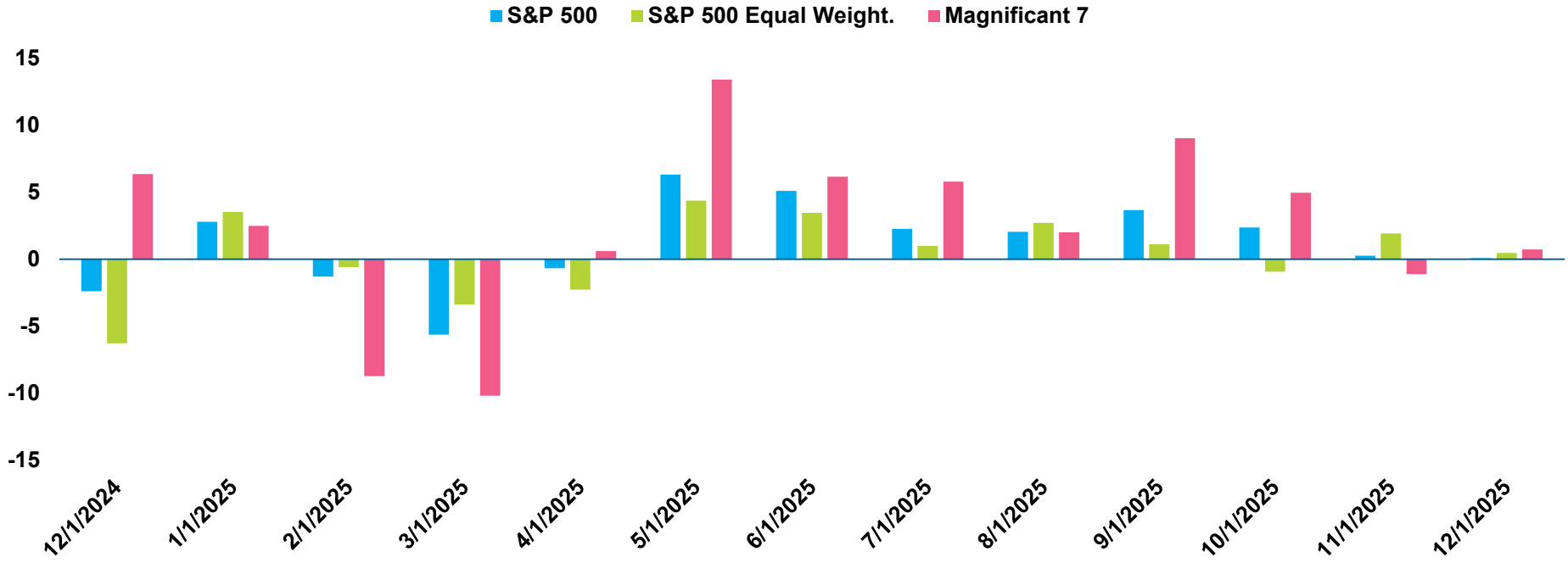
AI's contribution remains central but dispersion among leaders has increased.

Concerns about valuations, massive capex spending, and (in some cases) debt are driving increased scrutiny.

The market is increasingly differentiating which companies are best positioned across the Magnificent Seven.

→ Their collective impact on the capitalization-weighted index is decreasing.

2025 Monthly Returns for Mag Seven Stocks, S&P 500, & S&P 500 Equal Weight Indices



Source: Bloomberg as of December 2025. Bloomberg has a proprietary Mag 7 tracker. Mag 7 includes Meta, Alphabet, Microsoft, Nvidia, Amazon, Tesla, and Apple.

AI and Equity Market Leadership

AI is likely to remain the defining investment and economic theme.

- → Not all AI spend will translate into durable earnings power, and the market is likely to differentiate accordingly.
- → This could also open the door for leadership to broaden beyond mega-cap tech.
  - Sectors like software, industrials, healthcare, and financials may benefit from productivity improvements.

What we will be watching:

- → AI monetization and margin progression among major spenders.
- → The use of debt to help with the next stage of the AI infrastructure buildout.
- → How much the Magnificent Seven drive broader market returns.
- → The breadth of AI-driven earnings and comments in earnings calls outside of mega-cap tech.
- → Signs of productivity gains from AI as well as labor displacement signals.

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