

## Meketa Investment Group

2025

2025 Capital Markets Expectations

## Table of Contents

- 1. Executive Summary**
- 2. Market Overview**
- 3. Our Process**
- 4. FAQs**
- 5. 2025 Expected Returns and Changes from Prior Years**
- 6. Summary Data and Track Record**
- 7. Asset Class Models**
- 8. Long-Term Theme: The Sustainability of US Earnings**
- 9. Long-Term Theme: The Decreasing Number of Public Companies**
- 10. Long-Term Theme: China**

## **Executive Summary**

## Executive Summary

- We update our capital markets expectations (“CMEs”) each year in January.
  - Capital markets are dynamic, and regular updates ensure that assumptions accurately reflect the current market environment.
- Changes in our CMEs are driven by shifts in the capital markets, including factors such as interest rates, credit spreads, cap rates, and equity prices.
  - Yields increased for much of the investment grade bond market, while credit spreads tightened, especially for lower quality credit such as high yield.
  - Stock market valuations continued to rise, especially in the US, where equity markets rallied at a faster pace than the gain in earnings.
  - Cap rates for real estate moved higher, while the rebound in buyout multiples lagged the valuation gains for public markets.
  - Not only did current Treasury yields increase, but projections for future Treasury yields also increased.
- Our 10-year CMEs continue to be lower than our 20-year CMEs for every asset class, largely due to a higher assumed “risk-free” rate in the future.
- The return assumption decreased for two-thirds of the asset classes over the 10-year horizon, while it increased for half the asset classes over the 20-year horizon.
- Our lower return assumptions over the 10-year horizon implies that investors might be well served by moderating their return expectations for the next ten years.

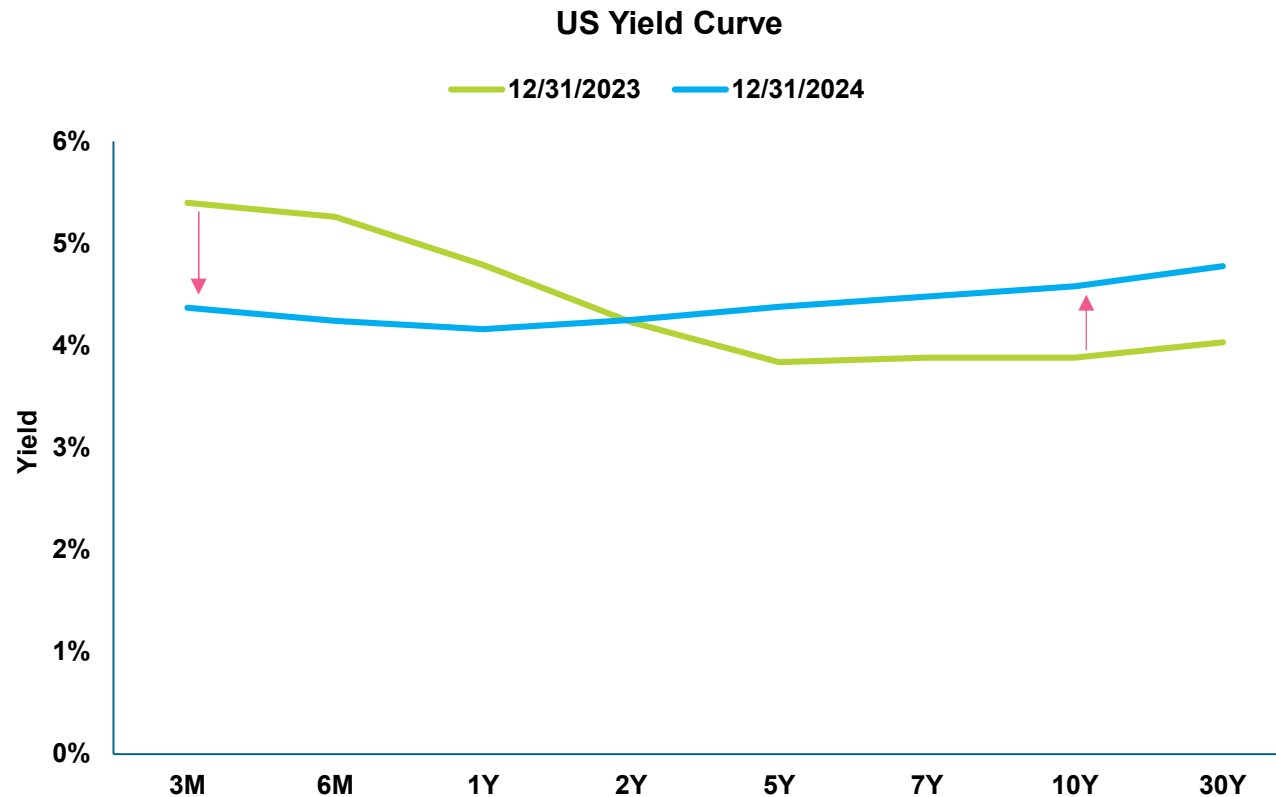
Expected Return and Changes for Major Asset Classes

Asset Class	10-year Expected Return (%)	Δ From 2024 (%)	20-year Expected Return (%)	Δ From 2024 (%)
Cash Equivalents	2.8	+0.4	3.1	+0.6
Investment Grade Bonds	4.9	+0.3	5.3	+0.5
Long-term Government Bonds	5.0	+0.7	5.7	+0.7
TIPS	4.3	0.0	5.0	+0.3
High Yield Bonds	6.3	-0.2	7.1	+0.3
Bank Loans	6.3	-0.2	6.8	+0.2
Emerging Market Debt	6.3	NA	6.8	NA
Private Debt	8.7	-0.5	9.1	-0.1
US Equity	6.4	-0.5	8.4	-0.1
Developed Non-US Equity	7.2	-0.5	8.7	-0.2
Emerging Non-US Equity	7.1	-0.5	8.7	-0.2
Global Equity	6.7	-0.5	8.5	-0.2
Private Equity	9.8	-0.1	11.2	0.0
Real Estate	6.9	+0.6	8.5	+0.5
Infrastructure	7.2	-0.2	9.2	+0.2
Commodities	5.5	+0.6	5.9	+0.6
Hedge Funds	4.2	-0.3	6.0	+0.2
Inflation	2.3	-0.1	2.7	-0.1

## **Market Overview**

## Rising Interest Rates

- While the short end of the yield curve moved down, the long end of the curve moved up.
- The result was a shift away from the inverted curve of the last two years to a slightly “U”-shaped curve with a nadir at the one-year maturity.

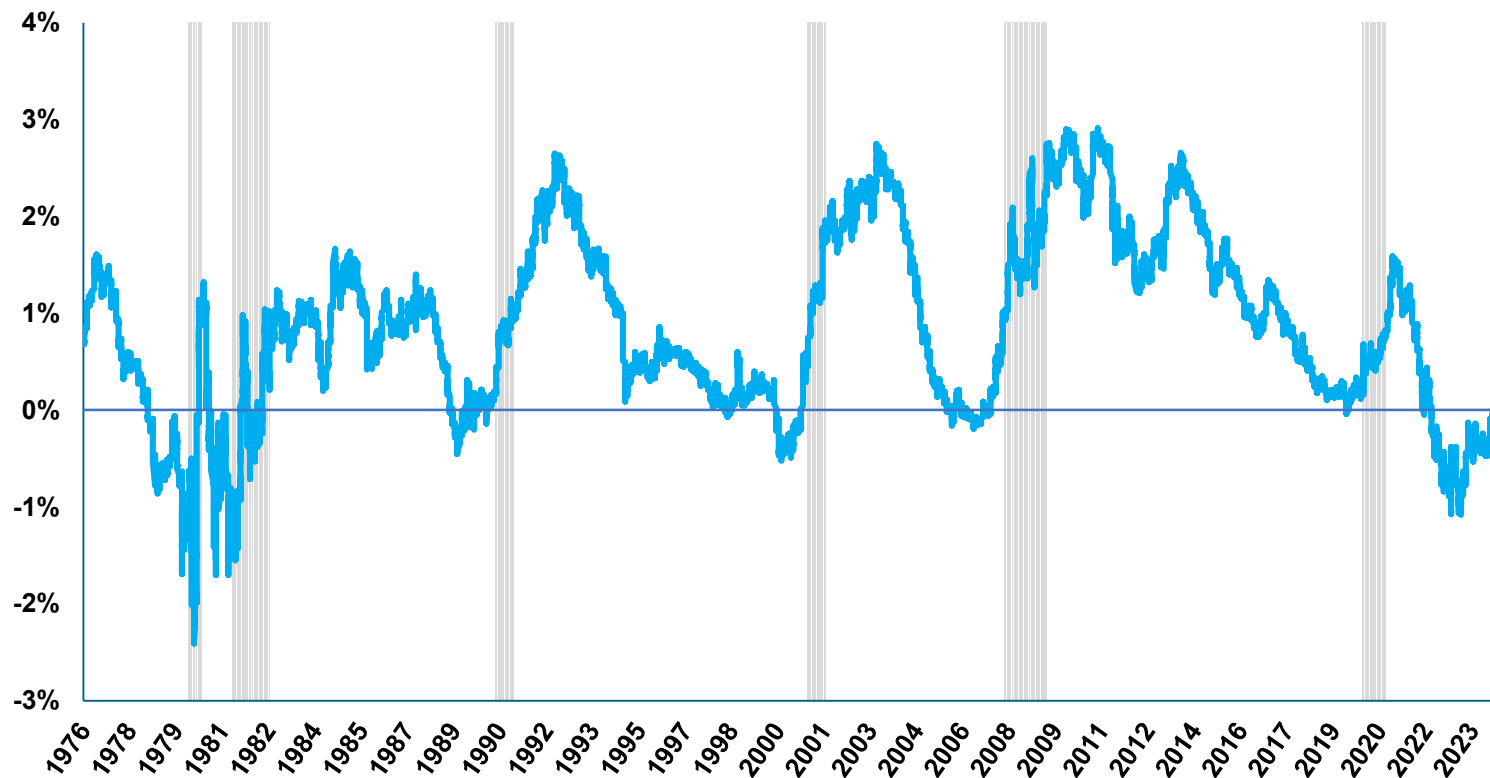


Source: Bloomberg. Data is as of December 31, 2024.

## Normalizing Yield Curve

- The yield curve began the year in inverted territory but gradually moved toward a positive slope.
  - The 2-10 spread moved positive before year-end; however, the curve is still inverted in other sections.

Yield Curve Slope (Ten Minus Two)



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, 2024.

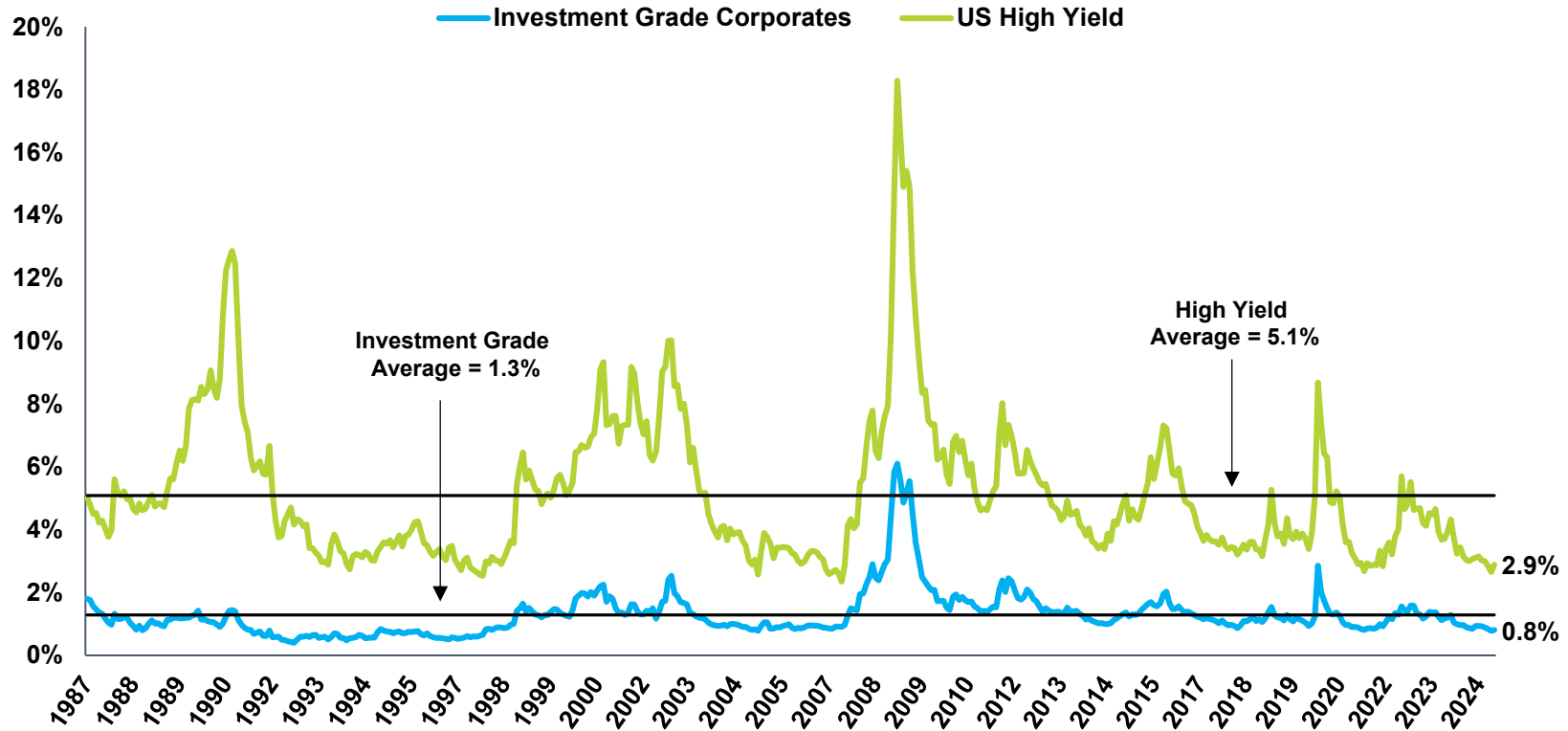


## Narrower Credit Spreads

→ Credit spreads tightened again in 2024, moving further below their long-term averages.

- The spread for high yield bonds declined from 323 basis points to 287 basis points, while the spread for investment grade corporates declined from 99 basis points to 80 basis points.

**US Investment Grade and High Yield Credit Spreads**



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, 2024.

### Similar or Higher Yields

- Short-term interest rates declined as the Fed cut its target rate, yet the yield on the 10-year Treasury increased.
- Despite tighter credit spreads, yields increased for all but the lower quality bond markets.

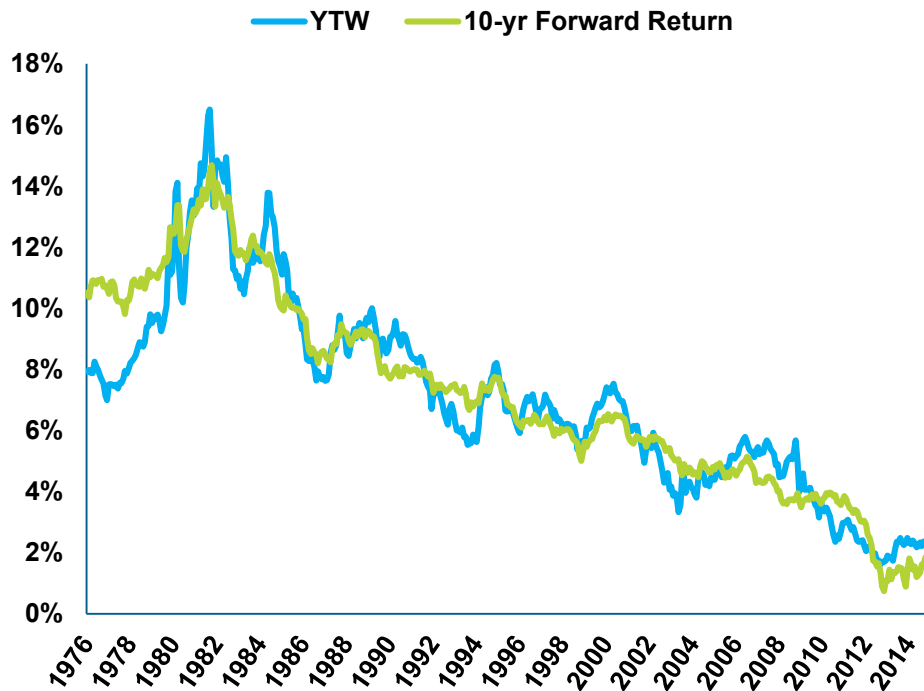
Index	Yield to Worst 12/31/23 (%)	Yield to Worst 12/31/24 (%)
Fed Funds Rate	5.25-5.50	4.25-4.50
10-year Treasury	3.88	4.58
Bloomberg Aggregate	4.53	4.91
Bloomberg Corporate	5.06	5.33
Bloomberg Securitized	4.72	5.25
Bloomberg Global Aggregate	3.51	3.68
Bloomberg US Corporate High Yield	7.59	7.49

Source: Bloomberg. Data is as of December 31, 2023 and December 31, 2024.

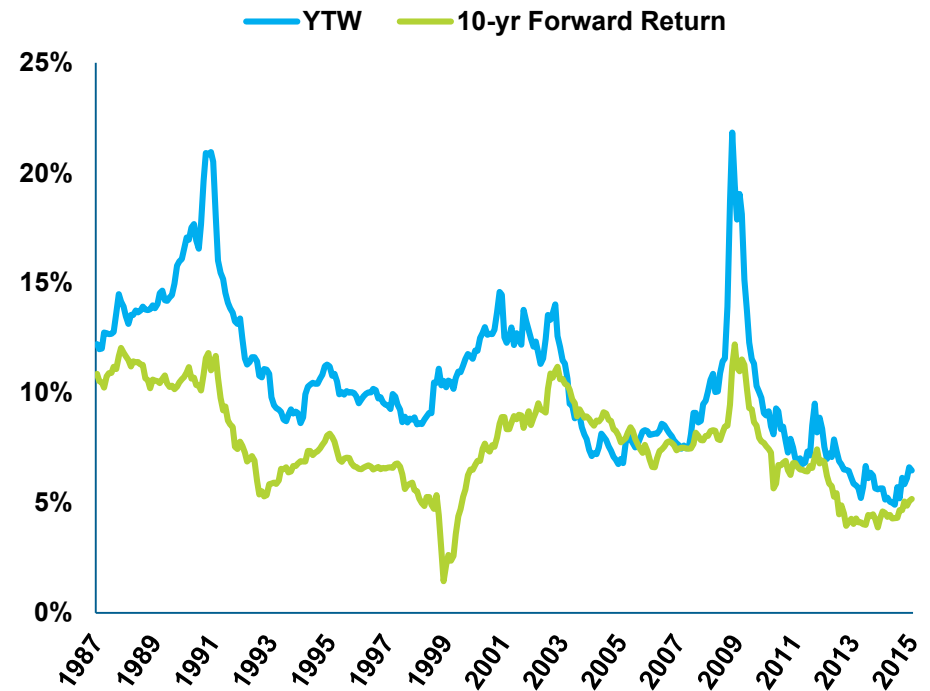
## Yields Drive Future Returns

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

YTW and Returns for Investment Grade Bonds



YTW and Returns for High Yield Bonds



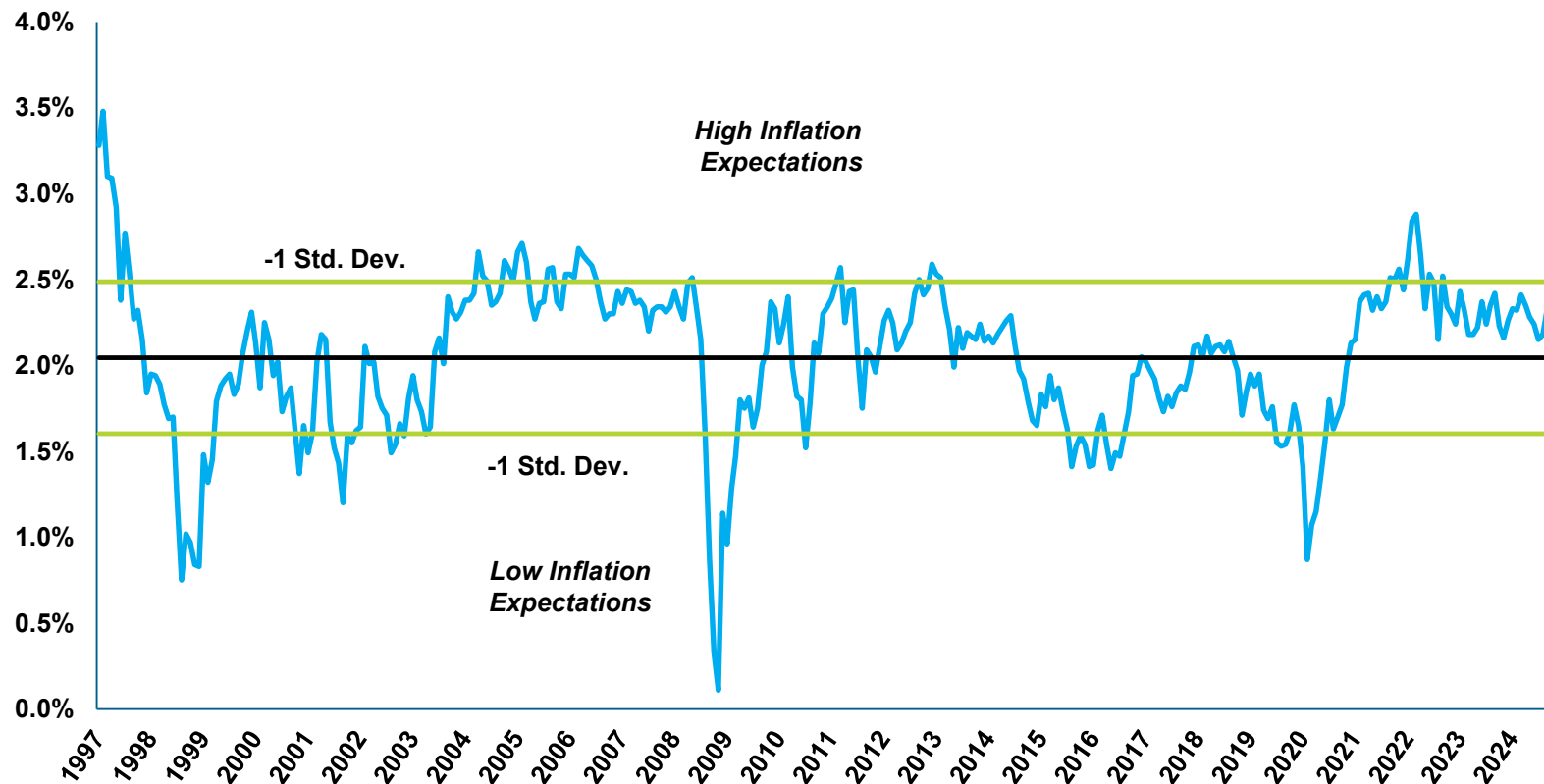
<sup>1</sup> When predicting returns for bonds, default risk should also be taken into account. For example, defaults are why the return for high yield bonds have generally been below the starting yield.  
Source: Bloomberg Aggregate and Bloomberg High yield indices. Data is as of December 31, 2024.

## Slightly Lower Inflation Expectations

→ After substantial changes in inflation expectations in recent years, the market's expectations for inflation were little changed at the end of 2024.

- The 10-year BEI rate increased from 2.2% to 2.3%. The 5-year BEI was slightly higher, at 2.4%.

Ten-Year Breakeven Inflation

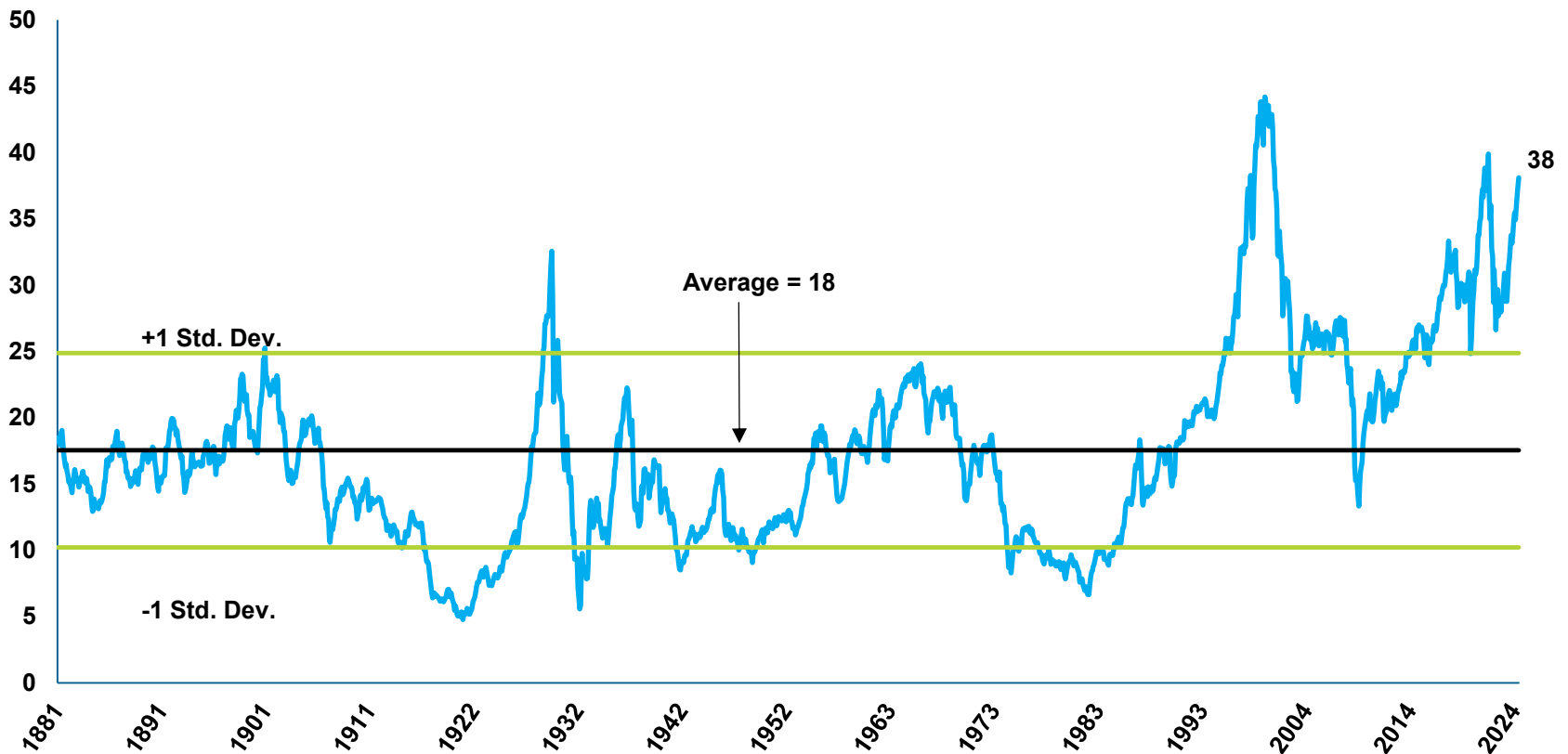


Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA). Data is as of December 31, 2024.

## Higher Prices for US Equities

- US stocks had another good year, with the S&P 500 index gaining 25%.
- Valuations increased and remain elevated relative to their long-term history.

US Equity Cyclically Adjusted Price/Earnings

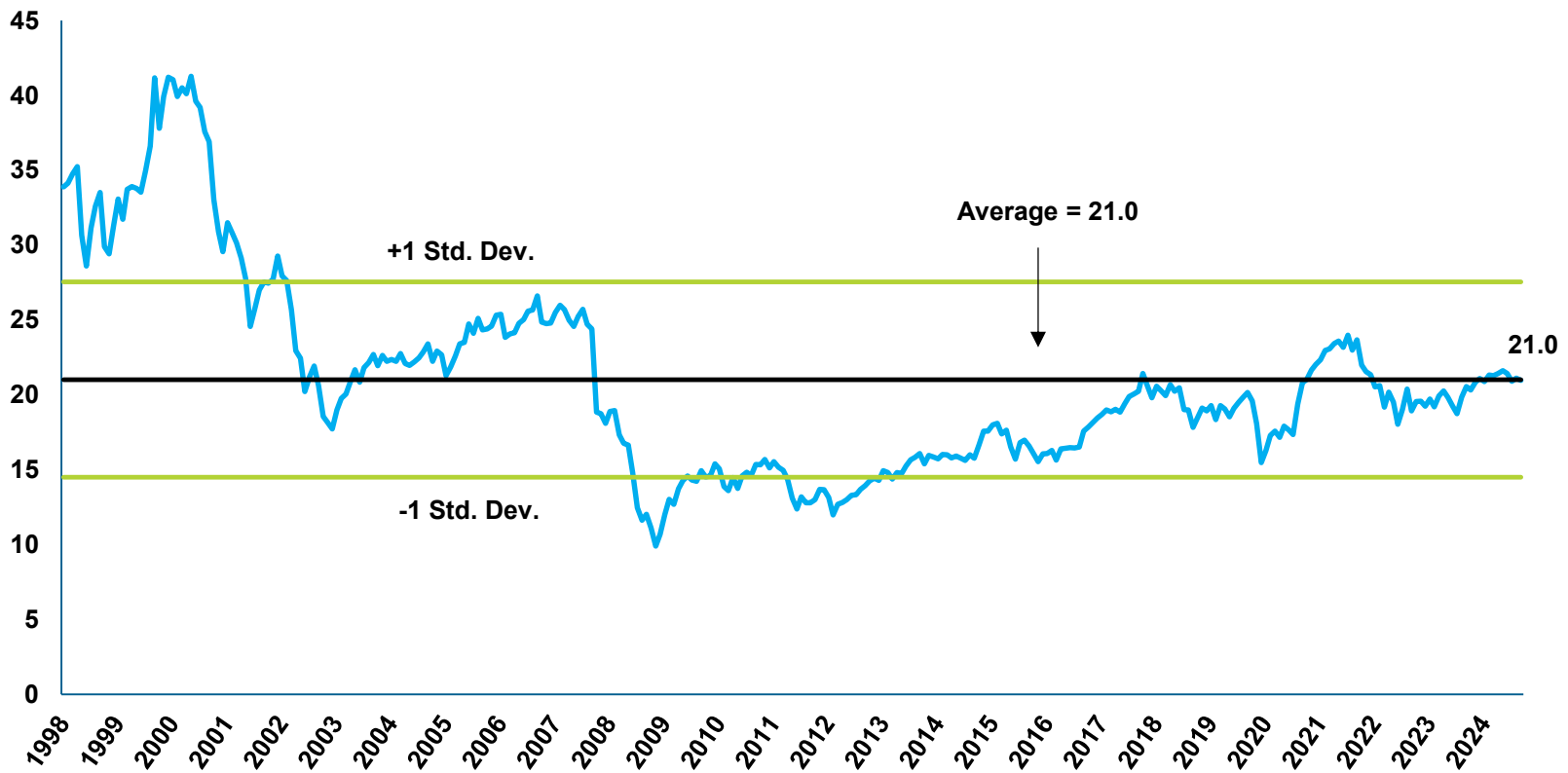


Source: Robert Shiller, Yale University, and Meketa Investment Group. Data is as of December 31, 2024 for the S&P 500 Index.

## Little Change in Non-US Equity Valuations

- EAFE equities had a good year in local currency terms (+11.3%), but a currency headwind ate into most of these gains for USD investors who only saw a 3.8% return.
- EAFE valuations are little changed from one year ago and remain close to their historical average.

Developed International Equity Cyclically Adjusted P/E

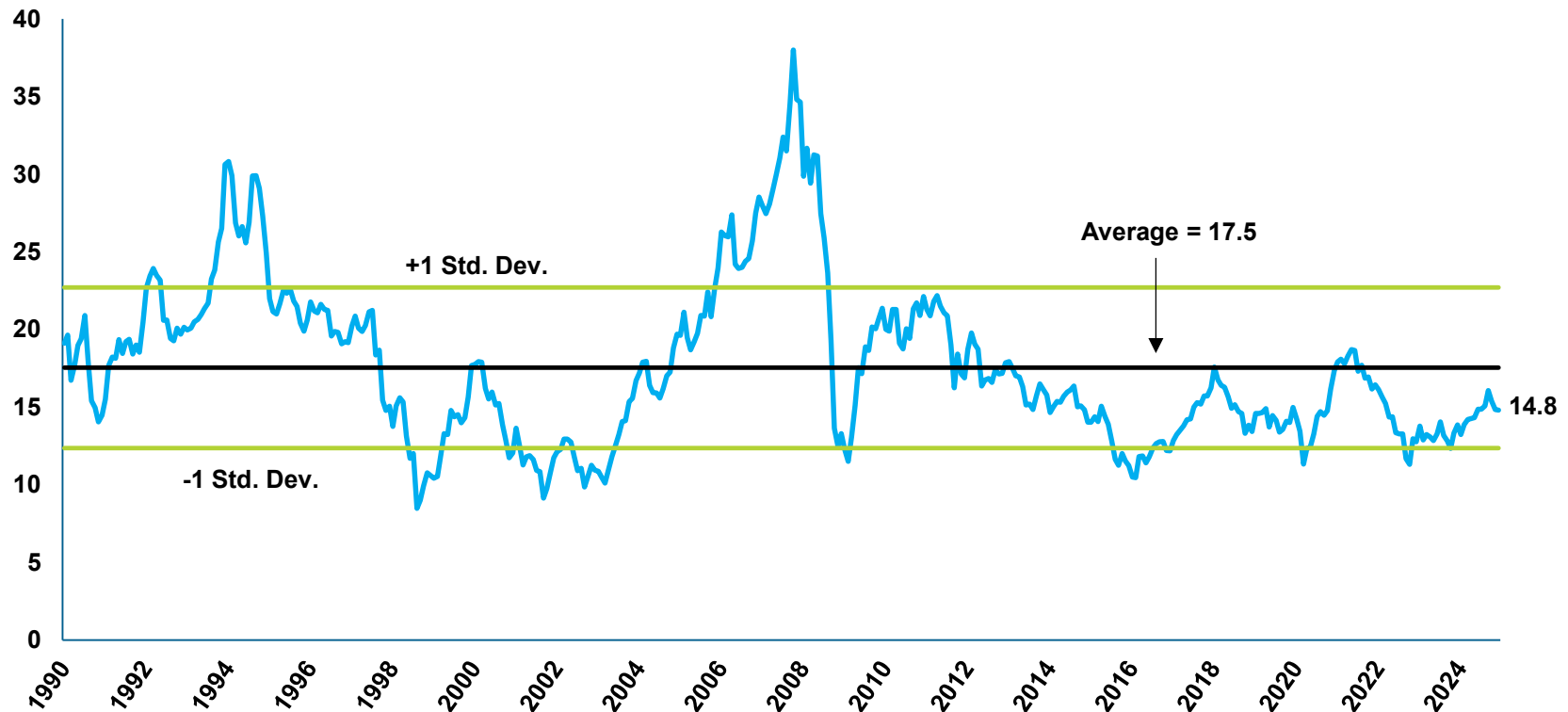


Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of December 31, 2024.

## Slightly Higher Prices in Emerging Market Equities

- Emerging market equities gained 13.1% in local currency terms, but the rising dollar cut returns to 7.5% for USD investors.
- EM equity valuations remain below 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

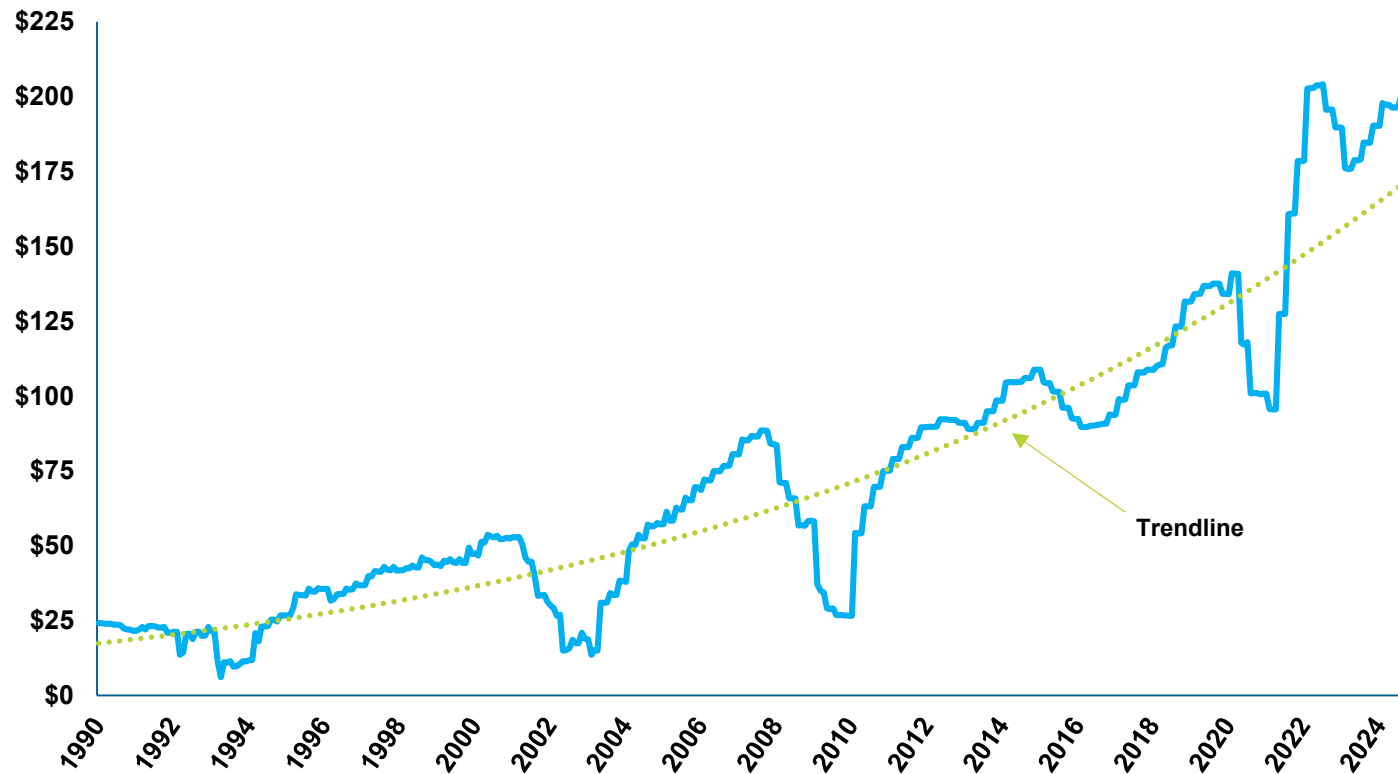


Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.. Data is as of December 31, 2024.

## US Earnings Growth

- S&P 500 earnings (EPS) rebounded after a short-lived dip in 2023.
- At year-end, estimates were that EPS was just shy of its peak in July 2022.

S&P 500 Earnings Per Share



Source: S&P 500 Index data from Bloomberg. Represents trailing 12-month "as reported" earnings per share. Data is as of December 31, 2024.

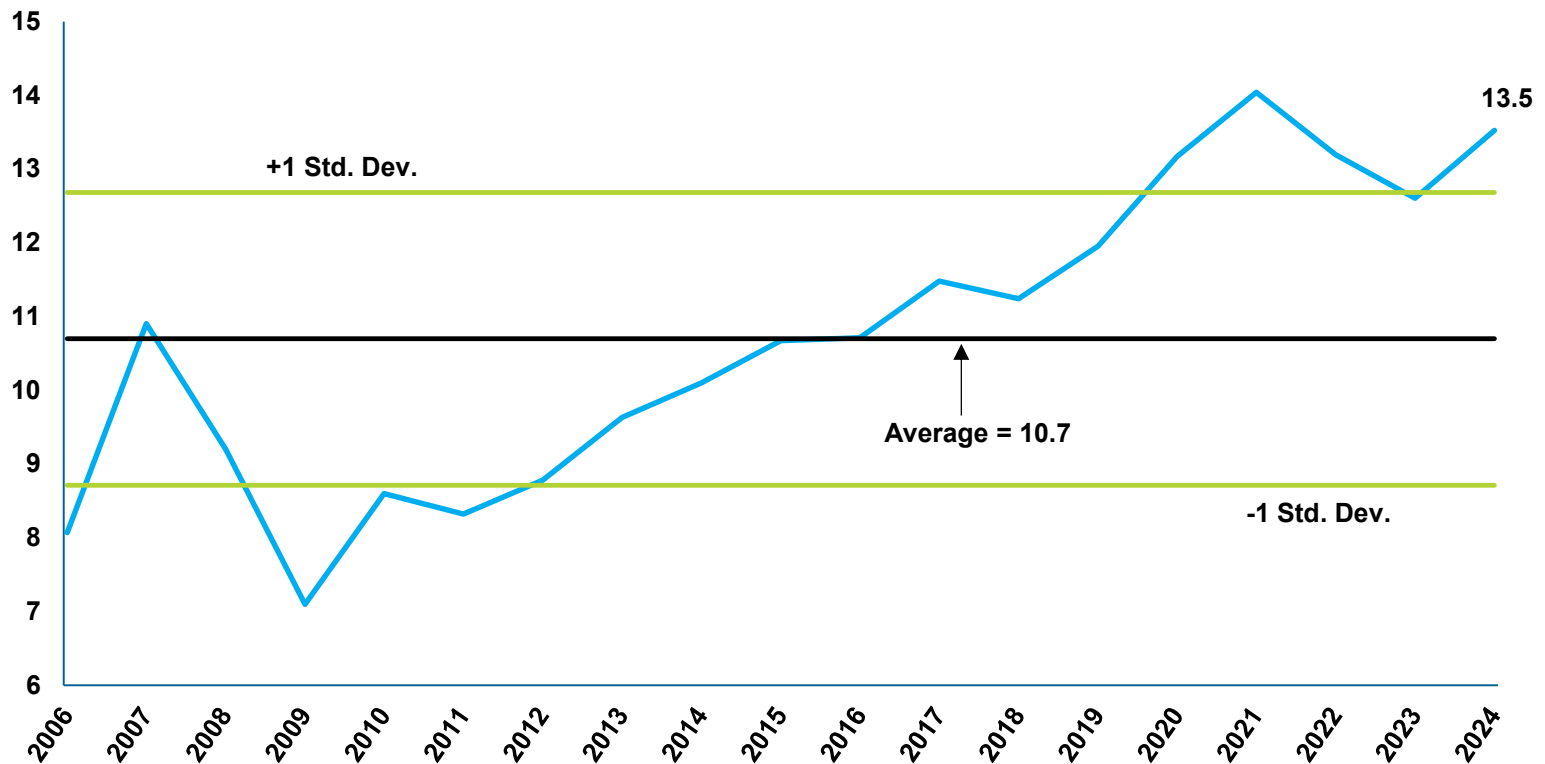


## Private Equity Prices Rebounding

→ EBITDA multiples rose from year end (note that the endpoint is as of September 30).

- Like public equities, valuations have been trending up since the GFC, though they did not rise as quickly as those for US equities over the past year.

EBITDA Multiples

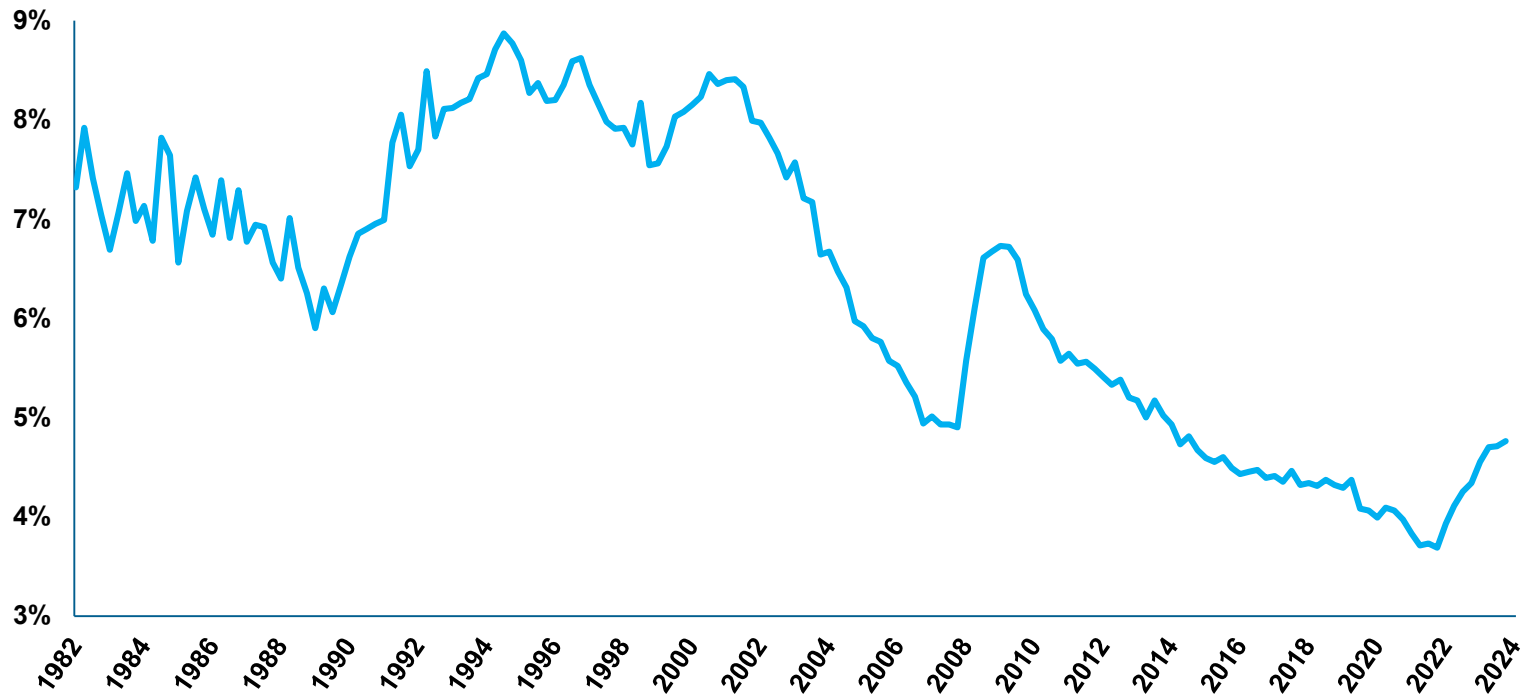


Source: Preqin Median EBITDA Multiples Paid in All LBOs, as of September 30, 2024.

## Real Estate Valuations Improving

- Cap rates for core real estate continued to improve in 2024.
  - This is despite a challenging year for many real estate segments.
- Higher cap rates may be indicative of better returns going forward.

Core Real Estate Cap Rates

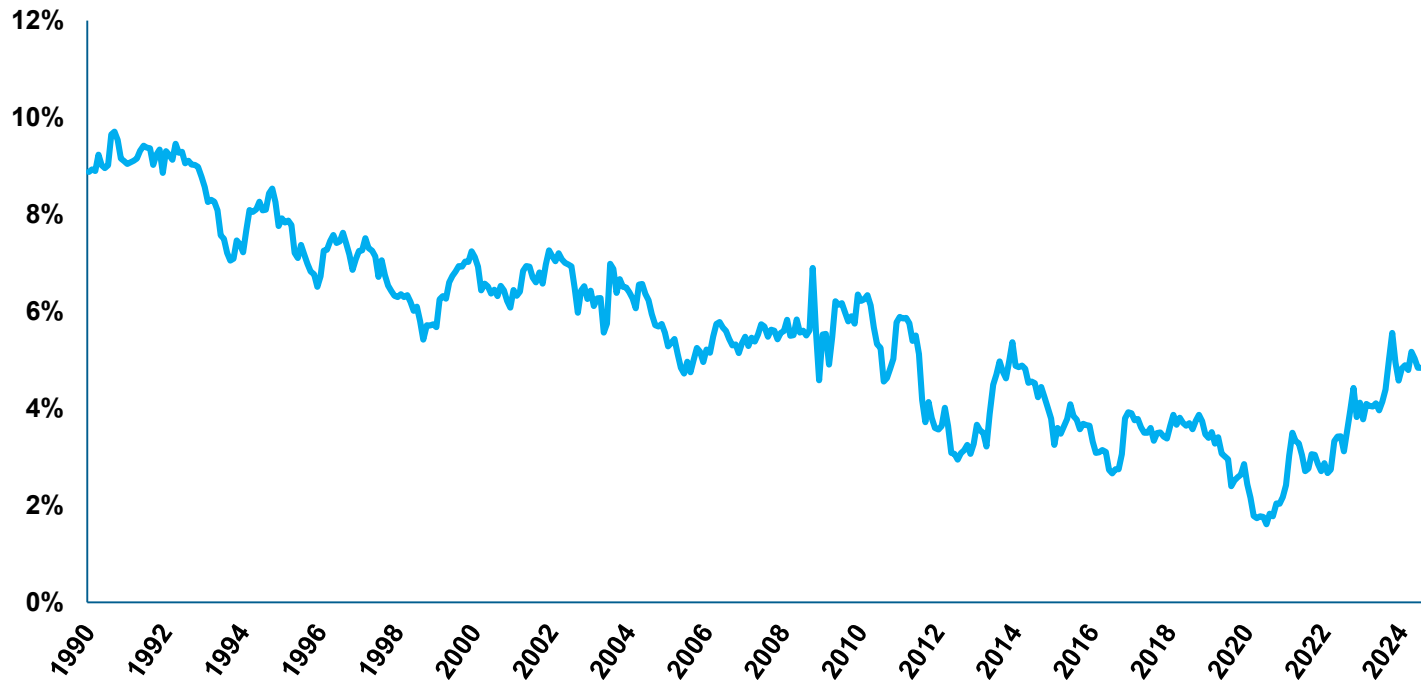


Source: NCREIF NPI value-weighted cap rates. As of September 30, 2024.

## Higher Projected Rates in the Future

- As interest rates have risen, 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 5.42%, versus a prediction of 4.57% twelve months ago.
- Higher future interest rates implies higher 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, 2024.

## **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.
  - Changes are driven by many factors, including interest rates, credit spreads, cap rates, and equity prices.
- 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 113 “asset classes” for our 2025 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:

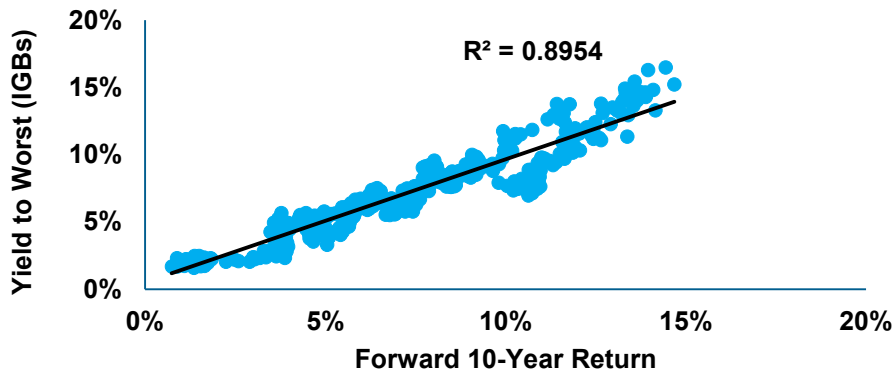
Asset Class Category	Major Factors
Equities	Dividend Yield, GDP Growth, Valuation
Bonds	Yield to Worst, Default Rate, Recovery Rate
Commodities	Collateral Yield, Roll Yield, Inflation
Infrastructure	Public IS Valuation, Income, Growth, Leverage
Natural Resources	Price per Acre, Income, Public Market 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.

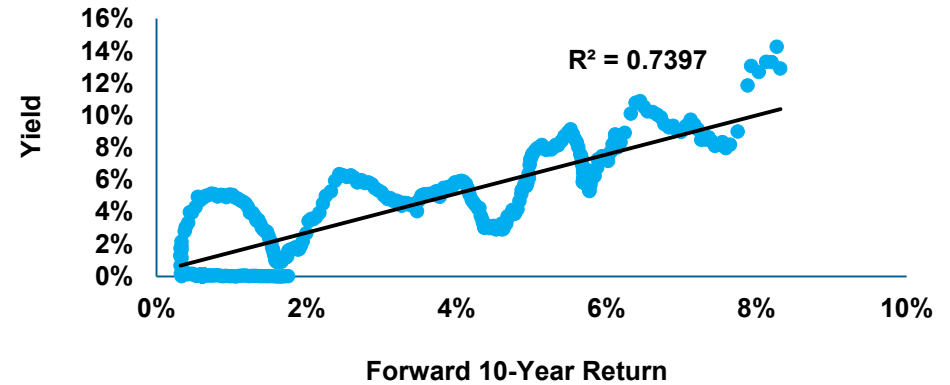
- Leverage and currency impact are also key factors for many strategies.

## Some Factors are Naturally More Predictive Than Others

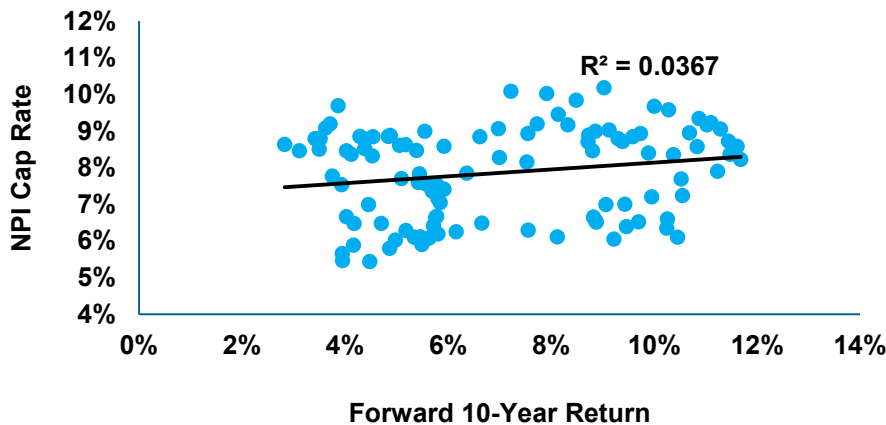
**Investment Grade Bonds**  
Yield to Worst vs. Forward 10-Year Returns



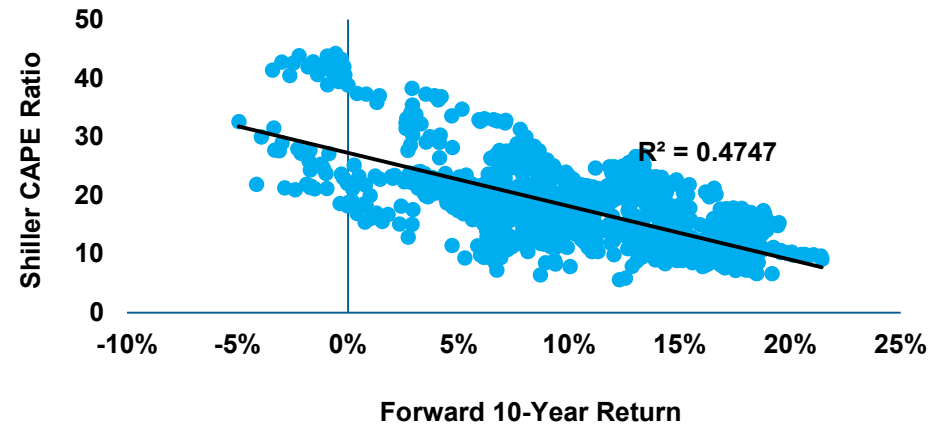
**Cash (90-Day T-Bill)**  
Yield vs. Forward 10-Year Returns



**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.

$$E(R) = \text{Dividend Yield} + \text{Expected Earnings Growth} + \text{Multiple Effect} + \text{Currency Effect}$$

→ 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, such as the 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.

Asset Class	Historical Standard Deviation (%)	Skewness	Assumption <sup>1</sup> (%)
Bank Loans	6.5	-2.9	10.0
FI / L-S Credit	5.8	-2.7	9.0

- 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).

<sup>1</sup> Note that we round our standard deviation assumptions to whole numbers.

## FAQs

### FAQs for 2025

#### 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.<sup>1</sup>
- 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 average of 20-year expected returns is 10 basis points higher than last January.

Year	Weighted Average Expected Return (%)	Change from Prior Year (%)
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

<sup>1</sup> 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 2025

### What is driving the changes from last year?

- US equity markets rallied, pushing them to higher valuations, thus reducing their forward-looking returns.
- Interest rates moved up, increasing yields and hence expected returns for higher quality bonds.
- Credit spreads tightened, leading to lower yields for riskier fixed income assets.
- Higher anticipated cash yields helped expected returns for hedge funds and related asset classes.
- Cap rates for real estate moved up, pushing up the expected returns.
- Higher anticipated long-term interest rates also provide a tailwind in our 20-year projections, as the bridge from 10 to 20 years is made via a risk premium being added to a (higher) future risk-free rate.
  - The market projection for the 10-year risk-free rate jumped from 4.57% to 5.42%.

## FAQs for 2025

### How do Meketa's CMEs compare to peers?

- Our CMEs are typically in the same ballpark as our peers.
- While we expect to 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 intermediate-term return assumptions tend to be lower than the long-term assumptions across the peer group, particularly for riskier asset classes.



## FAQs for 2025

### 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.
  - 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 changed to using two distinct currency models, one for developing markets that emphasizes interest rate parity and one for emerging markets that emphasizes purchasing power parity.
  - This was partly driven by the observation that central banks have intervened in their foreign exchange markets.
  - Currency movements are the portion of our CMEs that we probably have the least confidence in (hence why we have capped them historically).
  - For 2025, developed markets switches from a 50 basis point tailwind to a 20 basis point headwind, while there is no impact on emerging markets.
    - There are a few asset classes (e.g., foreign bonds, foreign equities) that feel the full impact and others (e.g., global equities, buyouts, natural resources) that will experience a more modest impact.

## FAQs for 2025

### What model changes were made?

- We switched from using historical *real* income to nominal income to predict near-term income for timberland and farmland.
  - The inflation of recent years dispelled the notion of a direct link between income and inflation in the short term for these asset classes.
- We started incorporating data from third parties for two private market asset classes where such data has traditionally been hard to come by:
  - In private credit, we are including yield and spread data from Lincoln Senior Debt Index.
  - In private infrastructure, we are including valuation metrics from Macquarie.
- For various private markets where we use a public market proxy to estimate valuations, we modified the composites to reflect the changing natures of those industries:
  - We added an AI index to our VC model.
  - We added an Energy Efficiency index to our Energy model.
  - We added a Clean Energy index to our Sustainability model
- We assume lower leverage for buyouts (range dropped from 1.4x – 1.6x to 1.3x - 1.5x) as leverage has declined over the past 5-10 years.

## FAQs for 2025

### What structural changes were made for 2025?

- We added the following “asset classes” (total now at 113):
- Multi-sector credit
  - High yield municipal bonds
  - Emerging market corporate bonds
  - Emerging market bonds aggregate

### Did volatility expectations change?

- Not systematically; there were very few changes, and most were +/- 1%.
- The biggest change was a 5% decrease in digital currencies. This reflects the growing institutionalization of the asset class (e.g., with bitcoin ETFs being introduced).
- Our methodology includes a 20-year look back, which includes the volatile years of 2022, 2020, and 2008.

### Were there any qualitative adjustments?

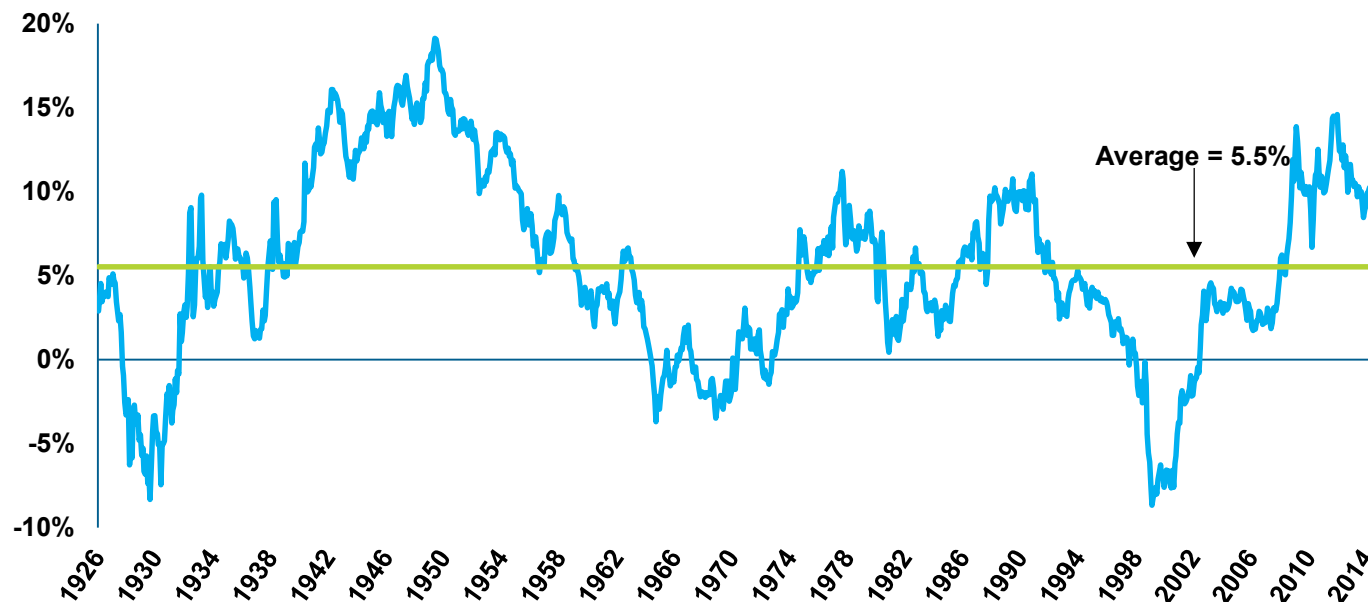
- We typically make some qualitative adjustments to the CMEs, though they have grown fewer in number over the years as we have refined our models.
- We made a manual adjustment to the 10-year foreign equity return given concerns we had about the data for geographic revenue sources provided by the vendor for the underlying index.

## FAQs for 2025

### What is the equity risk premium implied by the CMEs?

- We assume a long-term risk premium of 5.0% for US equities over 10-year Treasuries in our model.
  - However, our 10-year assumptions imply an equity risk premium of ~1.5%.
  - This averages out to a 20-year implied equity risk premium of ~3.0%.
- Historically, the risk premium for the S&P 500 over the yield for the 10-year Treasury has averaged 5.5%, though the range has varied considerably.

US Equity Risk Premium over 10-year Treasury<sup>1</sup>



<sup>1</sup> 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, 2024.

## FAQs for 2025

### 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 5.4% in ten years, versus the actual yield of 4.6% at the end of December 2024.
- By contrast, the FOMC is expecting the fed funds rate to fall to ~3.4% by 2026, implying a return to a more normally shaped 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 141 basis points over that for T-bills since 1962.
  - The 2-10 spread has averaged 86 basis points since 1976.
- This is consistent with the market's projections for short-term and longer-term rates noted above.

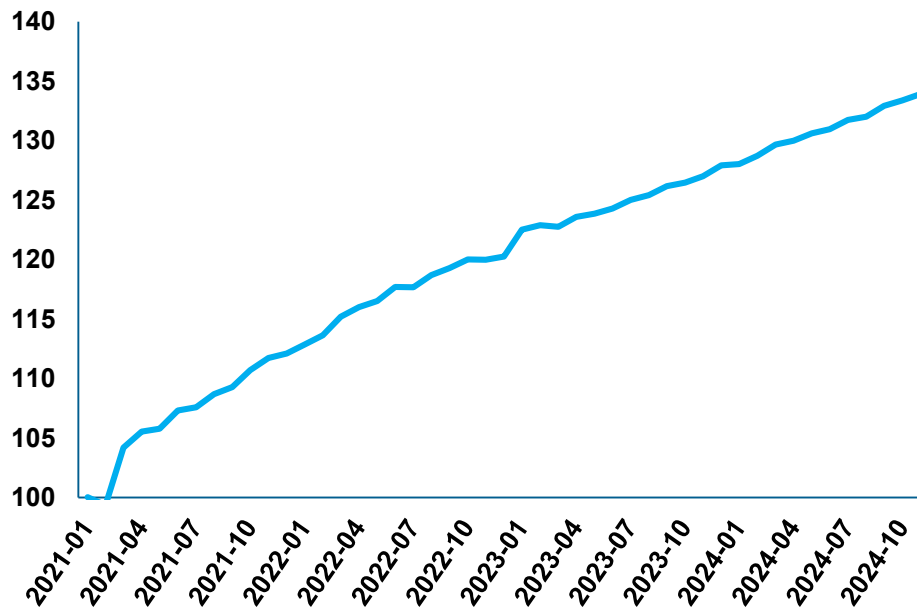
Source: FRED. 3-Month Treasury Bill Secondary Market Rate, Market Yield on US Treasury Securities at 10-Year Constant Maturity, 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity.

## FAQs for 2025

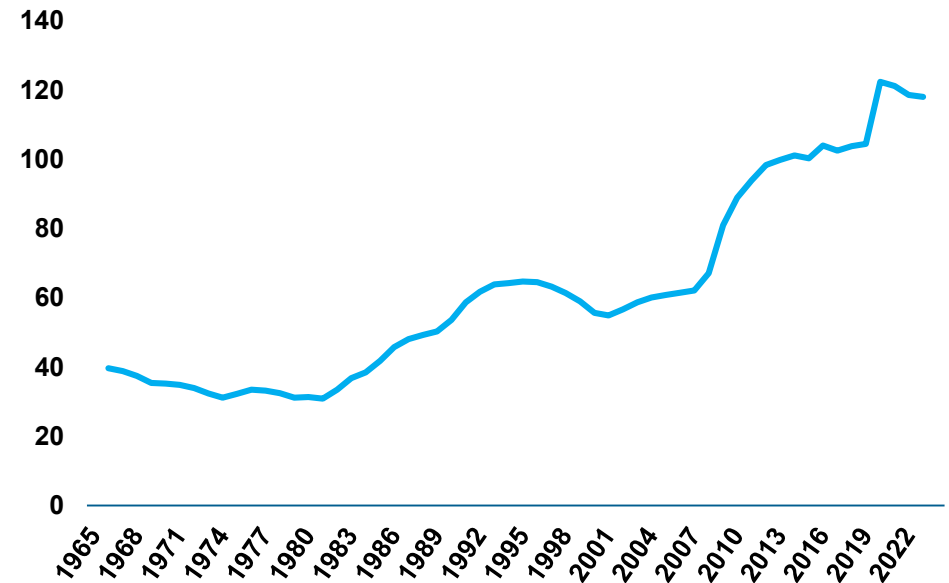
### Why is the market projecting rates will be higher in ten years?

- Expectations of high inflation could necessitate a demand by investors for higher nominal yields to compensate 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.

Cumulative PCE Inflation Since January 2021



Federal Debt as a % of GDP



Source: FRED. Personal Consumption Expenditures indexed to 100 on Jan 2021. Federal Debt: Total Public Debt as Percent of Gross Domestic Product, Percent of GDP, Seasonally Adjusted.

## FAQs for 2025

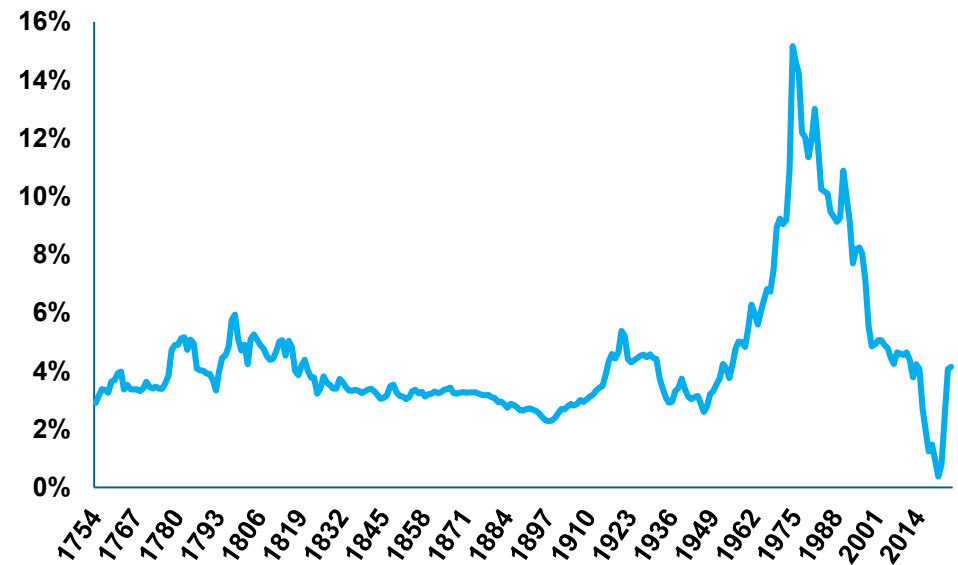
### Is it reasonable to believe that Treasury yields will be that high (5.4%) in ten years?

- Looking back, a 5.4% 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 5.4% 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 1755**

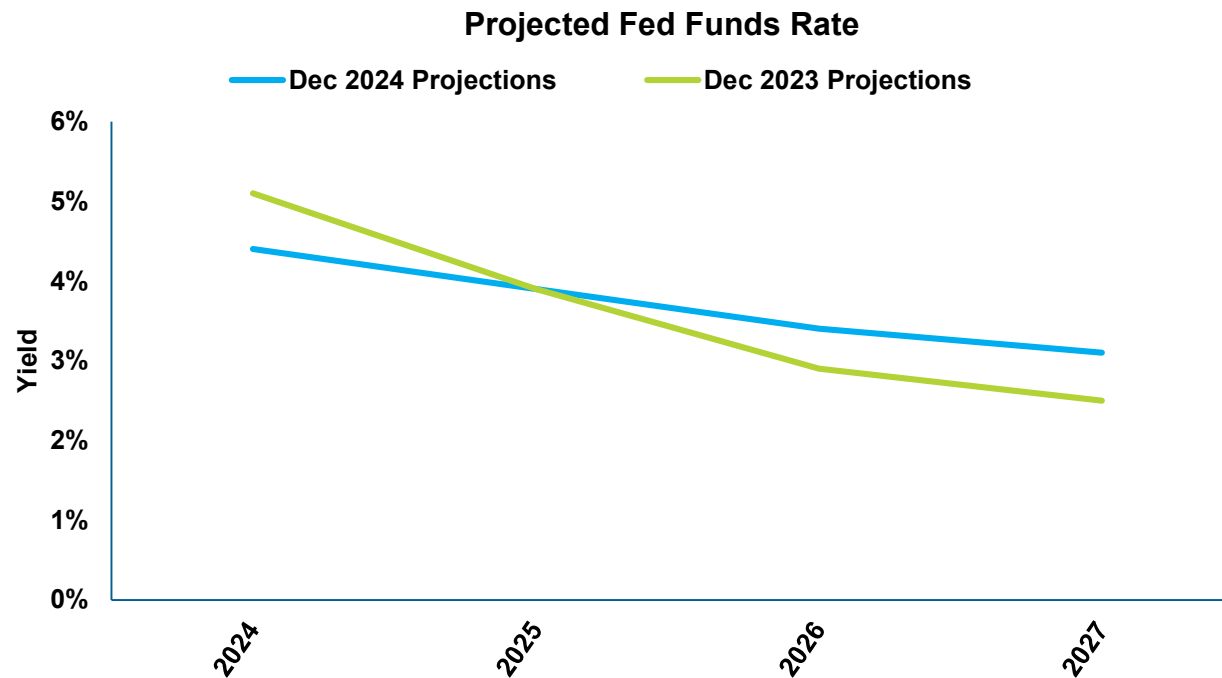


Source: FRED. Market Yield on US Treasury Securities at 10-Year Constant Maturity 1962-2024. Consol (Long-Term Bond) Yields in the United Kingdom 1754-2016, UK Long-Term (10-Year) Government Bond Yields 2017-2024.

## FAQs for 2025

### Why is the expected return for cash increasing when short-term rates decreased during 2024?

- 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 are expecting short-term rates to settle in much higher in 2-3 years than they were a year ago.
- Most of the horizon will be at these rates that are projected to be higher than they were one year ago.



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



### FAQs for 2025

#### How does Meketa arrive at its inflation assumption? Is it based on a combination of breakeven rates and other data?

- Most of our economic projections come from the IMF’s World Economic Outlook. Their inflation projections are in the table below.
  - They were projecting slightly lower inflation for the US in 2025, followed by benign levels 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.

#### Inflation Estimates

	2025	2026	2027	2028	2029	5-Year Average	5-yr-5 Inflation Swap	10-year Inflation Estimate
US	1.9	2.1	2.1	2.1	2.1	2.1	2.5	2.3
Euro Area	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1
UK	2.1	2.0	2.0	2.0	2.0	2.0	3.2	2.6
Japan	2.0	2.0	2.0	2.0	2.0	2.0	NA	1.7
China	1.7	2.0	2.0	2.0	2.0	1.9	NA	2.8

Sources: IMF World Economic Outlook, October 2024; Bloomberg.

## FAQs for 2025

### **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%, which are reasonably consistent with the 6.9% EPS growth rate observed since 1990, and conservatively below the 9.7% 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.

## FAQs for 2025

### **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 perhaps to a lesser extent than they have for the past decade.
- 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 2025

**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, we 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	61.7%	17.1%	19.6%	1.6%
MSCI EAFE	22.9%	52.9%	22.1%	2.0%
MSCI Emerging Markets	14.8%	7.9%	76.0%	1.2%

Source: MSCI Economic Exposure indices for USA, EAFE, Emerging Markets, and Frontier Markets as of December 31, 2024.

## FAQs for 2025

### 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 lackluster post-COVID economic rebound.
  - A shift in prioritization by the CCP to favor Marxism over growth.
  - Geopolitical tensions and “de-risking” by Western investors.
  - Real estate and debt challenges.
- As a result, we place a significant discount on Chinese (and hence, emerging market) growth translating to EPS growth.
  - This discount is greater than for EAFE and EM ex-China indices.
- 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 2025

### Why did the spread for private equity over public equity increase?

- Valuations increased to a greater extent for public equities (e.g., PE ratios) than they did for private equity (e.g., EBITDA multiples).
  - Of note, the private equity data (as always) is one quarter lagged (i.e., as of 9/30/24).

### 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 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 proxy is currently composed of: the NASDAQ; Pharma, Biotech & Life Sciences; IT Services; financial technology; AI; and Clean Tech/Environment.
  - The composition and weightings have changed over time.
- That said, we take our VC model with a large grain of salt, as there is very little private market data available.

## FAQs for 2025

### **Why did the 10-year expected returns for private real estate increase while it went down for REITs?**

- Cap rates and REIT yields moved in opposite directions.
  - Value-weighted cap rates are ~80 basis points above REIT yields.
- Higher cap rates pushed up our expected returns for core and non-core real estate, while lower yields pushed down our expected returns for REITs.

### **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 yield for EM local debt increase when it decreased for most other credit-focused asset classes?**

- We use the JPM GBI EM Global Diversified Index as our proxy for EM local debt.
- JPM added India to the index in 1% monthly increments starting in June, and the yield for Indian bonds was generally higher than that for the rest of the index.
  - This had the effect of pulling up the overall yield.

## FAQs for 2025

### 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.

### How much confidence do you have in your model for cryptocurrencies?

- We have the lowest amount of confidence in our projections for digital currencies.
- The lack of associated cash flows makes them challenging to model relative to most other financial assets, as does their sensitivity to government policy changes.





## 2025 Expected Returns and Changes from Prior Years

### 10-year Geometric Expected Returns Rate Sensitive

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Cash Equivalents	2.4	2.8	0.4	Higher projected short-term rates
Short-term Investment Grade Bonds	3.8	4.2	0.4	Higher projected short-term rates
Investment Grade (Core) Bonds	4.6	4.9	0.3	Higher yields
Intermediate Government Bonds	4.0	4.4	0.4	Higher yields
Long-term Government Bonds	4.3	5.0	0.7	Higher yields
Mortgage-Backed Securities	4.7	5.3	0.6	Higher yields
Investment Grade Corporate Bonds	5.2	5.4	0.2	Higher yields
Long-term Corporate Bonds	5.2	5.9	0.7	Higher yields
Short-term TIPS	3.8	3.9	0.1	Higher real yields
TIPS	4.3	4.3	0.0	Higher real yields
Long-term TIPS	4.7	5.0	0.3	Higher real yields
Global ILBs	4.3	4.2	-0.1	Switched to currency headwind
Foreign Bonds	3.1	2.4	-0.7	Switched to currency headwind
<i>US Inflation</i>	2.4	2.3	-0.1	<i>Slightly lower near-term economist and market projections</i>

### 10-year Geometric Expected Returns Credit

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
High Yield Bonds	6.5	6.3	-0.2	Tighter spreads
Bank Loans	6.5	6.3	-0.2	Higher projected short-term rates offset by tighter spreads
Multi-Sector Credit	NA	6.3	NA	
Collateralized Loan Obligations (CLOs)	8.1	6.9	-1.2	Substantial decline in yield
Emerging Market Bonds (major)	7.0	6.9	-0.1	Lower yields
Emerging Market Bonds (local)	6.3	6.5	0.2	Higher yields with addition of India
Emerging Market Corporate Bonds	NA	5.6	NA	
Private Debt	9.2	8.7	-0.5	Tighter spreads
Direct Lending	8.2	7.6	-0.6	Tighter spreads
Asset Based Lending	9.7	9.3	-0.4	Tighter spreads
Special Situations Lending	9.7	9.4	-0.3	Tighter spreads

### 10-year Geometric Expected Returns Equities

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
US Equity	6.9	6.4	-0.5	Higher valuations, partly offset by higher projected earnings growth
Developed Non-US (EAFE) Equity	7.7	7.2	-0.5	Switched to currency headwind
Emerging Market Equity	7.6	7.1	-0.5	Higher valuations and lower projected earnings growth
Emerging Market ex-China	7.8	7.5	-0.3	Lower dividends and projected earnings growth
China Equity	7.1	6.0	-1.1	Higher valuations and lower projected earnings growth
Frontier Market Equity	9.6	8.9	-0.7	Lower projected earnings growth
Global Equity	7.2	6.7	-0.5	Higher valuations and some currency headwind
Low Volatility Equity	6.5	6.0	-0.5	Higher valuations
Private Equity	9.9	9.8	-0.1	Higher valuations
Buyouts	9.5	9.5	0.0	Lower valuations relative to public markets offset by lower amount of leverage
Growth Equity	10.4	10.1	-0.3	Higher valuations
Venture Capital	10.8	10.4	-0.4	Higher valuations

### 10-year Geometric Expected Returns Real Estate and Infrastructure

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Real Estate	6.3	6.9	0.6	Higher cap rates
US REITs	5.6	5.3	-0.3	Lower yields
Core Private Real Estate	4.8	5.5	0.7	Higher cap rates
Value-Added Real Estate	7.3	8.4	1.1	Higher cap rates
Opportunistic Real Estate	8.4	9.5	1.1	Higher cap rates
Infrastructure	7.4	7.2	-0.2	Higher expected borrowing costs, no more currency tailwind
Infrastructure (Public)	8.0	7.6	-0.4	Higher valuations
Infrastructure (Core Private)	6.5	6.2	-0.3	Higher expected borrowing costs, no more currency tailwind
Infrastructure (Non-Core Private)	8.0	8.2	0.2	Higher income growth partly offset by higher borrowing costs, no more currency tailwind

### 10-year Geometric Expected Returns Natural Resources and Commodities

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Natural Resources	7.8	7.4	-0.4	Higher valuations
Natural Resources (Public)	8.3	7.8	-0.5	Slightly higher valuations, currency headwind
Natural Resources (Private)	7.7	7.4	-0.3	Higher valuations
Energy	9.1	8.8	-0.3	Slightly higher valuations
Mining	8.6	8.3	-0.3	Slightly higher valuations, currency headwind
Timberland	5.5	5.3	-0.2	Higher valuations
Farmland	5.0	3.6	-1.4	Higher valuations
Sustainability	8.4	8.6	0.2	Lower relative valuations
MLPs	6.6	5.7	-0.9	Higher valuations
Gold Mining	8.0	7.9	-0.1	Slightly higher valuations
Gold (Metal)	2.4	2.3	-0.1	Slightly lower inflation expectations
Commodities	4.9	5.5	0.6	Higher cash yield, moved to positive roll return

### 10-year Geometric Expected Returns Hedge Funds and Miscellaneous

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Hedge Funds	4.5	4.2	-0.3	Higher equity valuations, tighter spreads
Long-Short	3.2	3.1	-0.1	Higher equity valuations, partly offset by higher cash yields
Event Driven	7.0	5.1	-1.9	Higher equity valuations, tighter spreads
Global Macro	4.2	4.5	0.3	Higher yields
CTA – Trend Following	3.8	3.4	-0.4	Less favorable signals for rates and equities
Fixed Income/L-S Credit	5.0	4.9	-0.1	Tighter spreads
Relative Value/Arbitrage	5.6	4.9	-0.7	Lower projected arb spreads
RMS Aggregate	3.6	3.7	0.1	Higher cash yields offset by less favorable trend signals
Long Vol	0.7	0.7	0.0	
Insurance Linked Strategies	5.3	4.8	-0.5	Higher expected losses
Alternative Risk Premia	4.8	5.2	0.4	Higher cash yields
Risk Parity (10% vol)	6.3	6.1	-0.2	Higher equity valuations, tighter spreads
Digital Currencies	2.4	2.9	0.5	Growing institutionalization

### 20-year Geometric Expected Returns Rate Sensitive

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Cash Equivalents	2.5	3.1	0.6	Higher yields
Short-term Investment Grade Bonds	3.7	4.3	0.6	Higher yields
Investment Grade (Core) Bonds	4.8	5.3	0.5	Higher yields
Intermediate Government Bonds	4.1	4.6	0.5	Higher yields
Long-term Government Bonds	5.0	5.7	0.7	Higher yields
Mortgage-Backed Securities	4.9	5.5	0.6	Higher yields
Investment Grade Corporate Bonds	5.4	5.9	0.5	Higher yields
Long-term Corporate Bonds	6.0	6.7	0.7	Higher yields
Short-term TIPS	3.7	4.1	0.4	Higher real yields
TIPS	4.7	5.0	0.3	Higher real yields
Long-term TIPS	5.2	5.7	0.5	Higher real yields
Global ILBs	4.7	5.0	0.3	Higher yields
Foreign Bonds	3.9	3.9	0.0	Higher yields offset by currency headwind
<i>US Inflation</i>	2.8	2.7	-0.1	<i>Slightly lower near-term economist and market projections</i>



### 20-year Geometric Expected Returns Credit

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
High Yield Bonds	6.8	7.1	0.3	Higher yields offset by tighter spreads
Bank Loans	6.6	6.8	0.2	Higher yields offset by tighter spreads
Multi-Sector Credit	NA	7.0	NA	
Collateralized Loan Obligations (CLOs)	7.2	7.0	-0.2	Higher yields offset by tighter spreads
Emerging Market Bonds (major)	6.8	7.1	0.3	Higher yields
Emerging Market Bonds (local)	6.2	6.7	0.5	Higher yields with addition of India
Emerging Market Corporate Bonds	NA	6.5	NA	
Private Debt	9.2	9.1	-0.1	Higher yields offset by tighter spreads
Direct Lending	8.4	8.2	-0.2	Higher yields offset by tighter spreads
Asset Based Lending	9.4	9.3	-0.1	Higher yields offset by tighter spreads
Special Situations Lending	9.9	9.9	0.0	Higher yields offset by tighter spreads

### 20-year Geometric Expected Returns Equities

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
US Equity	8.5	8.4	-0.1	Higher valuations, partly offset by higher projected earnings growth
Developed Non-US (EAFE) Equity	8.9	8.7	-0.2	Switched to currency headwind
Emerging Market Equity	8.9	8.7	-0.2	Higher valuations and lower projected earnings growth
Emerging Market ex-China	9.0	9.0	0.0	
China Equity	8.6	8.1	-0.5	Higher valuations and lower projected earnings growth
Frontier Market Equity	10.0	9.8	-0.2	Lower projected earnings growth
Global Equity	8.7	8.5	-0.2	Higher valuations and some currency headwind
Low Volatility Equity	7.8	7.7	-0.1	Higher valuations
Private Equity	11.2	11.2	0.0	
Buyouts	10.8	10.9	0.1	Lower valuations relative to public markets offset by lower amount of leverage
Growth Equity	11.5	11.4	-0.1	Higher valuations
Venture Capital	12.0	11.9	-0.1	Higher valuations

20-year Geometric Expected Returns  
Real Estate and Infrastructure

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Real Estate	8.0	8.5	0.5	Higher cap rates
US REITs	7.8	7.8	0.0	
Core Private Real Estate	6.9	7.4	0.5	Higher cap rates
Value-Added Real Estate	9.0	9.6	0.6	Higher cap rates
Opportunistic Real Estate	10.3	10.9	0.6	Higher cap rates
Infrastructure	9.0	9.2	0.2	Higher income growth
Infrastructure (Public)	9.1	9.0	-0.1	Higher valuations
Infrastructure (Core Private)	8.0	8.0	0.0	
Infrastructure (Non-Core Private)	10.0	10.3	0.3	Higher income growth partly offset by higher borrowing costs

**20-year Geometric Expected Returns  
Natural Resources and Commodities**

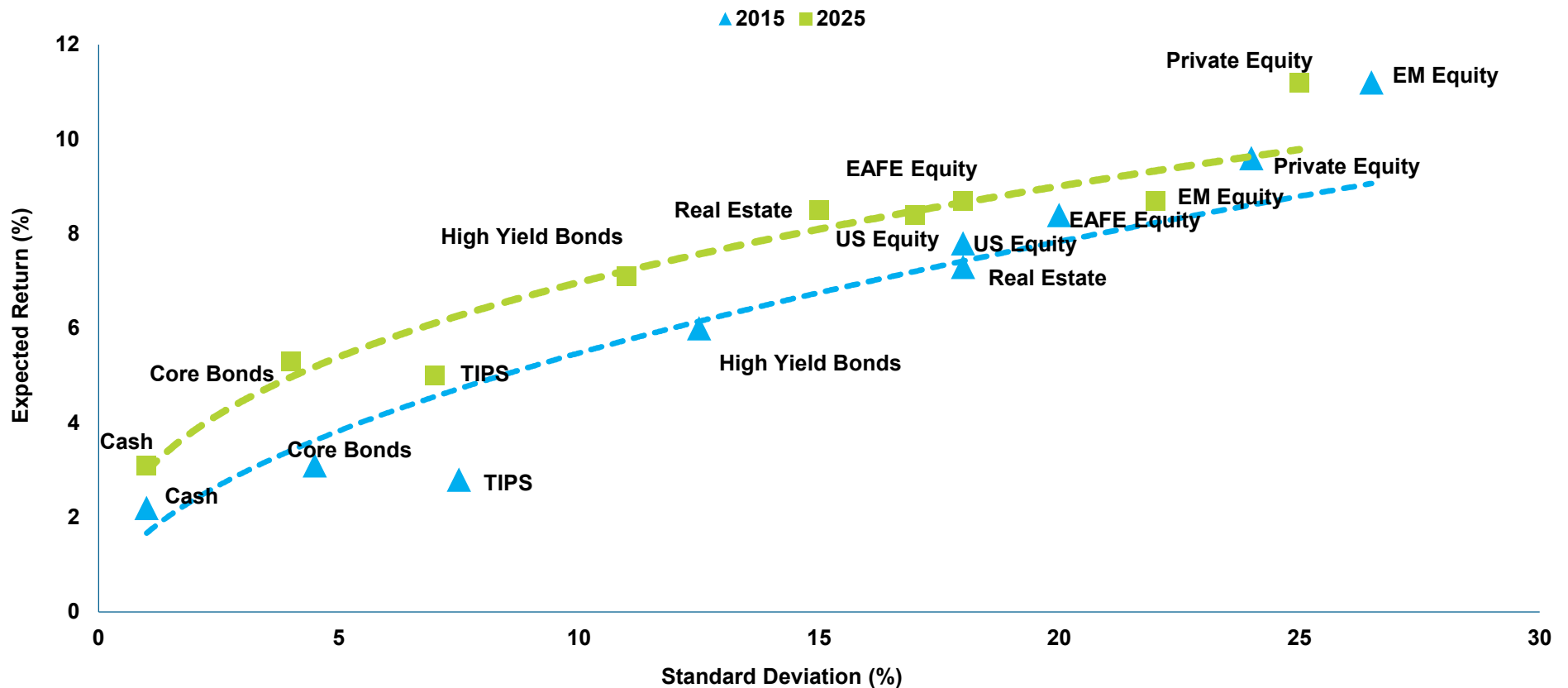
	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Natural Resources	9.3	9.2	-0.1	Higher valuations
Natural Resources (Public)	9.2	9.1	-0.1	Slightly higher valuations
Natural Resources (Private)	9.3	9.2	-0.1	Slightly higher valuations
Energy	10.4	10.3	-0.1	Slightly higher valuations
Mining	9.9	9.8	-0.1	Slightly higher valuations
Timberland	7.3	7.3	0.0	
Farmland	7.0	6.5	-0.5	Higher valuations
Sustainability	10.0	10.2	0.2	Lower relative valuations
MLPs	8.4	8.0	-0.4	Higher valuations
Gold Mining	9.5	9.5	0.0	
Gold (Metal)	3.5	3.6	0.1	
Commodities	5.3	5.9	0.6	Higher cash yield

### 20-year Geometric Expected Returns Hedge Funds and Miscellaneous

	2024 E(R) (%)	2025 E(R) (%)	Δ From 2024 (%)	Notes
Hedge Funds	5.8	6.0	0.2	Higher valuations offset by higher cash yields
Long-Short	5.3	5.5	0.2	Higher valuations offset by higher cash yields
Event Driven	7.6	6.7	-0.9	Higher equity valuations, tighter spreads
Global Macro	5.4	5.9	0.5	Higher yields
CTA – Trend Following	4.7	4.9	0.2	
Fixed Income/L-S Credit	6.1	6.4	0.3	Higher yields
Relative Value/Arbitrage	6.5	6.5	0.0	
RMS Aggregate	4.4	4.8	0.4	Higher cash yields
Long Vol	1.2	1.5	0.3	
Insurance Linked Strategies	6.2	6.3	0.1	
Alternative Risk Premia	5.2	5.8	0.6	Higher cash yields
Risk Parity (10% vol)	7.2	7.4	0.2	
Digital Currencies	3.5	4.1	0.6	Growing institutionalization

## The Big Picture: Higher Return for Similar Risk<sup>1</sup>

- 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.



<sup>1</sup> Expected return and standard deviation are based upon Meketa Investment Group's 2015 and 2025 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 <sup>1</sup> (%)
Cash Equivalents	2.8	3.1	1.0	-2.0
Investment Grade Bonds	4.9	5.3	4.0	0.4
Long-term Government Bonds	5.0	5.7	12.0	1.0
TIPS	4.3	5.0	7.0	0.4
High Yield Bonds	6.3	7.1	11.0	2.5
Bank Loans	6.3	6.8	10.0	2.0
Emerging Market Debt	6.3	6.8	11.0	1.8
Private Debt	8.7	9.1	15.0	4.1
US Equity	6.4	8.4	17.0	5.0
Developed Non-US Equity	7.2	8.7	18.0	4.9
Emerging Non-US Equity	7.1	8.7	22.0	5.0
Global Equity	6.7	8.5	17.0	5.0
Private Equity	9.8	11.2	25.0	7.3
Real Estate	6.9	8.5	15.0	4.8
Infrastructure	7.2	9.2	18.0	5.7
Commodities	5.5	5.9	17.0	1.0
Hedge Funds	4.2	6.0	7.0	2.4
Inflation	2.3	2.7	NA	NA

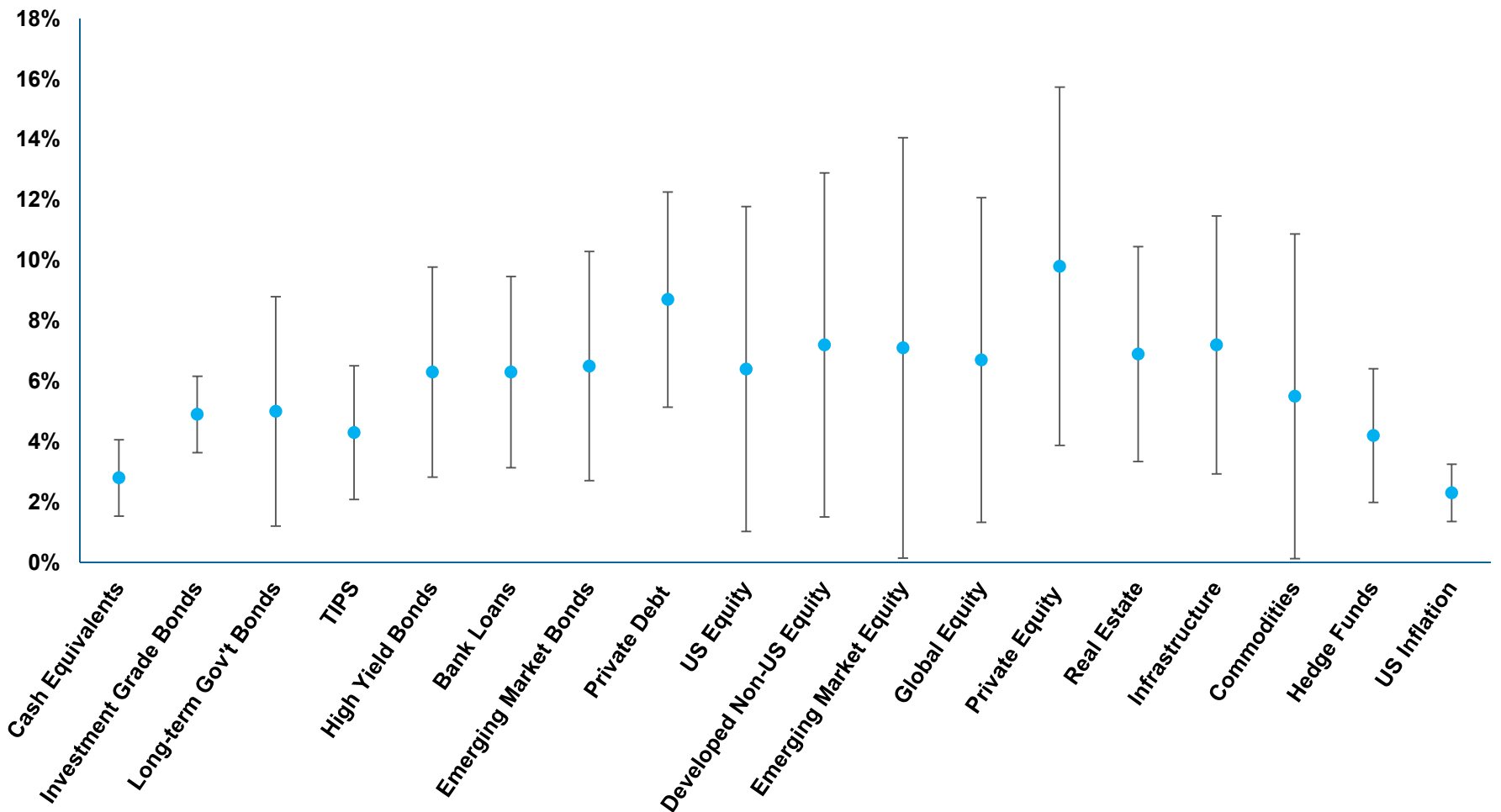
<sup>1</sup> Risk premia are calculated relative to the market's projection for the yield on the 10-year Treasury in ten years..



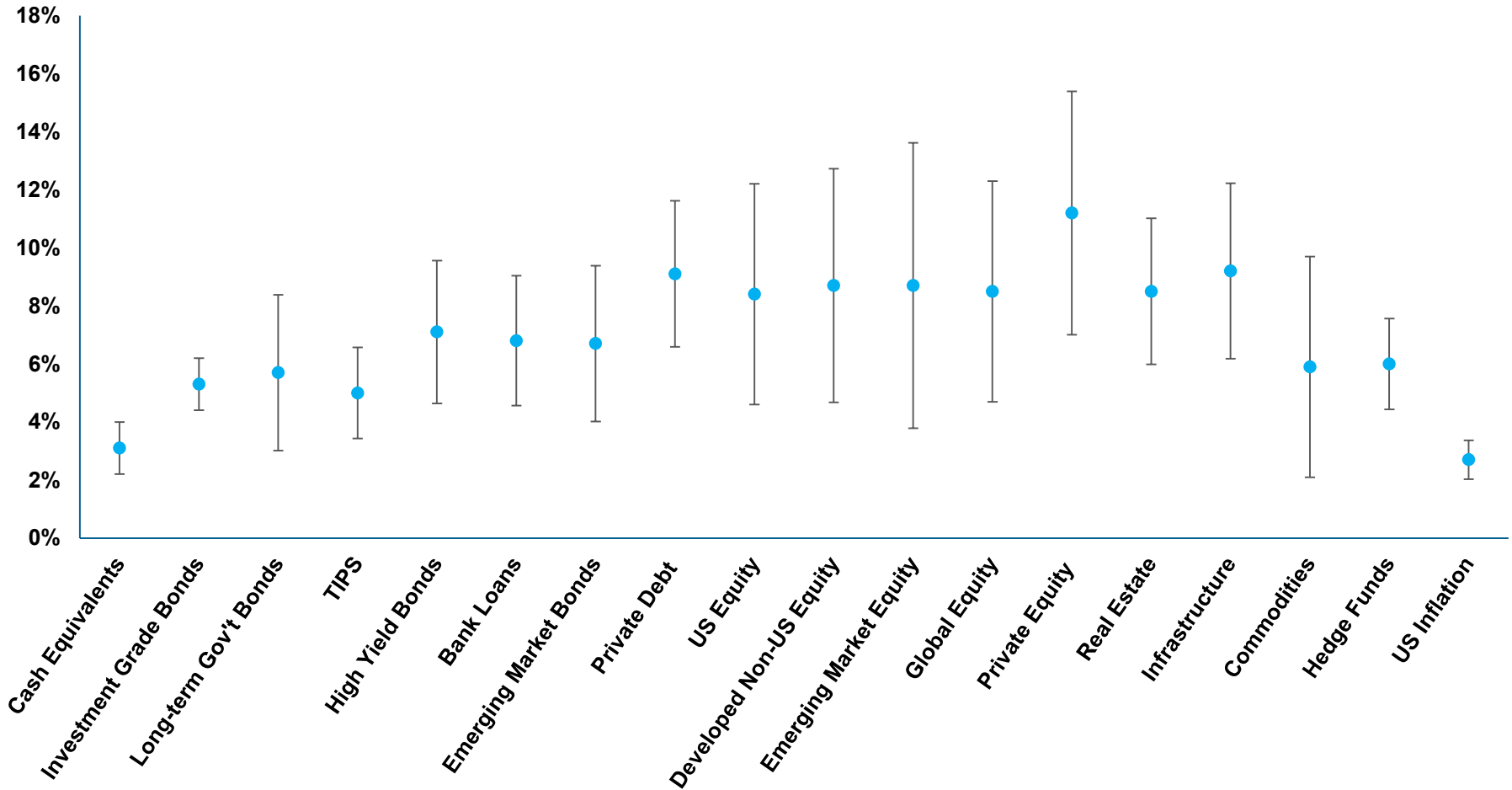
Correlation Data

	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	0.47	1.00								
US Equity	0.18	-0.13	0.25	0.74	1.00							
Developed Non-US Equity	0.28	-0.07	0.34	0.77	0.87	1.00						
Emerging Market Equity	0.26	-0.06	0.35	0.72	0.71	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	0.16	0.56	0.53	0.49	0.42	0.48	1.00			
Commodities	-0.01	-0.24	0.27	0.48	0.48	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	0.15	-0.17	0.30	0.78	0.79	0.83	0.80	0.53	0.47	0.64	0.61	1.00

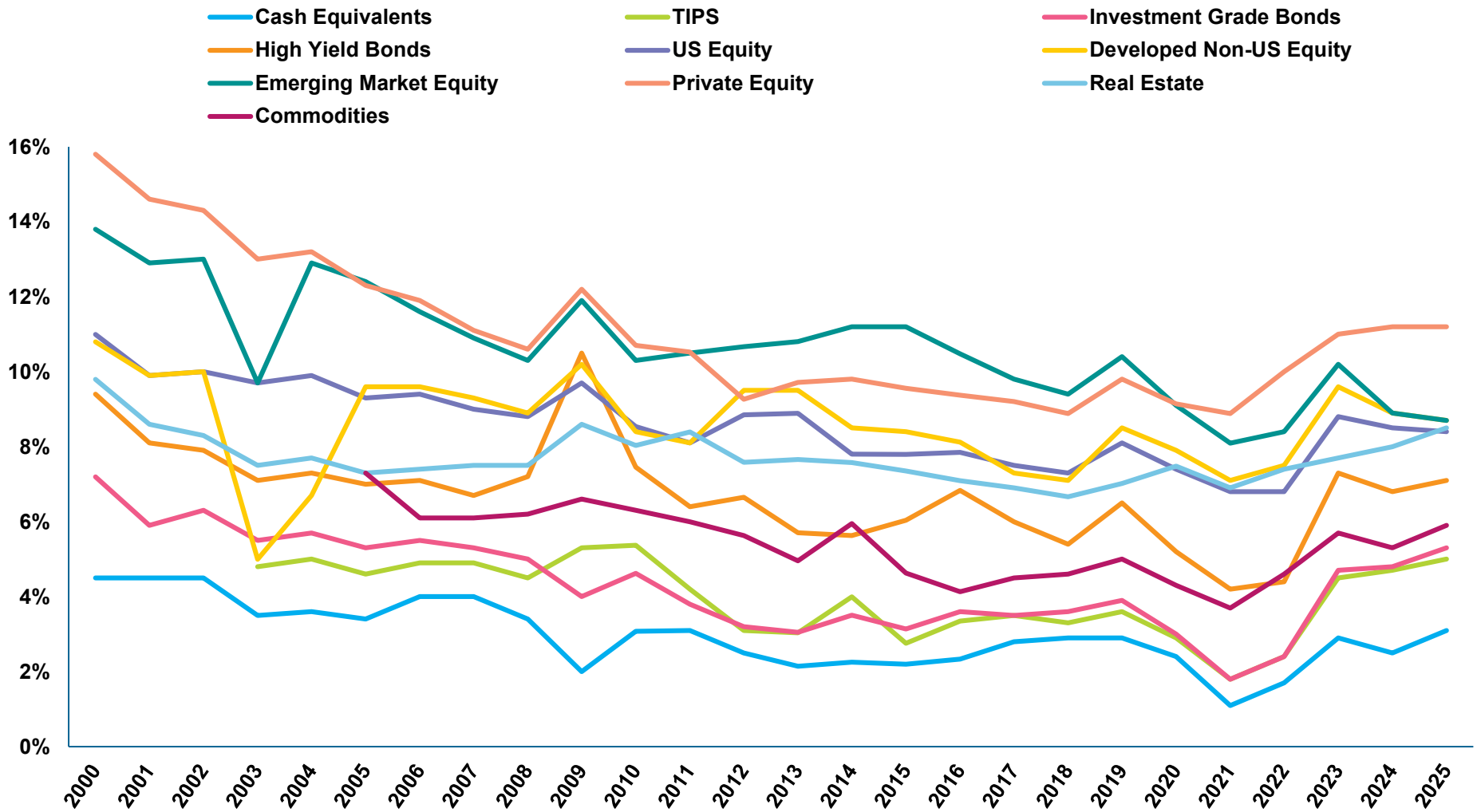
## 10-Year Return Forecasts and Likely Range



## 20-Year Return Forecasts and Likely Range

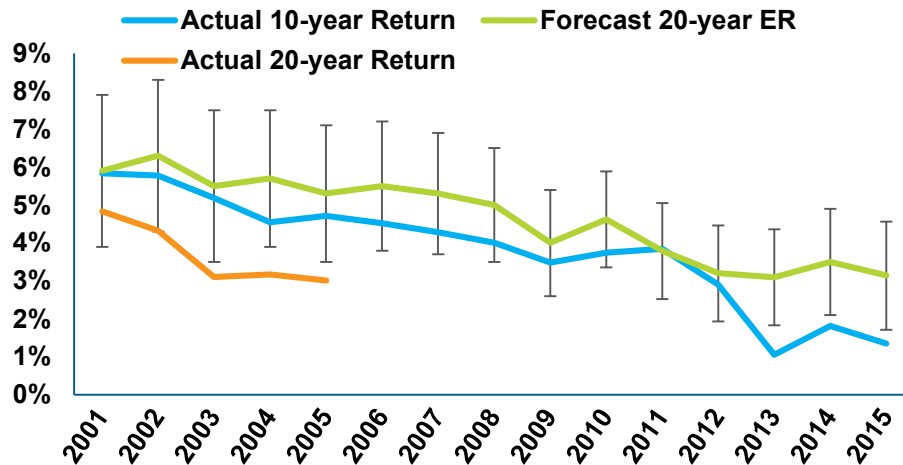


## Our 20-Year CMEs Since 2000

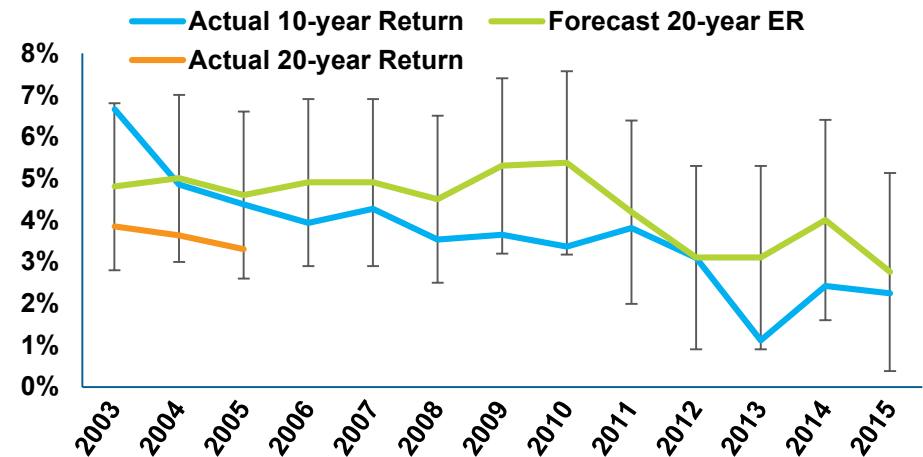


## Our Track Record

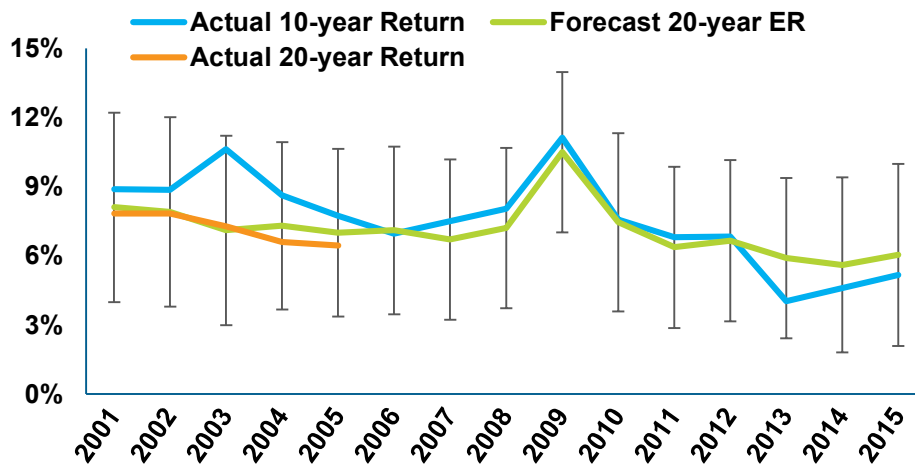
### Investment Grade Bonds



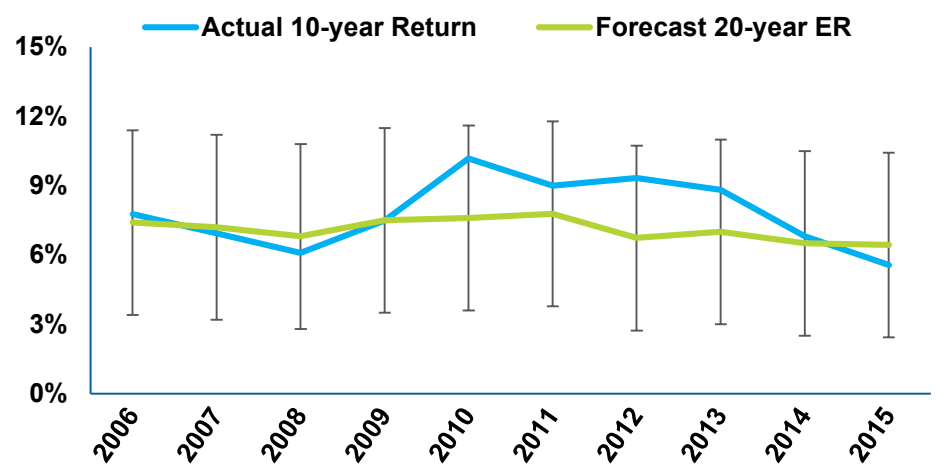
### TIPS



### High Yield Bonds

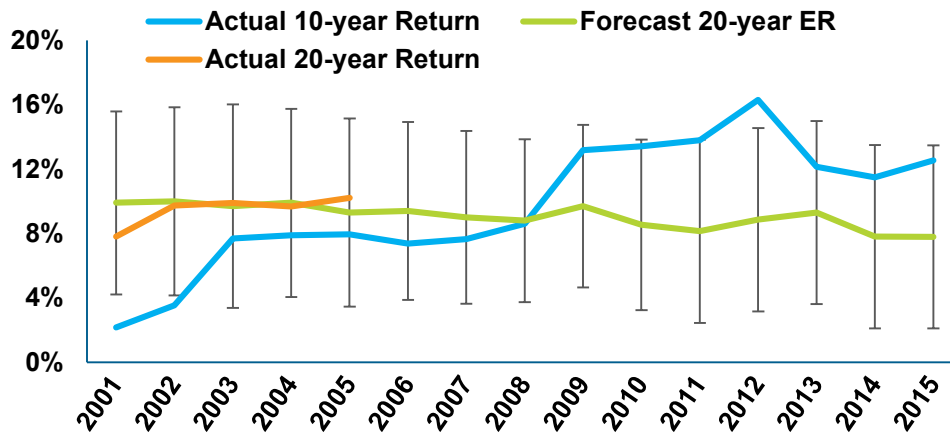


### Core Real Estate

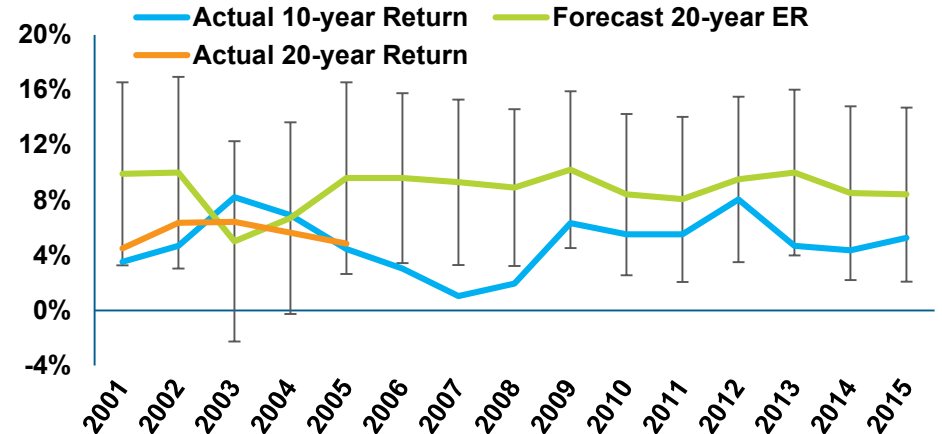


## Our Track Record (continued)

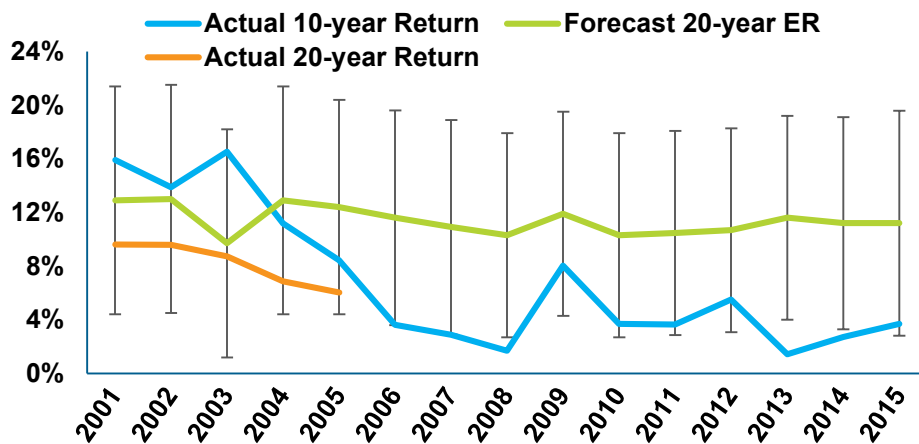
### US Equity



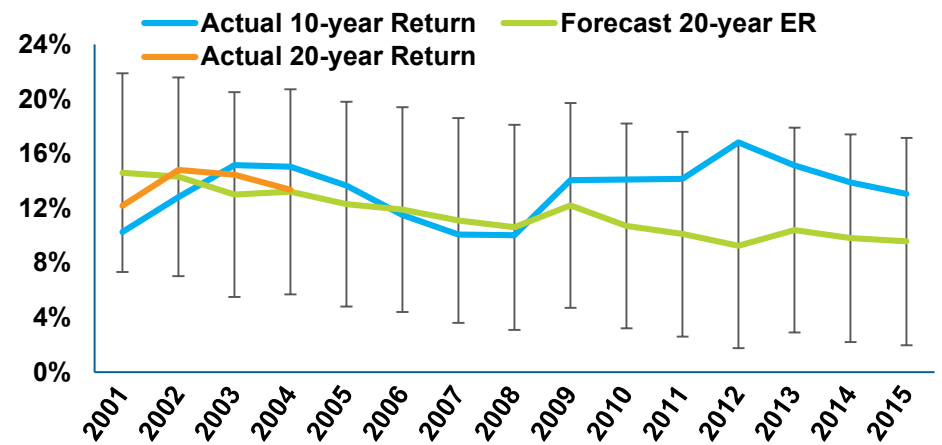
### EAFE Equity



### Emerging Markets Equity



### Private Equity



### 2024 Peer Survey

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.<sup>1</sup>
- 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	3.7	2.4	3.4	2.5
TIPS	4.4	4.3	4.3	4.7
US Core Bonds	4.9	4.6	4.9	4.8
US High Yield Bonds	6.1	6.5	6.4	6.8
Emerging Market Debt	6.2	6.3	6.3	6.2
Private Debt	8.3	9.2	8.4	9.2
US Equity (large cap)	6.5	6.9	7.0	8.5
Developed Non-US Equity	7.1	7.7	7.5	8.9
Emerging Non-US Equity	7.7	7.6	8.2	8.9
Private Equity	9.1	9.9	9.7	11.2
Real Estate	6.1	6.3	6.2	8.0
Infrastructure	7.3	7.4	7.4	9.0
Commodities	4.9	4.9	5.0	5.3
Hedge Funds	5.9	4.5	6.2	5.8
Inflation	2.4	2.4	2.4	2.8

<sup>1</sup> The 10-year horizon included all 41 respondents to the survey, and the 20-year horizon included 26 respondents. Figures are based on Meketa’s 2024 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:

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

$$\text{Price Return} = \text{Earnings Growth} + \text{Multiple Effect}$$

→ We use the current dividend yield on the respective index.<sup>1</sup>

→ 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).

$$\text{US Equity } E(R) = 1.3\% + [(1 + 6.4\%) \times (1 - 1.2\%) - 1] = 6.4\%$$

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

<sup>1</sup> 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.<sup>1</sup>
  - 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
Historical Growth in EPS per 1% Growth of GDP <sup>2</sup>	4.6%	2.5%	1.2%
Estimated % of Growth Translating to EPS	130%	85%	70%

<sup>1</sup> We constructed 5-year GDP based on the IMF World Economic Outlook as of October 2024 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 2024, historical averages and 5-year Inflation swaps maturing 5 years from now where available (e.g., US, Euro Area, UK).

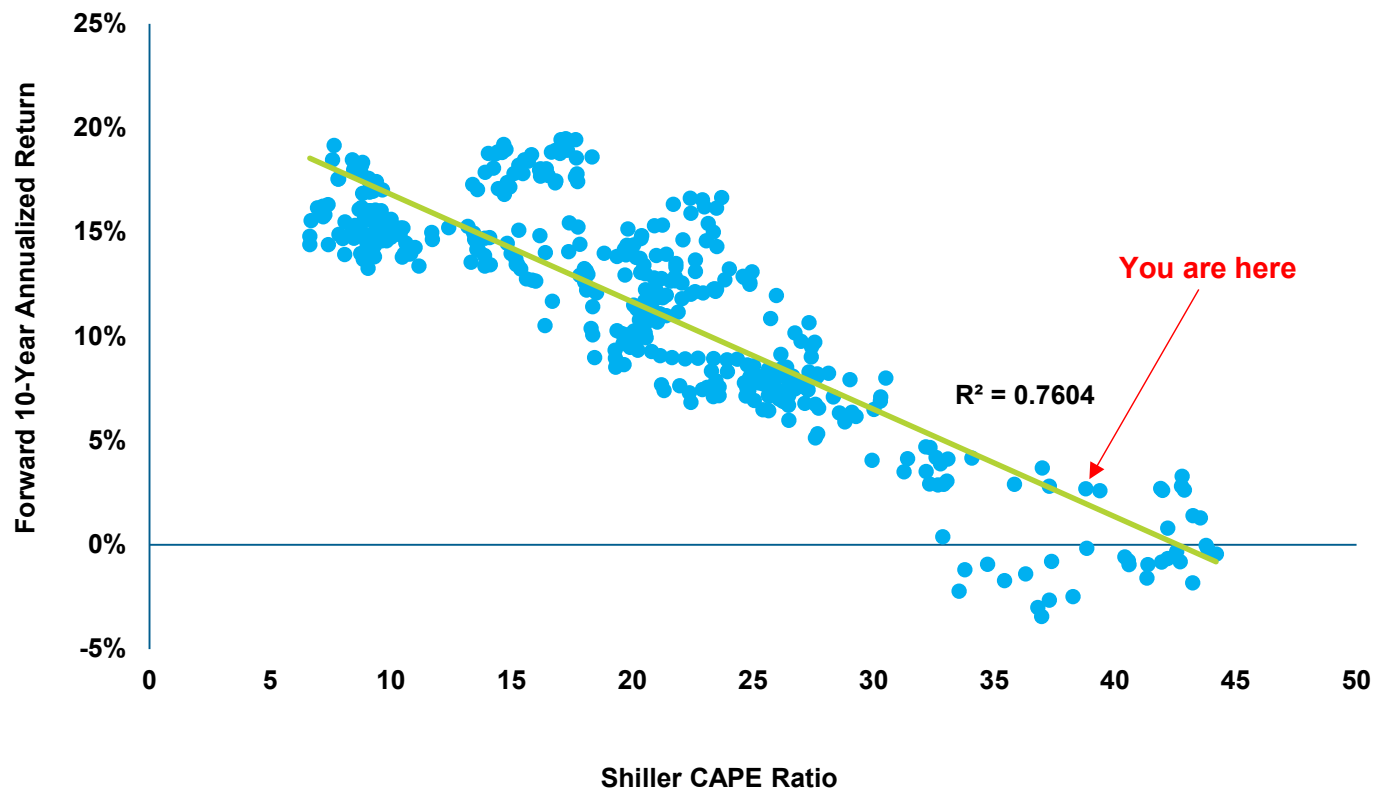
<sup>2</sup> Meketa analysis of data from the IMF and Bloomberg. EAFE estimated as the combined GDP of the Euro Aea, Australia, Japan, and Switzerland. Linear regression conducted on earliest available date (1992 for US, 1996 for EAFE, 2001 for EM) through year-end 2024.

## 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 2024.

## Equities: Valuation Model 1

- 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<sup>1</sup> 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	341.3	187.4	92.4	19.7	86.6	61.9

- 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.<sup>1</sup>

$$US\ Price\ Target = 341.3 \times 27.6 = 9,407$$

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

$$US\ Price\ Return = (9407 \div 5882) ^ {1/10} - 1 = 4.8\%$$

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

$$Multiple\ Effect_{Model\ 1} = 4.8\% - 6.4\% = -1.6\%$$

<sup>1</sup> 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

- 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.

$$US\ EPS = 238.7 \times (1 + 6.4\%)^{10} = 444.4$$

- We multiply EPS by our projected PE ratio<sup>1</sup> to arrive at a ten-year price target.<sup>2</sup>

$$US\ Price\ Target = 444.4 \times 19.1 = 8,497$$

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

$$US\ Price\ Return = (8497 \div 5882)^{1/10} - 1 = 3.7\%$$

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

$$Multiple\ Effect_{Model\ 2} = 3.7\% - 6.4\% = -2.7\%$$

<sup>1</sup> 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.

<sup>2</sup> 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.

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

- 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.<sup>1</sup>

$$\text{US Implied Discount Rate} = 4.6\% + 5.5\% = 10.1\%$$

→ The fair value can be calculated as:

$$\text{Fair Value}_{\text{Model 3}} = 166.5 \times (1 + 6.4\%) \div (10.1\% - 6.4\%) = 4,768$$

$$\text{Fair Value}_{\text{Model 4}} = 238.7 \times (1 + 6.4\%) \div (10.1\% - 6.4\%) = 6,836$$

→ 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.

$$\text{Multiplier Effect}_{\text{Model 3}} = 0.75 \times [(1 + (4768 - 5882) \div 5882)^{(1/10)} - 1] = -1.6\%$$

$$\text{Multiplier Effect}_{\text{Model 4}} = 0.75 \times [(1 + (6836 - 5882) \div 5882)^{(1/10)} - 1] = 1.1\%$$

<sup>1</sup> We use the historical discount rate as a starting point, but projected discount rates can vary. For example, in 2025 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 (%)
-1.2	0.2	-1.0	-0.8	-0.8

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.<sup>1</sup>
    - IRP posits that money will flow to the currency with the higher interest rate.<sup>2</sup>
  - 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	1.9%	-1.6%	-0.2%	-0.2%
EM	7.1%	0.7%	5.5%	0.5%
Global	1.3%	-0.3%	0.1%	0.1%
China	3.6%	-0.3%	2.7%	0.5%

<sup>1</sup> Sources for PPP data: World Bank (PPP Conversion Factor) and The Economist (Big Mac Index).

<sup>2</sup> We use the central bank discount rate or equivalent for the major countries of each region (source: FRED).

## 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 1.1x faster for midcap, 1.15x faster for small cap, and 1.2x faster for microcap (this is subjective and decreasingly consistent with their respective relationships since 1978).
  - We multiply EPS by our projected PE ratio<sup>1</sup> 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.

<sup>1</sup> 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:  $E(R) = \text{current yield to worst}$ .
- 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	1.86	0.34	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 and recovery rate roughly the same as for bank loans.
    - These are subjective, as we do not have access to any long-term data on private credit defaults.
  - 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 15-20%).
  - 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	35	7.6
Asset Based Lending	35	9.3
Special Situations	30	9.4
Private Debt Composite	NA	8.7

## 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 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 1.3x - 1.5x.
- 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.

<b>Component</b>	<b>Weight (%)</b>	<b>10-Year E(R) (%)</b>
Buyouts	65	9.5
Growth Equity	10	10.1
Venture Capital	25	10.4
Private Equity Composite	NA	9.8

## 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.
  - Value-added leverage ranges 50-70% while opportunistic ranges 60-80%.
  - 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 typically use the same default rate as high yield bonds.
      - In 2024, we increased the projected default rate and loss rate given market conditions.
  - 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.
  - REITs have yielded 1.7% more than 5-year Treasuries since 1990.
  - REITs have historically yielded 1.1% less than Baa corporate bonds 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 (%)
3.9	-9.3	-3.0

- 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	5.5
Value-added RE	25	8.4
Opportunistic RE	10	9.5
High Yield RE Debt	10	9.8
Private Real Estate	NA	7.0

→ 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.<sup>1</sup>
  - 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	21.4	19.2	19.4	16.1	22.0
Price Adjustment	1.3%	6.3%	6.0%	13.5%	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.

$$E(R) = 6.8\% + 0.8\% = 7.6\%$$

<sup>1</sup> 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 4-6% 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 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.
  - Core levered at 1.7:1, non-core at 1.5:1
  - Cost of debt for non-core is similar to buyouts, while the cost for core is slightly lower.
- 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.

<b>Component</b>	<b>Weight (%)</b>	<b>10-Year E(R) (%)</b>
Core Infrastructure	50	6.2
Non-Core Infrastructure	50	8.2
Private Infrastructure	NA	7.2

- 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	EBITDA	P-B
S&P Global NR vs. S&P Global BMI	34%	37%	52%
S&P North American NR vs S&P 500	28%	46%	76%

- 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 PE	Avg. PE	Current P-B	Avg. P-B	Current EV/EBITDA	Avg. EV/EBITDA
MSCI Australia Small Met/ Min	12.3	12.9	2.2	2.3	6.6	6.2
S&P TSX Diversified Met /Min	21.6	23.3	1.6	1.1	10.7	8.1

- We add a control premium (as these 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	50%	20%	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
\$1,448	\$1,665	8%

- 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.
- We assume that income will be consistent with its trailing 10-year average of 2.7%.
- We add a non-US component (with a premium) and a currency effect.
  - We assume ~25% ex-US exposure (e.g., Latin America and Australasia).
- We lever the portfolio 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.<sup>1</sup>
  - We then adjusted these prices for inflation and derived a long-term average.

	Current Price/Acre (\$)	Inflation-Adjusted Average (\$)	Price Adjustment (%)
Farmland	4,170	2,575	-29
Cropland	5,570	4,111	-26

- 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.
- We assume that income will be consistent with its trailing 10-year average of 3.8%.
- 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 lever the portfolio at 1.6:1 and then subtract the cost of borrowing.
- Finally, we subtract estimated management fees and carried interest.

<sup>1</sup> 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	3.6
Sustainability	20	8.6
Energy	35	8.8
Mining	15	8.3
<b>Aggregate Private Natural Resources</b>	<b>NA</b>	<b>7.4</b>

→ 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, and the expected return will be very close to our expected inflation rate.
- 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:

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

- The collateral yield represents our expected return from cash.
- The roll return should vary based on how backwardated or contangoed 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 than historical number (2.1%) since correlations among commodities have risen since the academic research was originally conducted.<sup>1</sup>

$$E(R) = 2.8\% + 0.1\% + 0.5\% + 2.1\% = 5.5\%$$

<sup>1</sup> 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 2.6%) as risk parity strategies tend to be more broadly diversified.
  - We lever the portfolio 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<sup>1</sup>:
  - Traditional betas:
    - Equities, distressed debt, credit, commodities, bonds
  - Alternative betas:
    - 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.

$$\text{Gross } E(R) = 0.6 * 6.6\% + 0.4 * 2.8\% = 5.1\%$$

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

<sup>1</sup> 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	3.1
Event-Driven	11	5.1
Global Macro	16	4.5
CTAs	7	3.4
Fixed Income/L-S Credit	24	4.9
Relative Value/Arbitrage	10	4.9
Aggregate Hedge Funds (net)	NA	4.2

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.<sup>1</sup>
  - 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%

<sup>1</sup> Note that we combine long-term government bonds and long volatility strategies to form the “first responders” category.

## Digital Currencies

- This model is quite different than our others, as cryptocurrencies do not derive value from income, some future stream of cash flows, or a risk premium.
- The model assumes that cryptocurrencies garner their value from taking advantage of speculative asset pricing.
- Using the price and volume of bitcoin, we create two sets of expected buy and sell values for two pricing bubbles based on two separate selling behaviors.
  - 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 the 10-year horizon assumption.

## Risk Parity

- To build our risk parity model we used 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	2.2	8
Commodities	14	1.0	17
Currencies	20	0.8	12
Interest Rates	23	1.4	10
<b>Aggregate Risk Parity (gross)</b>	<b>NA</b>	<b>6.6</b>	<b>NA</b>

- We subtract estimated management fees as there is no passive option.

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	6.4
EAFE Equities	12	7.2
EM Equities	8	7.1
Commodities	5	5.5
Cash	5	2.8
Investment Grade Bonds	15	4.9
TIPS	5	4.3
Foreign Bonds	5	2.4
EM Debt	5	6.3
High Yield	5	6.3
Bank Loans	5	6.3
<b>Aggregate TAA (gross)</b>	<b>NA</b>	<b>5.8</b>

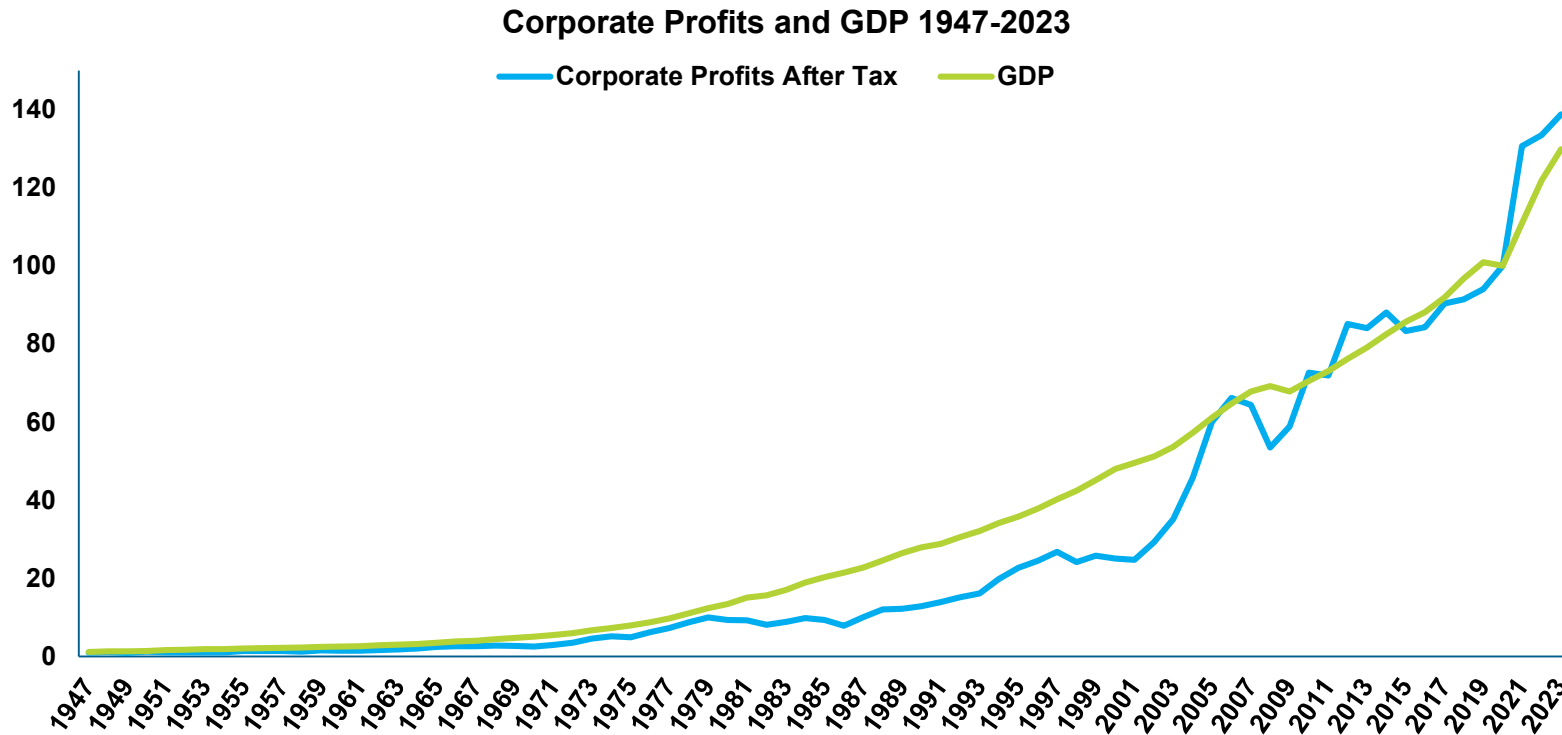
→ We subtract estimated management fees as there is no passive option.

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

**Long-Term Theme:  
The Sustainability of US Earnings**

## The Long-Term Link Between Profits and GDP

- There is an intuitive appeal to the idea that long-term earnings growth is linked to economic growth.
- Corporate profitability is based on factors such as consumption, investment, and spending that are the key ingredients of economic growth.
- Indeed, growth features in the discounted cash flow formula commonly used by investors to calculate the present value of a stock (or any asset).

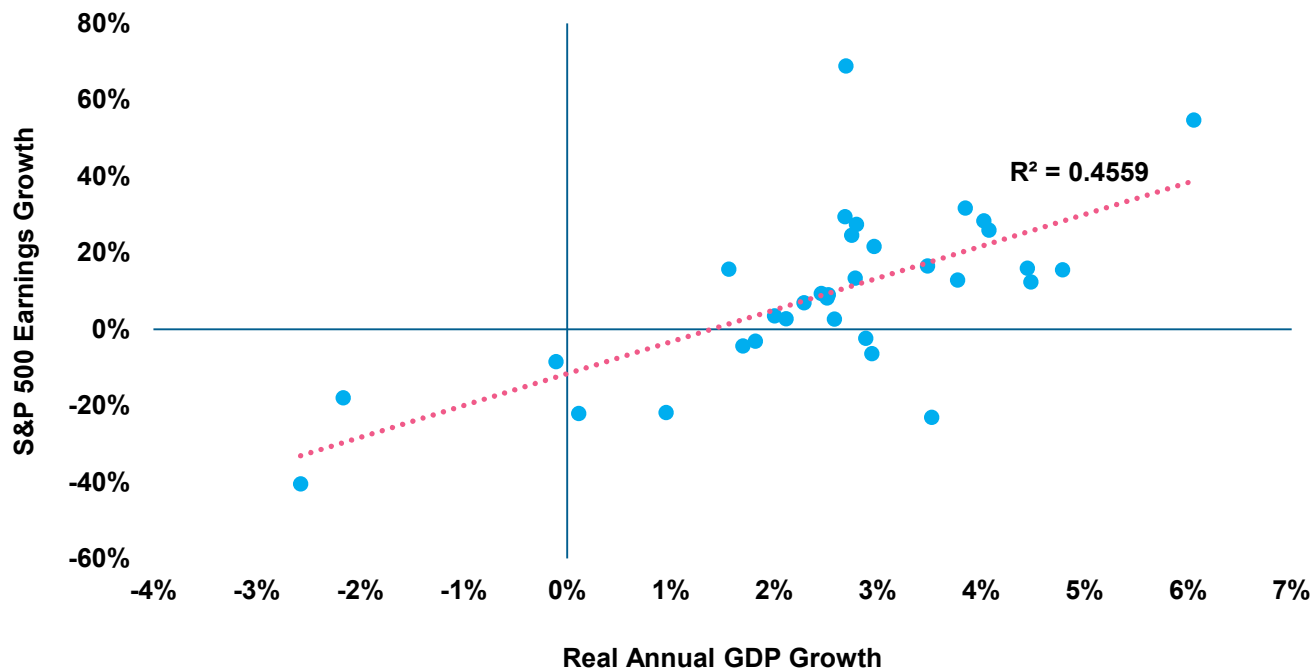


Source: Meketa analysis of FRED data as of December 2023. US annual GDP and corporate profits indexed annual growth to March 2020. Corporate profits include both private and publicly traded companies as calculated by the Bureau of Economic Analysis.

## The Long-Term Link Between Profits and GDP

- There appears to be a relationship between economic growth and earnings growth, at least in the US.
- Since 2000, there is a clear positive correlation between the earnings growth of S&P 500 companies and real GDP growth.
- The r-squared value of 0.456 implies that while economic growth is partly responsible for earnings growth, it is far from the full story.

**S&P 500 Earnings Growth and US Real Economic Growth Relationship**

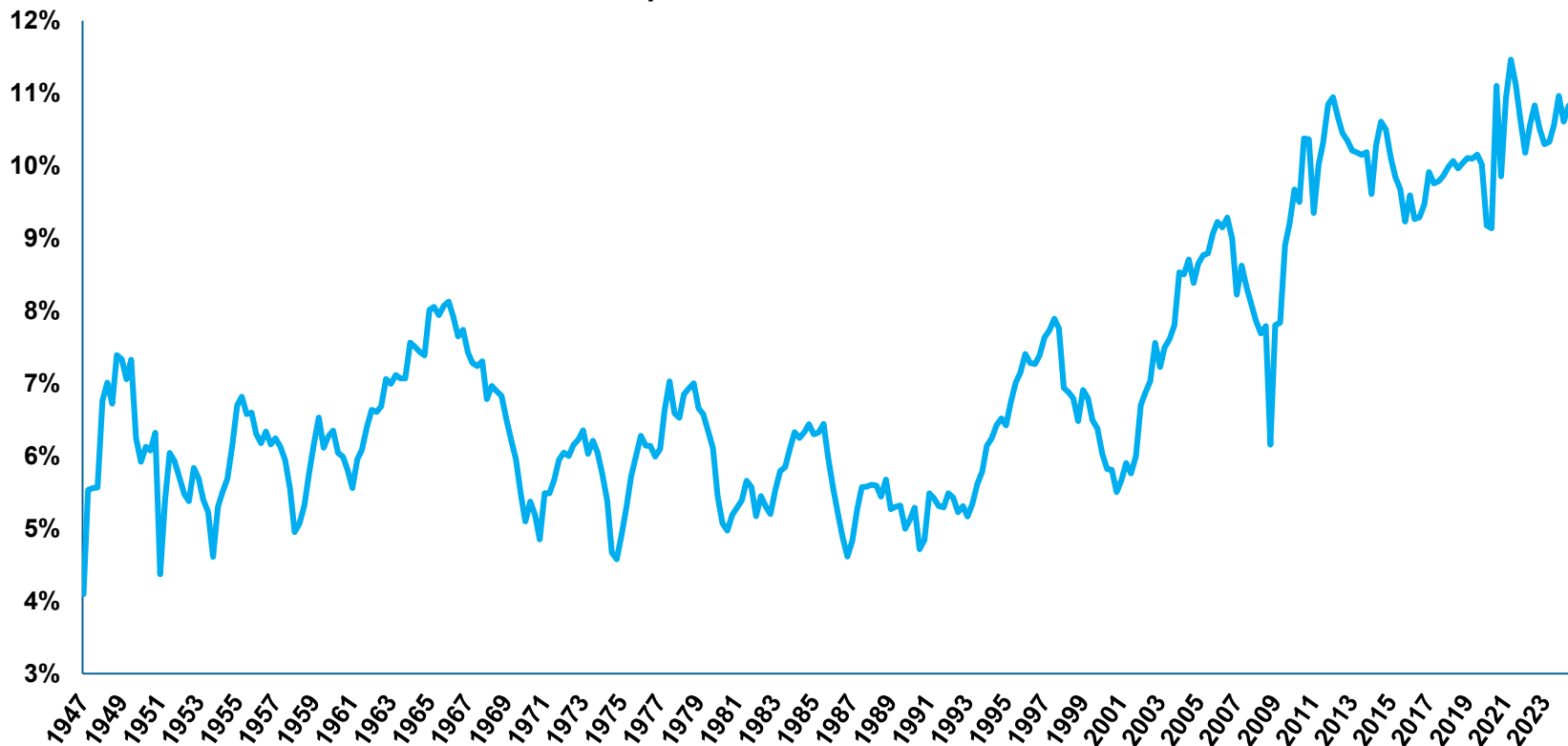


Source: Meketa analysis of FactSet and FRED data as of December 2023.

## US Profitability

- In the US, corporate profits have grown considerably faster than the broader economy since the 1990s.
- This is coincident with profits consuming a greater proportion of the economic pie.
  - Since 2000, corporate profits averaged 9.1% of GDP, vs 6.1% prior to that.

**Corporate Profits as a % of GDP**



Source: Meketa analysis of FRED data. Series uses Seasonally Adjusted Annual Rate for Nominal GDP and Corporate Profits After Tax with Inventory Valuation Adjustment (IVA) and Capital Consumption Adjustment (CCAdj). Data is from 1Q1947 through 3Q2024.

### Recent Corporate Profits

→ The strong growth in US earnings since 1990 is linked in part to profits consuming a greater proportion of the economic pie.

#### Growth of US GDP, Corporate Earnings, and EPS

	US Nominal GDP Growth Per Annum	US Corporate Earnings Growth Per Annum	S&P 500 EPS Growth Per Annum
Since 1990	4.8%	7.0%	6.9%
Since 2010	4.9%	5.6%	9.7%

→ This begs the question of why US corporate profits have grown faster than the broader economy (as well as other markets), and more importantly, whether this is sustainable.

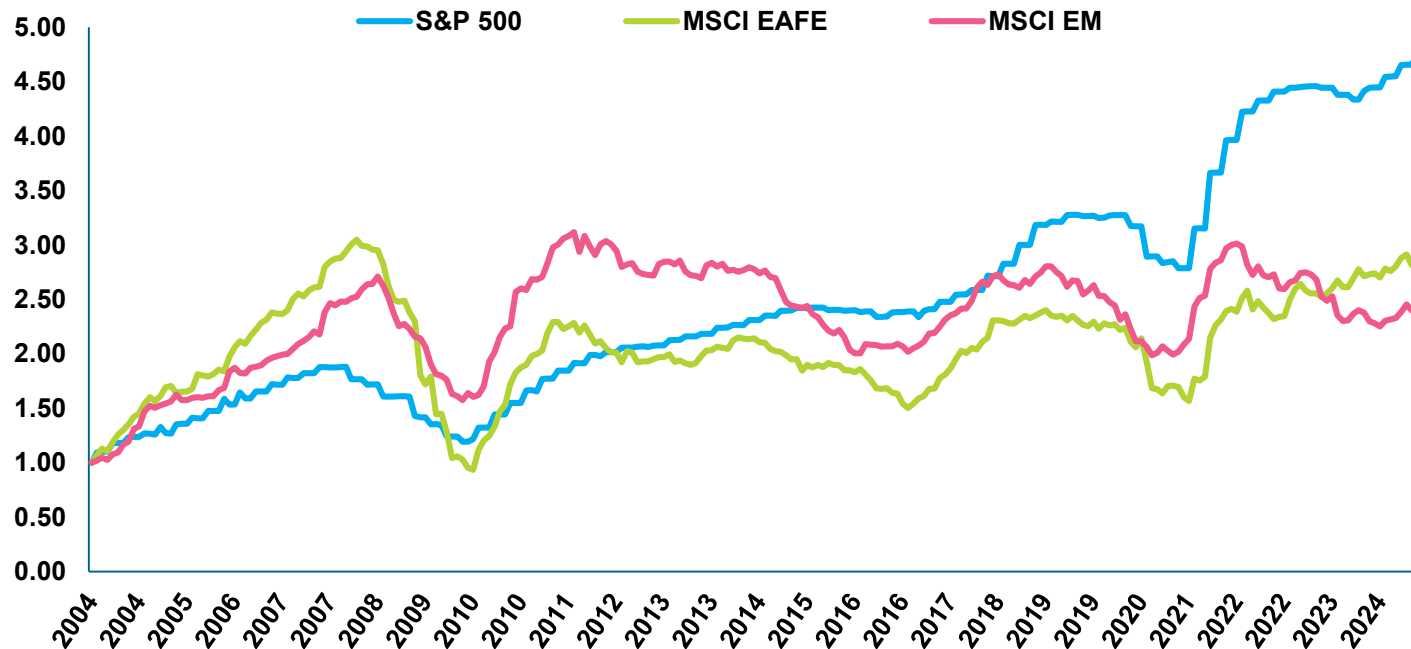
- Justifying higher future earnings growth implies that profits will continue to comprise a higher percentage of GDP.

Source: Federal Reserve Economic Data, S&P. Corporate earnings defined as Corporate Profits After Tax (with IVA and CCA<sub>adj</sub>). Seasonally Adjusted Annual Rate for Nominal GDP. Data is as of September 30, 2024.

## EPS Growth

- EPS growth for the EAFE and Emerging Markets indices has been essentially zero since 2011.
  - Meanwhile, US EPS growth has been strong over the past two decades.
- There has been a meaningful difference in EPS growth for the US versus other global markets, and it has not been due to a difference in GDP growth.

20-Year EPS Growth, Indexed to \$1



Source: Meketa analysis of MSCI and Bloomberg data. Series uses Trailing 12-month earnings per share in local currency. As of December 31, 2024.

## Reasons Why Profitability May Decouple from GDP Growth

- There are several reasons why profits have likely comprised a higher (or lower) percentage of GDP:
  - The global footprint of companies
  - Market composition
  - Technological advancements
  - Labor market dynamics
  - Government policies
  - The level of interest rates
- In addition, EPS can decouple from earnings.
  - Net issuance vs buybacks affects EPS.
- The question is to what extent some or all of these explanations will remain in place.



## A Global Footprint

- Many large corporations (i.e., most of the biggest publicly traded companies) operate internationally, allowing them to generate significant revenues and profits from overseas markets.
  - For example, the companies in the MSCI USA index derived an estimated 38.3% of their revenues from outside the US in 2024.
- Many of these companies expanded to international markets in the hope of taking advantage of faster growth in the target market for their product or service.
- Hence, exposure to faster-growing economies (e.g., many emerging markets countries) could help boost US profits to grow faster than US economic growth alone would allow.

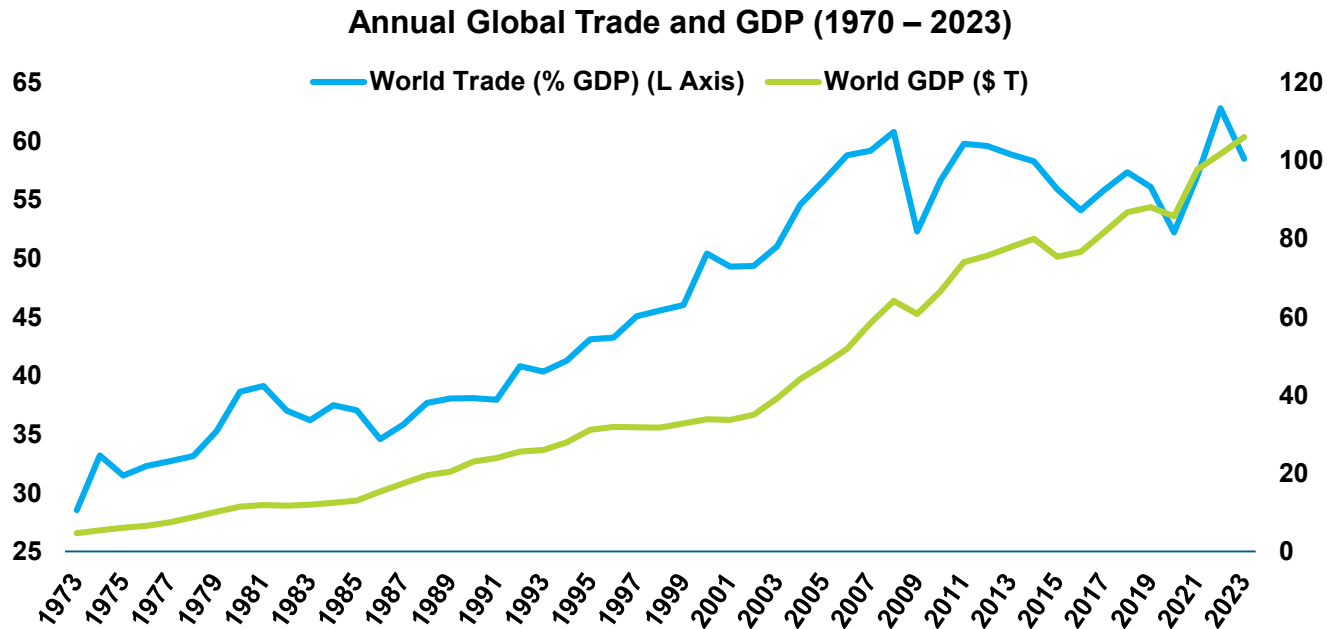
Revenue Source for the Stock Market

	% Revenues from US	% Revenues from EAFE	% Revenues from EM	% Revenues Frontier
MSCI USA	61.7	17.1	19.6	1.6
MSCI EAFE	22.9	52.9	22.1	2.0
MSCI Emerging Markets	14.8	7.9	76.0	1.2

Source: Meketa analysis of data provided by MSCI as of December 31, 2024.

## Shifting Winds in Global Trade

- Starting around 1990, the world experienced extraordinary growth in trade as countries adopted trade liberalization policies.
- Global trade grew from 20% of global GDP in 1970 to a peak of over 50% in 2008.
  - However, it has since plateaued and appears to be declining.
- As a result, the share of profits for US-based companies coming from outside the US may have peaked.
- Hence, the tailwind of expanded global trade has likely faded and may even be turning into a headwind if the world continues on its recent path of deglobalization.

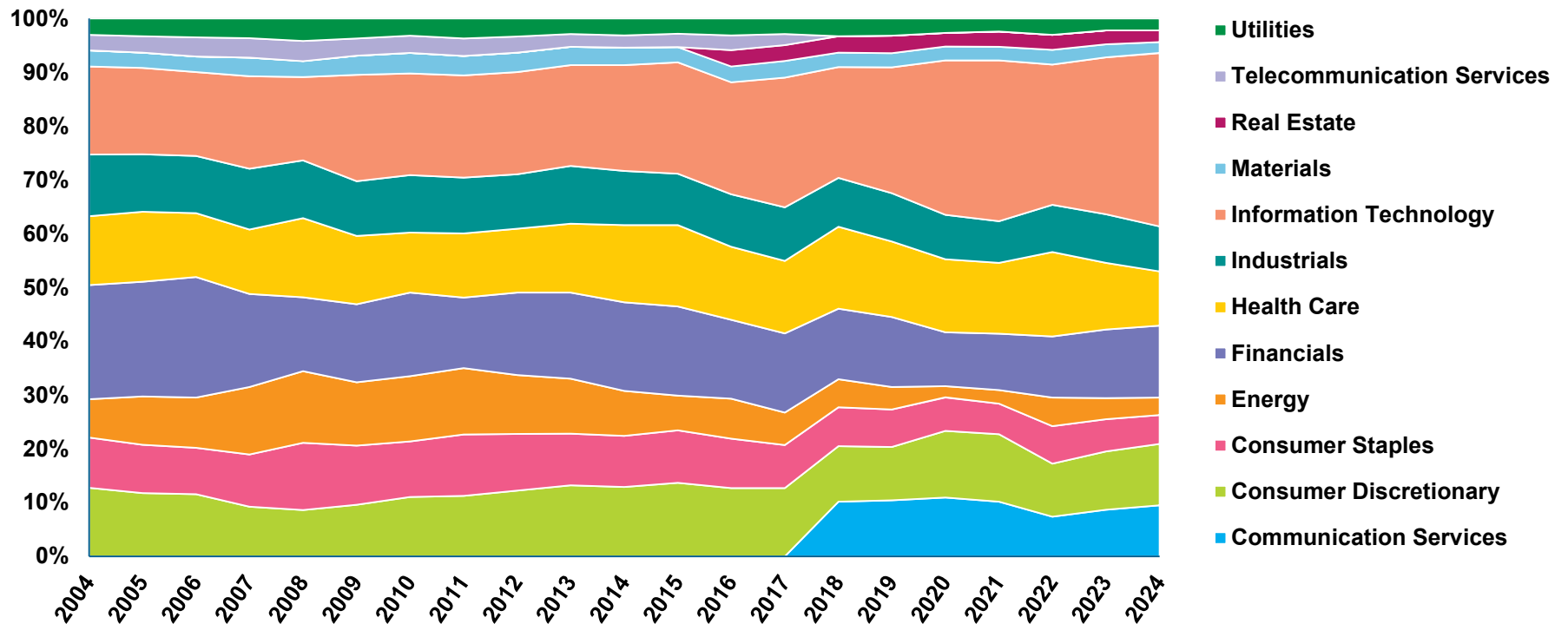


Source: World Bank, as of December 2023. World trade shown in current US dollars.

## Market Composition

- The composition of the US stock market is constantly evolving.
- At any point in time, it is often led by those companies that are driving change in the economy, from the railroad stocks of the late 1800s to the AI-related stocks of today.
- In the last two decades, it has become increasingly concentrated in the information technology sector.

MSCI USA Historical Sector Weightings

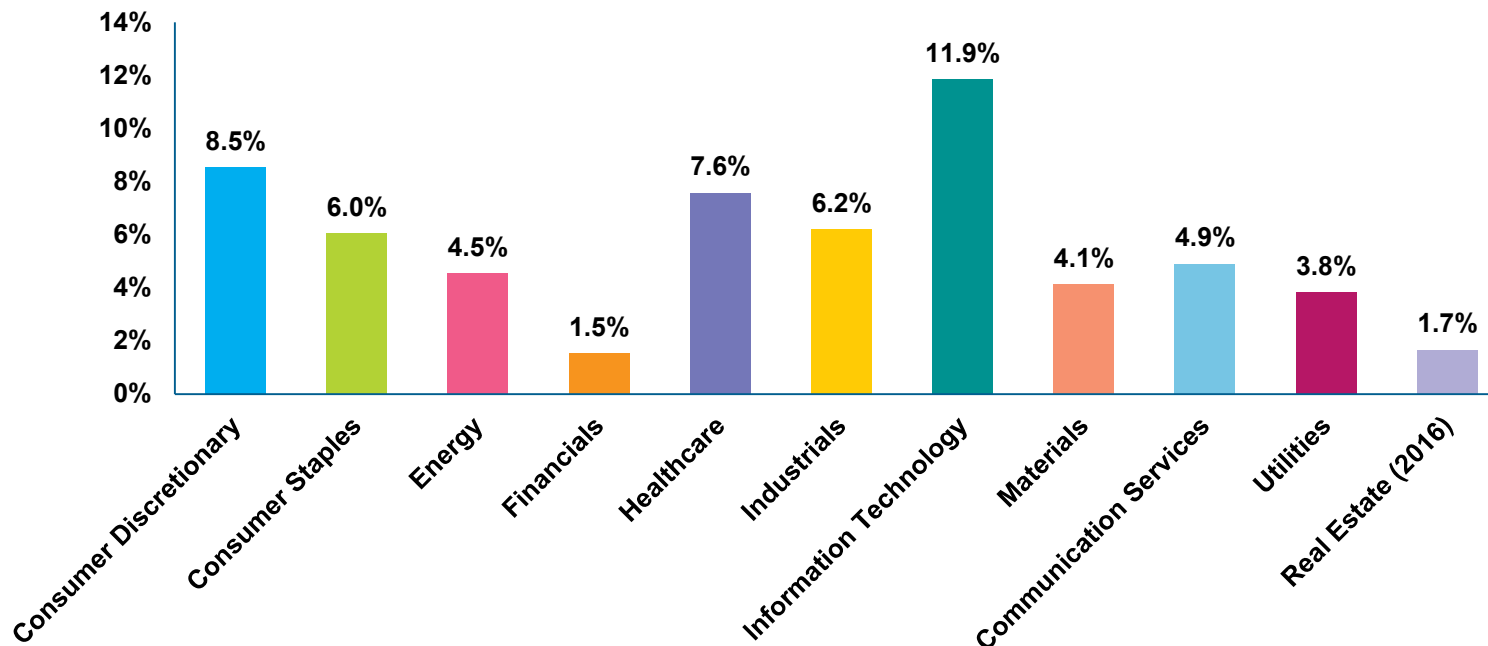


Source: MSCI as of December 2024. In 2017, the Communications sector was created from the telecommunications sector and some social media companies. And in 2017, Real Estate sector was introduced to the index

## Market Composition, continued

- This evolution in sector composition is important as different sectors have exhibited varied earnings growth profiles.
- For example, the two sectors that have exhibited the highest earnings growth since 2000 are now the two largest sectors in the S&P 500.
- If these sectors continue to grow faster than the rest of the market, their larger weighting supports the concept of the equity market growing faster than the broader economy.

Annualized Average US Earnings Growth by Sector

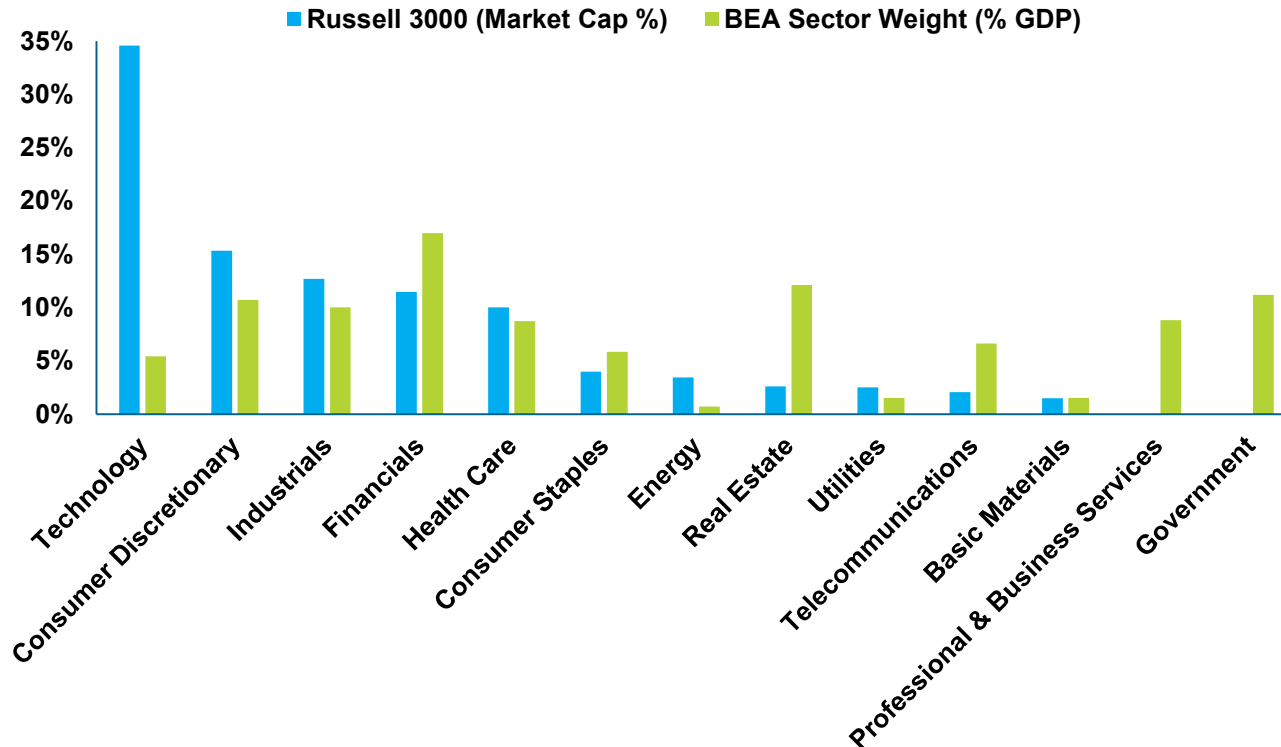


Source: MSCI USA index. Data as for the twenty years ending December 2024. Real estate established in 2016 and showing since inception return. Note that Meta and Alphabet were moved to communication services in 2016..

## Market Composition (continued)

- Just as important as the changes in the composition of the equity market are the differences between the stock market and the broad economy.
- For example, IT comprises a substantially larger portion of the stock market than it does of US GDP.

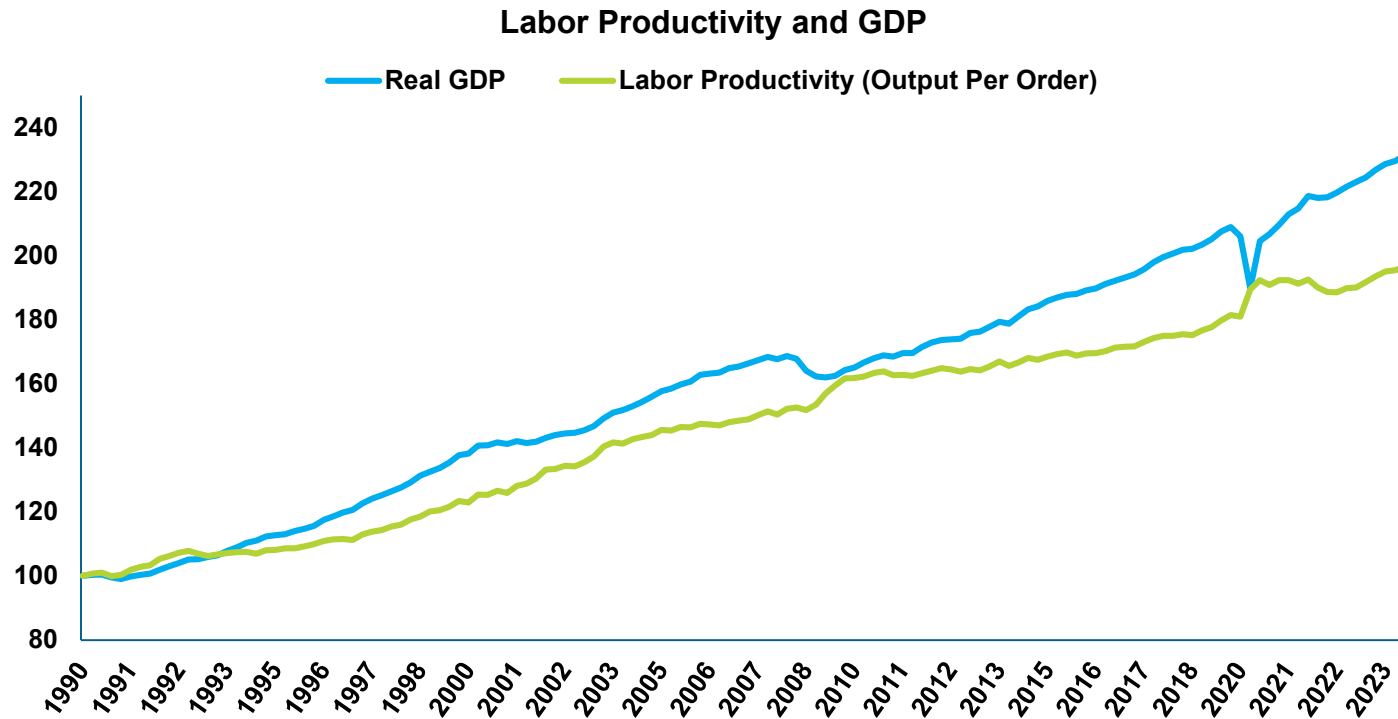
Composition of US Equity Market vs US GDP by Sector



Source: Russell 3000 index fact sheet as of December 2024. Bureau of Economic Analysis as of September 2024. For GDP analysis at the sector level, the BEA uses the 'valued added' approach to GDP calculation. Meketa estimated weights for BEA sectors into GICS sectors.

## Profitability and Productivity

- Productivity is a driver of growth at both the macroeconomic and microeconomic levels.
- Increases in labor productivity, for example, mean that more output is produced per hour worked, which directly contributes to GDP growth.
- Likewise, improvements in total factor productivity, often driven by technological advancements and innovation, can lead to significant increases in GDP.



Source: FRED. Data is for the period 1990 through 3Q2024.

## Profitability, Productivity, and Labor Market Dynamics

- Companies that can increase output without a corresponding increase in labor costs will enjoy higher productivity, leading to higher profits.
  - At the macro level, the economy has shifted such that labor has less pricing power.
  - As a result, a smaller share of economic gains goes to labor, while a larger share goes to corporate profits.
- The decreasing share of union workers in the workforce may be both a measure of and cause of this.
  - This decline is due to a number of factors, including the decrease as a % of the economy of heavily unionized industries like manufacturing, mining, and transportation.
  - As these industries have shrunk in relative terms, the economy has shifted towards sectors with traditionally lower unionization rates, such as services and technology.
  - The offshoring of manufacturing and other “low skill” jobs, as well as the automation of much of those industries, has also played a part.
  - More recently, the rise of the gig economy represents yet another area where labor has limited pricing power.

## Profitability, Productivity, and Scale

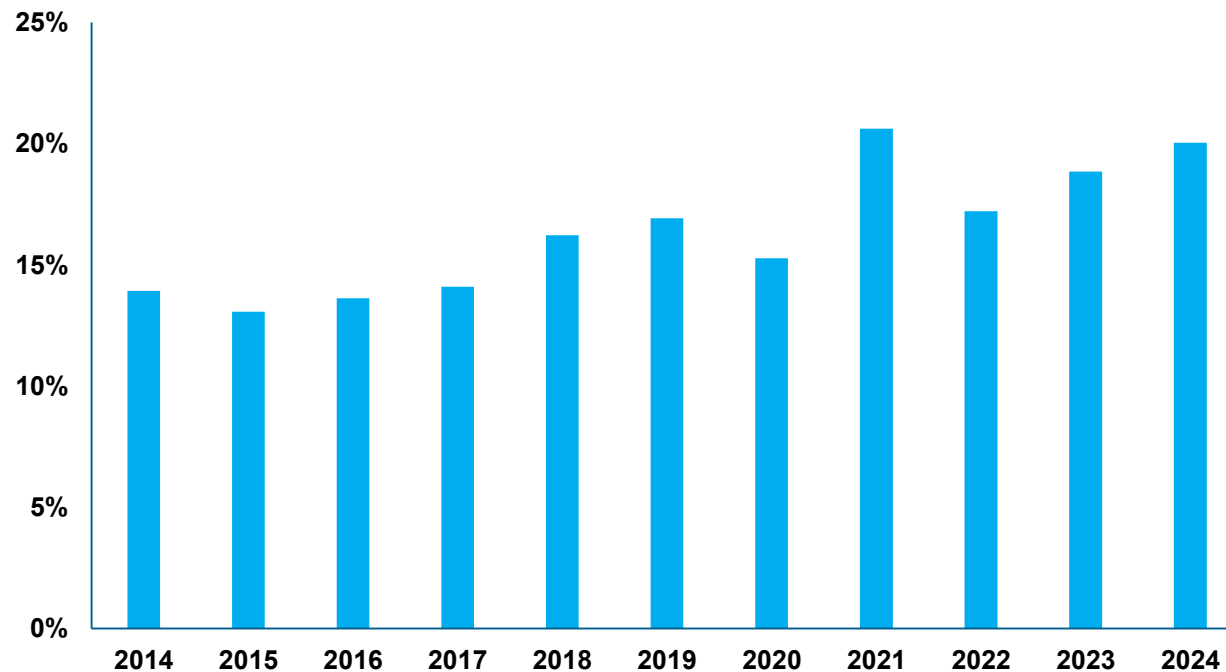
- Productivity can also be driven by economies of scale.
  - For example, companies in the tech sector, particularly those involved in software development and data centers, enjoy significant economies of scale.
  - Once the initial development costs are covered, the cost of producing additional “units” (e.g., software licenses) is minimal.
  - The pharmaceutical industry benefits from economies of scale in research and development (R&D) and production.
  - High initial costs for R&D can be spread over a large volume of drug sales, reducing the average cost per unit.
- If the stock market is more heavily weighted in industries/companies that have more favorable productivity characteristics, it might help explain why the market has been able to grow earnings faster than the broader economy.
  - Indeed, industries that enjoy low comparative labor costs and high comparative economies of scale represent a disproportionate share of the stock market relative to the economy.



## Profit Margins

- Profit margins for the S&P 500 have proved to be quite steady over the past decade, even during the global pandemic.
- This implies stable pricing power on behalf of listed companies, no matter the political administration, inflationary environment, or stage of the business cycle.

S&P 500 Net Profit Margin

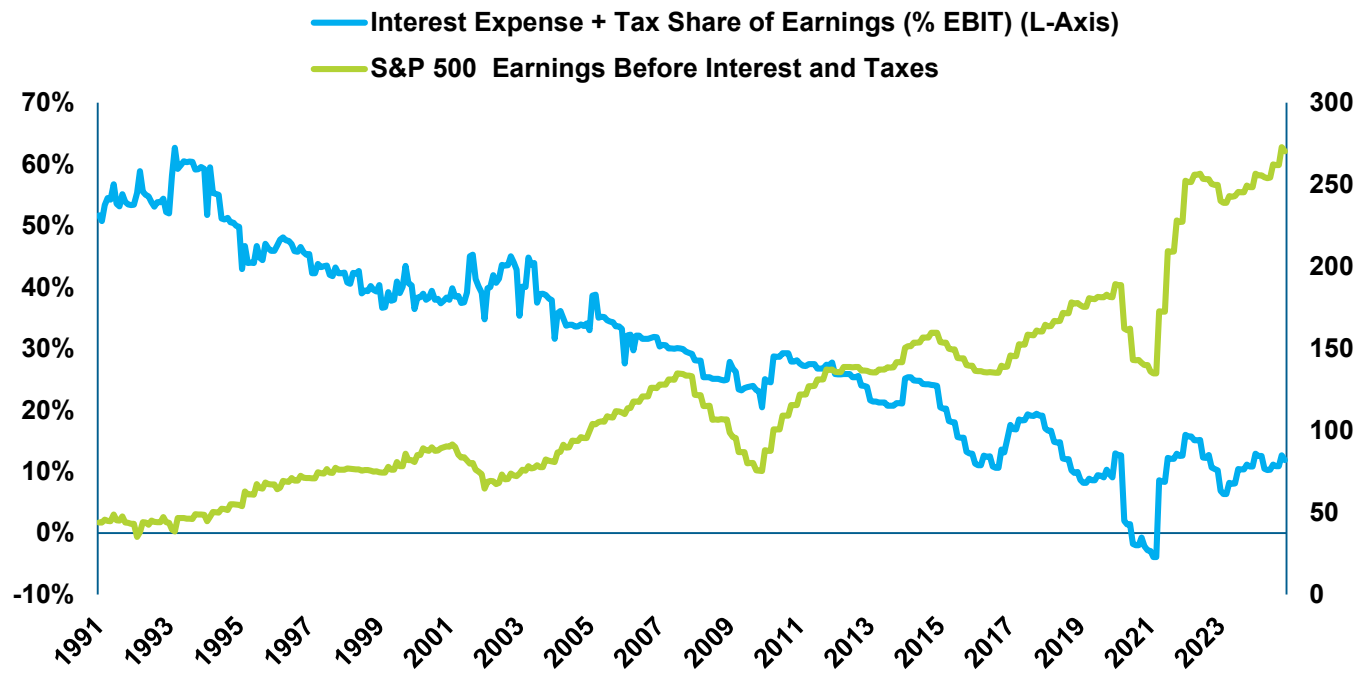


Source: FactSet as of December 31, 2024. Data pulled on January 7, 2025.

## Government Policies: Taxes and Interest Rates

- Declining effective tax rates, combined with lower interest rates, have served as a tailwind for profitability since the 1990s.
- In June of 2023, the Federal Reserve published a research note that found that between 1989 and 2019, falling tax rates and borrowing costs accounted for around forty percent of corporate profit growth.
- Indeed, corporate taxes and interest expense have fallen from around sixty percent of earnings in the early 1990s to about ten percent of earnings in 2024.

**Interest and Tax Share of S&P 500 Earnings (% EBIT)**



Source: Bloomberg as of February 2024.

## Societal Norms

- The US has a culture that encourages risk-taking, individualism, and entrepreneurial activities.
  - This is perhaps best exemplified by the venture capital industry, which is fairly unique to the US.
  - Venture capital tends to emphasize sectors that, on average, are growing faster than the broad economy, it has served as the breeding ground for many of the companies that are currently driving earnings growth in the US.
  - It is not too far-fetched to believe that the companies that will be powering earnings growth ten or twenty years in the future will come out of the US venture ecosystem of today.
- In the US, maximizing shareholder wealth has long been the primary goal of the boards and executives that run public companies.
  - Arguably, this results in companies seeking to maximize their long-term earnings per share growth.
  - However, the degree to which shareholder wealth is a primary motivation varies by market, and this changes over time.
  - For example, many European companies are focused on improving outcomes for all “stakeholders” in a company (i.e., stakeholder capitalism).

## Societal Norms (continued)

- Perhaps less benevolently, intervention by the state and structural inefficiencies such as lack of property rights or clear rule of law, may also affect earnings growth.
  - State-owned or state-controlled enterprises may pursue motives beside shareholder wealth.
  - State-backed companies may be more willing to tolerate low margins or even operate at a loss in order to achieve other strategic objectives.
  - Likewise, countries that lack clear property rights or rule of law are more likely to be subject to direct intervention by the state that can harm shareholders.
- Corruption, graft, and nepotism can affect the link between economic growth and earnings growth.
  - Capitalism, at least in theory, allows for the efficient allocation of resources and capital, as determined by the marketplace.
  - A culture where corruption is common is more likely to result in the misallocation of resources, where capital is directed from productive to unproductive uses (e.g., bribes).
  - Emerging economies tend to have the lowest scores on the global Corruption Perceptions Index published by Transparency International.
- A favorable regulatory environment can boost after-tax profits, while a high or unfavorable regulatory environment can detract them.
  - When comparing the relative ease of doing business, the World Bank finds that regulatory burdens are higher in countries with lower national income (i.e., many emerging market countries).

Source: Transparency International, Corruption Perceptions Index, 2023. The CPI measures the perceived levels of public sector corruption in countries and territories around the world.

Source: World Bank Group, "Doing Business 2020: Company Business Regulation in 190 Countries," 2020.

## Earnings Growth

- EPS has grown faster than earnings in the US in recent years, acting as a tailwind.
- This is primarily due to companies using excess cash to repurchase their shares.<sup>1</sup>

EPS with no change in shares	EPS with 2% reduction in shares
\$1,578B / 10.5M shares = \$150.3 per share	\$1,578B / 10.3M shares = \$153.2 per share EPS 2% higher

- Over ten years, this can have a significant compounding effect.

EPS with 2% reduction in shares for ten years
\$1,578B / 8.6M shares = \$183.9 per share <sup>2</sup> EPS 22% higher

- Data shows that this trend is almost two decades long.<sup>3</sup>
- This bucks the longer-term trend (still common in non-US markets) of companies being net issuers of shares.

<sup>1</sup> Buying back shares reduces the denominator in the Earnings per Share equation, thus increasing the result of the calculation. The example shown is illustrative.

<sup>2</sup> Throughout this document, numbers may not sum due to rounding.

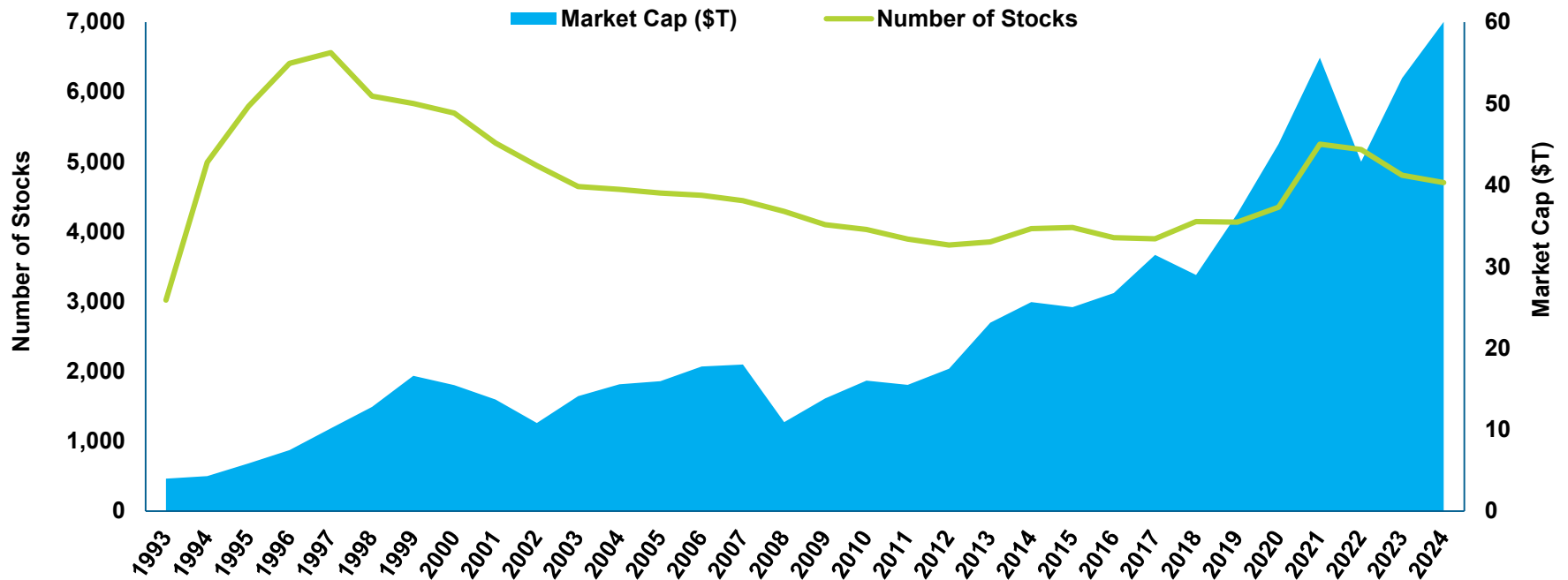
<sup>3</sup> Source: Yardeni research.

**Long-Term Theme:  
The Decreasing Number of Public Companies**

## Historical Perspective

- Throughout most of US market history, the number of publicly listed companies grew.
  - This trend peaked in 1997, when there were more than 6,500 listed companies.
- The number then declined by more 40% until reaching a nadir of just 3,800 companies in 2012.
- Market capitalization was relatively unhampered, increasing by nearly 6x to \$60 trillion in June 2024.

Number and Market Cap of US Listed Companies 1980 – June 2024

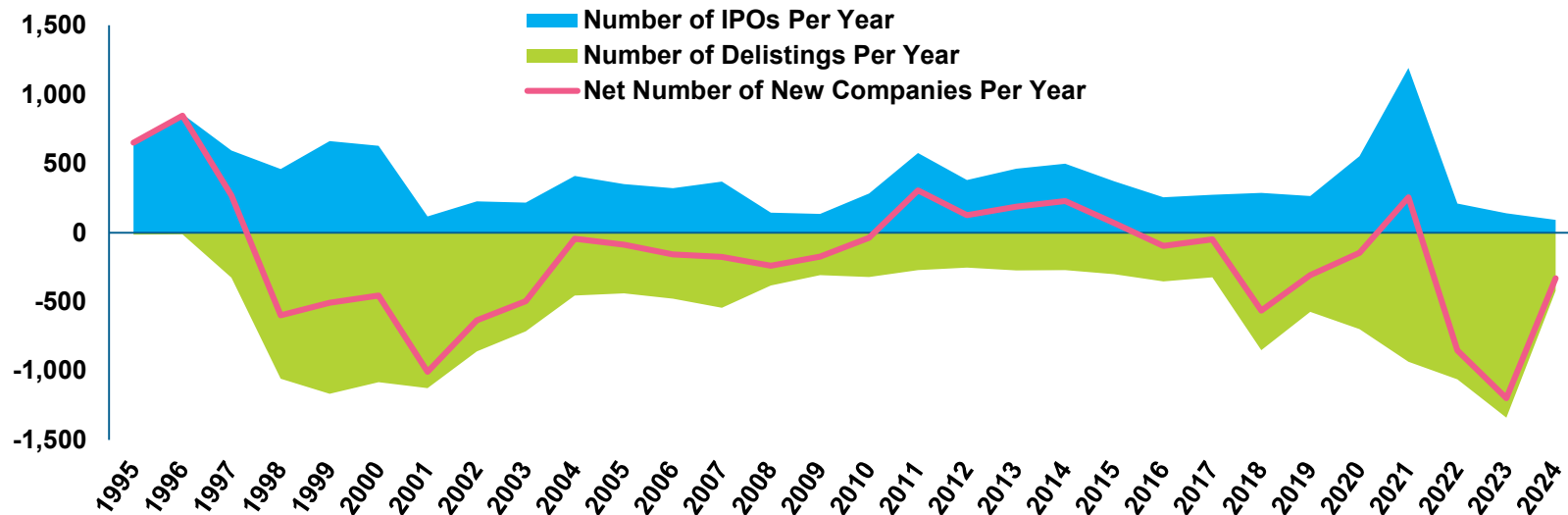


Source: Bloomberg. Stock count from NASDAQ, New York Stock Exchange (NYSE), and New York Stock Exchange American. Note that estimates of the total number of listed stocks vary. For example, data from the World Bank shows a peak of just over 8,000 stocks, while data from CRSP US Stocks Databases shows it peaking at 7,300.

## Delistings Rise as Initial Public Offerings (IPOs) Fall

- For the majority of the past thirty years, the number of net new companies has declined.
  - The number is impacted by both additions (i.e., IPOs) and subtractions (i.e., delistings).
- Delistings experienced two prolonged surges, one starting in 1997-98 and the other in 2018.
- IPOs declined from a peak in the mid 1990s, aside from a spike in 2021.
- Other developed markets (e.g., the UK) have seen similar trends of a decreasing number of public companies.
  - However, some emerging markets (e.g., China) have seen the opposite trend.

Net Changes to Number of US Listed Companies (IPOs – Delistings)



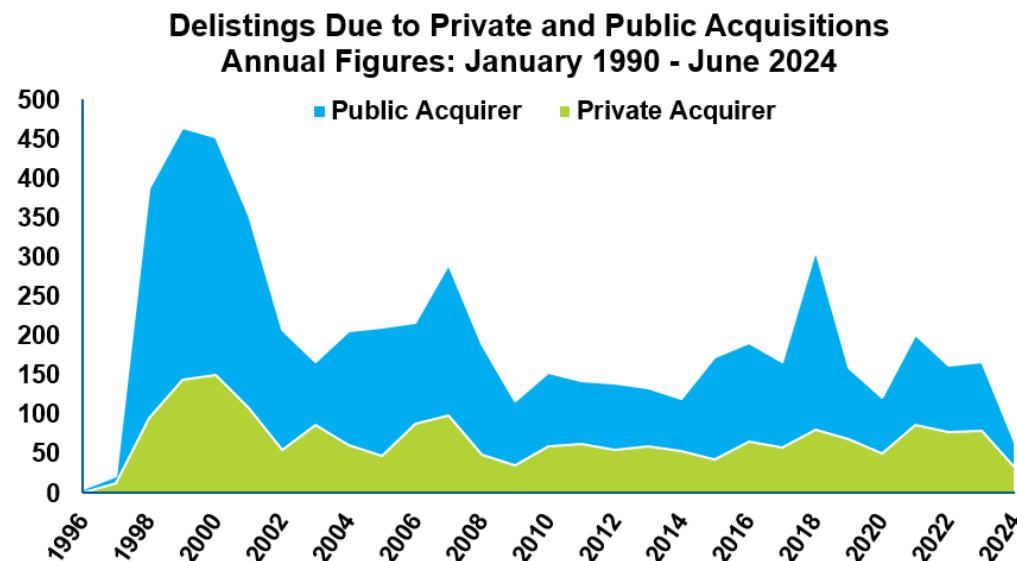
Source: London Stock Exchange as of June 2024 and Shanghai Stock Exchange as of August 16, 2024.

Source: Bloomberg data for delisting from NASDAQ, NYSE and NYSE American. Represents annual figures for 1996 through 2023 and partial year through June 2024. IPOs Data accounts only for "Primary Share Offerings," excludes "Secondary Share Offerings" and "Best Efforts." Delistings are based on delistings from NYSE and NASDAQ. "Other" reasons for delisting include reorganization, bankruptcy, liquidation, and not available.



## Delisting By Public and Private Acquisition

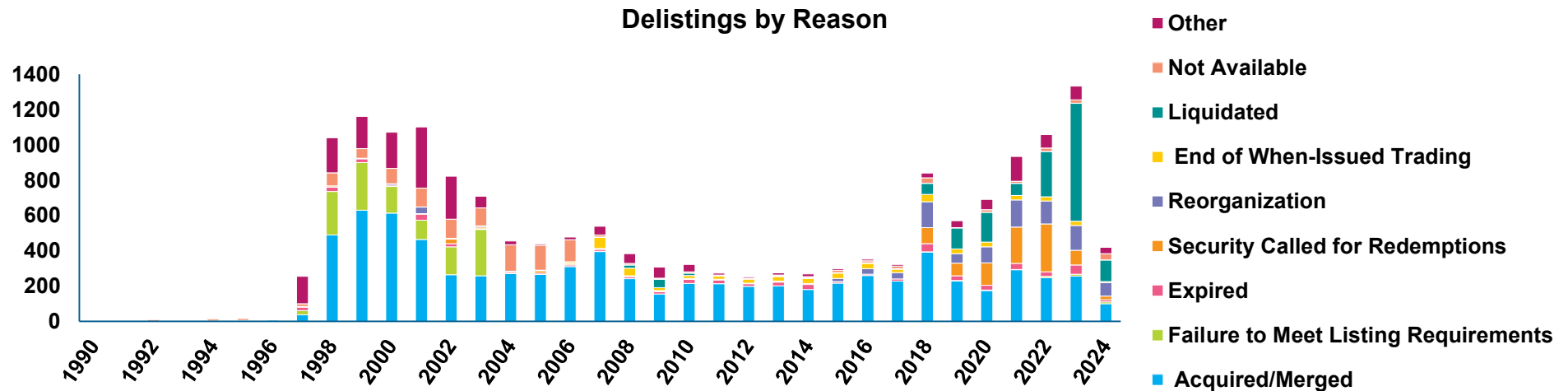
- If a company delists, shareholders may be bought out or offered new shares.
- Delistings due to M&A peaked in the late 1990s and early 2000s.
  - It has averaged ~250 companies per year since.
- Delistings due to acquisitions has been driven more by public companies' M&A activity than private companies taking public companies private.
  - When public companies acquire other public companies, investors continue to have access to the growth and revenues of the acquired companies through the merged entity.



Source: NBER Market Microstructure Meetings 2002, J. Macey et. Al., "Down and Out in the Stock Market: The Law and Economics of the Delisting Process," 2002 and updated in February 2005.  
Source: Bloomberg data as of June 2024 for NASDAQ, NYSE and NYSE American exchanges.

## Exchange and SEC Regulatory Changes

- Between 1990 and 1998, regulatory efforts to separate “penny stocks” from more valuable shares resulted in the creation of the Over-the-Counter Bulletin Board (OTCBB).
  - The number of penny stocks declined from ~6,000 to ~4,000 stocks.
- In 1996, NASDAQ increased its minimum market cap and share price requirements.
- In 2002, with the passage of Sarbanes-Oxley (SOX) regulation, all US exchanges amended their listing standards to include additional corporate governance requirements such as independent audits.
  - Between 1996 and 2002 more than 7,350 stocks delisted from US exchanges, with half of them being forced to delist for not meeting minimum asset, volume, and shareholder minimums.



Source: NBER Market Microstructure Meetings 2002, J. Macey et. Al., “Down and Out in the Stock Market: The Law and Economics of the Delisting Process,” 2002 and updated in February 2005.

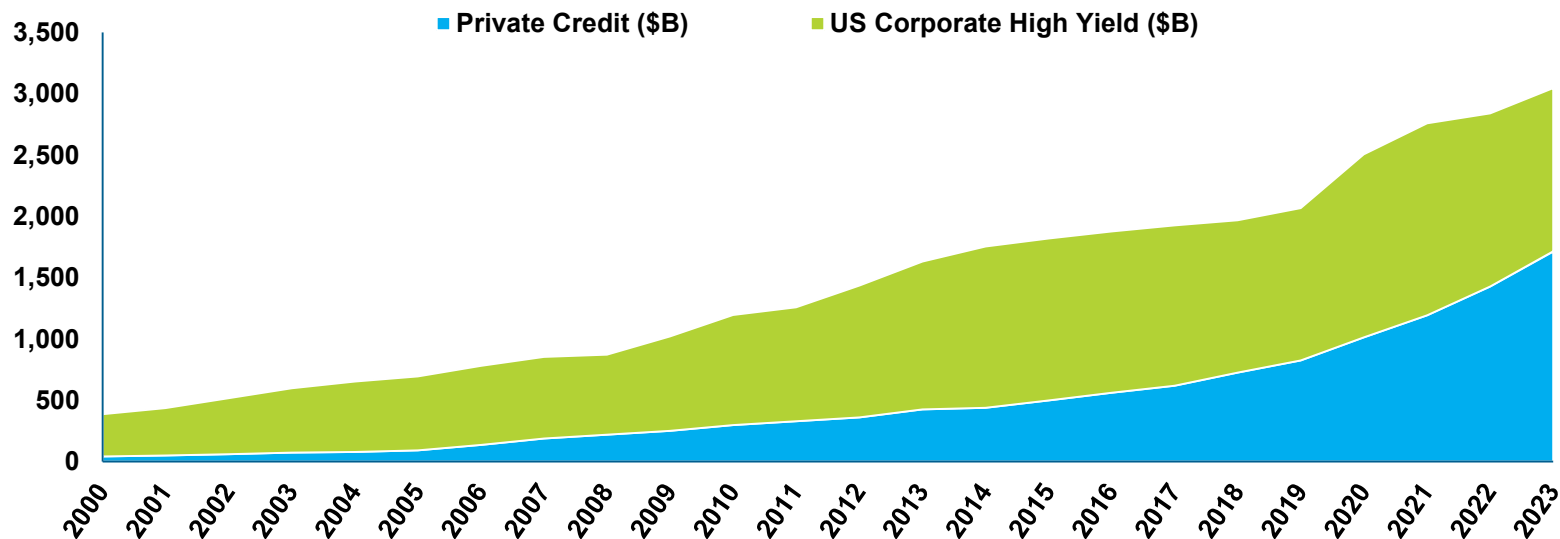
Source: Doidge, Karolyi, and Stulz, “The US listing gap,” July 2015.

Source: Bloomberg. Represents the period January 1990 to June 2024. IPOs Data accounts only for “Primary Share Offerings,” excludes “Secondary Share Offerings” and “Best Efforts.” Delistings are based on delistings from NYSE, NYSE American and NASDAQ. Chart does not include all of the reasons cited for delisting but focuses on the most often cited reasons.

## Private Equity and Shadow Banking

- In October 1996, the National Securities Markets Improvement Act (“NSMIA”) “made it easier for both private start-ups and private equity funds investing in them to raise private capital.”
- In an effort to de-risk systemically important banks and promote financial stability, Congress passed the Dodd-Frank Act in 2010.
  - As a result, many banks took a more conservative approach to lending and many companies found themselves unable to secure loans from banks.
  - Into this void stepped hedge funds, private credit funds, and other lenders, resulting in the rise of the “shadow banking” system.

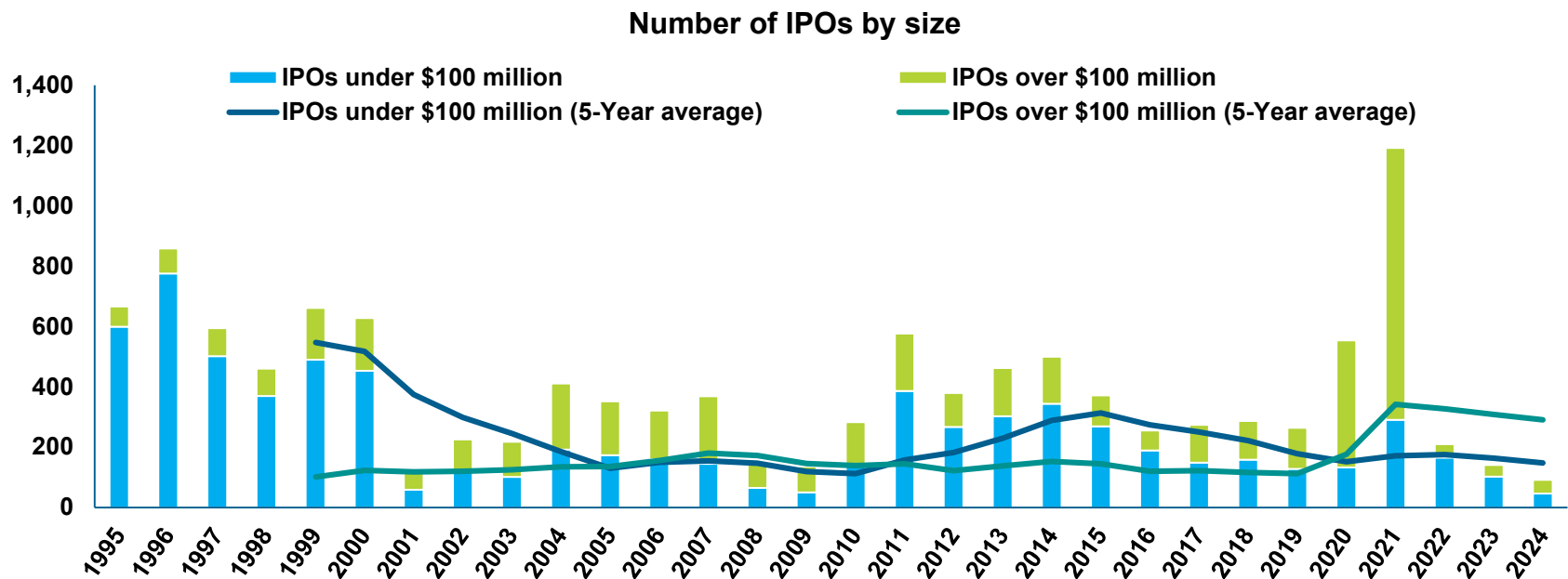
**Growth in Private Credit and High Yield Assets Under Management**



Source: Prequin private credit assets under management as of December 2023. Barclays Live high yield amount outstanding as of December 2023.

## Annual Number and Size of IPOs Has Declined

- Between 1980 and 2000, approximately 300 companies IPO'd each year, but for the subsequent decade, the annual average number of IPOs fell to just over 100.
- In recent years, companies are waiting longer, on average, to go public.
  - For example, the average age of a venture-backed IPO has doubled.
- Moreover, some of the most successful IPOs over the past decade were cashflow positive companies with an initial valuation of over \$1 billion dollars – the so-called unicorns.



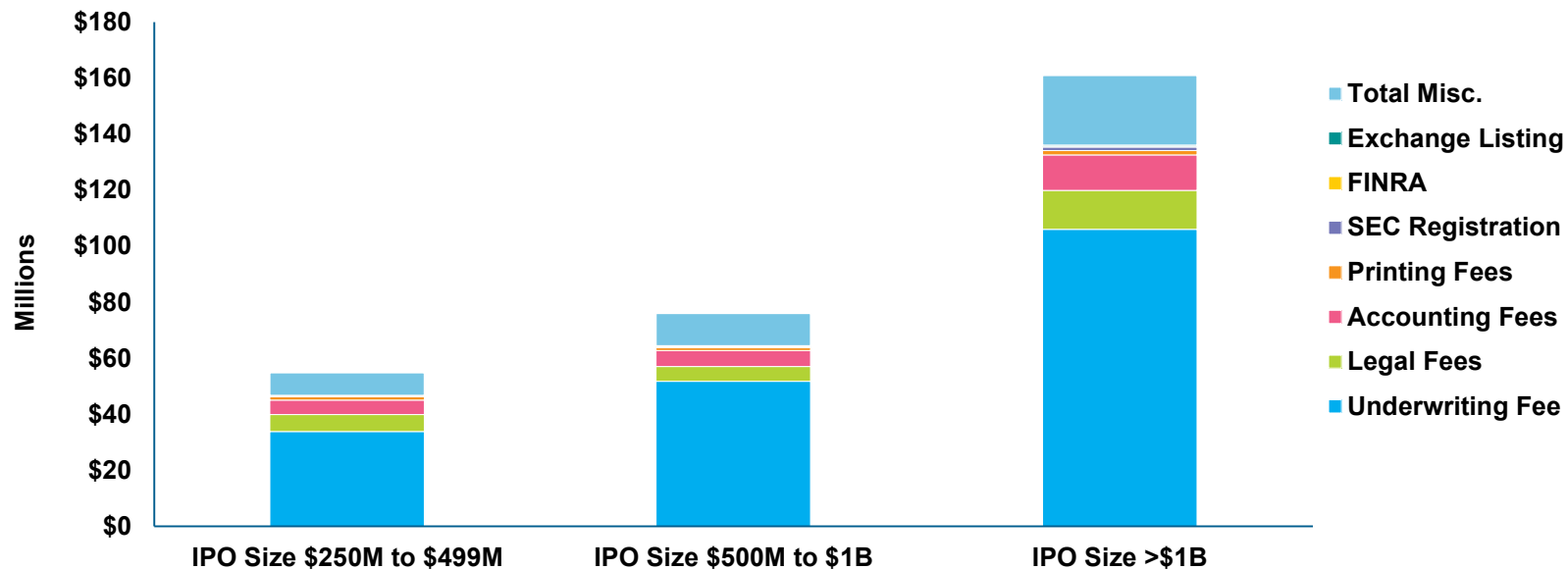
Source: Pitchbook, P. Mathur, "The Meteoric Rise of US Unicorns in 2021," January 5, 2024.

Source: Bloomberg. Represents annual figures for 1995 through 2023 and partial year through June 2024 for NYSE, NASDAQ and NYSE American.

## IPO Costs

- The higher investor limit provides private companies with more flexibility to access private capital without the burden (and costs) of compliance reporting or becoming public.
- These costs include expenses for accounting, legal, underwriting, and other services.
  - The smaller the company, the greater the proportion the IPO costs would be of their revenues and presumably of their value.
    - The decline in the number of IPOs appears to have been concentrated among small companies.

One-time IPO Costs



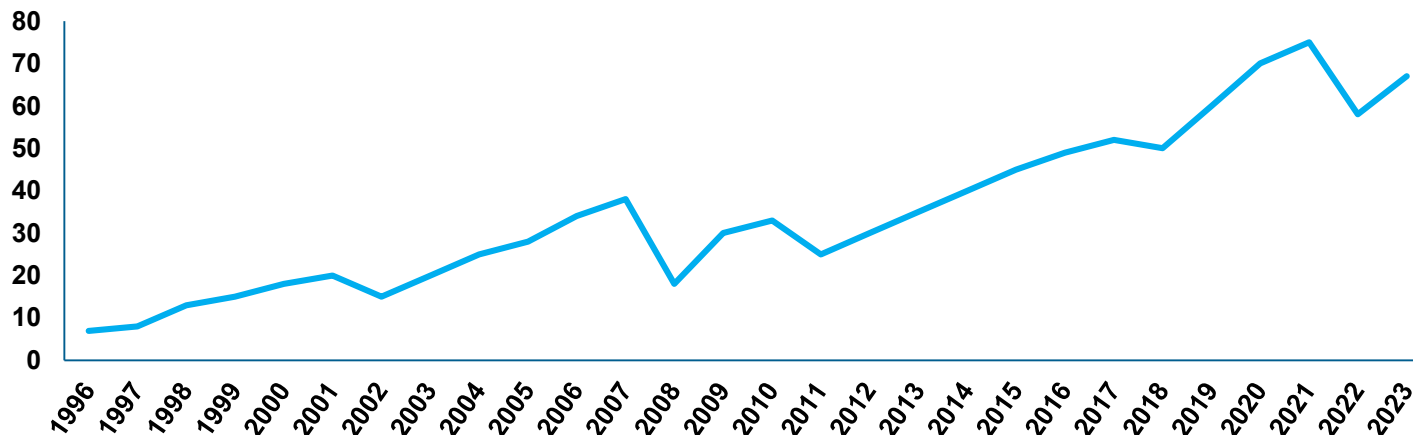
Source: SEC, X. Gao et al., "Where Have All the IPO's Gone?" April 3, 2024.

Source: PriceWaterHouse Coopers "Considering an IPO to fuel your company's future?" as of September 2024.

## Intangible Assets

- The increasing importance of intangible corporate assets may also be a factor in a company’s decision to stay private or go public.
  - Intangibles include patents, software and databases, trademarks, customer lists, franchise agreements, organization capital, and firm-specific human capital.
- Establishing and enforcing exclusive property rights for intangible assets can be challenging.
  - Unlike physical capital, an intangible can be readily copied or imitated.
- Companies heavily investing in intangibles may prefer to stay private.
  - This lowers the risk of proprietary information being divulged to competitors via regulatory disclosures.

Global Market Value of Intangible Assets (USD T)



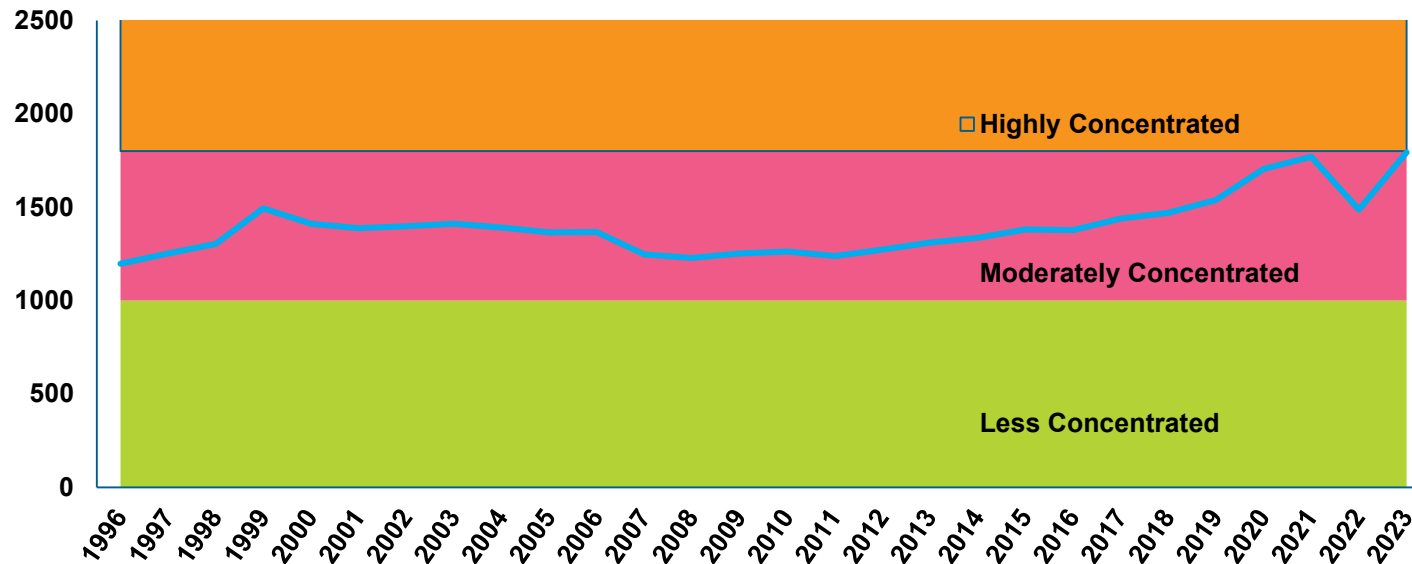
Source: Source: Journal of Economic Perspectives, N. Crouzet et. Al., "The Economics of Intangible Capital," Summer 2022.

Source: Brand Finance Global Intangible Finance Tracker (GIFT) as of December 2023. Journal of Economic Perspectives, N. Crouzet et. Al., "The Economics of Intangible Capital," Summer 2022.

## US Stock Market Concentration

- The change in the number of public US companies has potential ramifications for investors:
  - An increased level of concentration in public markets.
  - A broader opportunity set in private markets.
- The US stock market recently reached a peak level of concentration (for the past thirty years).

**US Stock Market Concentration based on HHI**  
Annual Figures: 1996 – June 2024

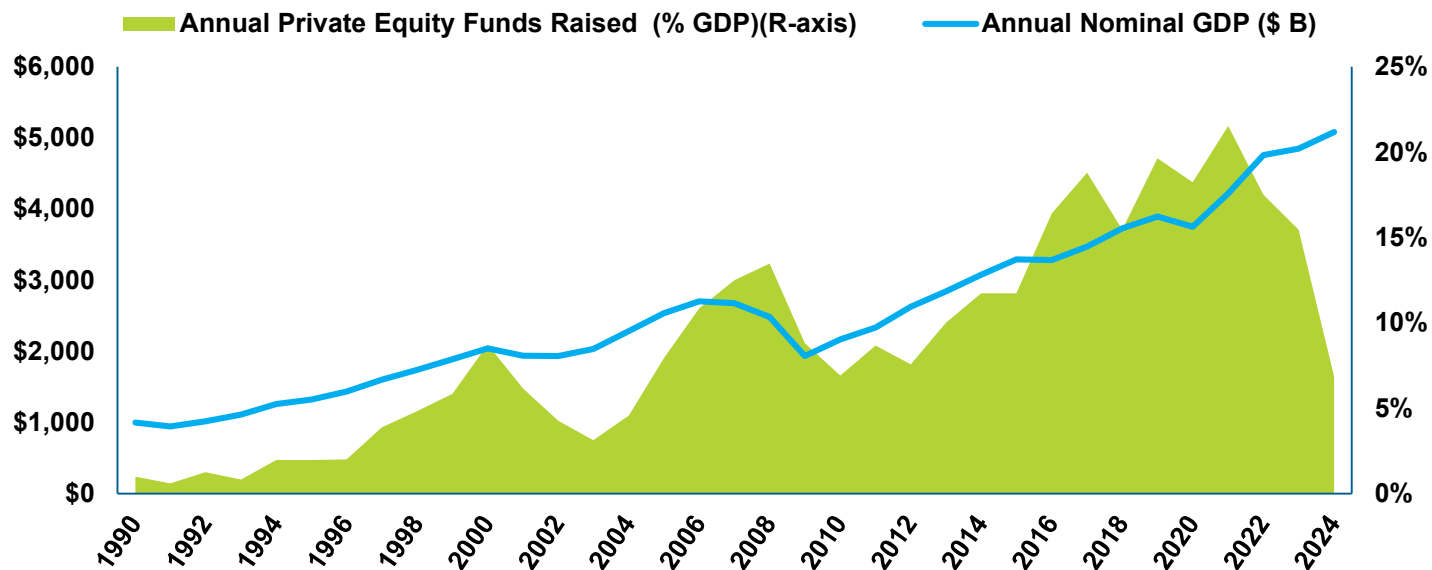


Source: Bloomberg and MSCI data. Represents annual figures from 1996 through 2023 and partial year as of June 2024. Based on the MSCI USA Index and GICS sector weights. Mechanics of the calculation make the result hold at the stock level as well. HHI refers to the Herfindahl-Hirschman Index, a widely used measure of market concentration. The metric calculates the sum of the squared market shares (or weights) for each member of the sample, and the higher the total, the more concentrated a market is. At the extreme, a market with only one company, or a monopoly, would be the most concentrated, with a HHI index of 10,000 (100<sup>2</sup>).

## The Shift to Private Markets

- If investors want to access the growth of a broader swath of companies, they may want to consider investing more in private equity.
  - More than 85% of companies with annual revenues over \$100 million are private companies.
- Some recent analysis suggests that the return on investment for firms backed by venture capital and private equity are notably higher than those of the companies in the S&P 500.

Private Equity Funds Raised as a % of US GDP



Source: FRED nominal GDP as of June 30, 2024. Prequin annual private equity fund raising as of June 30, 2024. Private equity funds raised includes venture, buyouts and growth equity. Bain & Company, using data from S&P Capital IQ as of December 2022 and Statistics of US Businesses as of 2017.

Source: NBER, B. Jovanovic et al., "Private Equity and Growth" October 2020. The authors' analysis suggest that venture and buyout equity investment of approximately 5% to 7% may contribute to growth between 14% and 21% between 2001 and 2019. See also, NBER, N. Garleau et al., "Finance in a Time of Disruptive Growth," March 2024.



## Summary

- The number of publicly traded companies in the US has decreased by 40-50% since its peak in 1996.
- The decline may be explained by a variety of developments, including:
  - Fewer companies going public,
  - Rising regulatory burdens from exchanges and federal legislation,
  - The growth and availability of private capital,
  - A surge of mergers and acquisitions, and
  - The rise of propriety technology and intellectual property.
- The changes have improved investor rights and corporate transparency for publicly traded companies.
- One possible side effect is a higher level of market concentration.
- Private equity provides an avenue for investing in many of the same types of companies that would have been public a generation ago.

**Long-Term Theme:  
China**

## Why the Pessimism on China?

- The anticipated economic rebound from exiting zero-COVID did not materialize.
- Real estate bubble is getting worse, not better.
- Investors have responded by voting with their feet.
- Xi's policies seem to be backfiring.

## The Economic Rebound That Wasn't

Chinese growth has disappointed in 2023 and into 2024.

- China exited their zero-COVID policy in late 2022.
- Many investors and economists alike anticipated a surge in growth as the economy re-opened.
- But the economic rebound did not materialize.
- Growth projections are being ratcheted down.
- Major causes include:
  - Debt overhang in the property sector – nearly  $\frac{1}{4}$  of China's economy.
  - Domestic demand/consumption has been weak.



Source: World Bank as of December 2023. World Bank data is from China's National Bureau of Statistics.

## The Real Estate Bubble

### Property market turns from tailwind to headwind.

- The issue is systemic.
- Both the private and public sectors are heavily indebted.
- The worst problems are with property developers and local governments.
- In 2021, it was Evergrande; in 2023, it was Country Garden.
- Old model:
  - CCP sold land to developers, filling local government coffers in the process.
  - This allowed CCP to spend freely while taking on more debt themselves.
  - Local governments are responsible for ~85% of expenditures.
  - Developers borrowed heavily and pre-sold properties to finance their acquisitions.
  - No other good savings options, so ~70% of household wealth tied up in the property market.
- Current status:
  - Housing prices falling.
  - Some property owners now refusing to make payments on unfinished properties.
  - This can turn into a vicious cycle where developers do not have the cash flow to complete projects.

## CCP Reaction Has Not Been Helpful

- Focus has become national security, not growth.
- Emphasizing nationalistic policies and self-sufficiency.
- CCP has clamped down on foreign businesses (e.g., office raid, iPhone restrictions).
- Wants to reign in the debt bubble, so little/no support for property developers.
- PBoC providing minimal stimulus.
- Relationships with trading partners and neighbors are becoming increasingly strained.
- Many investors and business have responded by seeking to reduce their ties to China.
- Missing and replaced ministers signal challenges at the top of party leadership.

*If growth continues to falter, China will face a choice:  
Backtrack or double down on security and repression.*

## The Change in the CCP under President Xi

- Pragmatism appears to be fading in favor of nationalism and autarky, led by President Xi Jinping.
- Xi may have an additional goal that takes priority over the others:
  - Personal dominance and cementing his legacy
- Xi has consolidated power in a way that means he is going to be the final decision maker on major policy issues.
- The goals announced at the October 2022 Party Congress may be at odds with each other<sup>1</sup>:
  - Reinvigorate Party ideological discipline and adherence to Marxist doctrine
  - Achieve first world economic wealth by 2035
  - Build “fortress China” that is self-sufficient in tech, military capacity, and geopolitical power
- The West has reacted to Xi’s assertive nationalism and now pursues an open policy of China containment.

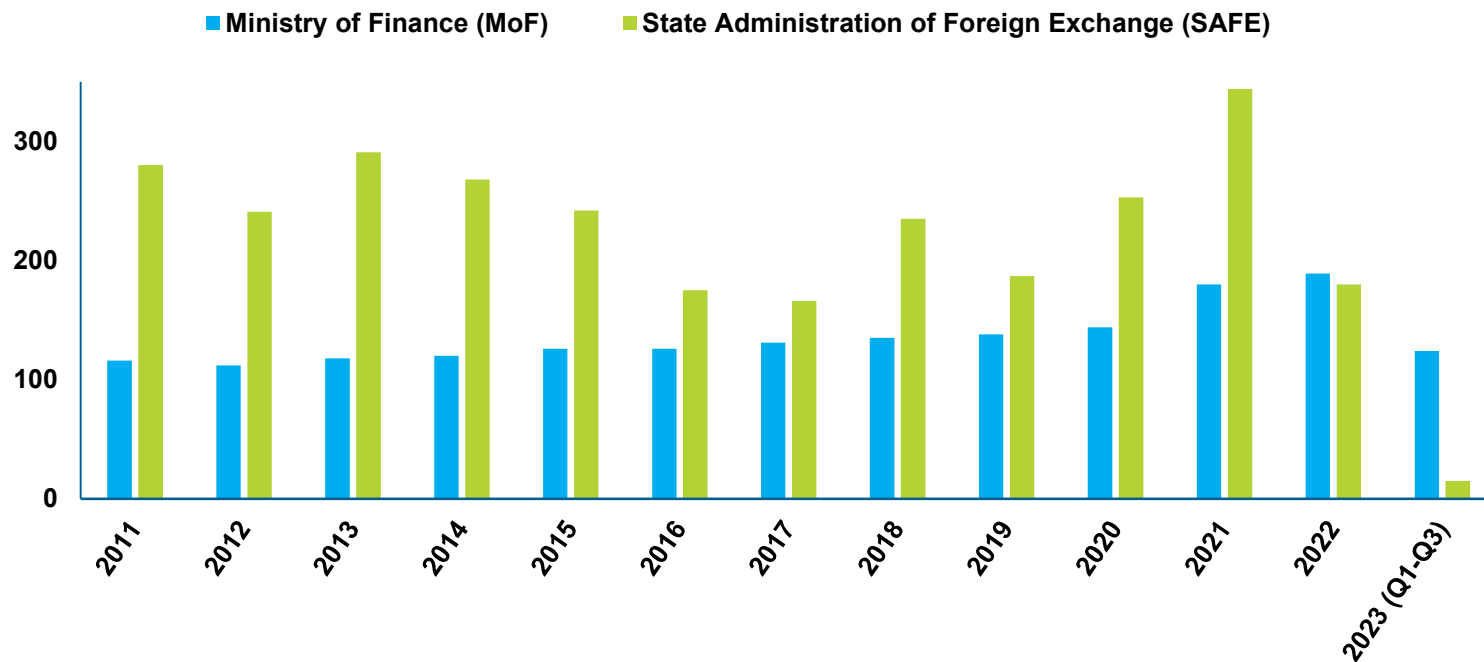


<sup>1</sup> Source: TS Lombard October 2022.

## Investor Concerns Turn into Portfolio Flows

→ In Q3 2023, China recorded its first quarterly decline in direct investments since 1998 (-\$11.8B).<sup>1</sup>

Foreign Direct Investment Inflows to China 2011-2023 (USD in Billions)<sup>2</sup>



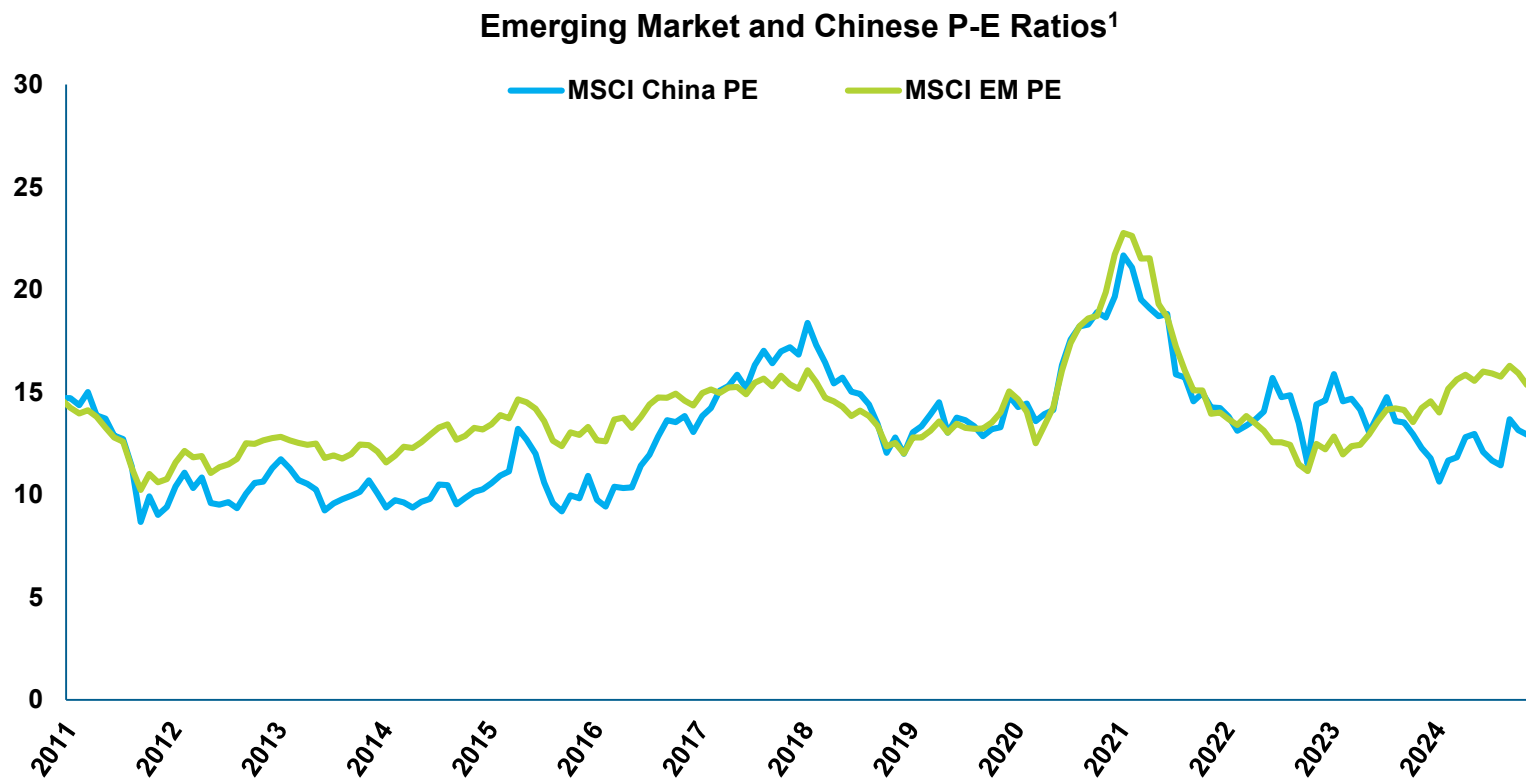
<sup>1</sup> Source: Reuters, "West's de-risking starts to bite China's prospects," November 27, 2023. Article based on preliminary balance of payment data as of September 30, 2023.

<sup>2</sup> Source: Peterson Institute for International Economics, N. Lardy "Foreign direct investment is exiting China, new data show," November 17, 2023. SAFE tracks net FDI while the Ministry of Finance tracks gross inflows.



## Cheap...for a Reason?

- Investors' lack of confidence in the economy and CCP policies continues to weigh on Chinese asset prices.
- Despite a rally in Chinese equities in 2024, valuations remain lower than the broader EM index.
- An important question is: Do valuations fairly represent the risks?



<sup>1</sup> Source: Bloomberg, as of December 31, 2024. Indices used: MSCI China, MSCI Emerging Markets.

These materials are intended solely for the recipient and may contain information that is not suitable for all investors. This presentation is provided by Meketa Investment Group (“Meketa”) for informational purposes only and no statement is to be construed as a solicitation or offer to buy or sell a security, or the rendering of personalized investment advice. The views expressed within this document are subject to change without notice. These materials include general market views and each client may have unique circumstances and investment goals that require tactical investments that may differ from the views expressed within this document. There is no agreement or understanding that Meketa will provide individual advice to any advisory client in receipt of this document. There can be no assurance the views and opinions expressed herein will come to pass. Any data and/or graphics presented herein is obtained from what are considered reliable sources; however, its delivery does not warrant that the information contained is correct. Any reference to a market index is included for illustrative purposes only, as an index is not a security in which an investment can be made and are provided for informational purposes only. For additional information about Meketa, please consult the Firm’s Form ADV disclosure documents, the most recent versions of which are available on the SEC’s Investment Adviser Public Disclosure website ([www.adviserinfo.sec.gov](http://www.adviserinfo.sec.gov)) and may otherwise be made available upon written request.