
DECEMBER 16, 2024

**AGENDA ITEM 8
INFORMATION ITEM**

SCHOLARSHARE INVESTMENT BOARD

Review of Asset Allocation Recommendation for 2025 for ScholarShare 529

Background

Each year, the ScholarShare Investment Board (SIB or Board) and the program manager, TIAA-CREF Tuition Financing, Inc. (TFI), review the asset allocation of the investment portfolios for ScholarShare 529 (Plan) to determine if any changes are necessary to continue to meet its investment objectives.

TFI has provided its “Asset Allocation Recommendation for 2025” (Exhibit A), which highlights the analysis completed for their recommendation for no changes for 2025. Their asset allocation study for the Plan was completed with a primary focus on:

- a review of changes in Capital Market Assumptions
- analysis of manager implementation across the investment program
- a review of the enrollment year and static investment portfolios for the Plan
- the simulated probability of outpacing tuition inflation in the enrollment year investment portfolio.

The Board’s investment consultant, Meketa Investment Group (Meketa), reviewed and analyzed TFI’s recommendation and provided a memo (Exhibit B) concurring with TFI’s recommendation for no changes for 2025. SIB staff have reviewed and concur with TFI’s recommendation for no changes in 2025 to the Plan’s asset allocation.

Presenters

Jeremy Thiessen, Senior Director, Institutional Investment Strategist,
TIAA-CREF Tuition Financing, Inc.

Jordan Jones, Investment Analyst, TIAA-CREF Tuition Financing, Inc.

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Asset Allocation

Recommendation for 2025

PRESENTED BY

TIAA-CREF Tuition
Financing, Inc.

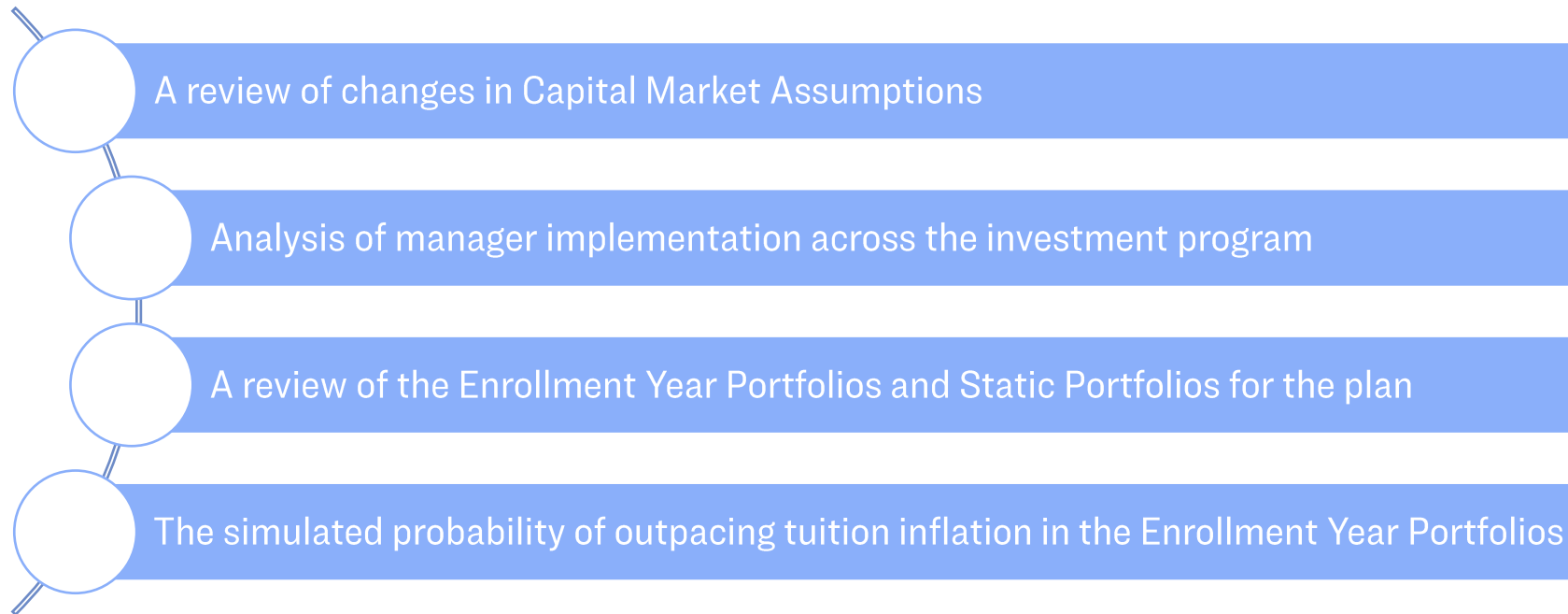
December 2024

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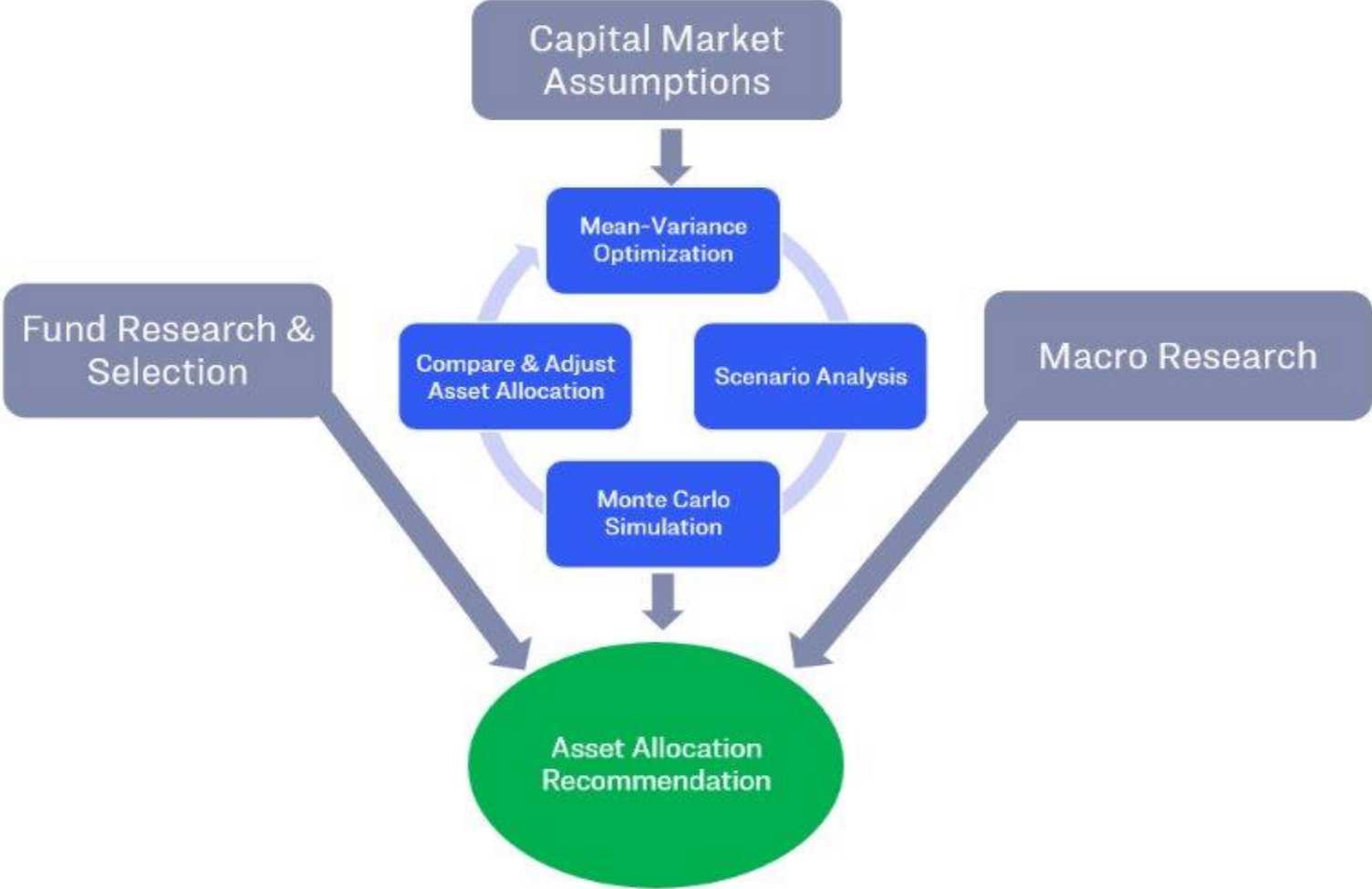
Executive Summary

TFI has completed this year's asset allocation study to evaluate the overall investment strategy for ScholarShare with focus on:



Based on this review, TFI is not recommending any changes to the investment strategy.

TIAA Education Savings: Investment Process



Capital Market Assumption Overview

Capital Market Assumption Comparison

Key Takeaways:

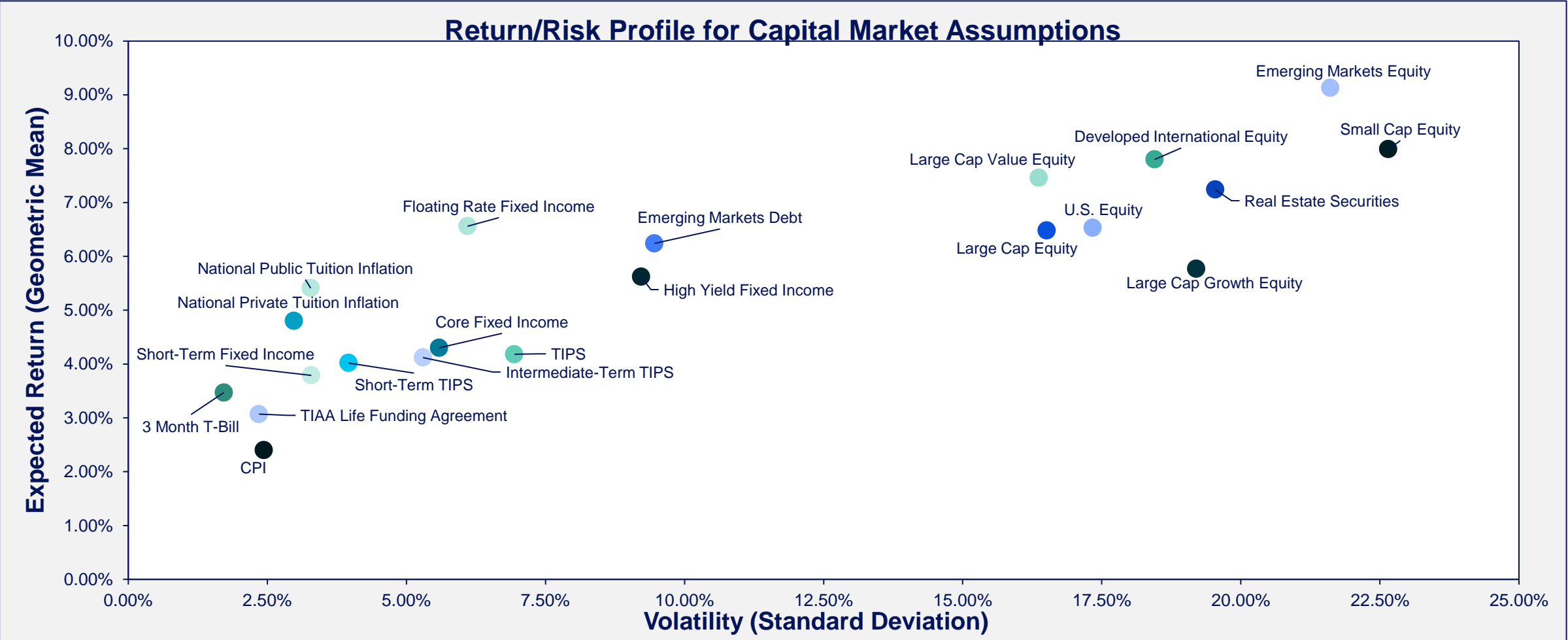
- Reduction in all equity asset class expected returns
- Mixed expected return movements in fixed income asset classes.

Variables	Benchmarks	2025		2024		Change in Capital Market Assumptions (Source: Ibbotson)	
		Returns (Long-Term Average)	Volatility (Standard Deviation)	Returns (Long-Term Average)	Volatility (Standard Deviation)	Returns (Long-Term Average)	Volatility (Standard Deviation)
U.S. Equity	Russell 3000 Index	6.53%	17.34%	7.92%	16.92%	-1.39%	0.42%
Large Cap Growth Equity	Russell 1000 Growth Index	5.77%	19.20%	7.20%	18.84%	-1.43%	0.36%
Large Cap Value Equity	Russell 1000 Value Index	7.46%	16.37%	7.61%	16.01%	-0.15%	0.36%
Large Cap Equity	S&P 500 Index	6.48%	16.51%	7.40%	16.54%	-0.92%	-0.03%
Small Cap Equity	Russell 2000 Index	7.99%	22.65%	8.92%	22.66%	-0.93%	-0.01%
Developed International Equity	MSCI EAFE Index	7.80%	18.45%	8.33%	18.51%	-0.53%	-0.06%
Emerging Markets Equity	MSCI Emerging Markets Index	9.13%	21.61%	9.74%	21.37%	-0.61%	0.24%
Core Fixed Income	Bloomberg Barclays US Aggregate Bond Index	4.30%	5.59%	4.17%	4.29%	0.13%	1.30%
Floating Rate Fixed Income	Credit Suisse Leveraged Loan Index	6.56%	6.10%	7.60%	6.37%	-1.04%	-0.27%
Emerging Markets Debt	JPM GBI-EM Global Diversified Index	6.24%	9.46%	7.17%	9.42%	-0.93%	0.04%
High Yield Fixed Income	BofAML US HY BB/B Cash Pay Index	5.62%	9.22%	6.54%	9.29%	-0.92%	-0.07%
TIPS	Bloomberg Global Inflation-Linked US TIPS Index	4.18%	6.94%	4.14%	6.78%	0.04%	0.16%
Intermediate-Term TIPS	Bloomberg US Treasury Inflation Note 1-10 Year Index	4.12%	5.30%	4.12%	5.31%	0.00%	-0.01%
Short-Term TIPS	Morningstar US Short TIPS Index	3.96%	3.72%	4.00%	3.81%	-0.04%	-0.09%
Short-Term Fixed Income	Bloomberg US 1-3 Year Government/Credit Bond Index	3.79%	3.29%	3.96%	3.31%	-0.17%	-0.02%
Real Estate Securities	FTSE NAREIT All Equity REITs Index	7.24%	19.54%	7.14%	18.83%	0.10%	0.71%
CPI	Consumer Price Index - All Urban Consumers	2.40%	2.44%	2.40%	2.46%	0.00%	-0.02%
3 Month T-Bill	ICE BofA US 3-Month Treasury Bill Index	3.47%	1.72%	3.21%	1.74%	0.26%	-0.02%
TIAA Life Funding Agreement	Funding Agreement	3.07%	2.35%	3.21%	2.31%	-0.14%	0.04%
Additional Variables (sources: The College Board and TIAA-CREF Tuition Financing, Inc.)							
	National Private Tuition Inflation	4.80%	2.98%	4.72%	3.03%	0.08%	-0.05%
	National Public Tuition Inflation	5.41%	3.28%	5.47%	3.31%	-0.06%	-0.03%

Comparison includes 2025 assumptions minus 2024 assumptions

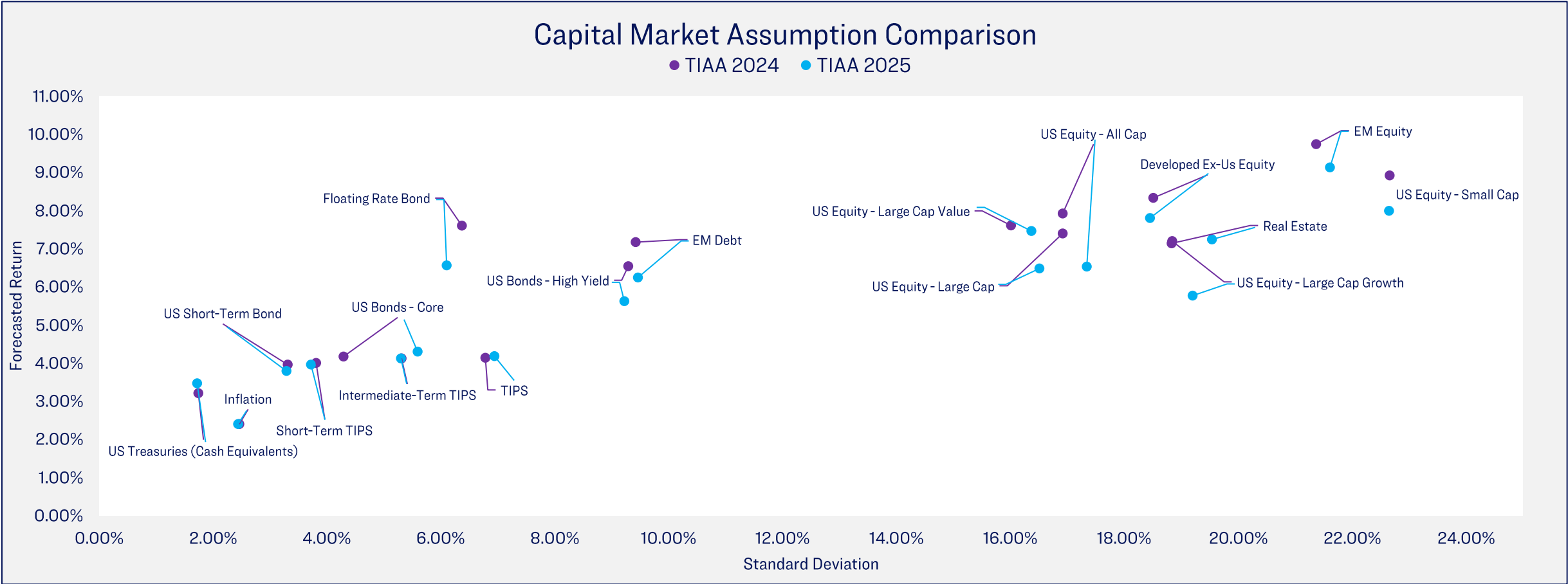
Capital Market Assumption Return/Risk Profile

- Fixed Income shows clustering in expected return level but dispersion in volatility
- Large Cap Value shows better risk-adjusted returns than Large Cap Growth



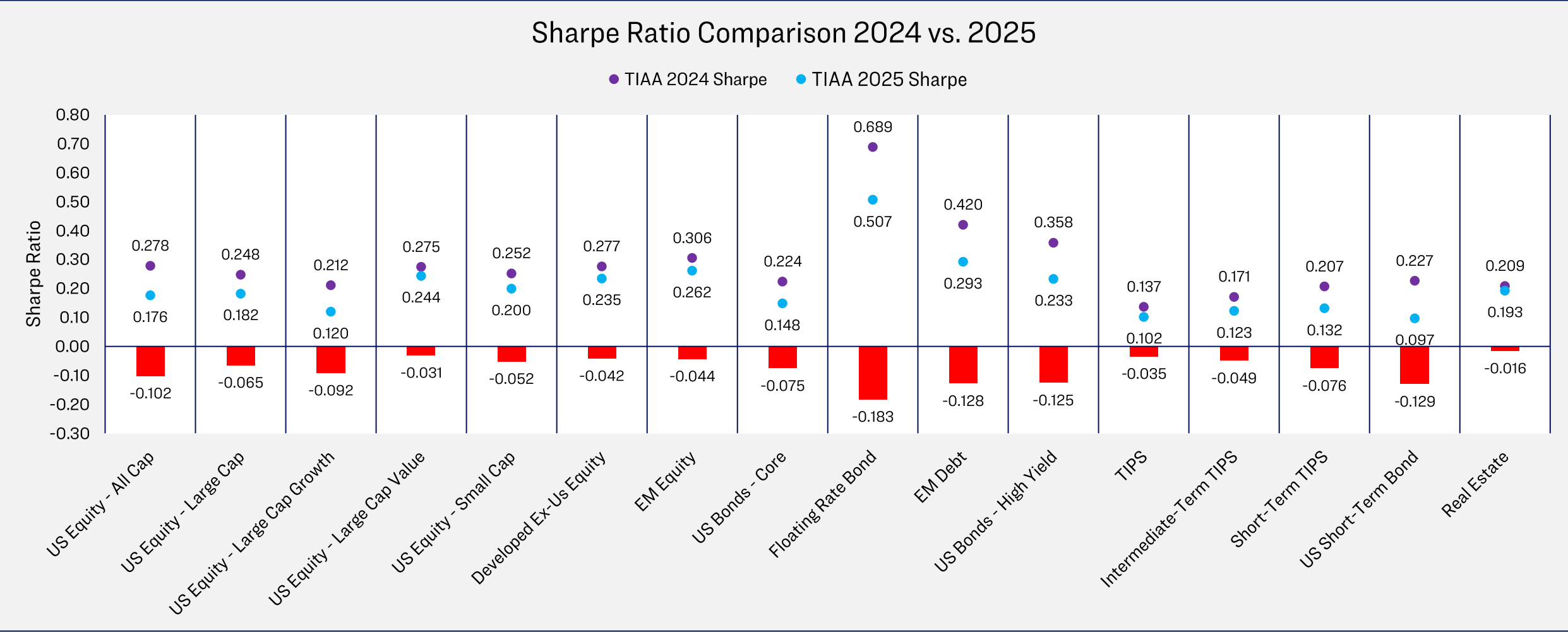
Risk-Return Profile of CMA Asset Classes Last Year vs. This Year

- Minimal changes to TIPS across maturity spectrum
- Return expectations have decreased for all equities, led by US Large Cap Growth
- Inflation expectations remain stable



CMA Sharpe Ratios Have Reduced Year-Over-Year For All Asset Classes

- Fixed Income Sharpe changes on par with equities due to greater proportional magnitude of change, particularly in the denominator of the Sharpe ratio
- Fixed Income spread sectors saw the greatest decline in expected return
- Domestic Large cap growth drags down US Equity – All Cap and US Equity – Large Cap



Asset Allocation & Manager Implementation Review

Asset Allocation Implications

We are maintaining the current glide path asset allocation and static allocation options, with no recommended changes at this time.

- Our long-term investment philosophy leads us to focus on structural changes
- Year-over-year changes in the CMAAs were not as material as last year
- Lower probabilities across key Monte Carlo Simulation metrics (Annual Shortfall, Prob of Exceeding Tuition Inflation, Average Annual Return) are driven by lower expected returns
- Having a long-time horizon reduces immediate need to increase expected mean return over the short-term at the expense of increasing left tail risk



Performance

Quarterly Category Ranking

- Measures the Fund's category ranking within its Morningstar Peer Category over a three-month period

	2023-12	2024-03	2024-06	2024-09
DFA Emerging Markets Core Equity I	46	53	27	49
T. Rowe Price Lrg Cp Gr I	38	39	28	67
Nuveen Emerging Markets Eq Idx R6	55	57	47	32
Nuveen International Eq Idx R6	26	33	58	53
Nuveen S&P 500 Index R6	47	40	21	49
Nuveen Quant Small Cap Equity R6	52	22	6	67
Nuveen ESG US Aggregate Bond ETF	71	75	59	49
Nuveen Equity Index R6	29	60	48	33
DFA Large Cap International I	47	36	71	44
TCW MetWest Total Return Bd Plan	11	91	82	10
PIMCO Income Instl	56	46	75	45
PIMCO Real Return Instl	34	39	25	28
T. Rowe Price Instl Floating Rate	28	61	7	38
T. Rowe Price Lrg Cp Va I	21	52	34	73
Vanguard High-Yield Corporate Adm	16	95	25	53
Vanguard Real Estate Index Institutional	11	55	79	14
Vanguard Shrt-Term Infl-Prot Sec Idx Ins	85	15	39	78
Nuveen Bond Index R6	59	69	42	37
Nuveen ESG Emerging Markets Equity ETF	81	79	55	12
Nuveen ESG High Yield Corporate Bd ETF	9	82	59	28
Nuveen International Res Eq R6	14	68	57	30
Nuveen Large Cap Responsible Eq R6	15	57	69	33

Quarterly Excess Return

- Measures the excess return for the Fund relative to its underlying benchmark over a three-month period

	2023-12	2024-03	2024-06	2024-09
DFA Emerging Markets Core Equity I	-0.01	0.02	0.57	-2.11
T. Rowe Price Lrg Cp Gr I	0.10	1.57	-0.81	-0.60
Nuveen Emerging Markets Eq Idx R6	-0.28	-0.15	-0.38	-1.06
Nuveen International Eq Idx R6	0.41	0.02	0.16	-0.02
Nuveen S&P 500 Index R6	-0.01	-0.03	-0.01	-0.02
Nuveen Quant Small Cap Equity R6	-0.92	2.44	2.43	-1.07
Nuveen ESG US Aggregate Bond ETF	-0.28	0.01	0.10	-0.04
Nuveen Equity Index R6	0.01	-0.01	-0.03	0.00
DFA Large Cap International I	-0.22	0.13	0.13	-0.18
TCW MetWest Total Return Bd Plan	0.72	-0.07	-0.02	0.51
PIMCO Income Instl	-0.92	2.15	0.37	-0.65
PIMCO Real Return Instl	-0.15	0.42	0.13	0.18
T. Rowe Price Instl Floating Rate	0.19	-0.33	0.23	-0.02
T. Rowe Price Lrg Cp Va I	1.75	-0.25	1.31	-2.53
Vanguard High-Yield Corporate Adm	0.11	-0.48	0.20	0.04
Vanguard Real Estate Index Institutional	-0.04	-0.01	-0.03	-0.05
Vanguard Shrt-Term Infl-Prot Sec Idx Ins	-0.05	0.01	0.02	0.02
Nuveen Bond Index R6	-0.18	0.03	0.17	0.01
Nuveen ESG Emerging Markets Equity ETF	-0.48	-0.24	-0.50	-0.78
Nuveen ESG High Yield Corporate Bd ETF	-0.27	0.05	0.01	-0.42
Nuveen International Res Eq R6	0.97	-1.21	0.20	0.76
Nuveen Large Cap Responsible Eq R6	1.03	-0.46	-2.77	0.37

Notable Developments of Underlying Managers

Firm



Nuveen

- Bill Huffman named CEO following Jose Minaya's departure – Q2 2024

Vanguard

- Salim Ramji named CEO following Tim Buckley's retirement – Q3 2024

Team

Nuveen

- Lei Liao, PM on all Nuveen Equity Index funds, retired - Q2 2024
- Nazar Romanyak added as PM on all Nuveen Equity Index funds – Q2 2024
- Darren Tran departed from the ESG Emerging Markets Equity ETF (NUEM) – Q1 2024

DFA

- Allen Pu added as a PM to the DFA Real Estate Securities Fund – Q1 2024
- Arun C. Keswani departed from DFA Large Cap International (DFALX) – Q2 2024

MetWest

- Jerry M Cudzil and Ruben Hovhannisyan were added to TCW MetWest Total Return Bond (MWTSX) – Q4 2023
- Laird R Landmann departed from TCW MetWest Total Return Bond (MWTSX) – Q4 2023

Process



Nuveen

- Nuveen Large Cap Responsible Equity Fund changed its benchmark from Russell 3000 Index to S&P 500 Index and added a carbon emissions overlay – Q1 2024

Conclusions



Asset Allocation

- Less material changes to CMAs year-over-year
- No recommended changes to asset allocation of the glide path or static allocation options

Manager Implementation

- Relative and absolute performance for each underlying fund is aligned with expectations
- No material negative changes to Firm, Team or Process for the underlying funds

Appendix 1

TFI 2024 Research Items

Active Management Opportunity Gauge

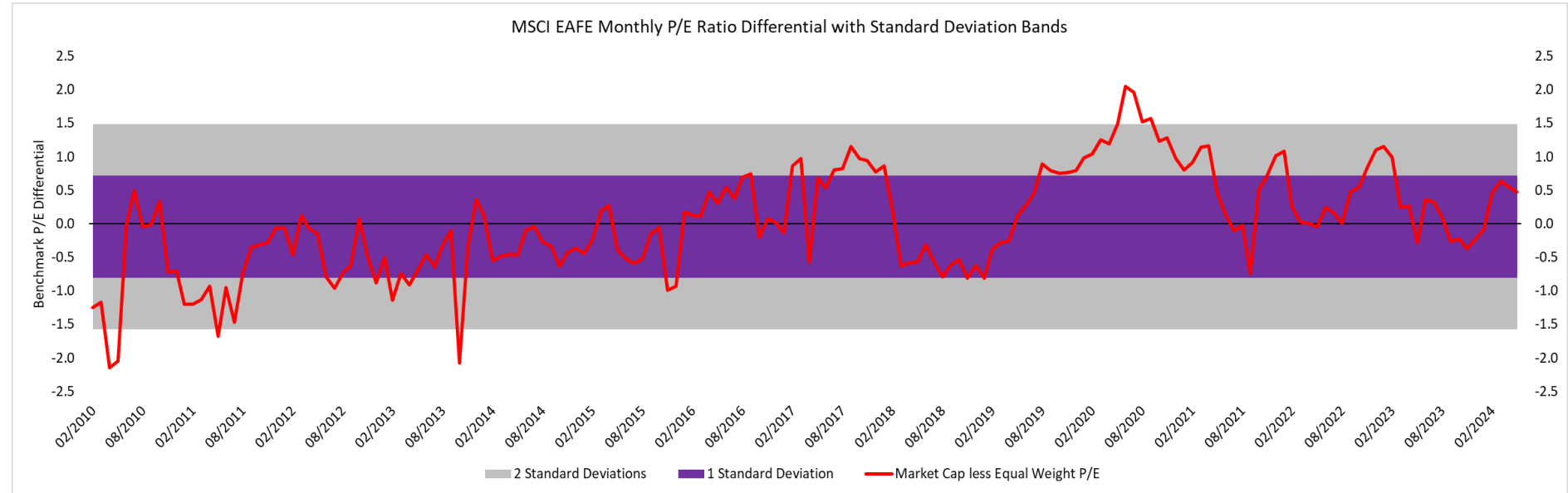
	Correlation	P/E Differential	Monthly Return Differential	Short Term Static Alpha	Long Term Static Alpha	Rolling Alpha
US Large Cap	+	+	+	-	-	-
US Small Cap	+	●	●	●	-	-
International Developed	+	●	+	-	+	-
Emerging Markets	+	●	●	●	-	+
Core Bond	+			+	●	+
Core Bond Plus	+			+	+	+

Favorable: + Neutral: ● Not Favorable: -

Equities: International Developed

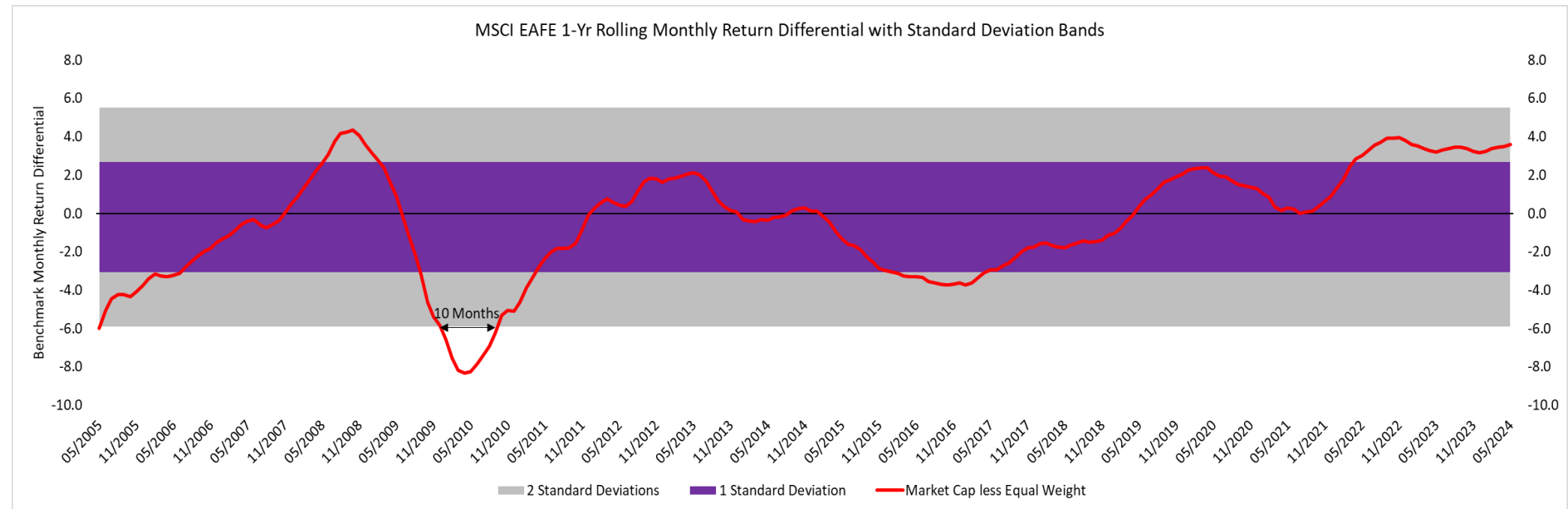
P/E Ratio

We can see the market valuations are not being pulled by a small number of companies but is being represented equally amongst the MSCI EAFE constituents. In other words, there are not a few large companies that are disproportionately valued comparatively. Even when this does occur, reversion to the mean is usually quick.



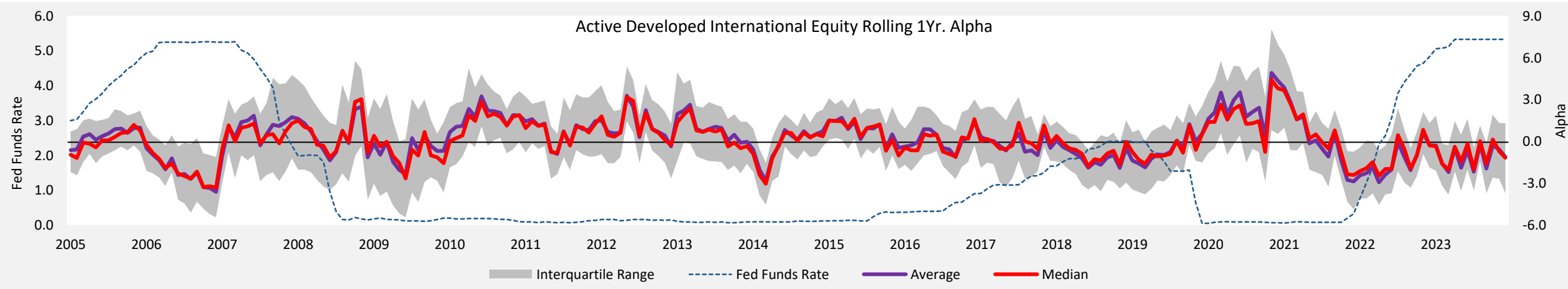
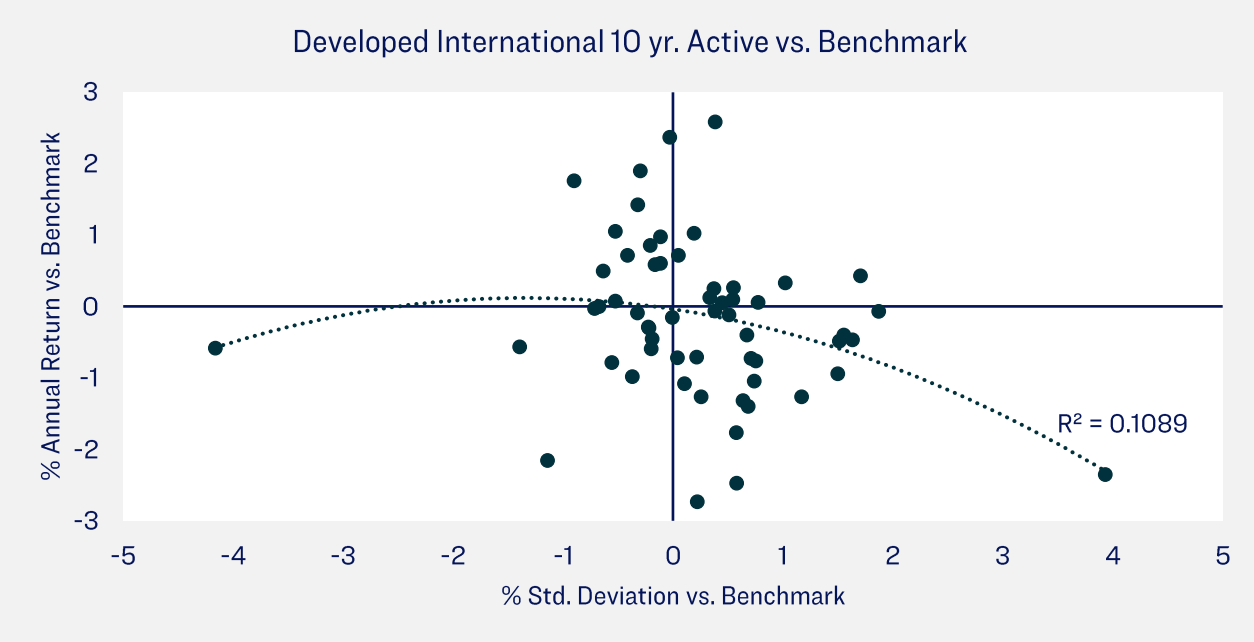
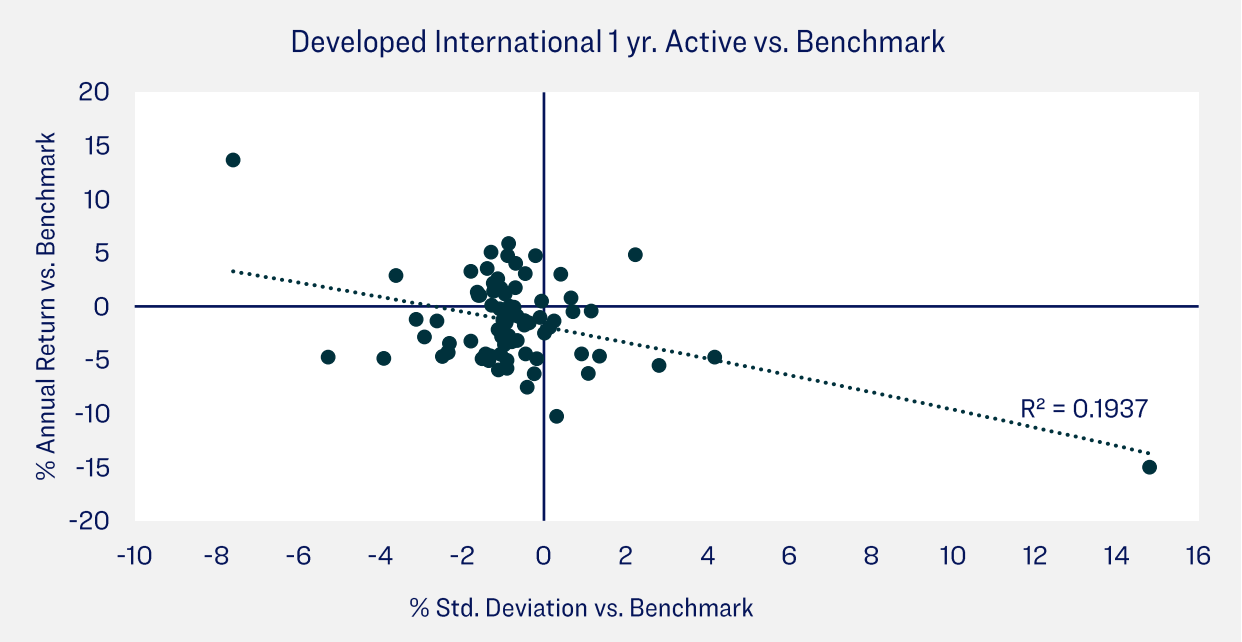
Monthly Return

The monthly return differential has been elevated above 1 standard deviation for 2 years even though valuations have undulated. This could be caused by earnings volatility for the underlying stocks.



Equities: International Developed

Developed International active managers have produced cumulative alpha over longer terms. On a rolling basis, 67% of active managers produce positive alpha over the most recent 10 years.



Source: Morningstar Direct, as of 05/31/2024

2 charts above display actively managed funds annual returns less benchmark return & standard deviation less benchmark deviation.

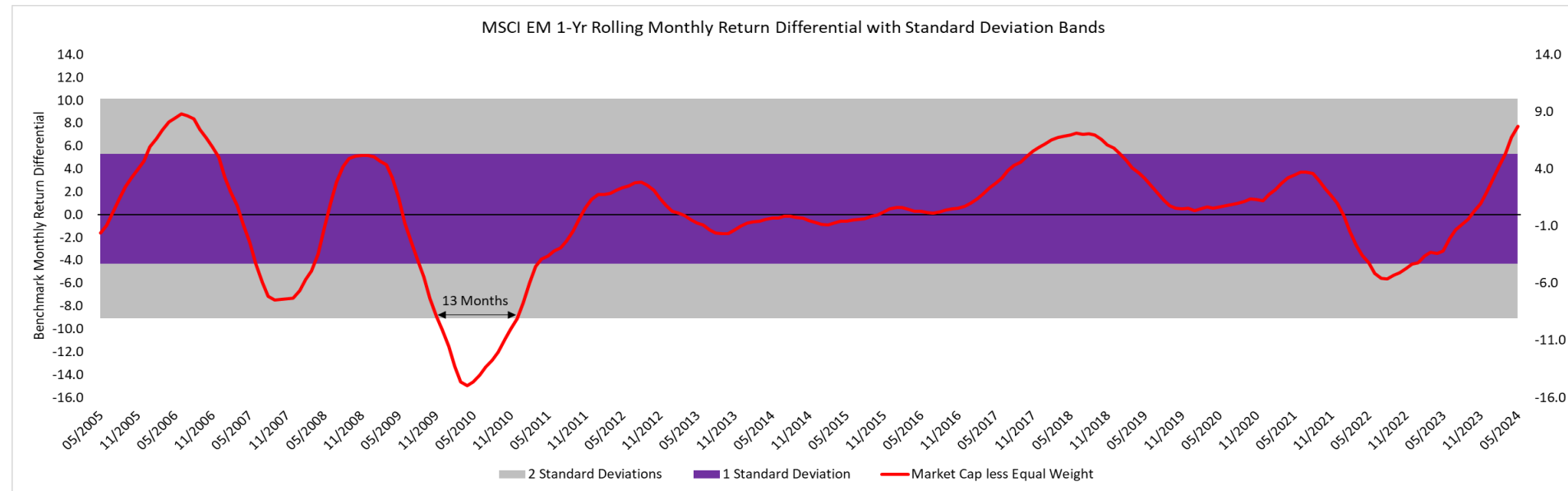
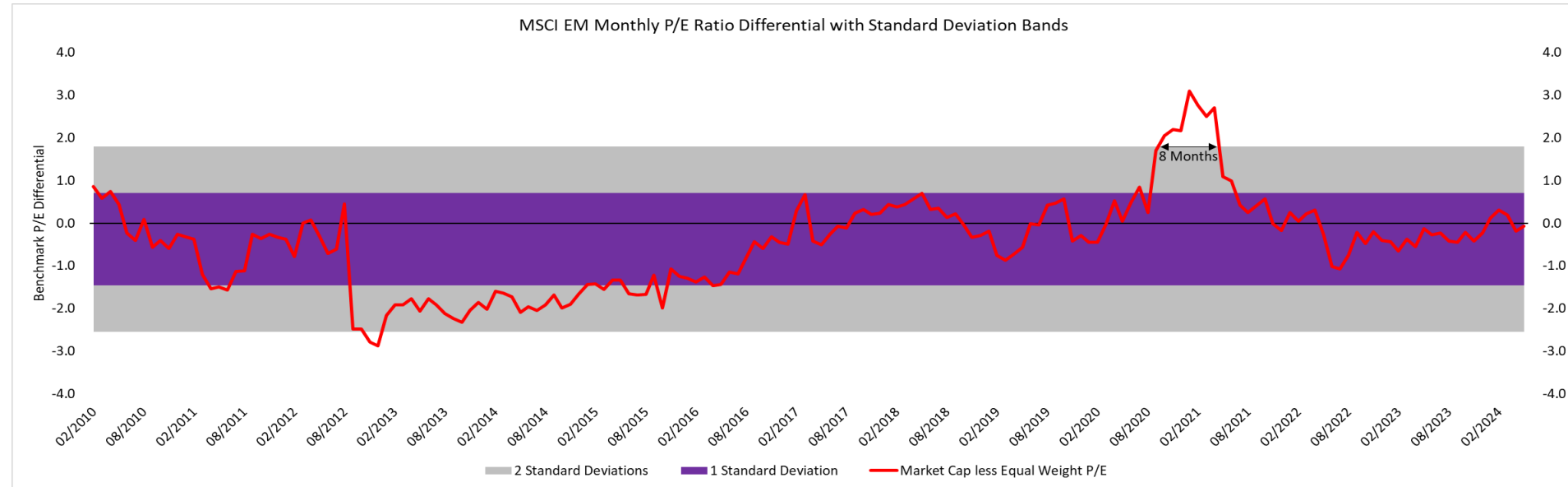
Equities: International Emerging Markets

P/E Ratio

We can see the market valuations are not being pulled by a small number of companies but is being represented equally amongst the MSCI EM constituents. In other words, there are not a few large companies that are disproportionately valued comparatively. Even when this does occur, reversion to the mean is usually quick.

Monthly Return

The monthly return differential has been elevated above 1 standard deviation at a significant pace even though valuation differential movement has been muted. As with past periods of divergence, we can expect to see reversion to the mean occur sometime in the future.

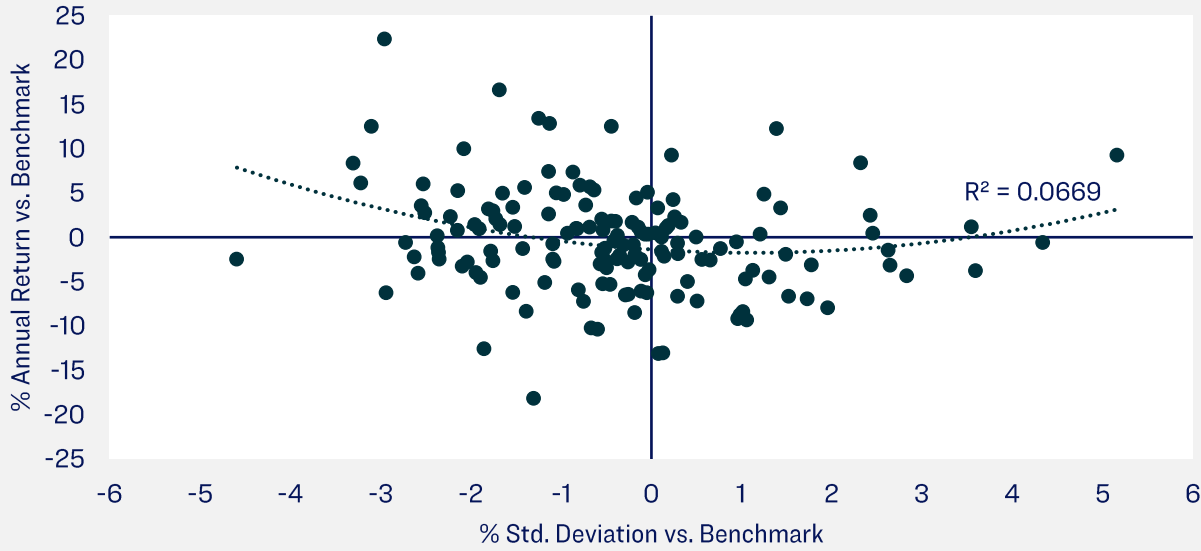


Source: Morningstar Direct, as of 05/31/2024
Both charts: rolling 1-yr, Standard deviations based on 20-yr data set

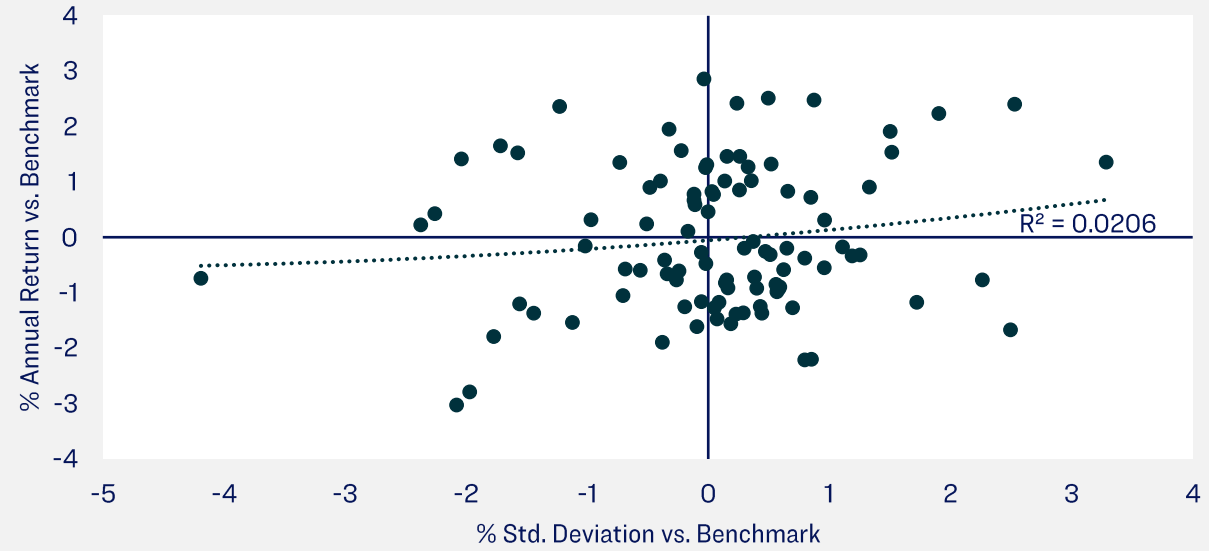
Equities: International Emerging Markets

Emerging Market Equity active managers have shown mixed results in producing cumulative alpha over longer terms. On a rolling basis, 34% of active managers produce positive alpha over the past 10 years.

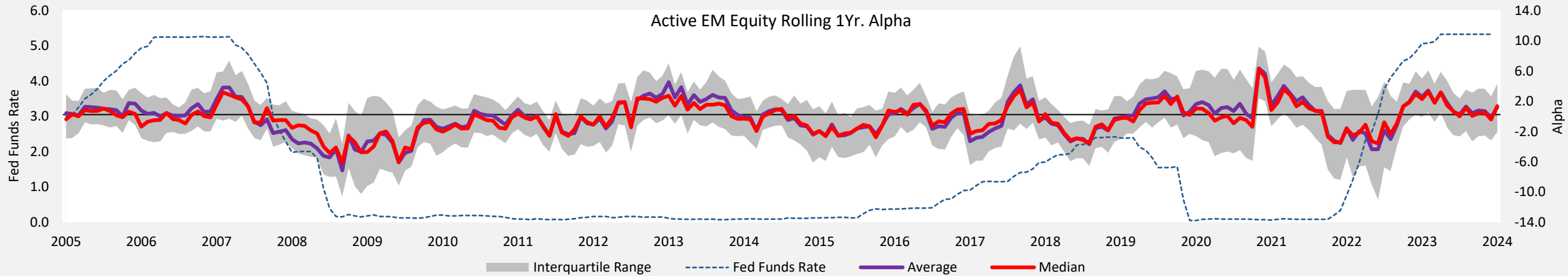
EM Equity 1 yr. Active vs. Benchmark



EM Equity 10 yr. Active vs. Benchmark

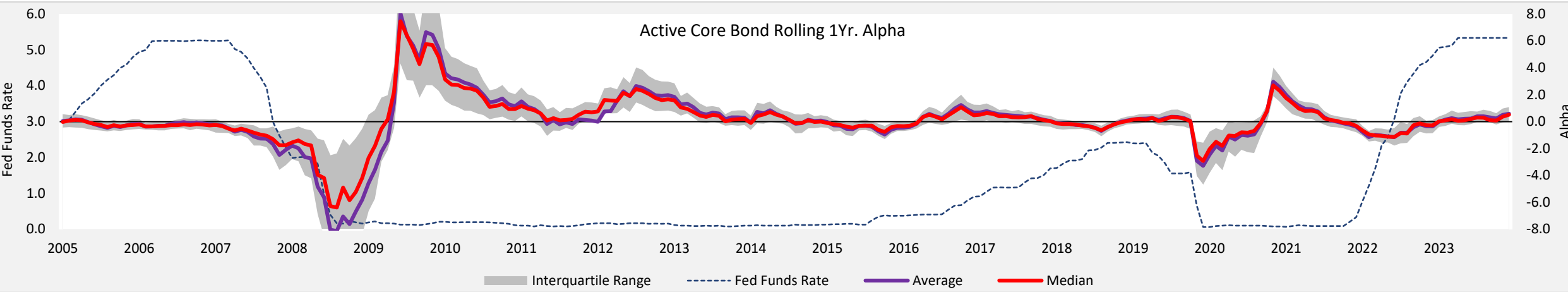
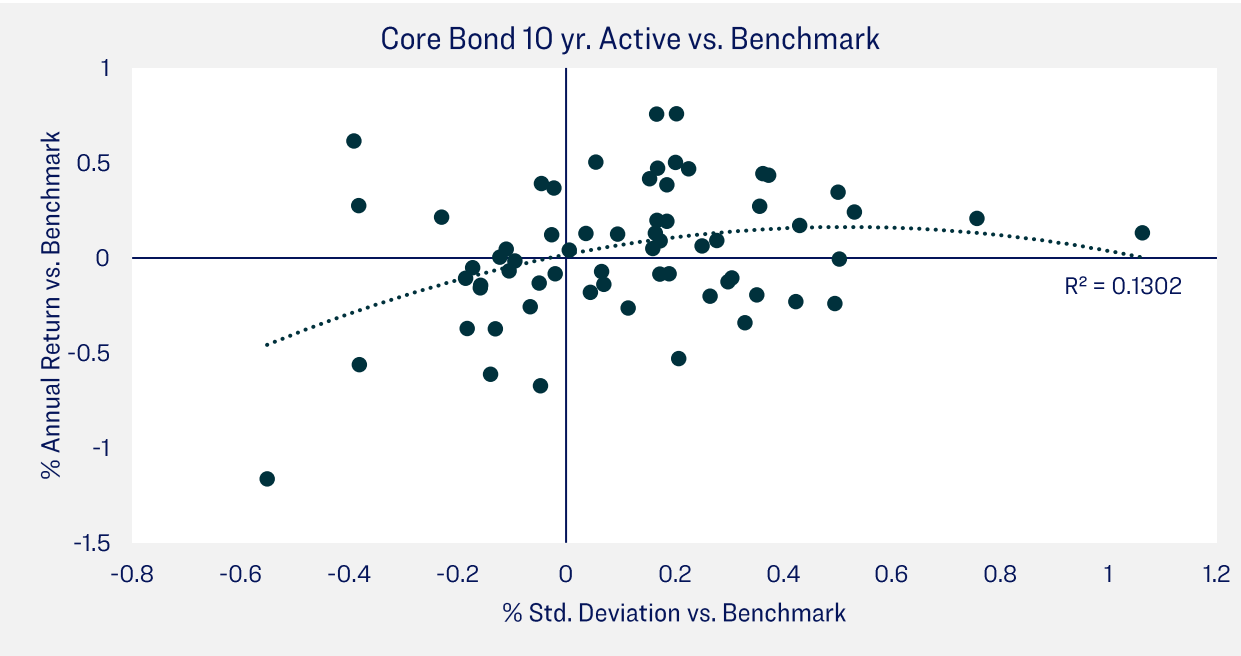
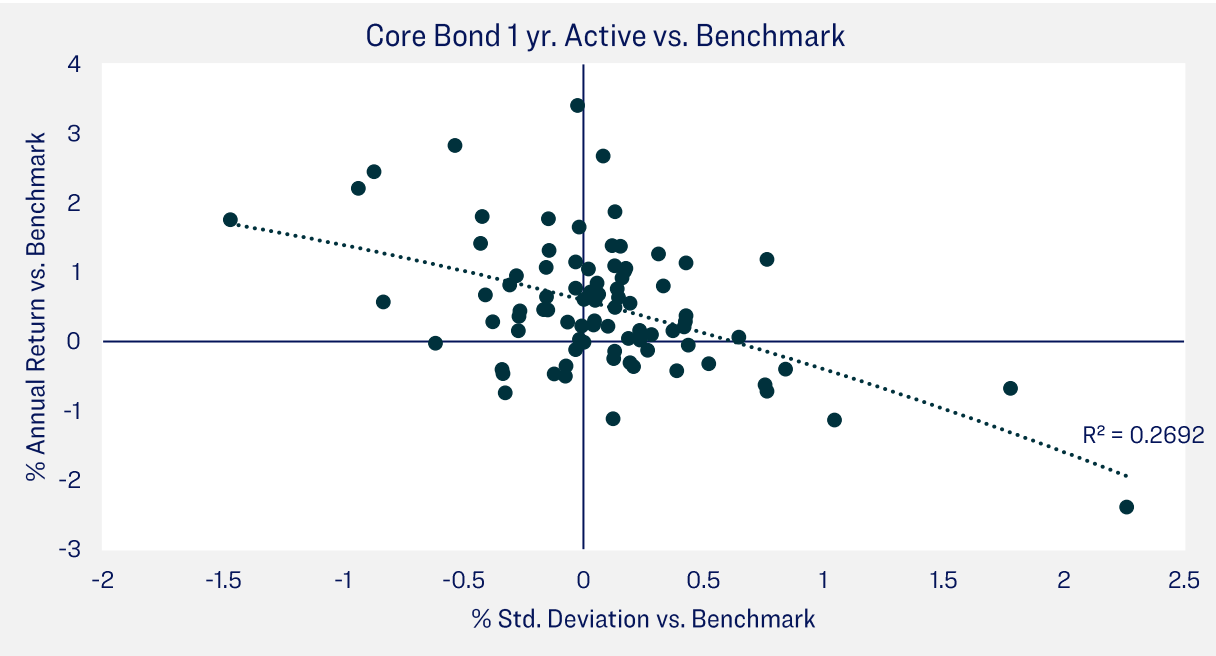


Active EM Equity Rolling 1Yr. Alpha



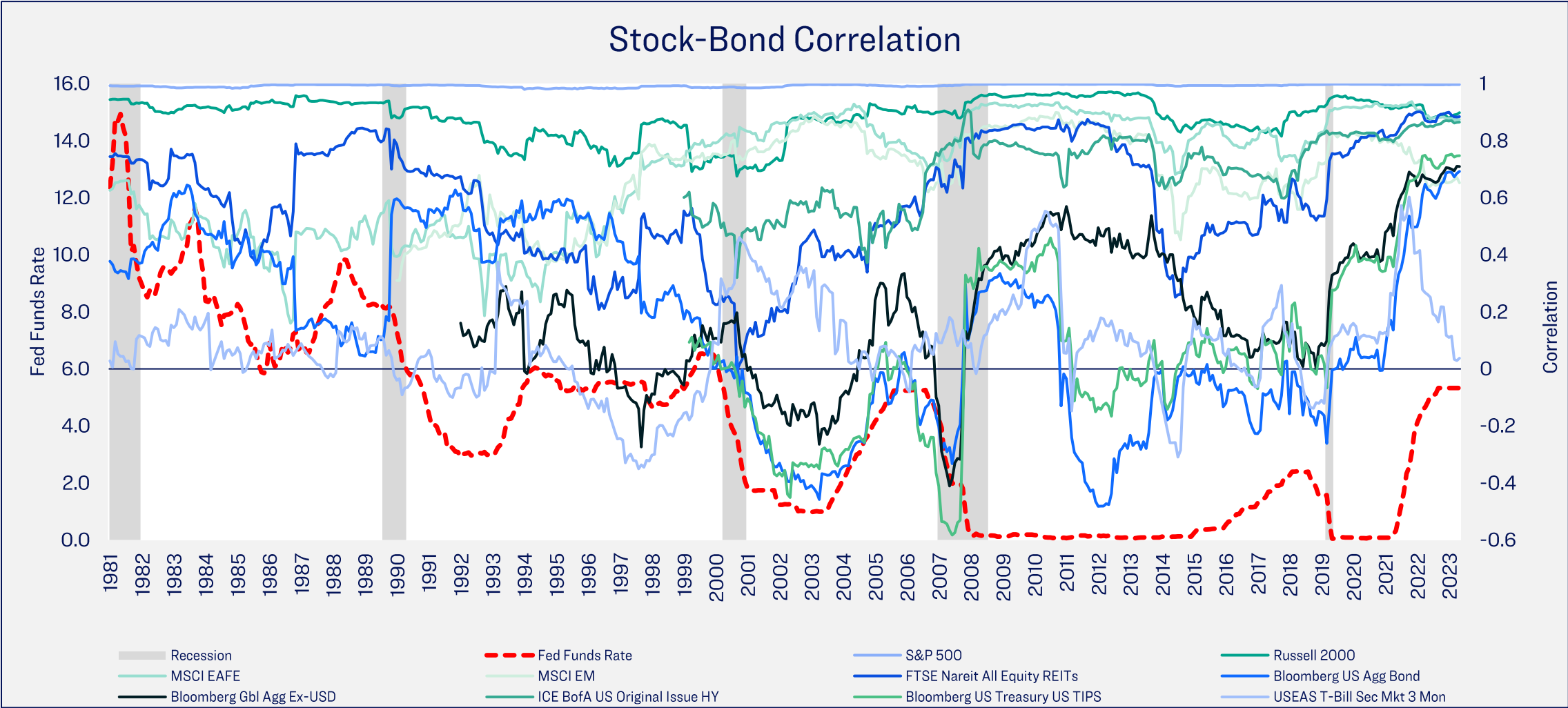
Fixed Income: US Core Bond

53% of active managers achieved positive alpha over the most recent cumulative 10-year period. Most managers who achieved positive alpha did so by capturing greater return further on the risk spectrum. Active managers have provided positive risk adjusted returns consistently over both rolling and static periods. We are currently in a period where nearly three-quarters of active managers are providing positive alpha on a rolling 1-year basis.



Stock-Bond Correlations at Historically High Levels

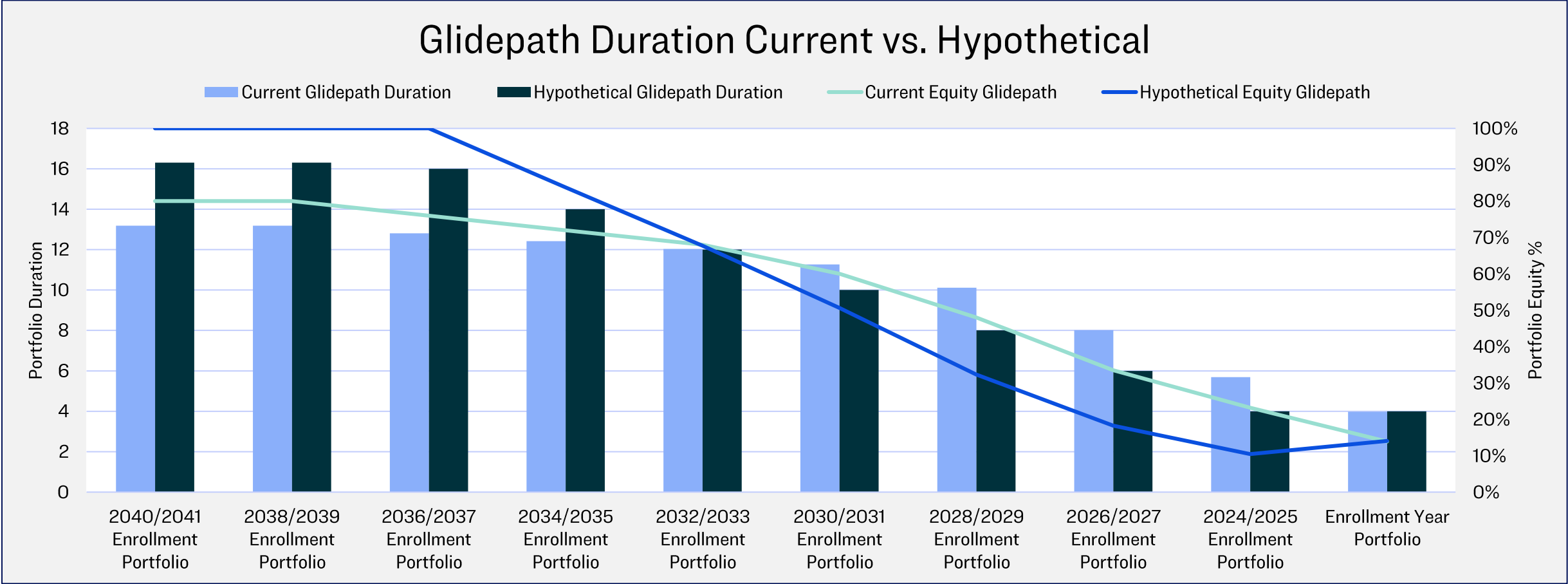
- There is compression above 0.5 in correlation levels of most asset classes
- This presents tailwinds for both stocks and bonds in the event of a sustained correlation downtrend in the future



Correlations based on Russell 3000 rolling 12-month, as of 04/30/2024
 Source: Morningstar Direct, Federal Reserve Bank of St. Louis - FRED

Matching Equity Duration to Glidepath Time Horizon by Applying Fixed Income Duration Paradigm

- Stocks can be seen as ultra-long maturity bonds due to their return of cashflow properties, using Macaulay duration
- Goal: match weighted average life of cashflows to time horizon (outflow need)
- Preliminary research shows increased risk-adjusted return potential when applying a hybrid duration optimization approach



Case study using California Passive Target Enrollment

Appendix 2

TFI Asset Allocation Process

Introduction to Monte Carlo Analysis

- The following asset allocation study uses the most recent capital market assumptions to evaluate prospective outcomes for the glide path models
- This year we modeled the Enrollment Year Investment Options using the appropriate asset allocations for each year along the glide path
- The Enrollment Year Investment Options seek to achieve a reasonable rate of expected return and high probability of outperforming tuition inflation while minimizing the potential shortfalls between expected returns and tuition inflation over the expected investment horizons



Glide Path Simulation Process

Capital market assumptions are used as inputs to a proprietary stochastic modeling tool developed by TFI

5,000 scenarios are run for each unique time horizon in the 21-year glide path considering a wide variety of different possible conditions in the financial markets

Outputs from the model specify a variety of risk and return characteristics, as well as the probability of outpacing tuition inflation

CMA Asset Class Correlations

	TC Life Funding Agreement	ICE BofA US 3-Month Treasury Bill Index	JPM GBI-EM Global Diversified Index	Bloomberg U.S. Aggregate Bond Index	Bloomberg Global Inflation-Linked US TIPS Index	Bloomberg U.S. TIPS 1-10 Year Index	Bloomberg U.S. 1-3 Year Gov't / Credit Bond Index	BofAML US HY BB/B Cash Pay Index	Credit Suisse Leveraged Loan Index	Morningstar US Short TIPS Index	FTSE NAREIT All Equity REITs Index	Russell 3000 Index	S&P 500 Index	Russell 1000 Value Index	Russell 1000 Growth Index	Russell 2000 Index	MSCI EAFE Index	MSCI Emerging Markets Index
TC Life Funding Agreement	1.00																	
ICE BofA US 3-Month Treasury Bill Index	0.56	1.00																
JPM GBI-EM Global Diversified Index	0.09	0.06	1.00															
Bloomberg U.S. Aggregate Bond Index	0.08	0.08	0.44	1.00														
Bloomberg Global Inflation-Linked US TIPS Index	0.06	0.01	0.48	0.77	1.00													
Bloomberg U.S. TIPS 1-10 Year Index	0.08	0.04	0.49	0.70	0.97	1.00												
Bloomberg U.S. 1-3 Year Gov't / Credit Bond Index	0.30	0.34	0.37	0.81	0.65	0.65	1.00											
BofAML US HY BB/B Cash Pay Index	-0.01	-0.09	0.65	0.40	0.52	0.57	0.26	1.00										
Credit Suisse Leveraged Loan Index	-0.04	-0.10	0.43	0.06	0.25	0.34	-0.05	0.81	1.00									
Morningstar US Short TIPS Index	0.12	0.09	0.48	0.52	0.85	0.94	0.57	0.61	0.46	1.00								
FTSE NAREIT All Equity REITs Index	-0.01	-0.06	0.58	0.36	0.38	0.39	0.16	0.70	0.55	0.36	1.00							
Russell 3000 Index	-0.08	-0.06	0.60	0.23	0.31	0.34	0.08	0.75	0.61	0.38	0.77	1.00						
S&P 500 Index	-0.09	-0.06	0.60	0.24	0.31	0.34	0.09	0.74	0.59	0.38	0.76	1.00	1.00					
Russell 1000 Value Index	-0.09	-0.07	0.62	0.18	0.25	0.29	0.06	0.72	0.60	0.34	0.77	0.96	0.96	1.00				
Russell 1000 Growth Index	-0.08	-0.05	0.55	0.27	0.35	0.38	0.11	0.73	0.58	0.40	0.70	0.96	0.97	0.86	1.00			
Russell 2000 Index	-0.04	-0.08	0.54	0.16	0.22	0.26	0.03	0.71	0.59	0.30	0.75	0.92	0.89	0.91	0.84	1.00		
MSCI EAFE Index	-0.04	-0.01	0.75	0.27	0.34	0.38	0.17	0.76	0.60	0.43	0.70	0.88	0.87	0.88	0.82	0.79	1.00	
MSCI Emerging Markets Index	0.04	0.01	0.81	0.26	0.35	0.39	0.18	0.71	0.58	0.44	0.59	0.74	0.74	0.72	0.71	0.68	0.85	1.00

Source: Morningstar Direct

Tuition data are sourced from the 2023 College Board Trends in Tuition Pricing.

Private 4-year Tuition Inflation:

$$T(t) = 0.0179 + i(t) + 0.0070 * S(t-1) + 0.1763 * B(t) + 0.2178 * R(t-1) + 0.0037 * GDP + e1(t)$$

Expected Value = 4.80%

Public Tuition Inflation:

$$T(t) = 0.0366 + i(t) + -0.0068 * S(t-1) + 0.2587 * B(t) + 0.2046 * R(t-1) + -0.6473 * GDP + e1(t)$$

Expected Value = 5.41%

where T(t) is the tuition inflation rate in year t,

i(t) is the CPI inflation rate in year t,

S(t) is the real stock total return (Russell 3000 Index) in year t,

B(t) is the real core fixed income total return (Bloomberg Barclays U.S. Aggregate Bond Index) in year t,

R(t) is the 3 Month T-Bill real return in year t,

GDP is the expected real GDP percent change (2.05%) for the next 10 years (source: Federal Reserve Bank of Philadelphia),

e1(t) is the random error term following a logistic distribution (0%, 1.19%) with a zero mean and standard deviation of 2.15%,

e2(t) is the random error term following a logistic distribution (0%, 1.42%) with a zero mean and standard deviation of 2.57%

Regression is based on data from 1977-2023.

For 2023-2024 school year, average tuition and fees were: \$11,260 for all in-state public colleges and \$41,540 for private 4-year colleges; based on most recent data 65% enrolled in public colleges and 35% enrolled in private colleges. The enrollment-weighted average tuition and fees for all colleges were \$21,858 = \$11,260 * 65% + \$41,540 * 35%. The forecasted enrollment-weighted average tuition and fees for year 1 are \$22,952 = \$11,260 * (1+5.41%) * 65% + \$41,540 * (1+4.80%) * 35%. Therefore, the public / private enrollment weighted tuition inflation rate for year 1 is: 5.01% = (\$22,952 / \$21,858) - 1

California - Active Enrollment Year Option Simulation Results

Enrollment Year	Domestic Large Cap Equity	Domestic Large Cap Value Equity	Domestic Large Cap Value Equity	Domestic Small Cap Equity	Developed International Equity	Emerging Market Equity	Real Estate Equity	Core Fixed Income	Inflation-Linked Fixed Income	Floating Rate Fixed Income	TC Life Funding Agreement	Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
2040/2041	15.80%	14.80%	14.80%	5.00%	19.20%	4.80%	5.60%	18.00%	0.00%	2.00%	0.00%	21	5.19%	2.27%	5.01%	53.62%	62.72%	98.64%	-1.19%
2038/2039	15.80%	14.80%	14.80%	5.00%	19.20%	4.80%	5.60%	18.00%	0.00%	2.00%	0.00%	19	5.12%	2.30%	5.01%	52.20%	62.28%	98.52%	-1.20%
2036/2037	15.20%	14.00%	14.00%	4.80%	18.10%	4.60%	5.30%	21.60%	0.00%	2.40%	0.00%	17	5.05%	2.30%	5.01%	50.68%	62.04%	98.46%	-1.21%
2034/2035	14.20%	13.30%	13.30%	4.50%	17.30%	4.30%	5.10%	25.20%	0.00%	2.80%	0.00%	15	5.00%	2.29%	5.01%	50.18%	62.96%	98.38%	-1.18%
2032/2033	13.60%	12.50%	12.50%	4.30%	16.30%	4.00%	4.80%	28.80%	0.00%	3.20%	0.00%	13	4.90%	2.25%	5.01%	48.24%	63.22%	98.28%	-1.19%
2030/2031	11.80%	11.10%	11.10%	3.80%	14.40%	3.60%	4.20%	36.00%	0.00%	4.00%	0.00%	11	4.83%	2.13%	5.01%	47.24%	66.00%	98.74%	-1.15%
2028/2029	9.60%	8.80%	8.80%	3.00%	11.50%	2.90%	3.40%	46.80%	0.00%	5.20%	0.00%	9	4.69%	2.02%	5.01%	43.88%	67.90%	98.74%	-1.15%
2026/2027	7.20%	6.60%	6.60%	2.30%	8.60%	2.20%	0.00%	40.30%	10.80%	5.40%	10.00%	7	4.51%	1.89%	5.01%	38.64%	71.84%	99.10%	-1.17%
2024/2025	5.00%	4.60%	4.60%	1.50%	6.00%	1.50%	0.00%	29.80%	8.00%	4.00%	35.00%	5	4.33%	1.87%	5.01%	35.48%	78.94%	98.96%	-1.25%
In-School	3.00%	2.70%	2.70%	1.00%	3.60%	0.90%	0.00%	25.60%	7.00%	3.50%	50.00%	3	4.22%	2.09%	5.02%	35.14%	91.20%	97.94%	-1.38%
	3.00%	2.70%	2.70%	1.00%	3.60%	0.90%	0.00%	25.60%	7.00%	3.50%	50.00%	1	4.22%	3.71%	5.06%	41.76%	99.28%	87.86%	-2.01%

California - Active Enrollment Year Option Simulation Results: Year-over-Year Comparison

Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
21	-0.55%	0.22%	0.03%	-10.64%	-10.02%	-1.12%	-0.38%
19	-0.53%	0.26%	0.03%	-10.56%	-10.52%	-1.24%	-0.38%
17	-0.49%	0.24%	0.03%	-10.18%	-10.40%	-1.14%	-0.36%
15	-0.43%	0.26%	0.03%	-9.12%	-9.18%	-1.14%	-0.31%
13	-0.36%	0.27%	0.04%	-7.52%	-8.82%	-1.20%	-0.30%
11	-0.27%	0.25%	0.04%	-5.64%	-6.44%	-0.78%	-0.25%
9	-0.24%	0.26%	0.04%	-5.74%	-6.44%	-1.00%	-0.22%
7	-0.20%	0.24%	0.03%	-5.42%	-5.88%	-0.60%	-0.19%
5	-0.16%	0.20%	0.03%	-3.78%	-4.32%	-0.68%	-0.15%
3	-0.18%	0.16%	0.03%	-3.24%	-1.76%	-0.90%	-0.14%
1	-0.15%	0.34%	0.08%	-1.06%	-0.38%	-2.86%	-0.16%

Comparison represents 2024 simulation results *minus* 2023 simulation results

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California - Passive Enrollment Year Option Simulation Results

Enrollment Year	Domestic Equity	Developed International Equity	Emerging Market Equity	Real Estate Equity	Core Fixed Income	Short-Term Inflation-Linked Fixed Income	High Yield Fixed Income	TC Life Funding Agreement	Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
2040/2041	50.40%	19.20%	4.80%	5.60%	16.00%	0.00%	4.00%	0.00%	21	5.10%	2.36%	5.01%	51.64%	61.24%	98.50%	-1.26%
2038/2039	50.40%	19.20%	4.80%	5.60%	16.00%	0.00%	4.00%	0.00%	19	5.05%	2.40%	5.01%	50.86%	60.76%	98.12%	-1.28%
2036/2037	47.90%	18.20%	4.60%	5.30%	19.20%	0.00%	4.80%	0.00%	17	4.99%	2.40%	5.01%	50.22%	60.96%	98.06%	-1.27%
2034/2035	45.40%	17.30%	4.30%	5.00%	22.40%	0.00%	5.60%	0.00%	15	4.91%	2.36%	5.01%	47.70%	61.20%	97.96%	-1.26%
2032/2033	42.80%	16.30%	4.10%	4.80%	25.60%	0.00%	6.40%	0.00%	13	4.83%	2.34%	5.01%	47.10%	62.00%	97.94%	-1.27%
2030/2031	37.80%	14.40%	3.60%	4.20%	32.00%	0.00%	8.00%	0.00%	11	4.73%	2.24%	5.01%	44.52%	63.26%	98.18%	-1.25%
2028/2029	30.20%	11.50%	2.90%	3.40%	41.60%	0.00%	10.40%	0.00%	9	4.59%	2.13%	5.01%	42.86%	65.84%	98.22%	-1.24%
2026/2027	22.70%	8.60%	2.20%	0.00%	40.30%	10.80%	5.40%	10.00%	7	4.43%	1.96%	5.01%	38.54%	69.86%	98.78%	-1.26%
2024/2025	15.70%	6.00%	1.50%	0.00%	29.80%	8.00%	4.00%	35.00%	5	4.25%	1.88%	5.01%	34.74%	77.46%	98.64%	-1.32%
In-School	9.40%	3.60%	0.90%	0.00%	25.60%	7.00%	3.50%	50.00%	3	4.15%	2.08%	5.03%	34.26%	89.64%	97.56%	-1.43%
	9.40%	3.60%	0.90%	0.00%	25.60%	7.00%	3.50%	50.00%	1	4.16%	3.59%	5.06%	40.78%	99.24%	87.94%	-2.04%

California - Passive Enrollment Year Option Simulation Results: Year-over-Year Comparison

Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
21	-0.74%	0.28%	0.01%	-14.34%	-12.90%	-1.16%	-0.47%
19	-0.69%	0.30%	0.02%	-13.08%	-12.64%	-1.48%	-0.47%
17	-0.66%	0.34%	0.02%	-12.36%	-12.08%	-1.56%	-0.46%
15	-0.62%	0.31%	0.02%	-12.44%	-12.36%	-1.50%	-0.44%
13	-0.57%	0.34%	0.02%	-10.30%	-10.66%	-1.50%	-0.42%
11	-0.47%	0.31%	0.03%	-9.38%	-9.44%	-1.46%	-0.35%
9	-0.39%	0.31%	0.03%	-6.72%	-8.56%	-1.38%	-0.31%
7	-0.30%	0.25%	0.03%	-5.36%	-6.90%	-0.86%	-0.26%
5	-0.24%	0.19%	0.02%	-4.64%	-4.58%	-0.98%	-0.20%
3	-0.23%	0.11%	0.06%	-4.72%	-2.74%	-1.42%	-0.18%
1	-0.22%	0.18%	0.14%	-2.50%	-0.30%	-2.78%	-0.18%

Comparison represents 2024 simulation results *minus* 2023 simulation results

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California - ESG Enrollment Year Option Simulation Results

Enrollment Year	Domestic Equity	Developed International Equity	Emerging Market Equity	Core Fixed Income	High Yield Fixed Income	TC Life Funding Agreement	Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
2040/2041	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%	21	5.10%	2.29%	5.01%	51.42%	60.68%	98.62%	-1.25%
2038/2039	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%	19	5.06%	2.30%	5.01%	51.70%	61.78%	98.48%	-1.23%
2036/2037	53.30%	18.10%	4.60%	21.60%	2.40%	0.00%	17	5.02%	2.30%	5.01%	50.32%	61.88%	98.28%	-1.22%
2034/2035	50.40%	17.30%	4.30%	25.20%	2.80%	0.00%	15	4.95%	2.27%	5.01%	49.26%	62.70%	98.18%	-1.20%
2032/2033	47.70%	16.30%	4.00%	28.80%	3.20%	0.00%	13	4.85%	2.25%	5.01%	47.84%	62.92%	98.36%	-1.21%
2030/2031	42.00%	14.40%	3.60%	36.00%	4.00%	0.00%	11	4.77%	2.19%	5.02%	45.52%	63.80%	98.34%	-1.21%
2028/2029	33.60%	11.50%	2.90%	46.80%	5.20%	0.00%	9	4.65%	2.06%	5.01%	43.18%	66.46%	98.60%	-1.20%
2026/2027	25.20%	8.60%	2.20%	48.60%	5.40%	10.00%	7	4.47%	1.96%	5.02%	38.82%	70.78%	98.90%	-1.23%
2024/2025	17.50%	6.00%	1.50%	36.00%	4.00%	35.00%	5	4.30%	1.93%	5.03%	35.48%	78.14%	98.52%	-1.30%
In-School	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%	3	4.22%	2.20%	5.04%	35.70%	89.04%	97.14%	-1.43%
	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%	1	4.30%	3.81%	5.10%	42.34%	99.18%	87.00%	-2.05%

California - ESG Enrollment Year Option Simulation Results: Year-over-Year Comparison

Inv Horizon (in Years)	Average Annual Return Over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of non-Negative Return	Annualized Shortfall
21	-0.46%	0.17%	0.02%	-9.04%	-9.34%	-0.74%	-0.34%
19	-0.43%	0.18%	0.02%	-7.76%	-7.28%	-0.84%	-0.30%
17	-0.39%	0.19%	0.02%	-7.62%	-7.64%	-1.10%	-0.28%
15	-0.37%	0.18%	0.02%	-7.36%	-7.02%	-1.26%	-0.25%
13	-0.36%	0.20%	0.02%	-6.44%	-7.18%	-1.00%	-0.26%
11	-0.27%	0.21%	0.02%	-6.12%	-5.74%	-0.94%	-0.22%
9	-0.19%	0.21%	0.02%	-2.96%	-5.20%	-0.94%	-0.17%
7	-0.20%	0.19%	0.02%	-3.78%	-4.44%	-0.66%	-0.16%
5	-0.21%	0.20%	0.02%	-3.50%	-3.58%	-0.94%	-0.16%
3	-0.14%	0.22%	0.06%	-2.82%	-2.78%	-1.58%	-0.15%
1	-0.08%	0.34%	0.11%	-1.54%	-0.32%	-2.90%	-0.15%

Comparison represents 2024 simulation results *minus* 2023 simulation results

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Definitions

- **(1) Expected Return.** The average of a distribution of possible annualized investment returns over an investment horizon of n years generated by Monte Carlo simulation. The returns are based on the assumption that each year money will be invested according to the asset class allocation assigned to the beneficiary's age.
- **(2) Standard Deviation of Returns.** A statistic used as a measure of the dispersion or variation in the distribution of annualized investment returns over an investment horizon of n years generated by Monte Carlo simulation, equal to the square root of the arithmetic mean of the squares of the deviations from the expected return. A higher standard deviation indicates a higher volatility.
- **(3) Average Annual Tuition Inflation.** The average of a distribution of possible annualized tuition inflation rates over an investment horizon of n years generated by the Monte Carlo simulation.
- **(4) Probability of Exceeding Tuition Inflation.** The likelihood that the annualized investment return exceeds the average tuition inflation rate over an investment horizon of n years, out of all the possible trials simulated by the Monte Carlo simulation.
- **(5) Probability of Achieving 90 Cents per Dollar of Future Tuition.** The likelihood that each dollar of investment today will grow to cover at least 90% of future tuition based on one dollar of today's tuition rising with tuition inflation over an investment horizon of n years.
- **(6) Probability of Non-negative Return.** The likelihood that the investment will achieve at least 0% of annualized return (preserving principal) over an investment horizon of n years.
- **(7) Annualized Shortfall.** The average of a distribution of the differences (shortfalls) between annualized investment returns and annualized tuition inflation rates over an investment horizon of n years among those scenarios that have annualized investment return failing to keep pace with tuition inflation.

Appendix 3

Investment Menu and Underlying Funds

Investment Menu - Active

Active Enrollment Year Investment Portfolios															
	T. Rowe Price Large Cap Growth Fund	T. Rowe Price Large Cap Value Fund	Nuveen Quant Small-Cap Equity	Nuveen S&P 500 Index Fund	DFA Large Cap Intl Portfolio	DFA Emerging Markets Core Equity I Portfolio	Vanguard Real Estate Index Fund	MetWest Total Return Bond Fund	Nuveen Bond Index Fund	PIMCO Real Return Fund	PIMCO Income Fund	T. Rowe Price Floating Rate Fund	Nuveen Life Funding Agreement	Nuveen Large Cap Responsible Equity Fund	Nuveen International Responsible Equity Fund
Tickers	TRLGX	TILCX	TISEX	TISPX	DFALX	DFCEX	VGSNX	MWTSX	TBIIX	PRRIX	PIMIX	RPIFX		TISCX	TSONX
2040/2041 Enrollment Portfolio Active	14.80%	14.80%	5.00%	15.80%	19.20%	4.80%	5.60%	7.00%	5.00%	0.00%	6.00%	2.00%	0.00%		
2038/2039 Enrollment Portfolio Active	14.80%	14.80%	5.00%	15.80%	19.20%	4.80%	5.60%	7.00%	5.00%	0.00%	6.00%	2.00%	0.00%		
2036/2037 Enrollment Portfolio Active	14.00%	14.00%	4.80%	15.20%	18.10%	4.60%	5.30%	8.40%	6.00%	0.00%	7.20%	2.40%	0.00%		
2034/2035 Enrollment Portfolio Active	13.30%	13.30%	4.50%	14.20%	17.30%	4.30%	5.10%	9.80%	7.00%	0.00%	8.40%	2.80%	0.00%		
2032/2033 Enrollment Portfolio Active	12.50%	12.50%	4.30%	13.60%	16.30%	4.00%	4.80%	11.20%	8.00%	0.00%	9.60%	3.20%	0.00%		
2030/2031 Enrollment Portfolio Active	11.10%	11.10%	3.80%	11.80%	14.40%	3.60%	4.20%	14.00%	10.00%	0.00%	12.00%	4.00%	0.00%		
2028/2029 Enrollment Portfolio Active	8.80%	8.80%	3.00%	9.60%	11.50%	2.90%	3.40%	18.20%	13.00%	0.00%	15.60%	5.20%	0.00%		
2026/2027 Enrollment Portfolio Active	6.60%	6.60%	2.30%	7.20%	8.60%	2.20%	0.00%	18.90%	8.10%	10.80%	13.30%	5.40%	10.00%		
2024/2025 Enrollment Portfolio Active	4.60%	4.60%	1.50%	5.00%	6.00%	1.50%	0.00%	14.00%	6.00%	8.00%	9.80%	4.00%	35.00%		
Enrollment Year Portfolio Active	2.70%	2.70%	1.00%	3.00%	3.60%	0.90%	0.00%	12.25%	5.25%	7.00%	8.10%	3.50%	50.00%		
Active Risk-Based Portfolios															
Active Conservative Portfolio								17.50%	7.50%	10.00%	10.00%	5.00%	50.00%		
Active Diversified Equity Portfolio	18.40%	18.40%	6.30%	19.90%	24.00%	6.00%	7.00%								
Active Growth Portfolio	12.50%	12.50%	4.30%	13.60%	16.30%	4.00%	4.80%	11.20%	4.80%	6.40%	6.40%	3.20%			
Active International Equity Portfolio					80.00%	20.00%									
ESG International Equity Portfolio															100%
Social Choice Equity Portfolio														100%	
Principal Plus Interest Portfolio													100.00%		

Duration in Enrollment Year Investment Options - Active

	MetWest Total Return Bond Fund	Nuveen Bond Index Fund	PIMCO Real Return Fund	PIMCO Income Fund	T. Rowe Price Floating Rate Fund	TIAA-CREF Life Funding Agreement	Weighted Average Duration (Years)
Portfolio Effective Duration*	6.91	6.14	6.55	4.22	0.56	0.00	
2040/2041 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2038/2039 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2036/2037 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2034/2035 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2032/2033 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2030/2031 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2028/2029 Enrollment Portfolio Active	35%	25%	0%	30%	10%	0%	5.3
2026/2027 Enrollment Portfolio Active	28%	12%	16%	20%	8%	15%	4.7
2024/2025 Enrollment Portfolio Active	18%	8%	10%	13%	5%	46%	3.0
Enrollment Year Portfolio Active	14%	6%	8%	9%	4%	58%	2.3

*Most recent as of September 2024

Investment Menu - Passive

Passive Enrollment Year Investment Portfolios

Enrollment Year	Nuveen Equity Index Fund	Nuveen International Equity Index Fund	Nuveen Emerging Markets Equity Index Fund	Vanguard Real Estate Index Fund	Nuveen Bond Index Fund	Vanguard Shrt-Term Infl-Prot Sec Index Fund	Vanguard High-Yield Corporate Fund	Nuveen Life Funding Agreement	Nuveen ESG US Aggregate Bond ETF
Tickers	TIEIX	TCIEX	TEQLX	VGSNX	TBIIX	VTSPX	VWEAX		NUBD
2040/2041 Enrollment Portfolio Passive	50.40%	19.20%	4.80%	5.60%	16.00%	0.00%	4.00%	0.00%	
2038/2039 Enrollment Portfolio Passive	50.40%	19.20%	4.80%	5.60%	16.00%	0.00%	4.00%	0.00%	
2036/2037 Enrollment Portfolio Passive	47.90%	18.20%	4.60%	5.30%	19.20%	0.00%	4.80%	0.00%	
2034/2035 Enrollment Portfolio Passive	45.40%	17.30%	4.30%	5.00%	22.40%	0.00%	5.60%	0.00%	
2032/2033 Enrollment Portfolio Passive	42.80%	16.30%	4.10%	4.80%	25.60%	0.00%	6.40%	0.00%	
2030/2031 Enrollment Portfolio Passive	37.80%	14.40%	3.60%	4.20%	32.00%	0.00%	8.00%	0.00%	
2028/2029 Enrollment Portfolio Passive	30.20%	11.50%	2.90%	3.40%	41.60%	0.00%	10.40%	0.00%	
2026/2027 Enrollment Portfolio Passive	22.70%	8.60%	2.20%	0.00%	40.30%	10.80%	5.40%	10.00%	
2024/2025 Enrollment Portfolio Passive	15.70%	6.00%	1.50%	0.00%	29.80%	8.00%	4.00%	35.00%	
Enrollment Year Portfolio Passive	9.40%	3.60%	0.90%	0.00%	25.60%	7.00%	3.50%	50.00%	

Passive Risk-Based Portfolios

ESG Bond Portfolio									100.00%
Index Bond Portfolio					100.00%				
Index International Equity Portfolio		80.00%	20.00%						
Index U.S. Equity Portfolio	100.00%								
Passive Conservative Portfolio					35.00%	10.00%	5.00%	50.00%	
Passive Diversified Equity Portfolio	63.00%	24.00%	6.00%	7.00%					
Passive Growth Portfolio	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%		

Duration in Enrollment Year Investment Options - Passive

	Nuveen Bond Index Fund	Vanguard Short-Term Inflation- Protected Securities Index Fund	Vanguard High Yield Corporate Fund	TC Life Funding Agreement	Weighted Average Duration (Years)
Portfolio Effective Duration*	6.14	2.51	3.03	0.00	
2040/2041 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2038/2039 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2036/2037 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2034/2035 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2032/2033 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2030/2031 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2028/2029 Enrollment Portfolio Passive	80%	0%	20%	0%	5.5
2026/2027 Enrollment Portfolio Passive	61%	16%	8%	15%	4.4
2024/2025 Enrollment Portfolio Passive	39%	10%	5%	46%	2.8
Enrollment Year Portfolio Passive	30%	8%	4%	58%	2.2

*Most recent as of September 2024

Investment Menu - ESG

ESG Enrollment Year Investment Portfolios						
	Nuveen Large Cap Responsible Equity Fund	Nuveen International Responsible Equity Fund	Nuveen ESG Emerging Markets Equity ETF	Nuveen ESG US Aggregate Bond ETF	Nuveen ESG High Yield Corporate Bd ETF	Nuveen Life Funding Agreement
Tickers	TISCX	TSONX	NUEM	NUBD	NUHY	
2040/2041 Enrollment Portfolio ESG	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%
2038/2039 Enrollment Portfolio ESG	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%
2036/2037 Enrollment Portfolio ESG	53.30%	18.10%	4.60%	21.60%	2.40%	0.00%
2034/2035 Enrollment Portfolio ESG	50.40%	17.30%	4.30%	25.20%	2.80%	0.00%
2032/2033 Enrollment Portfolio ESG	47.70%	16.30%	4.00%	28.80%	3.20%	0.00%
2030/2031 Enrollment Portfolio ESG	42.00%	14.40%	3.60%	36.00%	4.00%	0.00%
2028/2029 Enrollment Portfolio ESG	33.60%	11.50%	2.90%	46.80%	5.20%	0.00%
2026/2027 Enrollment Portfolio ESG	25.20%	8.60%	2.20%	48.60%	5.40%	10.00%
2024/2025 Enrollment Portfolio ESG	17.50%	6.00%	1.50%	36.00%	4.00%	35.00%
Enrollment Year Portfolio ESG	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%

Duration in Enrollment Year Investment Options - ESG

	Nuveen ESG US Aggregate Bond ETF	Nuveen ESG High Yield Corporate Bond ETF	TIAA-CREF Life Funding Agreement	Weighted Average Duration (Years)
Portfolio Effective Duration*	6.03	3.37	0.00	
2040/2041 Enrollment Portfolio ESG	90%	10%	0%	5.8
2038/2039 Enrollment Portfolio ESG	90%	10%	0%	5.8
2036/2037 Enrollment Portfolio ESG	90%	10%	0%	5.8
2034/2035 Enrollment Portfolio ESG	90%	10%	0%	5.8
2032/2033 Enrollment Portfolio ESG	90%	10%	0%	5.8
2030/2031 Enrollment Portfolio ESG	90%	10%	0%	5.8
2028/2029 Enrollment Portfolio ESG	90%	10%	0%	5.8
2026/2027 Enrollment Portfolio ESG	76%	8%	16%	4.9
2024/2025 Enrollment Portfolio ESG	48%	5%	47%	3.1
Enrollment Year Portfolio ESG	37%	4%	59%	2.4

*Most recent as of September 2024



MEMORANDUM

TO: ScholarShare Investment Board (SIB)
FROM: Meketa Investment Group (“Meketa”)
DATE: December 16, 2024
RE: 2024 TIAA-CREF Annual Review

Summary & Recommendation

Meketa reviewed TIAA-CREF Tuition Financing, Inc.’s (“TFI”) annual review and recommendation for the ScholarShare 529 (“Plan”) 2025 asset allocation, which is recommending no changes to the investment strategy (asset allocation or underlying funds). We also note no changes were recommended for the ESG enrollment-based options as ESG focused funds tend to be at the broader asset class level. ***Meketa recommends the SIB accept TFI’s recommendation of no changes to the Plan’s asset allocation and underlying funds.***

Background

SIB Staff requested that Meketa review TFI’s annual review and recommendation for the 2025 asset allocation for the Plan, which highlights TFI’s analysis behind the recommendation of no changes to the glidepaths.

TFI’s recommendations are due to their 2025 Capital Market Assumptions (CMAs) exhibiting less year-over-year changes relative to the 2024 CMAs. TFI noted that while their analysis calculates lower expected returns, these differences are not material enough to implement structural changes without increasing potential risks in the portfolios. TFI believes the glidepaths approved as part of the 2024 Annual Review remain sound. They believe the glidepaths should meet TFI’s expectation for a reasonable rate of expected return while minimizing the potential “shortfalls” between expected returns and tuition inflation over the investment horizons.

In addition to reviewing TFI’s annual review and recommendations, Meketa has analyzed the Glidepath returns using Meketa’s proprietary asset allocation tool. Following are Meketa’s 2024 Capital Market Expectations, which are the inputs into our model:



Expected Returns and Volatilities			Expected Long-Term Correlations										
Asset Class	Expected Geometric Return		Cash Equivalents	Investment Grade Bonds	TIPS	Bank Loans	US Equity	US Equity Growth	US Equity Value	US Small Cap	Developed Market Equity (non-US)	Emerging Market Equity	REITs
	2024	Std Dev											
Cash Equivalents	2.50%	1.00%	1.00										
Investment Grade Bonds	4.80%	4.00%	0.13	1.00									
TIPS	4.70%	7.00%	0.03	0.77	1.00								
Bank Loans	6.60%	10.00%	-0.15	0.06	0.24	1.00							
US Equity	9.00%	17.00%	-0.09	0.22	0.30	0.61	1.00						
US Equity Growth	8.00%	18.00%	-0.08	0.26	0.33	0.58	0.97	1.00					
US Equity Value	9.00%	17.00%	-0.09	0.16	0.24	0.60	0.97	0.88	1.00				
US Small Cap	9.40%	21.00%	-0.11	0.14	0.21	0.59	0.92	0.87	0.92	1.00			
Developed Market Equity (non-US)	8.90%	18.00%	-0.02	0.26	0.33	0.59	0.88	0.83	0.87	0.79	1.00		
Emerging Market Equity	8.40%	22.00%	0.00	0.27	0.36	0.57	0.74	0.71	0.73	0.69	0.86	1.00	
REITs	7.80%	24.00%	-0.06	0.36	0.40	0.54	0.76	0.70	0.77	0.74	0.69	0.59	1.00

Glidepath Asset Allocation Review

Meketa has analyzed the expected outcomes for the current glidepaths for the enrollment-based options using Meketa’s 2024 Capital Market Expectations vs. our 2023 CMEs. Asset allocation represents the conscious decision to accept and manage risk. Real world risks and objectives faced by investors can be complex and often conflicting as a result they cannot be summarized in a single statistic. Rather, we must use a variety of tools to build a more complete picture. Our analysis takes into consideration the unique aspects of a 529 plan: short accumulation and depletion periods. We focus on the portfolio’s effectiveness at generating returns relative to the risks incurred while accounting for distinctive risks of 529 plans such as drawdowns/losses in the latter years of the glidepath.

Our analysis (see table below) of the year-over-year shifts in expected outcomes are consistent with TFI’s observations noted above.

	Active		Passive		ESG	
	2023 CMEs	2024 CMEs	2023 CMEs	2024 CMEs	2023 CMEs	2024 CMEs
5 Percentile Return	12.07%	11.56%	12.11%	11.58%	11.82%	11.31%
25 Percentile Return	9.29%	8.91%	9.29%	8.89%	9.12%	8.73%
Expected Return	7.39%	7.11%	7.37%	7.06%	7.27%	6.98%
75 Percentile Return	5.53%	5.34%	5.48%	5.26%	5.46%	5.25%
95 Percentile Return	2.92%	2.84%	2.83%	2.72%	2.91%	2.81%
Expected Standard Deviation	11.58%	11.06%	11.74%	11.24%	11.28%	10.79%
Probability of Exceeding 5% Tuition Inflation	80.81%	78.93%	80.23%	78.01%	80.21%	78.00%
Probability of Exceeding 3% Tuition Inflation	94.67%	94.31%	94.32%	93.80%	94.65%	94.16%
Median Sharpe Ratio	0.39	0.42	0.38	0.41	0.39	0.41
Expected Worst Year	-38.97%	-37.08%	-39.12%	-37.24%	-38.51%	-36.64%
Expected Worst Year (Last 8 years)	-29.15%	-28.12%	-30.06%	-28.99%	-26.82%	-26.01%
Expected Worst Year (Last 4 years)	-18.48%	-18.06%	-18.40%	-17.97%	-16.22%	-15.87%

Conclusion

Meketa finds TFI’s analysis to be comprehensive and insightful and uses consistent and reasonable inputs in developing their conclusions. Meketa agrees the existing glidepaths are sound and should meet TFI’s expectation for a reasonable rate of expected return while being cognizant of the risks incurred to achieve those returns. Meketa, therefore, concurs with TFI’s analysis and recommendation.

KRC/AK/IH/mp

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