MEKETA
INVESTMENT GROUP

San Jose Federated City Employees' Retirement System

February 20, 2024

Capital Markets Expectations

Executive Summary

→ 2023 was a volatile year for most investors, but ultimately most asset classes experienced positive returns, including double-digit gains for many risky assets.

→ With the notable exception of China's markets, global bond and equity markets rallied at the end of the year, posting strong gains as inflation pressures eased and central banks appeared to be turning away from tightening policies.

- Despite short-term interest rates climbing, the yield on most Treasury bonds finished the year near where they started it.
- Credit spreads tightened, especially for lower quality credit such as high yield. The result is lower expected returns for many credit-oriented assets.
- Most equity markets rallied in 2023, generally at a much faster pace than the gain in earnings. Hence many equity markets were trading at higher valuations at year-end, thus reducing their forward-looking returns.

→ Our 10-year CMEs continue to be lower than our 20-year CMEs for the vast majority of asset classes, partly due to a higher assumed "risk-free" rate in the future.

→ The net result is a meaningful decrease in return assumptions for most assets over the 10-year horizon, with much more mixed and modest changes at the 20-year horizon.

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)

→ Our process relies on both quantitative and qualitative methodologies.

Building 10-year Forecasts

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

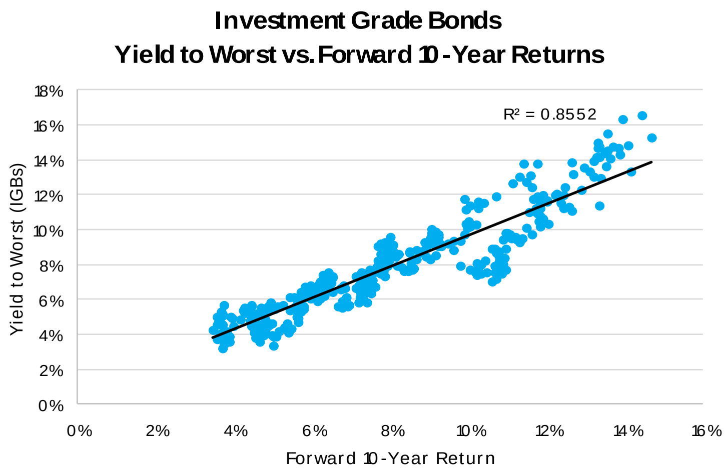
- Each model is based on the most important factors that drive returns for that asset class:

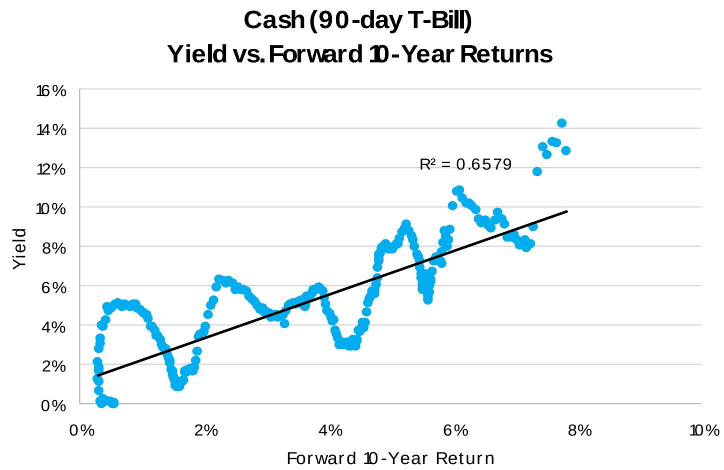
Asset Class Category	Major Factors
Equities	Dividend Yield, GDP Growth, Valuation
Bonds	Yield to Worst, Default Rate, Recovery Rate
Commodities	Collateral Yield, Roll Yield, Inflation
Infrastructure	Public IS Valuation, Income, Growth, Leverage
Natural Resources	Price per Acre, Income, Public Market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

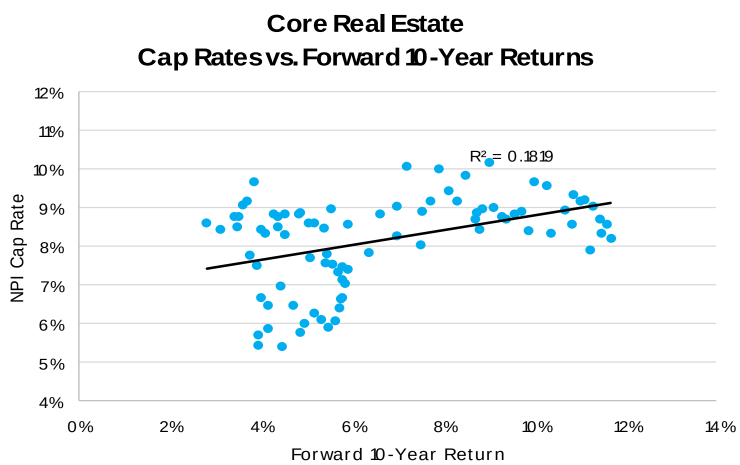
→ The common components are income, growth, and valuation.

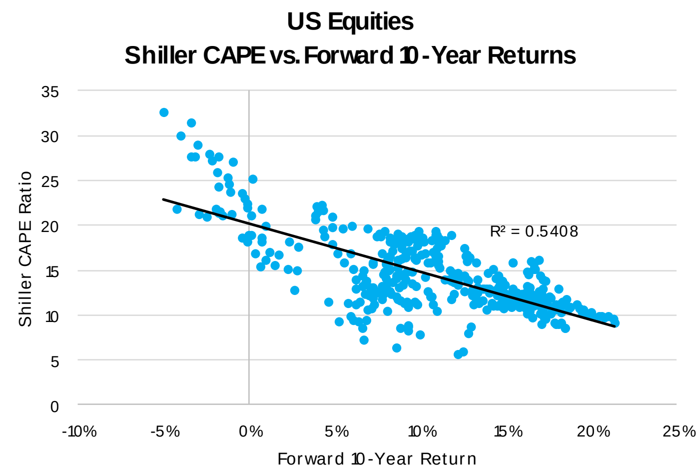
- Leverage and currency impact are also key factors for many strategies.

Some factors are naturally more predictive than others









Sources: Bloomberg, FRED, NCREIF, S&P, Robert Shiller (Yale University), and Meketa Investment Group. As of December 31, 2019.

10-year Model Example: Bonds

→ The short version for investment grade bond models is:

E(R) = 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 - (Annual Default Rate × Loss Rate)

10-year Model Example: Equities

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

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

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

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

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

Moving from 10-Year to 20-Year Forecasts

→ Our next step is to combine our 10-year forecasts with projections for years 11-20 for each asset class.

→ We use a risk premia 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 premia 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[1] (%)
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).

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

What is driving the changes from last year?

→ Credit spreads tightened, leading to lower yields, thus decreasing expected returns for fixed income assets.

→ Most equity markets rallied, pushing them to higher valuations, thus reducing their forward-looking returns.

→ Lower anticipated borrowing costs had a positive impact on assets that use leverage.

→ Lower anticipated cash yields hurt expected returns for hedge funds and related asset classes.

→ The long downward trend in cap rates for real estate reversed, pushing up their 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 risk-free rate jumped from 4.17% to 4.64%.

→ The changes we made to several models also had an impact:

- We reweighted our private market composites to reflect a blend of the market opportunity and a typical client portfolio.
- We reduced the cap for the magnitude of currency impact from +/- 100 bp to +/- 50 bp per annum.
- We increased the % of GDP growth that translates to EPS growth for the US, while decreasing it for most other equity markets.
- We extended our look-back period from 15 years to 20 years for historical volatility (and correlations).

Similar or Lower Yields

→ Short-term interest rates are higher than one year ago, while the 10-year Treasury yield ended the year where it started it.

→ Similar levels of interest rates combined with tighter credit spreads to result in slightly lower yields for most sectors of the global bond market.

Index	Yield to Worst 12/31/23 (%)	Yield to Worst 12/31/22 (%)
Fed Funds Rate	5.25-5.50	4.25-4.50
10-year Treasury	3.88	3.88
Bloomberg Aggregate	4.53	4.68
Bloomberg Corporate	5.06	5.42
Bloomberg Securitized	4.72	4.75
Bloomberg Global Aggregate	3.51	3.73
Bloomberg EM Local Currency Government	4.08	4.42
Bloomberg EM Hard Currency Aggregate	6.77	7.26
Bloomberg US Corporate High Yield	7.59	8.96

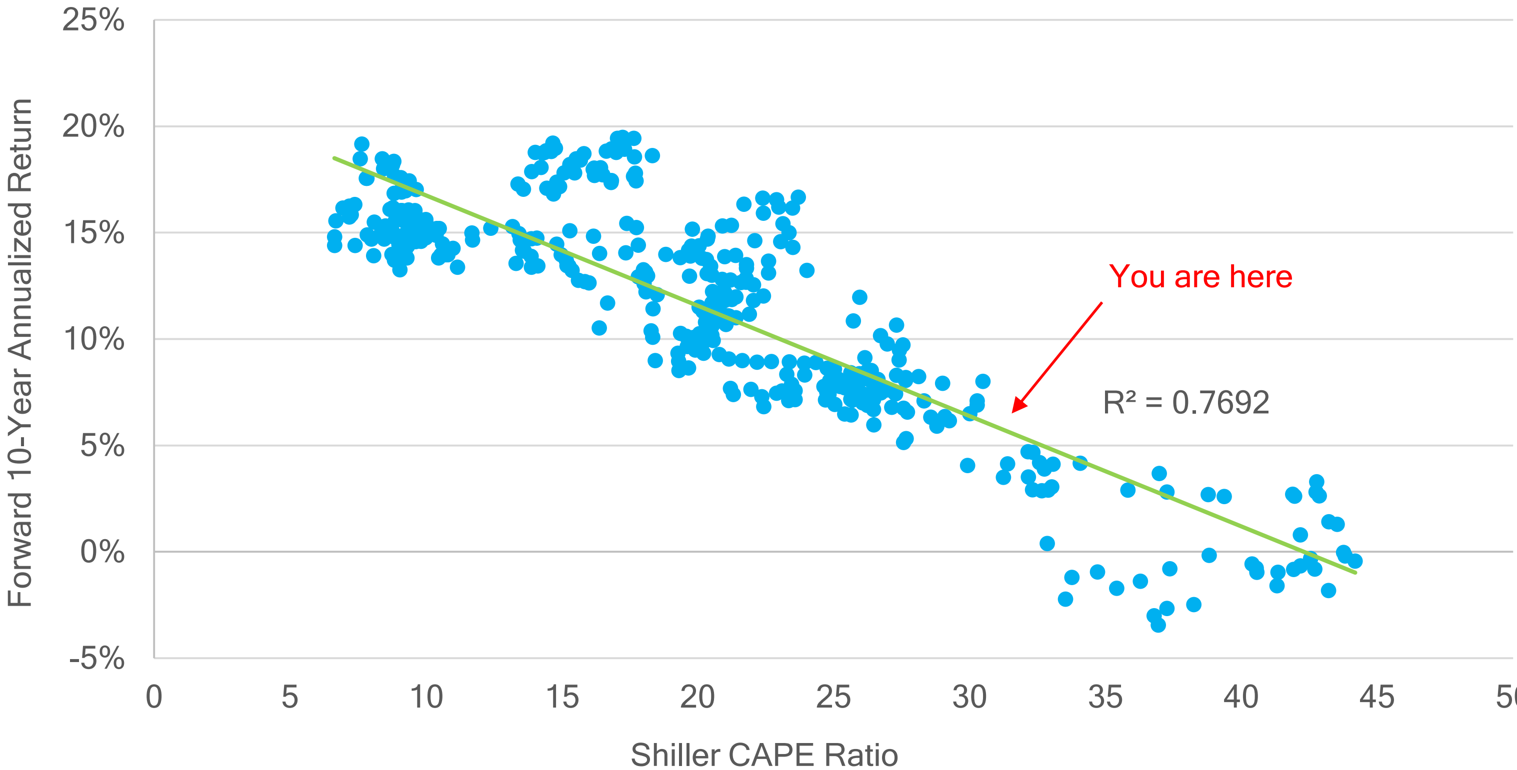
Source: Bloomberg. Data is as of December 31, 2023 and December 31, 2022.

Impact of Equity Prices on Returns

→ 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 2023.

20-year Geometric Expected Returns
Rate Sensitive

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
Cash Equivalents	2.5	2.9	-0.4	Lower projected short-term rates
Short-term Investment Grade Bonds	3.7	3.5	0.2	
Investment Grade (Core) Bonds	4.8	4.7	0.1	
Intermediate Government Bonds	4.1	3.7	0.4	Slightly higher yields
Long-term Government Bonds	5.0	5.0	0.0	
Mortgage Backed Securities	4.9	4.6	0.3	
Investment Grade Corporate Bonds	5.4	5.4	0.0	
Long-term Corporate Bonds	6.0	5.7	0.3	
Short-term TIPS	3.7	3.6	0.1	
TIPS	4.7	4.5	0.2	
Long-term TIPS	5.2	5.2	0.0	
Global ILBs	4.7	4.7	0.0	
Foreign Bonds	3.9	4.0	-0.1	Slightly lower yields
US Inflation	*2.8*	*2.6*	*0.2*	Higher long-term inflation expectations

20-year Geometric Expected Returns
Credit

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
High Yield Bonds	6.8	7.3	-0.5	Tighter spreads
Higher Quality High Yield	6.4	6.7	-0.3	Tighter spreads
Bank Loans	6.6	7.0	-0.4	Tighter spreads
Collateralized Loan Obligations (CLOs)	7.2	7.2	0.0	
Convertible Bonds	6.2	6.4	-0.2	Tighter spreads
Emerging Market Bonds (major)	6.8	6.4	0.4	Higher yields
Emerging Market Bonds (local)	6.2	6.0	0.2	
Private Debt	9.2	9.0	0.2	
Direct Lending	8.4	8.3	0.1	Lower assumed leverage
Asset Based Lending	9.4	9.0	0.4	Lower average fees
Special Situations Lending	9.9	10.2	-0.3	Less extreme distressed pricing

20-year Geometric Expected Returns
Equities

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
US Equity	8.5	8.7	-0.2	Higher valuations
US Small Cap	9.4	9.3	0.1	
Developed Non-US (EAFE) Equity	8.9	9.8	-0.9	Higher valuations, lower projected earnings growth
Dev. Non-US Small Cap	9.5	10.1	-0.6	Higher valuations
Emerging Market Equity	8.9	10.0	-1.1	Higher valuations, lower projected earnings growth
Emerging Market Small Cap	8.9	10.0	-1.1	Higher valuations, lower dividend yields
Emerging Market ex-China	9.0	10.3	-1.3	Higher valuations, lower projected earnings growth
China Equity	8.6	9.3	-0.7	Lower projected earnings growth
Frontier Market Equity	10.0	10.7	-0.7	Higher valuations, lower projected growth & dividends
Global Equity	8.7	9.2	-0.5	Higher valuations
Low Volatility Equity	7.8	8.3	-0.5	Higher valuations
Private Equity	11.2	11.0	0.2	Mixed valuations and slightly lower borrowing costs
Buyouts	10.8	10.7	0.1	Mixed valuations and slightly lower borrowing costs
Growth Equity	11.5	11.2	0.3	Mixed valuations and slightly lower borrowing costs
Venture Capital	12.0	11.6	0.4	Lower valuations

20-year Geometric Expected Returns
Real Estate & Infrastructure

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
Real Estate	8.0	7.8	0.2	Higher cap rates
US REITs	7.8	8.0	-0.2	Lower yields
Core Private Real Estate	6.9	6.5	0.4	Higher cap rates
Value-Added Real Estate	9.0	8.3	0.7	Higher cap rates
Opportunistic Real Estate	10.3	9.6	0.7	Higher cap rates
Infrastructure	9.0	8.3	0.7	Lower borrowing costs, model changes
Infrastructure (Public)	9.1	8.8	0.3	
Infrastructure (Core Private)	8.0	7.8	0.2	
Infrastructure (Non-Core Private)	10.0	9.5	0.5	Lower borrowing costs

20-year Geometric Expected Returns
Natural Resources & Commodities

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
Natural Resources	9.3	NA		90% private, 10% public
Natural Resources (Public)	9.2	8.7	0.5	Improved relative valuations
Natural Resources (Private)	9.3	9.8	-0.5	Higher valuations
Energy	10.4	10.4	0.0	
Mining	9.9	10.2	-0.3	Higher valuations
Timberland	7.3	7.4	-0.1	
Farmland	7.0	6.5	0.5	Improved valuations, higher income expectations
Sustainability	10.0	10.3	-0.3	Higher valuations
MLPs	8.4	7.4	1.0	Improved relative valuations
Gold Mining	9.5	9.7	-0.2	Higher valuations
Gold (Metal)	3.5	3.3	0.2	Slightly higher long-term inflation expectations
Commodities	5.3	5.7	-0.4	Lower cash yield

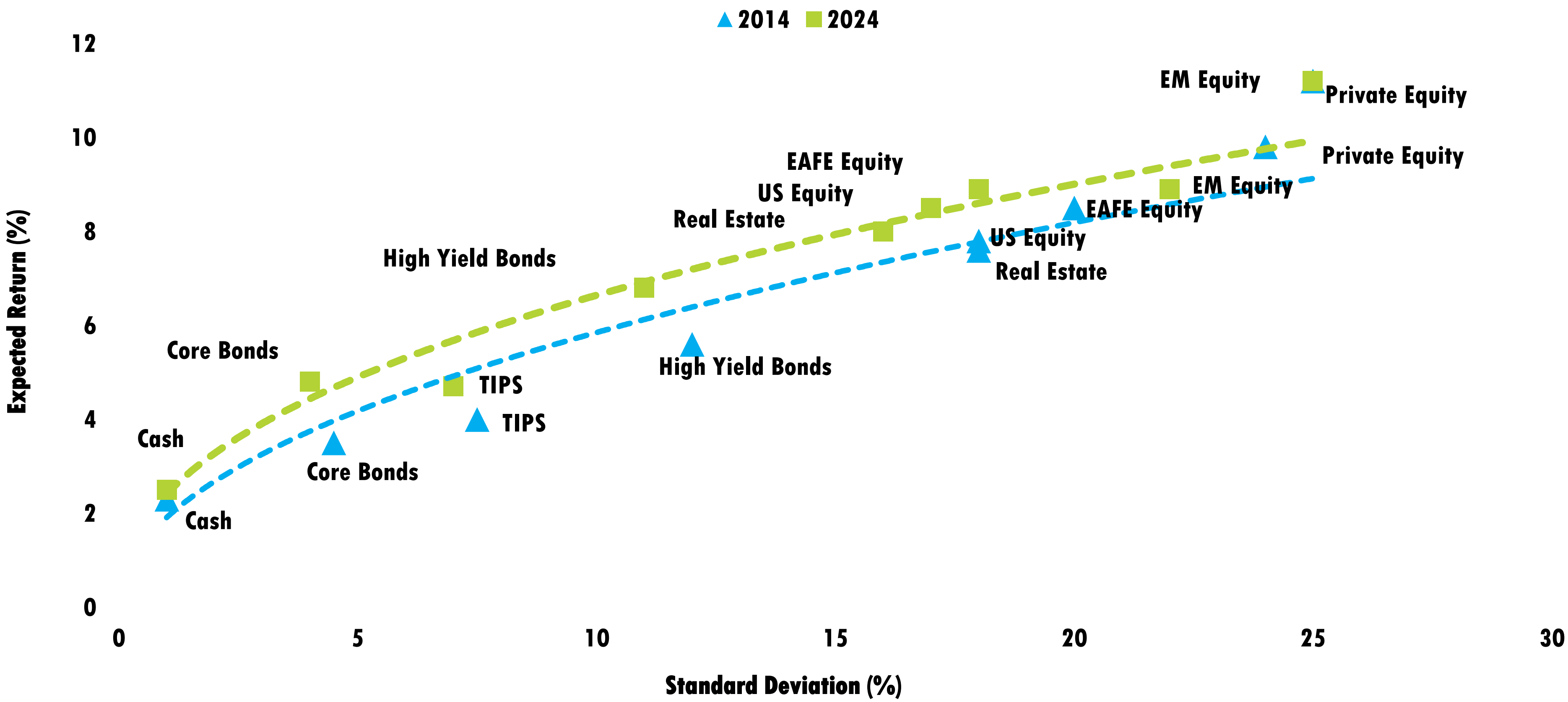
20-year Geometric Expected Returns
Alternative Strategies (Other)

	2024 E(R) (%)	2023 E(R) (%)	Δ From 2023 (%)	Notes
Hedge Funds	5.8	6.1	-0.3	Lower cash/credit yield, higher equity valuations
Long-Short	5.3	5.6	-0.3	Higher valuations, lower projected cash yield
Event Driven	7.6	7.7	-0.1	Higher valuations, lower projected cash yield
Global Macro	5.4	5.7	-0.3	Higher valuations, lower cash yield, tighter spreads
CTA - Trend Following	4.7	4.8	-0.1	
Fixed Income/L-S Credit	6.1	6.5	-0.4	Tighter spreads
Relative Value/Arbitrage	6.5	6.7	-0.2	Lower projected cash yield
Long Vol	1.2	1.1	0.1	
Insurance Linked Strategies	6.2	6.2	0.0	
Alternative Risk Premia	5.2	5.6	-0.4	Lower projected cash yield
Risk Parity (10% vol)	7.2	7.7	-0.5	Higher equity valuations, tighter credit spreads
TAA	6.1	5.7	0.4	Model changes
Digital Currencies	3.5	3.3	0.2	

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

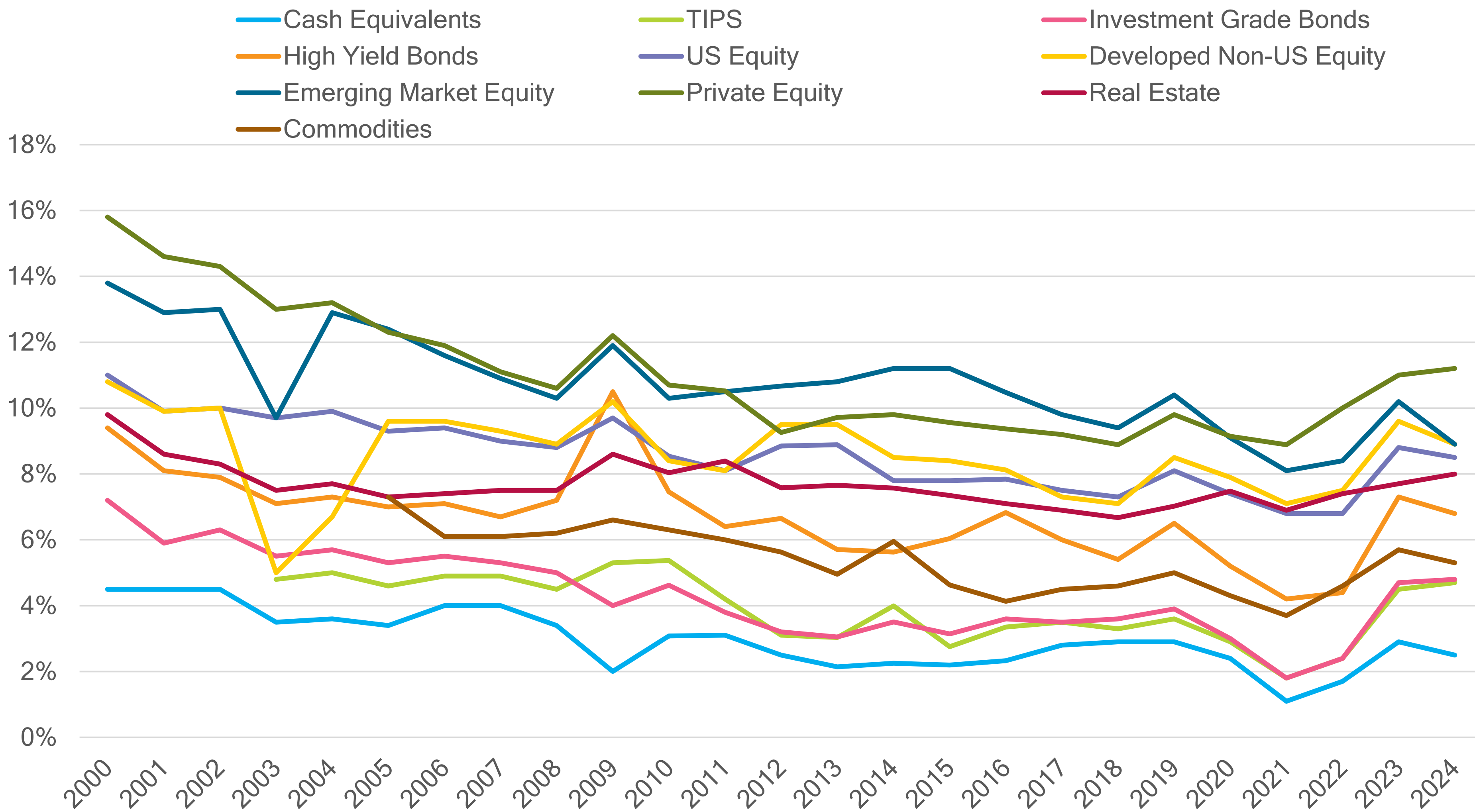
→ The relationship between long-term return expectations and the level of risk accepted is not static.

→ The higher interest rates of the last two years mean that many investors should be able to take on less risk than they have over the past decade if they want to achieve their target returns.



[1] Expected return and standard deviation are based upon Meketa Investment Group's 2014 and 2024 20-year capital market expectations.

Our 20-year CMEs since 2000



Return and Risk Data

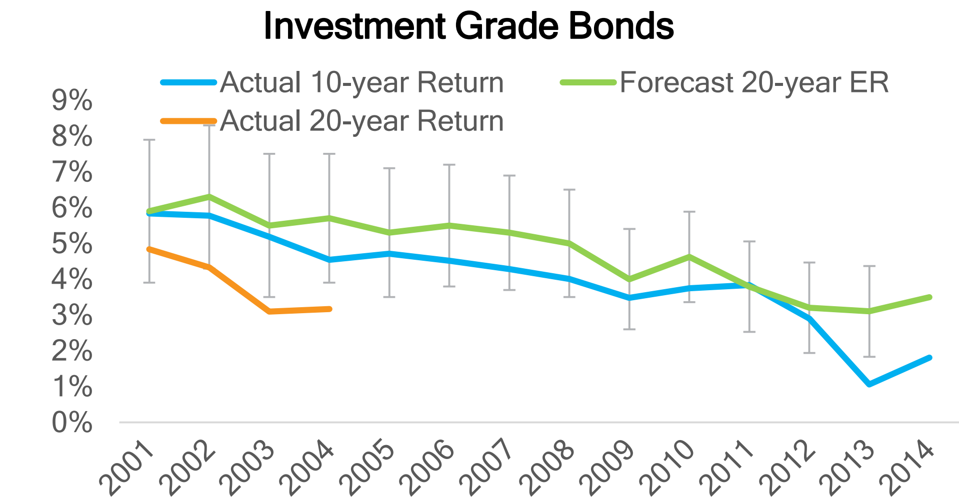
Asset Class	10-year Expected Return (%)	20-year Expected Return (%)	Standard Deviation (%)	11-20 year Risk Premia[1] (%)
Cash Equivalents	2.4	2.5	1.0	-2.0
Investment Grade Bonds	4.6	4.8	4.0	0.4
Long-term Government Bonds	4.3	5.0	12.0	1.0
TIPS	4.3	4.7	7.0	0.4
High Yield Bonds	6.5	6.8	11.0	2.5
Bank Loans	6.5	6.6	10.0	2.0
Emerging Market Debt (local)	6.3	6.2	12.0	1.5
Private Debt	9.2	9.2	15.0	4.6
US Equity	6.9	8.5	17.0	5.5
Developed Non-US Equity	7.7	8.9	18.0	5.4
Emerging Non-US Equity	7.6	8.9	22.0	5.5
Global Equity	7.2	8.7	17.0	5.5
Private Equity	9.9	11.2	25.0	7.8
Real Estate	6.3	8.0	16.0	5.3
Infrastructure	7.4	9.0	18.0	6.1
Commodities	4.9	5.3	17.0	1.0
Hedge Funds	4.5	5.8	7.0	2.5
Inflation	2.4	2.8		-1.5

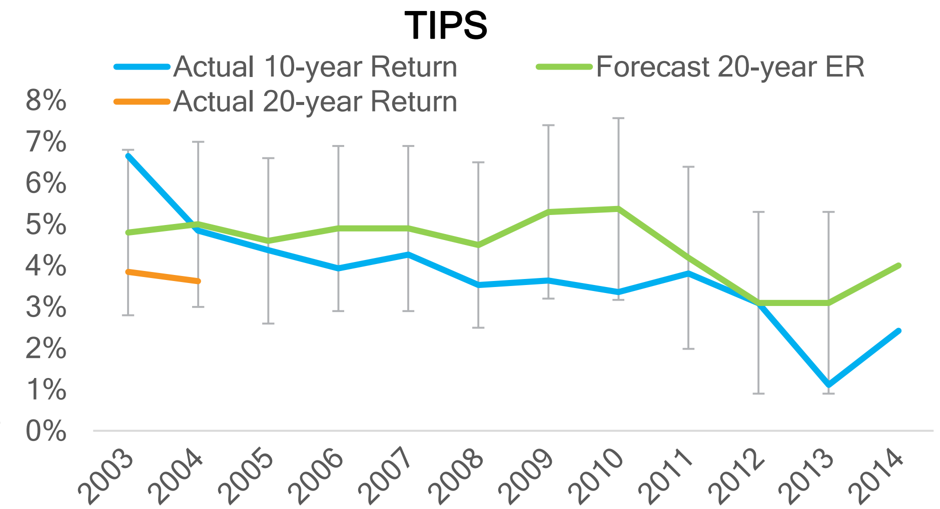
[1] Risk Premia are calculated relative to the market's projection for the yield on the 10-year Treasury in ten years..

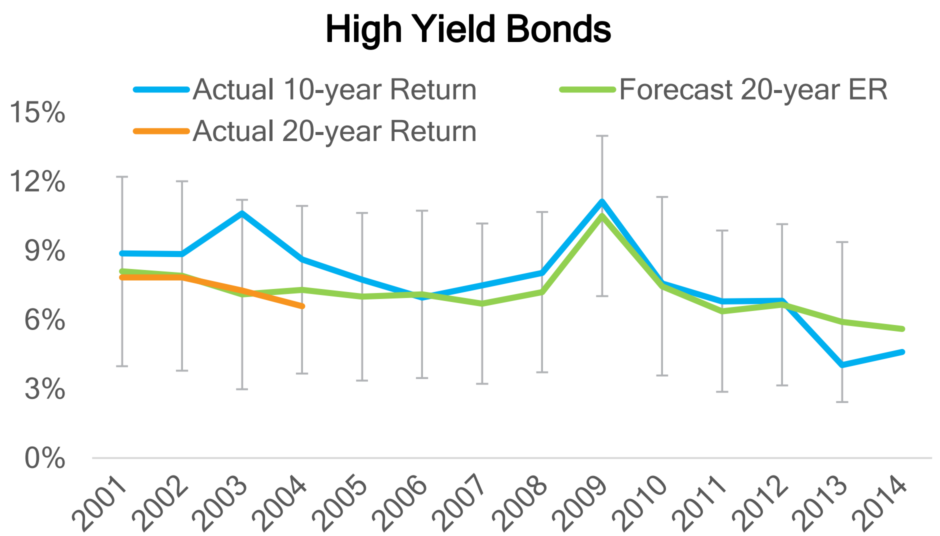
Correlation Data

	Inv. Grade Bonds	Long-term Gov't Bonds	TIPS	High Yield Bonds	US Equity	Dev. Non-US Equity	Em. Market Equity	Private Equity	Real Estate	Commod.	Infra.	Hedge Funds
Investment Grade Bonds	1.00											
Long-term Government Bonds	0.86	1.00										
TIPS	0.77	0.61	1.00									
High Yield Bonds	0.35	-0.04	0.46	1.00								
US Equity	0.22	-0.10	0.30	0.76	1.00							
Developed Non-US Equity	0.26	-0.09	0.33	0.76	0.88	1.00						
Emerging Market Equity	0.27	-0.05	0.36	0.72	0.74	0.86	1.00					
Private Equity	0.00	-0.10	0.03	0.66	0.90	0.83	0.79	1.00				
Real Estate	0.26	0.06	0.17	0.56	0.53	0.49	0.43	0.49	1.00			
Commodities	0.00	-0.23	0.28	0.47	0.46	0.55	0.58	0.23	0.15	1.00		
Infrastructure	0.31	0.14	0.32	0.65	0.64	0.68	0.60	0.51	0.61	0.41	1.00	
Hedge Funds	0.12	-0.20	0.30	0.78	0.80	0.83	0.81	0.53	0.47	0.64	0.61	1.00

Our Track Record

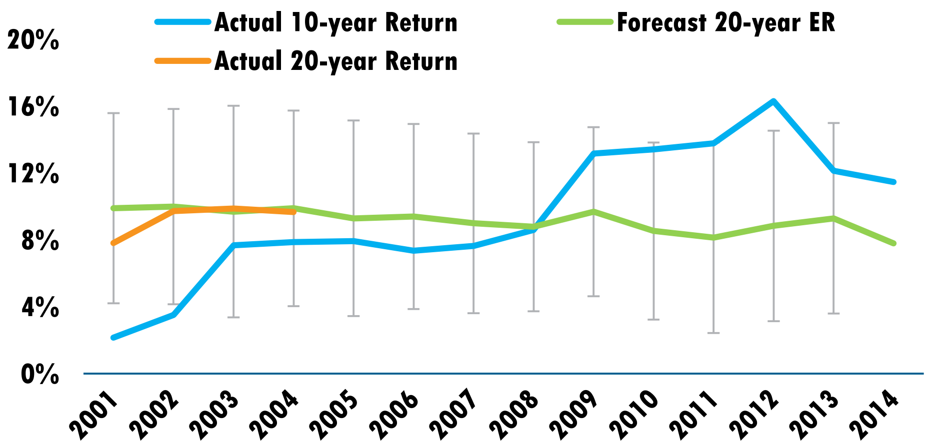




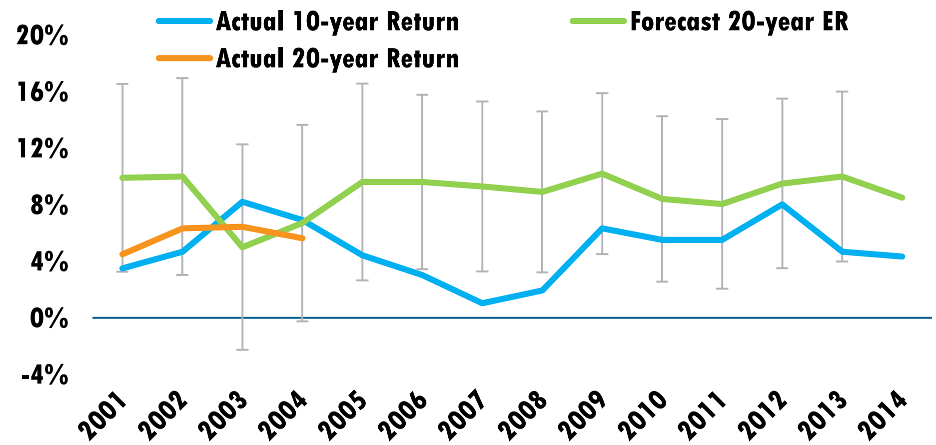


Our Track Record (continued)

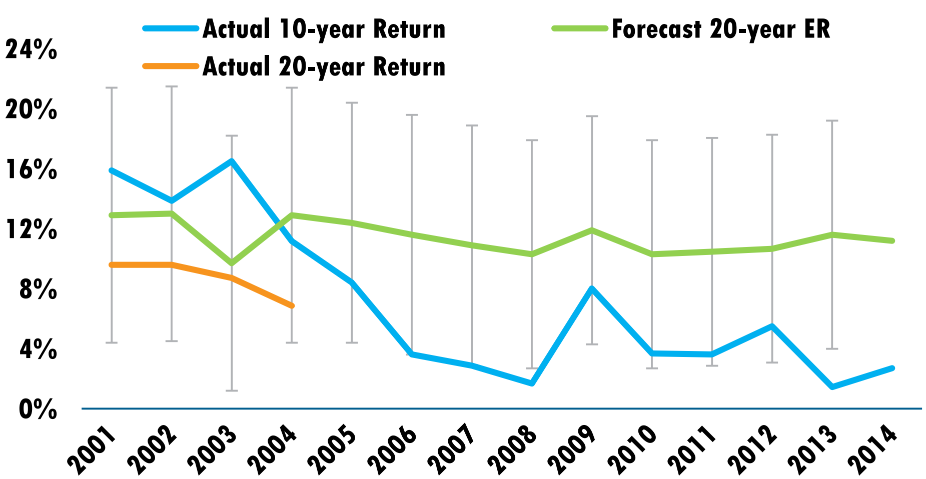
US Equity



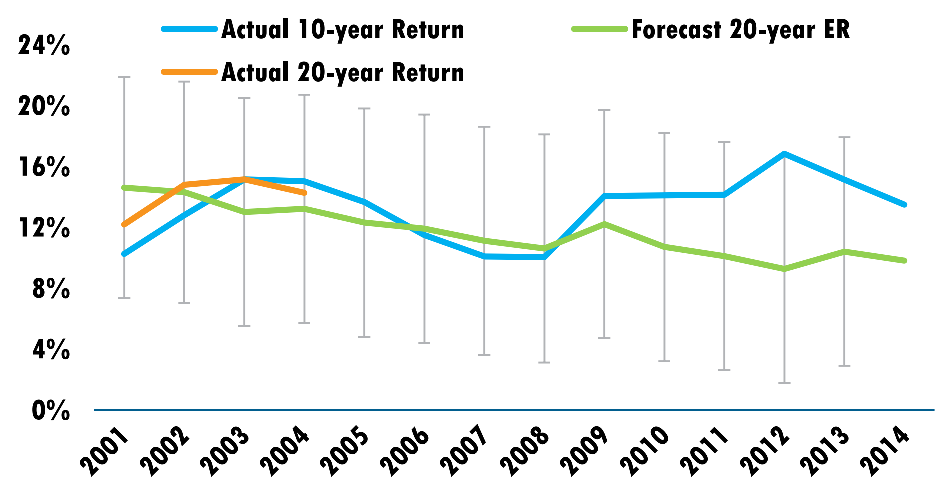
EAFE Equity



Emerging Markets Equity



Private Equity



2023 Peer Survey

→ Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.[1]

→ The Horizon survey is a useful tool to determine whether a consultant's expectations for returns (and risk) are reasonable.

Asset Class	Horizon 10-Year Average (%)	Meketa 10-Year (%)	Horizon 20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	3.4	3.1	3.2	2.9
TIPS	4.1	4.3	4.1	4.5
US Core Bonds	4.7	4.8	4.8	4.7
US High Yield Bonds	6.4	8.0	6.5	7.3
Emerging Market Debt	6.3	6.5	6.4	6.2
Private Debt	8.2	9.4	8.2	9.0
US Equity (large cap)	6.9	7.8	7.4	8.7
Developed Non-US Equity	7.5	10.1	7.8	9.8
Emerging Non-US Equity	8.2	10.3	8.6	10.0
Private Equity	9.5	9.7	10.1	11.0
Real Estate	6.0	5.9	6.3	7.8
Infrastructure	7.0	6.9	7.1	8.3
Commodities	5.0	6.3	4.9	5.7
Hedge Funds	6.0	5.4	6.2	6.1
Inflation	2.6	2.5	2.5	2.6

[1] The 10-year horizon included all 42 respondents to the survey, and the 20-year horizon included 27 respondents. Figures are based on Meketa's 2023 CMEs.

San Jose Federated City Employees' Retirement System Strategic Asset Allocation

→ Policy Targets represent approved asset allocation from March of 2021.

Asset Allocation	Policy (%)	2024 Expected Return (%)	2023 Expected Return (%)	Change
Growth	**75.0**	**9.0**	**9.4**	**-0.4**
Public Equity	49.0	8.7	9.3	-0.6
Private Markets	21.0	10.3	10.1	0.2
Emerging Markets Debt	3.0	6.5	6.2	0.3
High Yield Bonds	2.0	7	7.3	-0.5
Low Beta	**8.0**	**3.7**	**4.1**	**-0.4**
Cash Equivalents	5.0	2.5	2.9	-0.4
Hedge Funds	3.0	5.8	6.1	-0.3
Other	**17.0**	**5.4**	**5.2**	**0.2**
Core Private Real Estate	5.0	6.9	6.5	0.4
TIPS	2.0	4.7	4.5	0.2
Investment Grade Bonds	8.0	4.8	4.7	0.1
Long-term Government Bonds	2.0	5.0	5.0	0.0

Year-over-Year Comparison

Asset Allocation	2024 Expectations (%)	2023 Expectations (%)	Change
Expected Return	8.5	8.8	-0.3
Meketa Standard Deviation	13.4	14.0	-0.6
Sharpe Ratio	0.45	0.42	+0.3
Verus Standard Deviation	11.8	12.1	

→ Meketa Investment Group's long-term (20-year) annualized expected return for the San Jose Federated City Employees' Retirement System portfolio has decreased from 8.8% using our 2023 assumptions to 8.5% using our 2024 assumptions.

→ The portfolio's expected standard deviation has also decreased from 14.0% to 13.4%.

→ The standard deviation decreasing by more than the expected return has led to a greater amount of expected return per amount of expected risk.

Year-over-Year Comparison (continued)

Asset Allocation	Policy (%)	2024 Expected Return (%)	2023 Expected Return (%)	Change
Growth	75.0	9.0	9.4	-0.4
Low Beta	8.0	3.7	4.1	-0.4
Other	17.0	5.4	5.2	+0.2

→ The table above lists the 20-year return expectations for each Federated asset class.

Asset Allocation	Policy (%)	2023 Standard Deviation (%)	2022 Standard Deviation (%)	Change
Growth	75.0	12.8	13.5	-0.6
Low Beta	8.0	0.2	0.2	+0.0
Other	17.0	0.4	0.4	+0.1

→ The table above lists the 20-year standard deviation expectations for each Federated asset class.

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