
DECEMBER 7, 2021

**AGENDA ITEM 7
INFORMATION ITEM**

SCHOLARSHARE INVESTMENT BOARD

Review of 2022 Asset Allocation Recommendation 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.

In 2022, the Plan will implement changes to its investment portfolios following the Board's approval of the contract award to TFI resulting from SIB's competitive request for proposals (RFP) issued in summer 2021. TFI has provided its "Asset Allocation Recommendation for 2022" (Exhibit A), which highlights the analysis completed for their recommendation for no additional changes for 2022 outside of the approved changes to the Plan's investment portfolios scheduled for February 2022. TFI's analysis primarily captures the investment proposal made in TFI's RFP response.

The Board's investment consultant, Meketa Investment Group, Inc. (Meketa), reviewed and analyzed TFI's recommendation and provided a memo (Exhibit B) concurring with TFI's recommendation for no additional changes for 2022. Meketa and SIB staff have reviewed and concur with TFI's recommendation for no additional changes in 2022 to the Plan's asset allocation.

Presenters

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

Glenn Friedman, Director, Asset Allocation and Investments, TIAA-CREF Tuition Financing, Inc.
Eric White, Principal, Meketa Investment Group, Inc.



Asset Allocation Recommendation for 2022

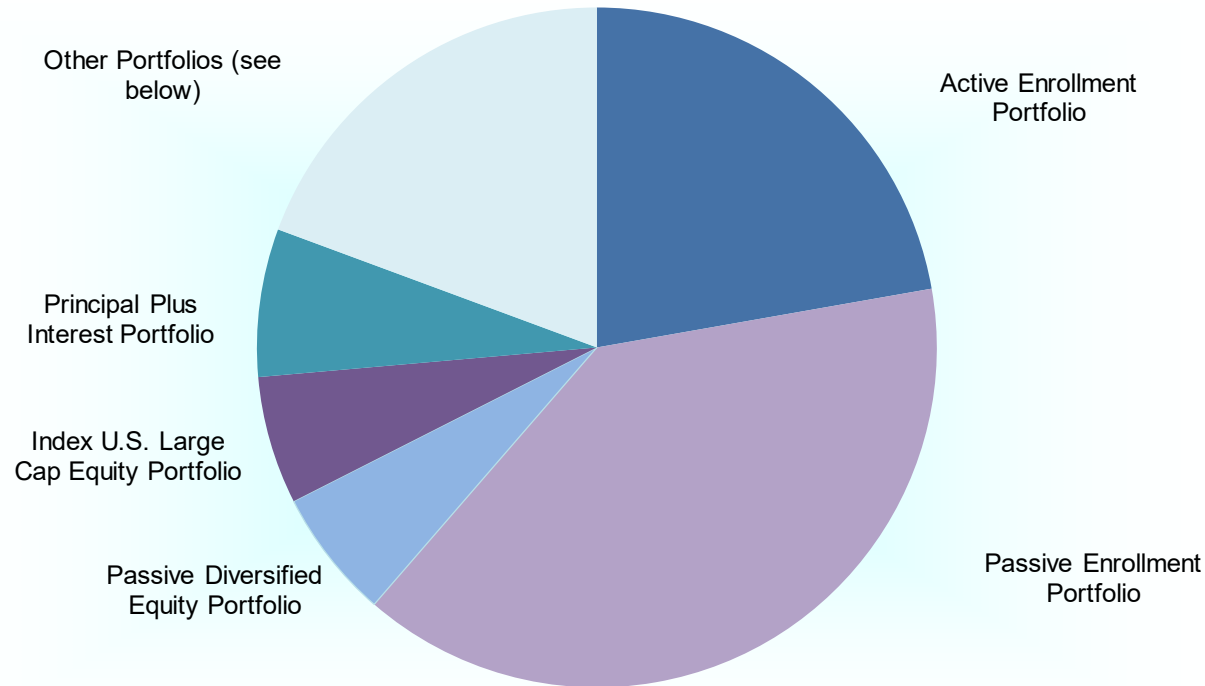
Prepared by TIAA-CREF Tuition Financing, Inc.
December 7, 2021



	Page
Executive Summary	3
Assets by Investment Option	4
Approved Investment Lineup with Changes	5-8
Market Update	9-10
Glide Path Portfolios	11
International Equity Risk	12
Duration in the Approved Enrollment Year Portfolios	13-15
Conclusions	16
Appendix 1: Asset Allocation Process	17
Investment Return Quilt	18-19
Tuition Inflation Forecasting and Monte Carlo Analysis	20-31
Appendix 2: Other Supporting Material	32
Current Investment Menus	33-34
Domestic Equity Composition	35-37
Underlying Funds by Strategy	38
Fee Tables	39

- TFI has completed this year's asset allocation study to evaluate the overall investment strategy for ScholarShare 529
- This year's asset allocation recommendation captures the investment proposal made in TFI's response to the RFP in July 2021:
 - Expand the ESG offering to include an all-new ESG glide path, and add additional single-fund ESG investment options for the international equity and U.S. core bond markets
 - Reduce participant fees in both the Active and Passive portfolios by introducing allocations to low-cost Vanguard and TIAA-CREF funds
 - Streamline the five diversified Multi-Fund Portfolios from five to three in both the Active and Passive lineups, and merge the Index U.S. Large Cap Equity Portfolio into the Index U.S. Equity Portfolio to facilitate the decision-making process and holistically scale the investment menu
- **These recommendations have been approved and are scheduled for implementation in February**

Assets by Investment Option as of 09/30/20: \$12.46 B



Portfolio	% of Assets	\$ Millions	Portfolio	% of Assets	\$ Millions
Passive Enrollment Portfolio	39.13%	\$ 4,876	Index U.S. Equity Portfolio	6.17%	\$ 768
Active Enrollment Portfolio	22.23%	\$ 2,770	Passive Diversified Equity Portfolio	6.08%	\$ 757
Index U.S. Large Cap Equity Portfolio	7.03%	\$ 876	Other Portfolios (see below)	19.36%	\$ 2,412
Other Portfolios					
Principal Plus Interest Portfolio	4.58%	\$ 570	Passive Moderate Growth Portfolio	0.72%	\$ 90
Active Diversified Equity Portfolio	3.33%	\$ 415	Active Moderate Growth Portfolio	0.71%	\$ 89
Active Growth Portfolio	2.25%	\$ 280	Passive Conservative Portfolio	0.52%	\$ 65
Social Choice Portfolio	2.24%	\$ 279	Active Conservative Portfolio	0.37%	\$ 46
Passive Growth Portfolio	1.71%	\$ 212	Active International Equity Portfolio	0.33%	\$ 41
Index International Equity Portfolio	1.25%	\$ 156	Active Diversified Fixed Income Portfolio	0.30%	\$ 37
Index Bond Portfolio	0.77%	\$ 96	Passive Diversified Fixed Income Portfolio	0.28%	\$ 35

Approved Passive Lineup

Passive Investment Options	TIAA-CREF Equity Index Fund	TIAA-CREF International Equity Index Fund	TIAA-CREF Emerging Markets Equity Index Fund	Vanguard Real Estate Index Fund	TIAA-CREF Bond Index Fund	Vanguard Short-Term Inflation-Protected Securities Index Fund	Vanguard High Yield Fund	TIAA-CREF Life Funding Agreement
Ticker	TIEIX	TCIEX	TEQLX	VGSNX	TBIIX	VTSPX	VWEAX	NA
2038-2039 Passive	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	
2036-2037 Passive	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	
2034-2035 Passive	47.90%	18.20%	4.60%	5.30%	16.80%	4.80%	2.40%	
2032-2033 Passive	45.40%	17.30%	4.30%	5.00%	19.60%	5.60%	2.80%	
2030-2031 Passive	42.80%	16.30%	4.10%	4.80%	22.40%	6.40%	3.20%	
2028-2029 Passive	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	
2026-2027 Passive	30.20%	11.50%	2.90%	3.40%	36.40%	10.40%	5.20%	
2024-2025 Passive	22.70%	8.60%	2.20%	2.50%	37.80%	10.80%	5.40%	10.00%
2022-2023 Passive	15.70%	6.00%	1.50%	1.80%	28.00%	8.00%	4.00%	35.00%
Enrollment Year Passive	9.40%	3.60%	0.90%	1.10%	24.50%	7.00%	3.50%	50.00%
Passive Diversified Equity	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%	
Passive Conservative					35.00%	10.00%	5.00%	50.00%
Index International Equity		80.00%	20.00%					
Index Bond Portfolio					100.00%			
Index U.S. Equity Portfolio	100.00%							

Features the Passive Enrollment Year Investment Portfolio, Multi-Fund Portfolios, and two Single-Fund Portfolios

Approved Active Lineup

Active Investment Options	T. Rowe Price Large Cap Growth Fund	T. Rowe Price Large Cap Value Fund	TIAA-CREF Quant Small-Cap Equity	TIAA-CREF 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	TIAA-CREF Bond Index Fund	PIMCO Real Return Fund	PIMCO Income Fund	T. Rowe Price Floating Rate Fund	TIAA-CREF Life Funding Agreement
Ticker	TRLGX	TILCX	TISEX	TISPX	DFALX	DFCEX	VGSNX	MWTSX	TBIIX	PRRIX	PIMIX	RPIFX	NA
2038-2039 Active	14.80%	14.80%	5.00%	15.80%	19.20%	4.80%	5.60%	7.00%	3.00%	4.00%	4.00%	2.00%	
2036-2037 Active	14.80%	14.80%	5.00%	15.80%	19.20%	4.80%	5.60%	7.00%	3.00%	4.00%	4.00%	2.00%	
2034-2035 Active	14.00%	14.00%	4.80%	15.20%	18.10%	4.60%	5.30%	8.40%	3.60%	4.80%	4.80%	2.40%	
2032-2033 Active	13.30%	13.30%	4.50%	14.20%	17.30%	4.30%	5.10%	9.80%	4.20%	5.60%	5.60%	2.80%	
2030-2031 Active	12.50%	12.50%	4.30%	13.60%	16.30%	4.00%	4.80%	11.20%	4.80%	6.40%	6.40%	3.20%	
2028-2029 Active	11.10%	11.10%	3.80%	11.80%	14.40%	3.60%	4.20%	14.00%	6.00%	8.00%	8.00%	4.00%	
2026-2027 Active	8.80%	8.80%	3.00%	9.60%	11.50%	2.90%	3.40%	18.20%	7.80%	10.40%	10.40%	5.20%	
2024-2025 Active	6.60%	6.60%	2.30%	7.20%	8.60%	2.20%	2.50%	18.90%	8.10%	10.80%	10.80%	5.40%	10.00%
2022-2023 Active	4.60%	4.60%	1.50%	5.00%	6.00%	1.50%	1.80%	14.00%	6.00%	8.00%	8.00%	4.00%	35.00%
Enrollment Year Active	2.70%	2.70%	1.00%	3.00%	3.60%	0.90%	1.10%	12.25%	5.25%	7.00%	7.00%	3.50%	50.00%
Active Diversified Equity	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 Conservative								17.50%	7.50%	10.00%	10.00%	5.00%	50.00%
Active International Equity					80.00%	20.00%							
Principal Plus Interest													100.00%

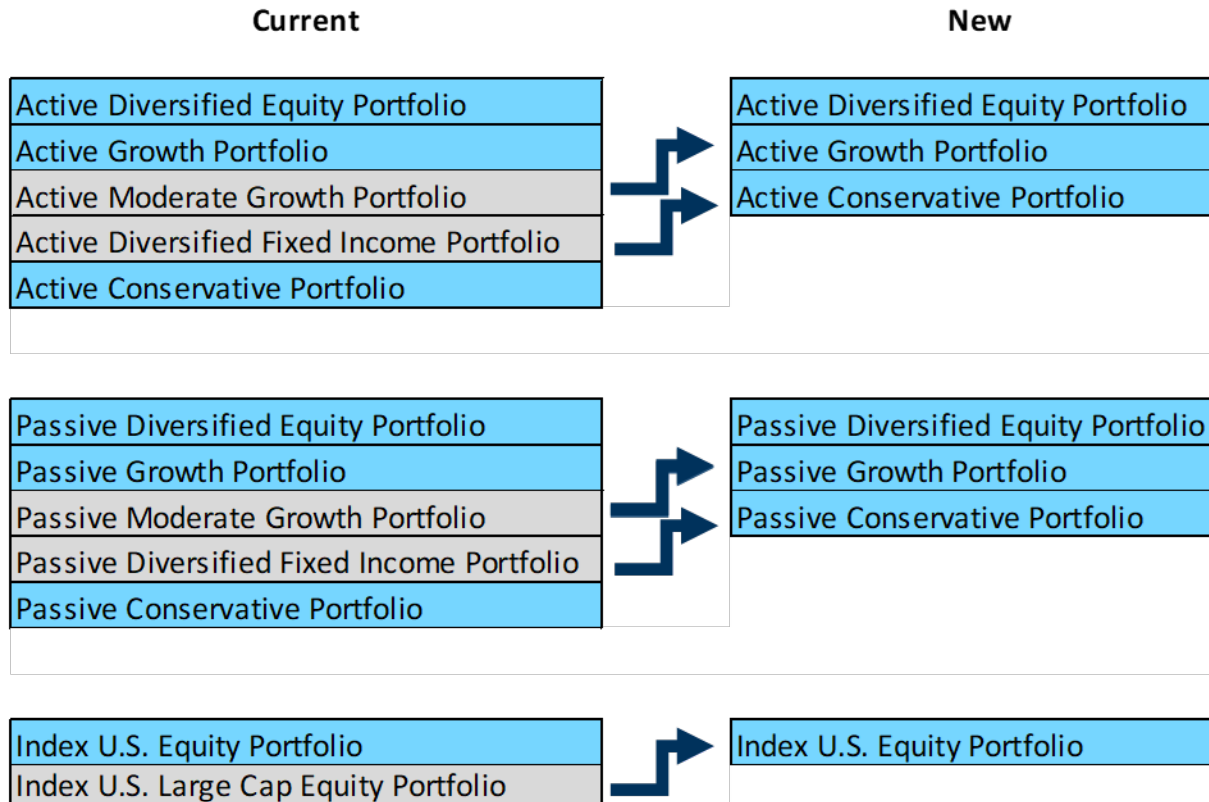
Features the Active Enrollment Year Investment Portfolio, Multi-Fund Portfolios, and the Principal Plus Interest Portfolio

Approved ESG Lineup

ESG Investment Options	TIAA-CREF Social Choice Equity Fund	TIAA-CREF Social Choice International Equity Fund	Nuveen ESG Emerging Markets Equity ETF	Nuveen ESG US Aggregate Bond ETF	Nuveen ESG High Yield Corporate Bond ETF	TIAA-CREF Life Funding Agreement
Ticker	TISCX	TSOX	NUEM	NUBD	NUHY	NA
2038-2039 ESG	56.00%	19.20%	4.80%	18.00%	2.00%	
2036-2037 ESG	56.00%	19.20%	4.80%	18.00%	2.00%	
2034-2035 ESG	53.30%	18.10%	4.60%	21.60%	2.40%	
2032-2033 ESG	50.40%	17.30%	4.30%	25.20%	2.80%	
2030-2031 ESG	47.70%	16.30%	4.00%	28.80%	3.20%	
2028-2029 ESG	42.00%	14.40%	3.60%	36.00%	4.00%	
2026-2027 ESG	33.60%	11.50%	2.90%	46.80%	5.20%	
2024-2025 ESG	25.20%	8.60%	2.20%	48.60%	5.40%	10.00%
2022-2023 ESG	17.50%	6.00%	1.50%	36.00%	4.00%	35.00%
Enrollment Year ESG	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%
Social Choice Equity	100.00%					
ESG International Equity		100.00%				
ESG Bond Portfolio				100.00%		

Features the ESG Enrollment Year Investment Portfolio and three Single-Fund Portfolios

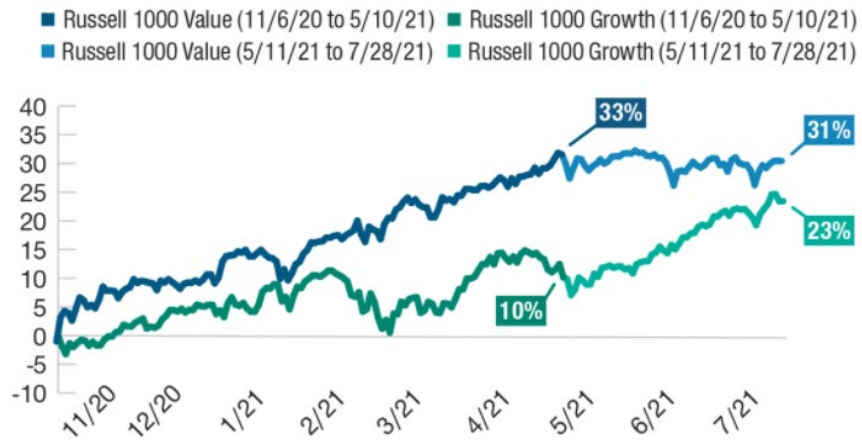
Streamlining Underutilized Portfolios



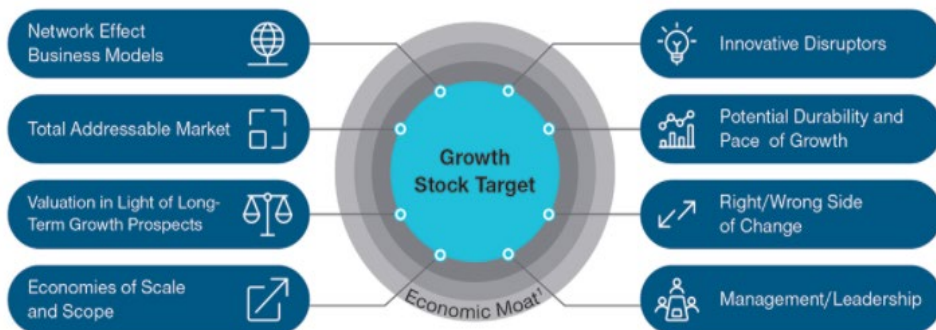
The current lineup will be simplified with portfolios that best fit participant needs and remove underused investment options



U.S. equities continue to exhibit fairly clear style cycles. During the last seven months as of July, there was, at first, a period of strong value outperformance, followed by a period of strong growth outperformance. Investors who tried to time the market were likely disappointed as predicting these shifts is difficult. Because of these uncertain dynamics, and as a long-term strategic solution, TFI recommends balanced exposure to both value and growth segments to prudently participate in style cycles and remove the urge to time markets based on short-term swings.



Past performance is not a reliable indicator of future performance. Sources: Russell. T. Rowe Price analysis using data from FactSet Research Systems Inc. All rights reserved.

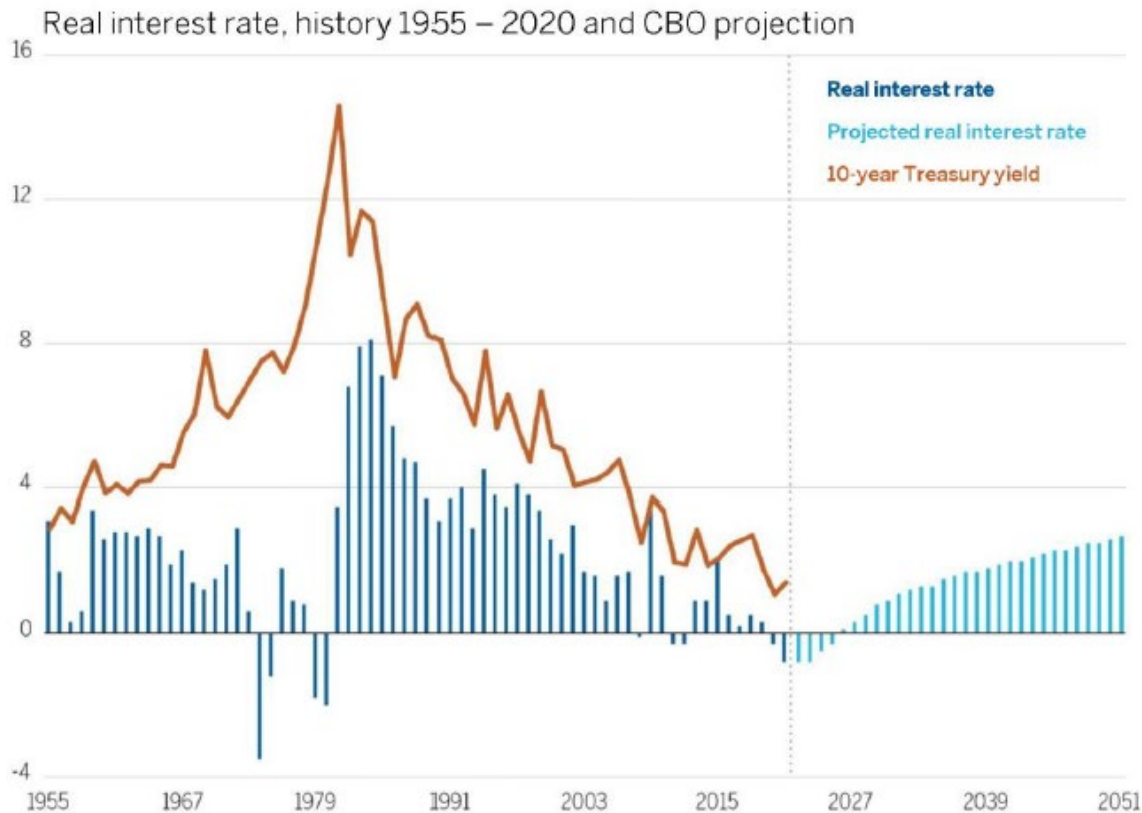


Source: T. Rowe Price.

For illustrative purposes only.

¹ Economic moat refers to the defensibility of a company's business model, a quality that can have implications for the potential durability of its market share and profitability.

Active management pays off when a fund manager has deep resources devoted to research and a clearly defined, repeatable investment process. T. Rowe Price's large-cap strategies comprise a main component of the Active lineup and serve Plan participants well over the long run with their commitment to fundamental security selection and bottom-up analysis.

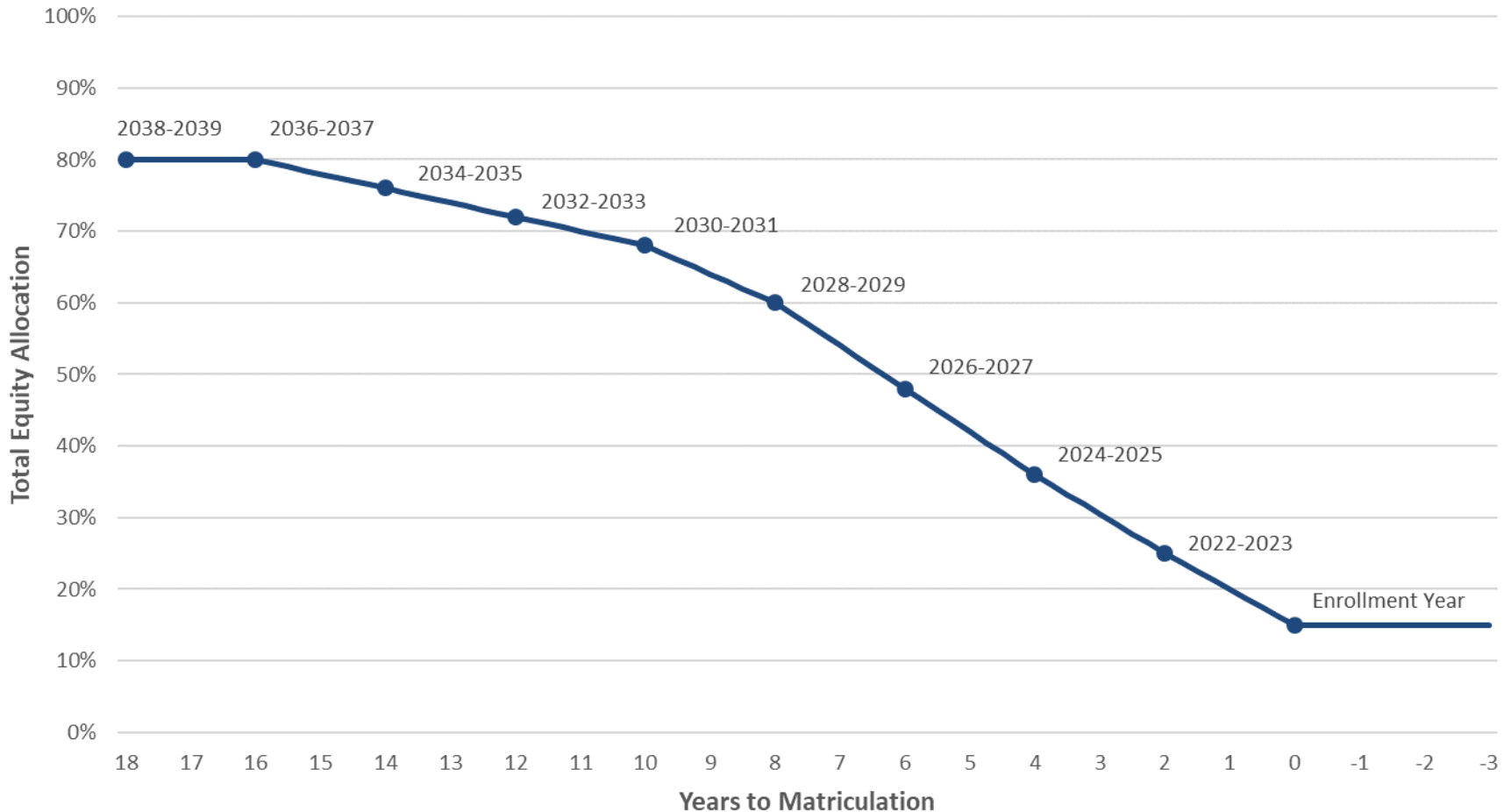


Source: CBO. Real interest rate defined by CBO as annual constant maturity 10-year Treasury yield minus annual CPI-U growth rate.



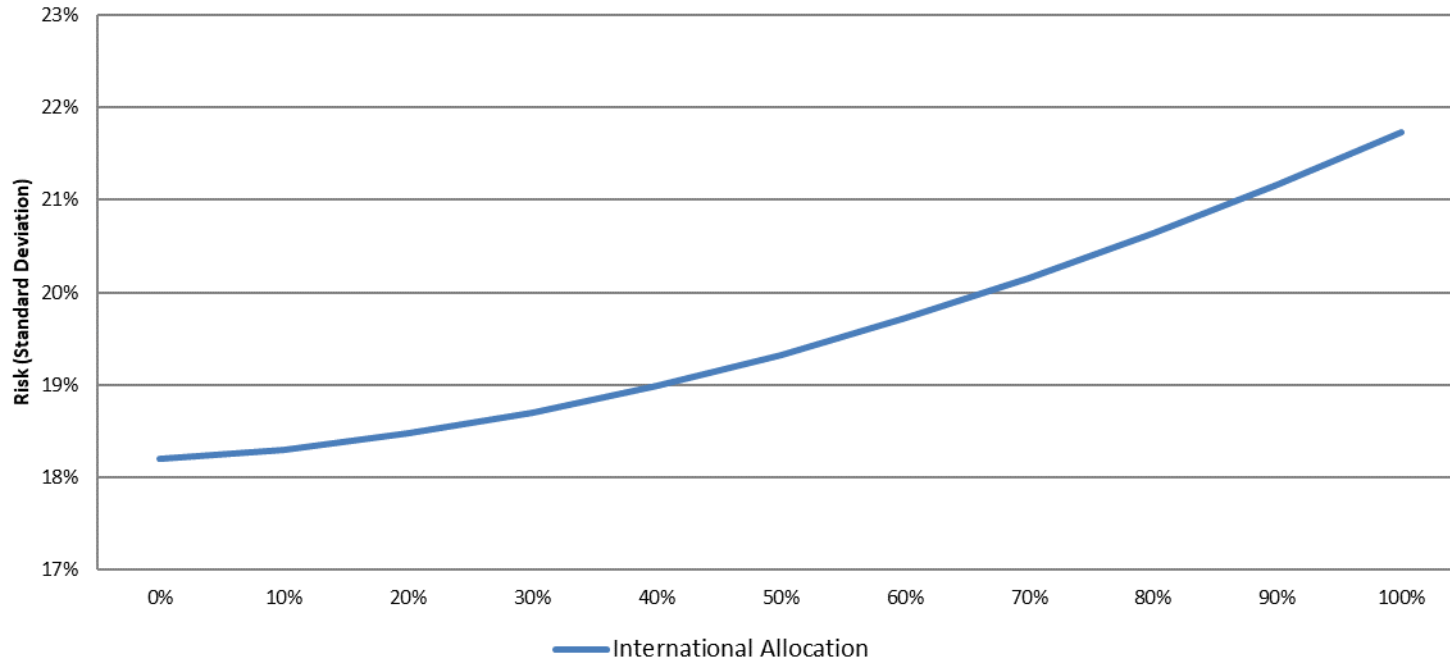
The combination of low rates and high inflation has created negative real interest rates. Bond investors broadly continue to search for yield to maintain purchasing power and enhance outcomes during challenging times. Diversification is key to blend strategies and offer sound solutions for conservative portfolios to serve education savers.

Active and Passive Enrollment Year Glide Paths



- In June 2021, the 2038-2039 Portfolio was created, and the 2020-2021 Portfolio merged into the Enrollment Year Portfolio.

Portfolio Risk as a Function of International Allocation
2001 - 2020



* Russell 3000 for domestic equity, MSCI EAFE for international developed markets equity, and MSCI EM for emerging markets equity (80% developed markets and 20% emerging markets, in line with the current allocation in ScholarShare 529).

- An international allocation of 20%-40% is meaningful enough to reap the benefits of global diversification, but not too much to hurt performance if foreign markets temporarily fall out of favor
- An allocation greater than 50% suggests that any potential incremental return is outweighed by taking on a disproportionate large amount of risk

Duration in the Approved Active Enrollment Year Portfolio

Interest Rate Sensitivity of Fixed Income and Short-Term Investments

	MetWest Total Return Bond Fund	TIAA-CREF 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*	5.97	6.60	7.76	1.68	0.40	0.00	
2038/2039 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2036/2037 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2034/2035 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2032/2033 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2030/2031 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2028/2029 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2026/2027 Enrollment Portfolio Passive	35%	15%	20%	20%	10%	0%	5.0
2024/2025 Enrollment Portfolio Passive	30%	13%	17%	17%	8%	16%	4.2
2022/2023 Enrollment Portfolio Passive	19%	8%	11%	11%	5%	47%	2.7
Enrollment Year Portfolio Passive	14%	6%	8%	8%	4%	59%	2.1

*Most recent as of September 2021.

- Each portfolio is short duration relative to the Bloomberg Barclays U.S. Aggregate Index (6.60 years), which is a prudent strategy for a low yield environment

Duration in the Approved Passive Enrollment Year Portfolio

Interest Rate Sensitivity of Fixed Income and Short-Term Investments

	TIAA-CREF 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*	6.60	2.80	3.70	0.00	
2038/2039 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2036/2037 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2034/2035 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2032/2033 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2030/2031 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2028/2029 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2026/2027 Enrollment Portfolio Passive	70%	20%	10%	0%	5.6
2024/2025 Enrollment Portfolio Passive	59%	17%	8%	16%	4.7
2022/2023 Enrollment Portfolio Passive	37%	11%	5%	47%	3.0
Enrollment Year Portfolio Passive	29%	8%	4%	59%	2.3

*Most recent as of September 2021.

- Similar to the Active glide path, each portfolio is short duration relative to the Bloomberg Barclays U.S. Aggregate Index (6.60 years)

Duration in the Approved ESG Enrollment Year Portfolio

Interest Rate Sensitivity of Fixed Income and Short-Term Investments

	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*	6.42	3.41	0.00	
2038/2039 Enrollment Portfolio ESG	90%	10%	0%	6.1
2036/2037 Enrollment Portfolio ESG	90%	10%	0%	6.1
2034/2035 Enrollment Portfolio ESG	90%	10%	0%	6.1
2032/2033 Enrollment Portfolio ESG	90%	10%	0%	6.1
2030/2031 Enrollment Portfolio ESG	90%	10%	0%	6.1
2028/2029 Enrollment Portfolio ESG	90%	10%	0%	6.1
2026/2027 Enrollment Portfolio ESG	90%	10%	0%	6.1
2024/2025 Enrollment Portfolio ESG	76%	8%	16%	5.2
2022/2023 Enrollment Portfolio ESG	48%	5%	47%	3.3
Enrollment Year Portfolio ESG	37%	4%	59%	2.5

*Most recent as of September 2021.

Enrollment Year Portfolios...

- continue to be the most popular investment options and the new ESG glide path should appeal to a new class of investors.

Market Fluctuations...

- are inevitable, but we continue to stress the time-tested process for long term investing: define your risk parameters, start investing early, and stick to a savings plan

Reduced Fees...

- keep the recommended portfolios competitively priced and are viewed very favorably by independent agencies, consultants, and investors

Prospective Investment Outcomes...

- may be more moderate than past results due to current valuations and low return expectations for the major asset classes, but results from the Monte Carlo analysis help quantify future outcomes and support the approved asset allocations

Appendix 1: TFI Asset Allocation Process

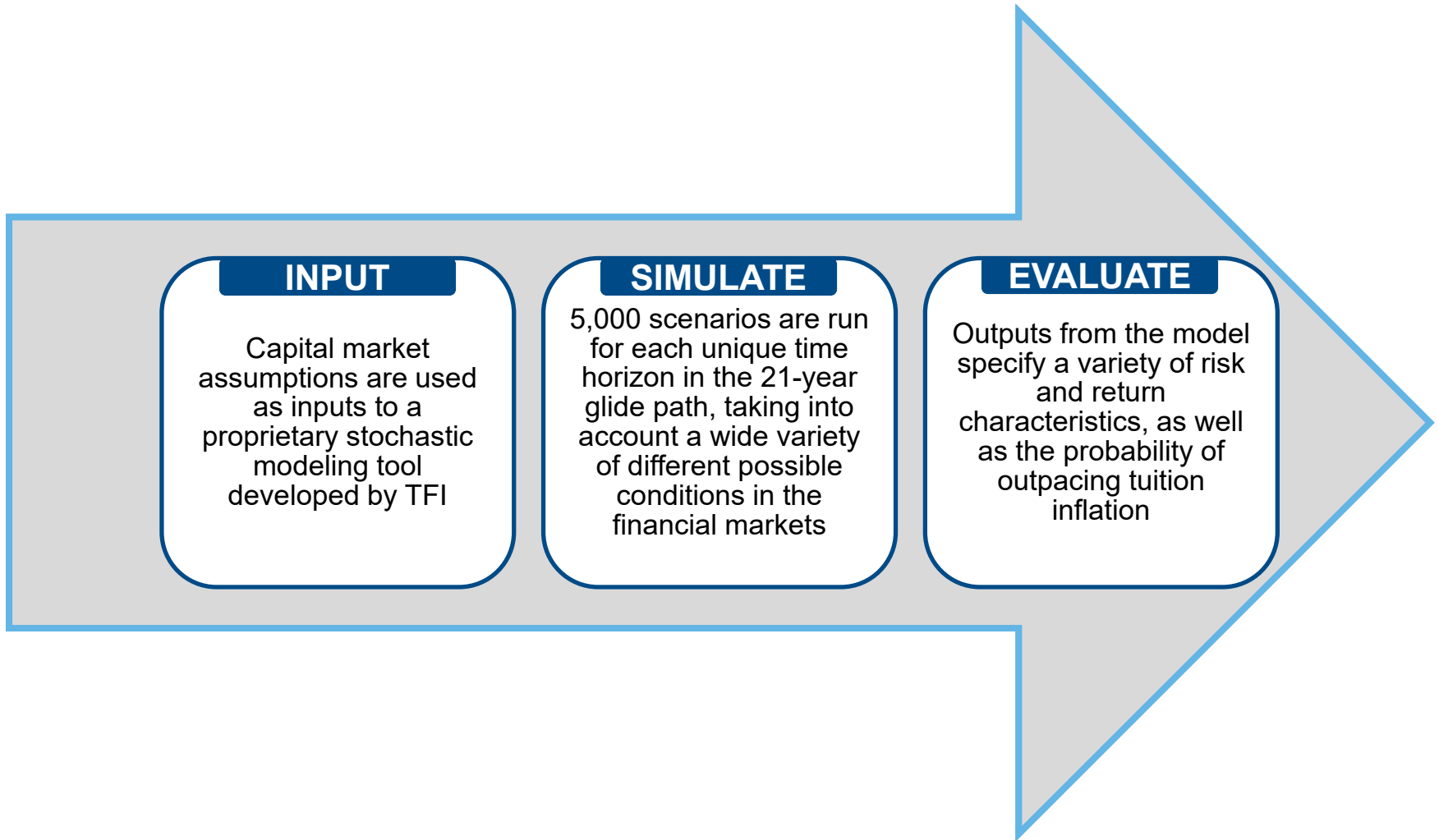
The Importance of Diversification

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Highest	27.9 Real Estate	13.6 TIPS	19.7 Real Estate	33.6 US Stocks	28.0 Real Estate	2.8 Real Estate	14.8 HY Bond	37.3 EM Stocks	1.6 ST Bond	31.0 US Stocks	20.9 US Stocks
	18.9 EM Stocks	8.3 Real Estate	18.2 EM Stocks	22.8 Intl Stocks	12.6 US Stocks	0.7 ST Bond	12.7 US Stocks	25.0 Intl Stocks	1.4 MM	28.7 Real Estate	18.3 EM Stocks
	16.9 US Stocks	7.8 Bond	17.3 Intl Stocks	6.3 HY Bond	6.0 Bond	0.6 Bond	11.2 EM Stocks	21.1 US Stocks	0.6 Bank Loan	22.0 Intl Stocks	10.1 Global Bond
	14.3 HY Bond	6.4 Global Bond	16.4 US Stocks	5.4 Bank Loan	3.6 TIPS	0.5 US Stocks	10.4 Bank Loan	8.7 Real Estate	0.0 Bond	18.4 EM Stocks	8.4 TIPS
	10.4 Bank Loan	5.4 HY Bond	14.6 HY Bond	2.9 Real Estate	3.5 HY Bond	0.1 Bank Loan	8.6 Real Estate	7.5 Global Bond	-0.8 Global Bond	15.1 HY Bond	7.8 Intl Stocks
	7.8 Intl Stocks	1.6 ST Bond	9.8 Bank Loan	0.6 ST Bond	1.8 Bank Loan	0.0 MM	4.7 TIPS	7.0 HY Bond	-1.3 TIPS	8.7 Bond	7.5 Bond
	6.5 Bond	1.5 Bank Loan	7.0 TIPS	0.0 MM	0.8 ST Bond	-0.8 Intl Stocks	2.7 Bond	4.3 Bank Loan	-2.0 HY Bond	8.7 Bank Loan	6.3 HY Bond
	6.3 TIPS	1.0 US Stocks	4.2 Bond	-2.0 Bond	0.0 MM	-1.4 TIPS	1.6 Global Bond	3.5 Bond	-4.0 Real Estate	6.9 TIPS	3.5 Bank Loan
	5.2 Global Bond	0.0 MM	1.6 Global Bond	-2.6 EM Stocks	-0.5 Global Bond	-2.8 HY Bond	1.3 ST Bond	3.0 TIPS	-5.2 US Stocks	5.9 Global Bond	3.3 ST Bond
	2.8 ST Bond	-12.1 Intl Stocks	1.3 ST Bond	-4.0 Global Bond	-2.2 EM Stocks	-3.6 Global Bond	1.0 Intl Stocks	0.8 ST Bond	-13.8 Intl Stocks	4.0 ST Bond	0.7 MM
Lowest	0.0 MM	-18.4 EM Stocks	0.0 MM	-8.6 TIPS	-4.9 Intl Stocks	-14.9 EM Stocks	0.1 MM	0.5 MM	-14.6 EM Stocks	1.8 MM	-5.1 Real Estate

The Importance of Diversification: Notes

Bond	uses the Bloomberg Barclays US Aggregate Bond Index, which measures the performance of the U.S. investment-grade, fixed-rate bond market, including government and credit securities, agency mortgage pass through securities, asset-backed securities and commercial mortgage-backed securities.
TIPS	uses the Bloomberg Barclays US TIPS Index, which measures the performance of fixed-income securities with fixed-rate coupon payments that adjust for inflation as measured by the Consumer Priced Index for All Urban Consumers.
HY Bond	uses the ICE BofAML US HY Cash Pay BB-B Constrained Index, which measures the performance of securities that pay interest in cash and have a credit rating of BB or B.
Real Estate	uses the FTSE NAREIT All Equity REITs Index, which is an unmanaged, market capitalization weighted index of all publicly-traded REITs that invest predominantly in the equity ownership of real estate. The index is designed to reflect the performance of all publicly-traded equity REITs as whole.
Intl Stocks	uses the MSCI EAFE Index, which is a free-float-adjusted market capitalization index designed to measure developed market equity performance, excluding the United States and Canada.
EM Stocks	uses the MSCI Emerging Markets Index, which tracks the performance of the leading stocks in 23 MSCI emerging countries in the following areas: Europe, Asia, Africa, Latin America and the Middle East.
US Stocks	uses Russell 3000 Index, which measures the performance of 3,000 of the largest publicly traded U.S. companies, based on market capitalization, and it measures the performance of about 98% of the total market capitalization of the publicly traded U.S. equity market.
Bank Loan	uses the S&P/LSTA Performing Loan Index, which is a subset of the S&P/LSTA Leveraged Loan Index, and comprises non-investment-grade and non-rated loans. Tracking only performing loans, unlike its parent index, it removes defaulted issues at the price they reach directly following the default.
Global Bond	uses the Citigroup World Government Bond Index, which comprises sovereign debt from over 20 countries, denominated in a variety of currencies.
ST Bond	uses the Bloomberg Barclays US Govt/Credit 1-3 Yr Index, which measures all medium and larger issues of U.S. government, investment-grade corporate, and investment-grade international dollar-denominated bonds that have maturities of between 1 and 3 years and are publicly issued.
MM	uses the iMoneyNet Fund Averages - All Government, which is the average of all major government money market mutual fund yields published weekly for 7- and 30-day simple and compound yields.

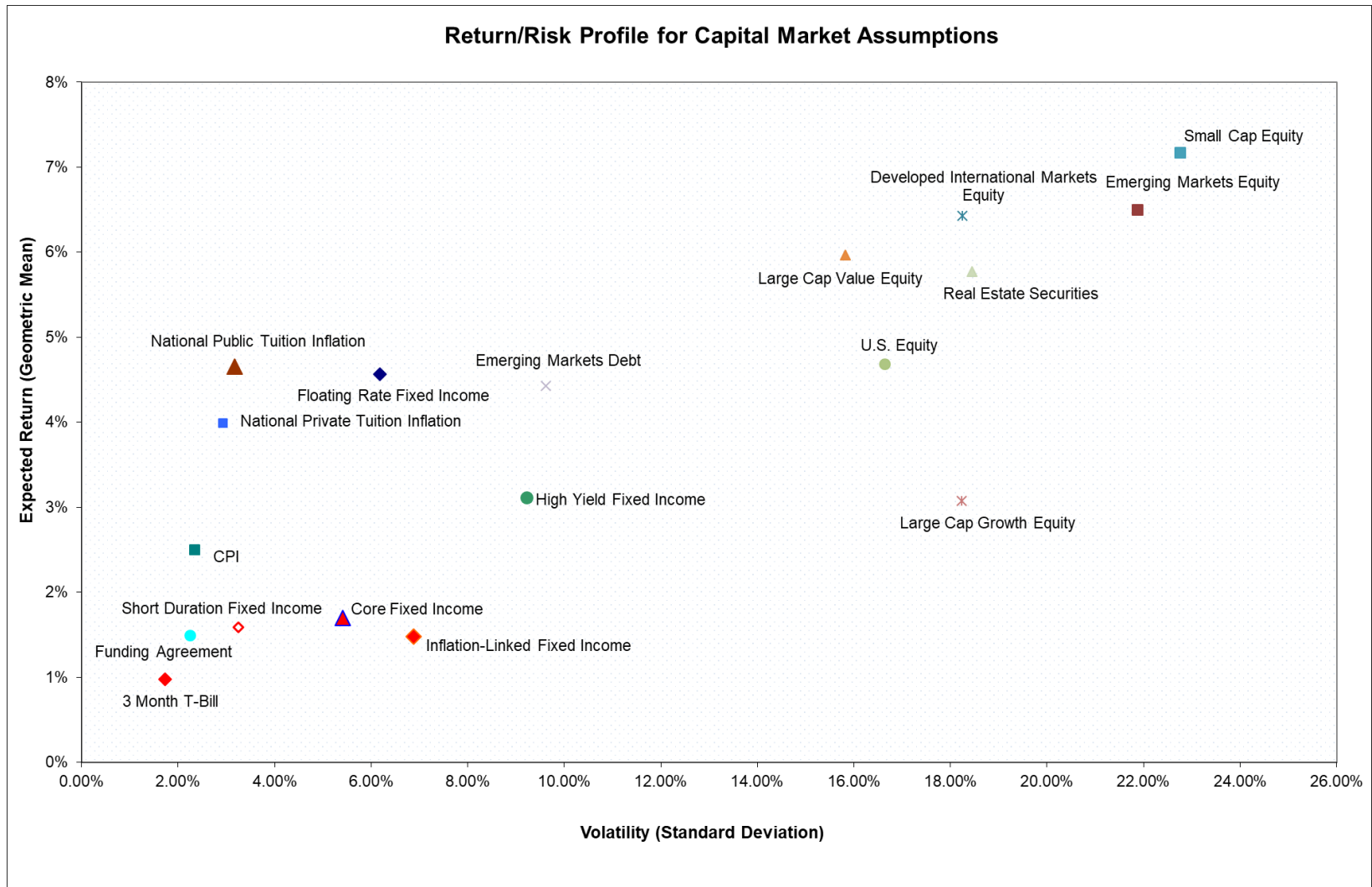
- The following asset allocation study uses the most recent capital market assumptions to evaluate prospective outcomes for the glide path models
- This year, we modeled the Enrollment Year Investment Portfolios using the appropriate asset allocations for each year along the glide path
- The Enrollment Year Investment Portfolios 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



Asset Allocation Assumptions

Variables	Benchmarks	Capital Market Assumptions (source: Ibbotson)	
		Returns (Long-Term Average)	Volatility (Standard Deviation)
U.S. Equity	Russell 3000 Index	4.69%	16.63%
Large Cap Growth Equity	Russell 1000 Growth Index	3.08%	18.23%
Large Cap Value Equity	Russell 1000 Value Index	5.97%	15.82%
Large Cap Equity	S&P 500 Index	4.36%	16.33%
Small Cap Equity	Russell 2000 Index	7.17%	22.76%
Developed International Equity	MSCI EAFE Index	6.43%	18.25%
Emerging Markets Equity	MSCI Emerging Markets Index	6.50%	21.87%
Core Fixed Income	Bloomberg Barclays U.S. Aggregate Bond Index	1.70%	5.41%
Floating Rate Fixed Income	Credit Suisse Leveraged Loan Index	4.57%	6.18%
Emerging Markets Debt	JPM EMBI Global Diversified Index	4.43%	9.62%
High Yield Fixed Income	BofAML US HY BB/B Cash Pay Index	3.12%	9.22%
TIPS	Bloomberg Inflation-Linked U.S. TIPS Index	1.48%	6.88%
Intermediate-Term TIPS	Bloomberg Inflation-Linked 1-10 Year U.S. TIPS Index	1.75%	5.32%
Short-Term TIPS	Bloomberg U.S. 0-5 Year TIPS Index	1.73%	3.71%
Short-Term Fixed Income	Bloomberg U.S. 1-3 Year Government/Credit Bond Index	1.59%	3.25%
Real Estate Securities	FTSE NAREIT All Equity REITs Index	5.77%	18.45%
CPI	Consumer Price Index - All Urban Consumers	2.50%	2.35%
3 Month T-Bill	BofAML US Treasury Bill 3 Month Index	0.98%	1.73%
TIAA Life Funding Agreement	Funding Agreement	1.50%	2.24%
Additional Variables (sources: The College Board and TIAA-CREF Tuition Financing, Inc.)			
	National Private Tuition Inflation	3.99%	2.93%
	National Public Tuition Inflation	4.66%	3.17%

Asset Allocation Assumptions



Correlation Matrix

	TC Life Funding Agreement	JPM EMBI Global Diversified Index	Bloomberg U.S. Aggregate Bond Index	Bloomberg U.S. TIPS Year Index	Bloomberg U.S. TIPS 1-10 Year Index	Bloomberg U.S. 1-3 Year Gov't / Credit Bond Index	BBofAML US HY BB/B Cash Pay Index	Credit Suisse Leveraged Loan Index	Bloomberg U.S. 0-5 Year TIPS Index	FTSE NAREIT All Equity REITs Index	Russell 3000 Index	S&P 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																	
JPM EMBI Global Diversified Index	0.38	1.00																
Bloomberg U.S. Aggregate Bond Index	0.71	-0.14	1.00															
Bloomberg U.S. TIPS Year Index	0.43	0.36	0.87	1.00														
Bloomberg U.S. TIPS 1-10 Year Index	0.09	0.70	0.72	0.97	1.00													
Bloomberg U.S. 1-3 Year Gov't / Credit Bond Index	0.69	-0.19	0.95	0.59	0.61	1.00												
BBofAML US HY BB/B Cash Pay Index	0.49	0.49	0.35	0.32	0.61	0.32	1.00											
Credit Suisse Leveraged Loan Index	-0.20	0.81	0.09	0.41	0.54	-0.32	0.96	1.00										
Bloomberg U.S. 0-5 Year TIPS Index	0.23	0.69	0.55	0.82	0.94	0.22	0.68	0.64	1.00									
FTSE NAREIT All Equity REITs Index	0.24	0.45	0.04	0.23	0.26	0.04	0.52	0.61	0.27	1.00								
Russell 3000 Index	0.27	0.60	-0.07	-0.25	0.30	-0.08	0.58	0.69	0.38	0.67	1.00							
S&P Index	-0.18	0.64	0.03	0.23	0.29	-0.61	0.76	0.68	0.36	0.71	0.99	1.00						
Russell 1000 Value Index	0.29	0.60	-0.02	0.16	0.19	-0.02	0.56	0.62	0.27	0.68	0.95	0.94	1.00					
Russell 1000 Growth Index	0.30	0.58	-0.05	0.14	0.37	-0.04	0.55	0.68	0.44	0.65	0.95	0.94	0.86	1.00				
Russell 2000 Index	0.21	0.54	-0.10	0.11	0.25	-0.11	0.54	0.62	0.34	0.69	0.90	0.92	0.85	0.82	1.00			
MSCI EAFE Index	0.21	0.65	-0.16	0.18	0.35	-0.16	0.62	0.69	0.49	0.70	0.80	0.88	0.78	0.80	0.75	1.00		
MSCI Emerging Markets Index	0.08	0.61	-0.19	0.09	0.61	-0.19	0.49	0.79	0.73	0.91	0.64	0.69	0.60	0.61	0.62	0.65	1.00	

Tuition data are sourced from the 2020 College Board Trends in Tuition Pricing.

Private 4-year Tuition Inflation:

$$T(t) = 0.0246 + i(t) + 0.0096 * S(t-1) + 0.1536 * B(t) + 0.2856 * R(t-1) - 0.1980 * GDP + e1(t)$$

Expected Value = 3.99%

Public Tuition Inflation:

$$T(t) = 0.0476 + i(t) - 0.0108 * S(t-1) + 0.2182 * B(t) + 0.2496 * R(t-1) - 0.9199 * GDP + e2(t)$$

Expected Value = 4.66%

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 (2.20%) for the next 10 years (source: Federal Reserve Bank of Philadelphia),

$e1(t)$ is the random error term following a logistic distribution (0%, 0.01%) with a zero mean and standard deviation of 2.00%,

$e2(t)$ is the random error term following a lognormal distribution (-0.1%, 0.01%) with a zero mean and standard deviation of 2.36%

Regression is based on data from 1977-2020.

For 2019-2020 school year, average tuition and fees were: \$10,560 for all in-state public colleges and \$37,650 for private 4-year colleges; based on most recent data 66% enrolled in public colleges and 34% enrolled in private colleges. The enrollment-weighted average tuition and fees for all colleges were \$19,771 = \$10,560 * 66% + \$37,650 * 34%. The forecasted enrollment-weighted average tuition and fees for year 1 are \$20,606 = \$10,560 * (1+4.66%) * 66% + \$37,650 * (1+3.99%) * 34%. Therefore, the public / private enrollment weighted tuition inflation rate for year 1 is: 4.22% = \$20,606 / \$19,771 - 1

Approved Passive Enrollment Year Portfolio Simulation Results

Results of Monte Carlo Simulation Passive Enrollment Portfolio

Enrollment Year	Asset Allocations								Investment Horizon (in years)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Domestic Equities	Int'l Equities	Emerging Market Equities	Real Estate Securities	Core Fixed Income	Short-Term Inflation-Linked Bond	High Yield Fund	Funding Agreement		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
2039	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%	21	3.32%	2.06%	4.22%	31.92%	42.24%	94.60%	-2.49%
2038	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%	20	3.27%	2.04%	4.22%	31.36%	41.12%	94.72%	-2.53%
2037	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%	19	3.26%	2.06%	4.22%	30.68%	41.72%	94.14%	-2.47%
2036	49.15%	18.70%	4.70%	5.45%	15.40%	4.40%	2.20%	0.00%	18	3.20%	2.06%	4.22%	29.98%	41.64%	94.10%	-2.49%
2035	47.90%	18.20%	4.60%	5.30%	16.80%	4.80%	2.40%	0.00%	17	3.14%	2.05%	4.22%	28.92%	41.18%	93.28%	-2.51%
2034	46.65%	17.75%	4.45%	5.15%	18.20%	5.20%	2.60%	0.00%	16	3.04%	2.07%	4.22%	26.98%	39.58%	93.26%	-2.51%
2033	45.40%	17.30%	4.30%	5.00%	19.60%	5.60%	2.80%	0.00%	15	3.08%	2.06%	4.22%	27.72%	41.56%	93.18%	-2.47%
2032	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%	14	2.95%	2.10%	4.22%	25.86%	39.94%	91.98%	-2.51%
2031	42.80%	16.30%	4.10%	4.80%	22.40%	6.40%	3.20%	0.00%	13	2.95%	2.09%	4.22%	26.18%	41.04%	92.20%	-2.50%
2030	40.30%	15.35%	3.85%	4.50%	25.20%	7.20%	3.60%	0.00%	12	2.86%	2.04%	4.22%	24.44%	40.94%	91.84%	-2.47%
2029	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	0.00%	11	2.78%	2.01%	4.22%	22.88%	41.08%	91.44%	-2.48%
2028	34.00%	12.95%	3.25%	3.80%	32.20%	9.20%	4.60%	0.00%	10	2.75%	1.95%	4.22%	21.28%	41.98%	91.98%	-2.42%
2027	30.20%	11.50%	2.90%	3.40%	36.40%	10.40%	5.20%	0.00%	9	2.71%	1.89%	4.22%	20.76%	42.82%	92.26%	-2.43%
2026	26.45%	10.05%	2.55%	2.95%	37.10%	10.60%	5.30%	5.00%	8	2.67%	1.92%	4.22%	20.54%	45.50%	91.94%	-2.43%
2025	22.70%	8.60%	2.20%	2.50%	37.80%	10.80%	5.40%	10.00%	7	2.62%	1.86%	4.22%	18.66%	48.32%	92.50%	-2.39%
2024	19.20%	7.30%	1.85%	2.15%	32.90%	9.40%	4.70%	22.50%	6	2.54%	1.84%	4.22%	17.62%	52.36%	91.38%	-2.43%
2023	15.70%	6.00%	1.50%	1.80%	28.00%	8.00%	4.00%	35.00%	5	2.51%	1.87%	4.22%	18.36%	59.36%	91.26%	-2.43%
2022	12.55%	4.80%	1.20%	1.45%	26.25%	7.50%	3.75%	42.50%	4	2.47%	1.93%	4.22%	19.12%	67.92%	90.10%	-2.51%
In School	9.40%	3.60%	0.90%	1.10%	24.50%	7.00%	3.50%	50.00%	3	2.43%	2.10%	4.22%	21.04%	79.20%	87.96%	-2.66%
	9.40%	3.60%	0.90%	1.10%	24.50%	7.00%	3.50%	50.00%	2	2.40%	2.56%	4.22%	25.46%	89.94%	82.84%	-3.07%
	9.40%	3.60%	0.90%	1.10%	24.50%	7.00%	3.50%	50.00%	1	2.51%	3.74%	4.22%	33.96%	98.26%	75.12%	-4.20%

*Annualized Shortfall is the expected annual percentage difference between tuition inflation and returns among all scenarios that fail to exceed tuition inflation.

Approved Active Enrollment Year Portfolio Simulation Results

Results of Monte Carlo Simulation Active Enrollment Portfolio

Enrollment Year	Asset Allocations											Investment Horizon (in years)	(1) Average Annual Return over Investment Horizon	(2) Standard Deviation of Returns over Investment Horizon	(3) Average Annual Tuition Inflation over Investment Horizon	(4) Probability of Exceeding Tuition Inflation	(5) Probability of Achieving 90 cents per Dollar of Future Tuition	(6) Probability of Non-Negative Return	(7) Annualized Shortfall
	Large Cap Growth	Large Cap Value	Large Cap Core	Small Cap Equity	Real Estate Securities	Int'l Equities	Emerging Market Equities	Core Fixed Income	Inflation-Linked Bond	Floating Rate	Funding Agreement								
2039	14.80%	14.80%	15.80%	5.00%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%	21	3.42%	1.77%	4.22%	31.86%	43.46%	97.26%	-2.34%
2038	14.80%	14.80%	15.80%	5.00%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%	20	3.44%	1.77%	4.22%	31.78%	44.44%	97.26%	-2.29%
2037	14.80%	14.80%	15.80%	5.00%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%	19	3.40%	1.77%	4.22%	31.58%	44.12%	97.12%	-2.31%
2036	14.40%	14.40%	15.50%	4.90%	5.45%	18.65%	4.70%	15.40%	4.40%	2.20%	0.00%	18	3.32%	1.78%	4.22%	30.12%	42.26%	97.14%	-2.33%
2035	14.00%	14.00%	15.20%	4.80%	5.30%	18.10%	4.60%	16.80%	4.80%	2.40%	0.00%	17	3.31%	1.79%	4.22%	30.14%	44.20%	96.78%	-2.30%
2034	13.65%	13.65%	14.70%	4.65%	5.20%	17.70%	4.45%	18.20%	5.20%	2.60%	0.00%	16	3.24%	1.79%	4.22%	28.02%	42.88%	96.28%	-2.30%
2033	13.30%	13.30%	14.20%	4.50%	5.10%	17.30%	4.30%	19.60%	5.60%	2.80%	0.00%	15	3.25%	1.78%	4.22%	28.64%	44.88%	96.58%	-2.26%
2032	12.90%	12.90%	13.90%	4.40%	4.95%	16.80%	4.15%	21.00%	6.00%	3.00%	0.00%	14	3.14%	1.80%	4.22%	27.14%	43.32%	96.10%	-2.29%
2031	12.50%	12.50%	13.60%	4.30%	4.80%	16.30%	4.00%	22.40%	6.40%	3.20%	0.00%	13	3.11%	1.77%	4.22%	26.34%	44.26%	95.80%	-2.24%
2030	11.80%	11.80%	12.70%	4.05%	4.50%	15.35%	3.80%	25.20%	7.20%	3.60%	0.00%	12	3.04%	1.72%	4.22%	24.78%	42.98%	95.78%	-2.27%
2029	11.10%	11.10%	11.80%	3.80%	4.20%	14.40%	3.60%	28.00%	8.00%	4.00%	0.00%	11	2.95%	1.72%	4.22%	21.88%	42.84%	95.78%	-2.26%
2028	9.95%	9.95%	10.70%	3.40%	3.80%	12.95%	3.25%	32.20%	9.20%	4.60%	0.00%	10	2.92%	1.66%	4.22%	22.08%	44.76%	96.32%	-2.24%
2027	8.80%	8.80%	9.60%	3.00%	3.40%	11.50%	2.90%	36.40%	10.40%	5.20%	0.00%	9	2.84%	1.63%	4.22%	20.28%	45.92%	96.16%	-2.23%
2026	7.70%	7.70%	8.40%	2.65%	2.95%	10.05%	2.55%	37.10%	10.60%	5.30%	5.00%	8	2.80%	1.64%	4.22%	19.42%	48.00%	95.64%	-2.23%
2025	6.60%	6.60%	7.20%	2.30%	2.50%	8.60%	2.20%	37.80%	10.80%	5.40%	10.00%	7	2.67%	1.59%	4.22%	17.36%	49.70%	95.62%	-2.28%
2024	5.60%	5.60%	6.10%	1.90%	2.15%	7.30%	1.85%	32.90%	9.40%	4.70%	22.50%	6	2.70%	1.57%	4.22%	18.48%	56.44%	95.98%	-2.25%
2023	4.60%	4.60%	5.00%	1.50%	1.80%	6.00%	1.50%	28.00%	8.00%	4.00%	35.00%	5	2.58%	1.63%	4.22%	16.42%	62.22%	94.32%	-2.30%
2022	3.65%	3.65%	4.00%	1.25%	1.45%	4.80%	1.20%	26.25%	7.50%	3.75%	42.50%	4	2.54%	1.71%	4.22%	18.00%	70.82%	93.68%	-2.42%
In School	2.70%	2.70%	3.00%	1.00%	1.10%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%	3	2.47%	1.86%	4.22%	19.28%	80.84%	91.40%	-2.56%
	2.70%	2.70%	3.00%	1.00%	1.10%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%	2	2.50%	2.33%	4.22%	24.46%	92.12%	86.14%	-2.89%
	2.70%	2.70%	3.00%	1.00%	1.10%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%	1	2.54%	3.34%	4.22%	33.20%	99.02%	78.12%	-3.80%

*Annualized Shortfall is the expected annual percentage difference between tuition inflation and returns among all scenarios that fail to exceed tuition inflation.

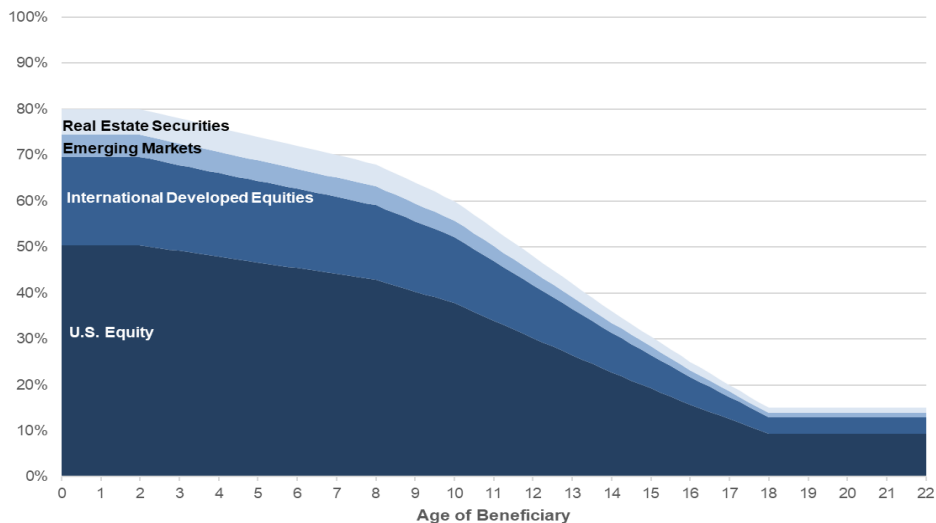
Approved ESG Enrollment Year Portfolio Simulation Results

Enrollment Year	Asset Allocations						Investment Horizon (in years)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Domestic Equities	Int'l Equities	Emerging Market Equities	Core Fixed Income	High Yield Fund	Funding Agreement		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
2039	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%	21	3.15%	2.21%	4.22%	30.38%	39.44%	91.76%	-2.65%
2038	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%	20	3.15%	2.19%	4.22%	30.80%	40.60%	92.42%	-2.61%
2037	56.00%	19.20%	4.80%	18.00%	2.00%	0.00%	19	3.08%	2.23%	4.22%	29.68%	39.78%	91.04%	-2.66%
2036	54.65%	18.65%	4.70%	19.80%	2.20%	0.00%	18	3.07%	2.22%	4.22%	30.58%	41.10%	91.78%	-2.65%
2035	53.30%	18.10%	4.60%	21.60%	2.40%	0.00%	17	3.01%	2.25%	4.22%	28.64%	39.68%	91.66%	-2.64%
2034	51.85%	17.70%	4.45%	23.40%	2.60%	0.00%	16	3.00%	2.22%	4.22%	28.18%	40.44%	91.50%	-2.58%
2033	50.40%	17.30%	4.30%	25.20%	2.80%	0.00%	15	3.01%	2.23%	4.22%	28.66%	40.64%	91.20%	-2.58%
2032	49.05%	16.80%	4.15%	27.00%	3.00%	0.00%	14	2.85%	2.20%	4.22%	26.48%	39.02%	90.26%	-2.62%
2031	47.70%	16.30%	4.00%	28.80%	3.20%	0.00%	13	2.87%	2.17%	4.22%	25.64%	40.32%	91.14%	-2.56%
2030	44.85%	15.35%	3.80%	32.40%	3.60%	0.00%	12	2.85%	2.20%	4.22%	26.04%	41.78%	90.44%	-2.57%
2029	42.00%	14.40%	3.60%	36.00%	4.00%	0.00%	11	2.79%	2.14%	4.22%	24.22%	41.28%	90.62%	-2.55%
2028	37.80%	12.95%	3.25%	41.40%	4.60%	0.00%	10	2.72%	2.13%	4.22%	23.52%	42.22%	89.70%	-2.54%
2027	33.60%	11.50%	2.90%	46.80%	5.20%	0.00%	9	2.69%	2.09%	4.22%	21.58%	43.82%	89.36%	-2.49%
2026	29.40%	10.05%	2.55%	47.70%	5.30%	5.00%	8	2.65%	2.05%	4.22%	21.20%	45.88%	90.30%	-2.50%
2025	25.20%	8.60%	2.20%	48.60%	5.40%	10.00%	7	2.57%	1.98%	4.22%	19.62%	47.58%	89.88%	-2.48%
2024	21.35%	7.30%	1.85%	42.30%	4.70%	22.50%	6	2.54%	1.96%	4.22%	18.78%	52.74%	90.46%	-2.47%
2023	17.50%	6.00%	1.50%	36.00%	4.00%	35.00%	5	2.47%	1.97%	4.22%	18.22%	58.42%	90.10%	-2.53%
2022	14.00%	4.80%	1.20%	33.75%	3.75%	42.50%	4	2.38%	2.04%	4.22%	18.30%	66.74%	88.58%	-2.60%
In School	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%	3	2.46%	2.25%	4.22%	22.34%	78.04%	86.12%	-2.73%
	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%	2	2.41%	2.74%	4.22%	25.98%	89.34%	81.16%	-3.11%
	10.50%	3.60%	0.90%	31.50%	3.50%	50.00%	1	2.42%	3.82%	4.22%	34.08%	98.06%	73.88%	-4.23%

*Annualized Shortfall is the expected annual percentage difference between tuition inflation and returns among all scenarios that fail to exceed tuition inflation.

- **(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.

Glide Path by Asset Class

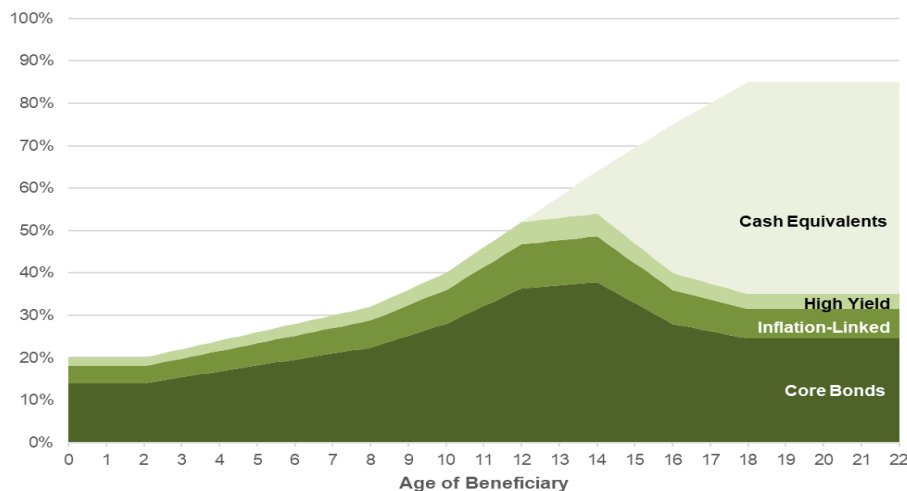


Equity

- Total equity allocation is split between U.S. (70%) and International (30%) exposure
- No sector biases
- Similar compositions to broad, cap-weighted domestic and international equity markets

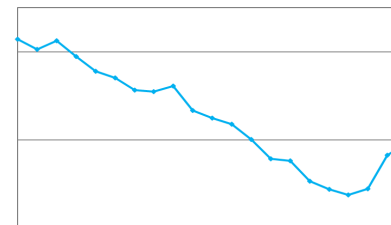
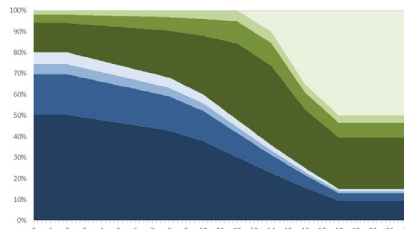
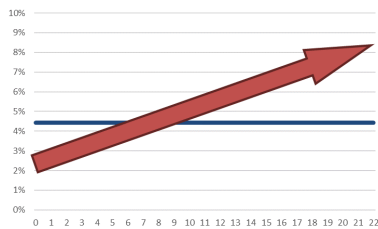
Fixed Income

- Total fixed-income exposure starts at 20% and ends at 35% fixed income/50% cash equivs
- Core and satellite approach
- Inflation-linked bonds provide a hedge against inflation risk and enhance diversification
- Cash (Funding Agreement) provides a hedge against interest rate risk, reduces volatility, and provides principal protection



The above chart represents the strategic asset allocation progression of one of a series of multi-asset class portfolios. Asset allocations represent the exposures sought along the glide path and are not actual mutual fund exposures. Allocations are presented for information only and may not represent the actual allocation at the time of investment.

Glide Path Simulation Summary



Outpacing tuition inflation is associated with

- Long time horizons for investing
- High capital market assumptions for capital appreciation
- Gradually de-risking the portfolio over time to preserve assets when needed

Asset class diversification

- Forms the building blocks for a goals-based portfolio
- Is a measured way to integrate many investment characteristics
- Can improve an investor's long-term risk/reward profile

Tuition Inflation

- Probabilities follow the "inverse J" pattern
- Continues to be in the range of 4-5%, which exceeds the long-term capital market assumption for several asset classes, creating challenges

Appendix 2: Other Supporting Material

Current Active Investment Portfolios

Active Enrollment Year Portfolio

Enrollment Year	T. Rowe Price Instl Large Cap Growth Fund	T. Rowe Price Instl Large Cap Value Fund	T. Rowe Price Instl Floating Rate Fund	TIAA-CREF Quant Small-Cap Equity Instl	TIAA-CREF Real Estate Securities Fund	DFA Large Cap Intl Portfolio	DFA Emerging Markets Core Equity I Portfolio	MetWest Total Return Bond Fund	PIMCO Real Return Instl Fund	PIMCO Income Instl Fund	T-C Life Funding Agreement
Tickers	TRLGX	TILCX	RPIFX	TISEX	TIREX	DFALX	DFCEX	MWTSX	PRRIX	PIMIX	
2036/2037 Enrollment Portfolio Active	22.70%	22.70%	2.00%	5.00%	5.60%	19.20%	4.80%	10.00%	4.00%	4.00%	0.00%
2034/2035 Enrollment Portfolio Active	22.70%	22.70%	2.00%	5.00%	5.60%	19.20%	4.80%	10.00%	4.00%	4.00%	0.00%
2032/2033 Enrollment Portfolio Active	21.60%	21.60%	2.40%	4.80%	5.30%	18.10%	4.60%	12.00%	4.80%	4.80%	0.00%
2030/2031 Enrollment Portfolio Active	20.40%	20.40%	2.80%	4.50%	5.10%	17.30%	4.30%	14.00%	5.60%	5.60%	0.00%
2028/2029 Enrollment Portfolio Active	19.30%	19.30%	3.20%	4.30%	4.80%	16.30%	4.00%	16.00%	6.40%	6.40%	0.00%
2026/2027 Enrollment Portfolio Active	17.00%	17.00%	4.00%	3.80%	4.20%	14.40%	3.60%	20.00%	8.00%	8.00%	0.00%
2024/2025 Enrollment Portfolio Active	13.60%	13.60%	5.20%	3.00%	3.40%	11.50%	2.90%	26.00%	10.40%	10.40%	0.00%
2022/2023 Enrollment Portfolio Active	10.20%	10.20%	5.40%	2.30%	2.50%	8.60%	2.20%	27.00%	10.80%	10.80%	10.00%
2020/2021 Enrollment Portfolio Active	7.10%	7.10%	4.00%	1.50%	1.80%	6.00%	1.50%	20.00%	8.00%	8.00%	35.00%
Enrollment Year Portfolio Active	4.20%	4.20%	3.50%	1.00%	1.10%	3.60%	0.90%	17.50%	7.00%	7.00%	50.00%

Active Multi-Fund Investment Portfolios

Active Diversified Equity Portfolio	28.35%	28.35%		6.30%	7.00%	24.00%	6.00%				
Active Growth Portfolio	19.85%	19.85%	3.00%	4.40%	4.90%	16.80%	4.20%	15.00%	6.00%	6.00%	
Active Moderate Growth Portfolio	11.34%	11.34%	6.00%	2.52%	2.80%	9.60%	2.40%	30.00%	12.00%	12.00%	
Active Diversified Fixed Income Portfolio			10.00%					50.00%	20.00%	20.00%	
Active Conservative Portfolio			5.00%					25.00%	10.00%	10.00%	50.00%
Active International Equity Portfolio						80.00%	20.00%				

Active Single Fund Investment Portfolios

	TIAA-CREF Social Choice Equity Fund	T-C Life Funding Agreement
Tickers	TISCX	
Social Choice Portfolio	100.00%	
Principal Plus Interest Portfolio		100.00%

Glide Path asset allocations are as reflected in the Plan Description.

Current Passive Investment Portfolios

Passive Enrollment Year Portfolio								
Enrollment Year	TIAA-CREF Equity Index Fund	TIAA-CREF International Equity Index Fund	TIAA-CREF Emerging Markets Equity Index Fund	TIAA-CREF Real Estate Securities Fund	TIAA-CREF Bond Index Fund	TIAA-CREF Inflation-Linked Bond Fund	TIAA-CREF High Yield Fund	T-C Life Funding Agreement
Tickers	TIEIX	TCIEX	TEQLX	TIREX	TBIIX	TIILX	TIHYX	
2036/2037 Enrollment Portfolio Passive	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
2034/2035 Enrollment Portfolio Passive	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
2032/2033 Enrollment Portfolio Passive	47.90%	18.20%	4.60%	5.30%	16.80%	4.80%	2.40%	0.00%
2030/2031 Enrollment Portfolio Passive	45.40%	17.30%	4.30%	5.00%	19.60%	5.60%	2.80%	0.00%
2028/2029 Enrollment Portfolio Passive	42.80%	16.30%	4.10%	4.80%	22.40%	6.40%	3.20%	0.00%
2026/2027 Enrollment Portfolio Passive	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	0.00%
2024/2025 Enrollment Portfolio Passive	30.20%	11.50%	2.90%	3.40%	36.40%	10.40%	5.20%	0.00%
2022/2023 Enrollment Portfolio Passive	22.70%	8.60%	2.20%	2.50%	37.80%	10.80%	5.40%	10.00%
2020/2021 Enrollment Portfolio Passive	15.70%	6.00%	1.50%	1.80%	28.00%	8.00%	4.00%	35.00%
Enrollment Year Portfolio Passive	9.40%	3.60%	0.90%	1.10%	24.50%	7.00%	3.50%	50.00%

Passive Multi-Fund Investment Portfolios								
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%	
Passive Moderate Growth Portfolio	25.20%	9.60%	2.40%	2.80%	42.00%	12.00%	6.00%	
Passive Diversified Fixed Income Portfolio					70.00%	20.00%	10.00%	
Passive Conservative Portfolio					35.00%	10.00%	5.00%	50.00%
Index International Equity Portfolio		80.00%	20.00%					

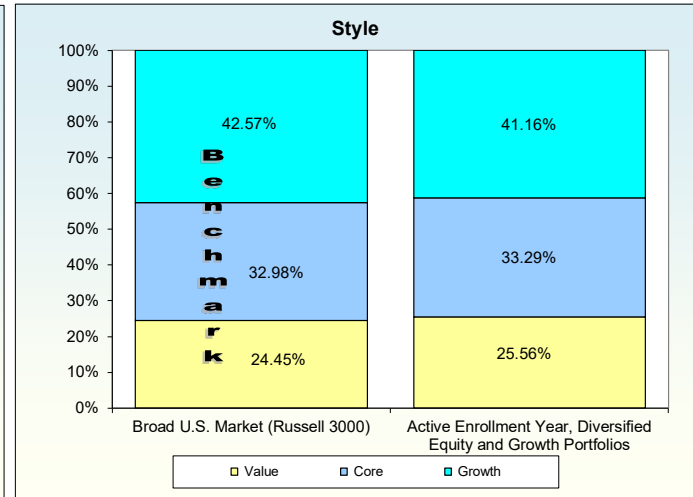
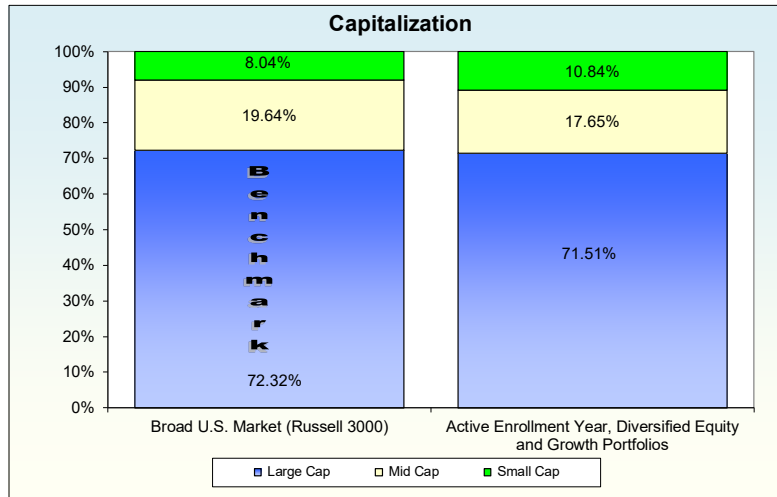
Passive Single Fund Investment Portfolios			
	TIAA-CREF Bond Index Fund	TIAA-CREF S&P 500 Index Fund	TIAA-CREF Equity Index Fund
Tickers	TBIIX	TISPX	TIEIX
Index Bond Portfolio	100.00%		
Index U.S. Large Cap Equity Portfolio		100.00%	
Index U.S. Equity Portfolio			100.00%

Glide Path asset allocations are as reflected in the Plan Description.

- TFI reviewed the recommended domestic equity allocation compared to each of the Morningstar 9 Style categories in relation to the broad domestic equity index (Russell 3000 Index).
- TFI's philosophy in developing a domestic equity strategy is to maintain a neutral and balanced position in both style (growth vs. value) and capitalization (large cap, mid cap, and small cap) to the Russell 3000 Index.
- The style and capitalization weightings for the recommended domestic equity component of the Active Enrollment Year Portfolio and Active Multi-Fund Portfolios with U.S. equity exposure are in line with those of the Russell 3000 Index.

Domestic Equity Composition: Market Cap and Style

Benchmarks	Asset Allocation	Capitalization Analysis				Style Analysis			
	Active Enrollment Year, Diversified Equity and Growth Portfolios	Large Cap	Mid Cap	Small Cap	Total	Value	Core	Growth	Total
Russell 1000 Value Index	29.37%	67.05%	29.25%	3.70%	100.00%	45.49%	41.78%	12.74%	100.00%
Russell 1000 Growth Index	29.37%	86.26%	12.72%	1.02%	100.00%	4.23%	24.10%	71.67%	100.00%
Russell Mid Cap Value Index	0.00%	9.03%	80.42%	10.55%	100.00%	36.45%	51.61%	11.94%	100.00%
Russell Mid Cap Growth Index	0.00%	26.74%	67.80%	5.46%	100.00%	7.06%	33.75%	59.19%	100.00%
Russell 2000 Index	9.92%	0.00%	5.15%	94.86%	100.00%	32.78%	39.71%	27.52%	100.00%
S&P 500 Index	31.34%	84.51%	15.36%	0.13%	100.00%	24.58%	31.92%	43.50%	100.00%
Russell 3000 Index	0.00%	72.32%	19.64%	8.04%	100.00%	24.45%	32.98%	42.57%	100.00%
Total Blended Portfolio	100.00%								
Broad U.S. Market (Russell 3000)		72.32%	19.64%	8.04%	100.00%	24.45%	32.98%	42.57%	100.00%
Active Enrollment Year, Diversified Equity and Growth Portfolios		71.51%	17.65%	10.84%	100.00%	25.56%	33.29%	41.16%	100.00%



Domestic Equity Composition: Style Box Comparison

Benchmarks	Asset Allocation		Morningstar 9 Style Categories									
	Active Enrollment Year, Diversified Equity and Growth Portfolios		Large Value	Large Core	Large Growth	Mid Value	Mid Core	Mid Growth	Small Value	Small Core	Small Growth	Total
Russell 1000 Value Index	29.37%		32.26%	25.34%	9.45%	11.52%	14.70%	3.03%	1.72%	1.73%	0.25%	100.00%
Russell 1000 Growth Index	29.37%		3.01%	19.18%	64.07%	0.97%	4.57%	7.18%	0.24%	0.36%	0.42%	100.00%
Russell Mid Cap Value Index	0.00%		0.66%	5.25%	3.12%	30.89%	41.43%	8.10%	4.90%	4.94%	0.72%	100.00%
Russell Mid Cap Growth Index	0.00%		0.91%	7.36%	18.47%	4.87%	24.46%	38.47%	1.29%	1.93%	2.25%	100.00%
Russell 2000 Index	9.92%		0.00%	0.00%	0.00%	1.13%	1.75%	2.26%	31.65%	37.95%	25.25%	100.00%
S&P 500 Index	31.34%		18.99%	24.69%	40.84%	5.48%	7.22%	2.67%	0.11%	0.02%	0.00%	100.00%
Russell 3000 Index	0.00%		15.90%	20.75%	35.67%	5.70%	8.92%	5.02%	2.85%	3.31%	1.89%	100.00%
Total Blended Portfolio	100.00%											

Broad Market (Russell 3000)	15.90%	20.75%	35.67%	5.70%	8.92%	5.02%	2.85%	3.31%	1.89%	100.00%
Active Enrollment Year, Diversified Equity and Growth Portfolios	16.30%	20.81%	34.39%	5.50%	8.09%	4.06%	3.75%	4.38%	2.70%	100.00%

Difference in Portfolios vs. Broad Market			
Active Enrollment Year, Diversified Equity and Growth Portfolios	Value	Core	Growth
Large Cap	0.40%	0.06%	-1.28%
Mid Cap	-0.20%	-0.83%	-0.96%
Small Cap	0.90%	1.07%	0.81%

Underlying Funds by Strategy

U. S. Equities	International and Emerging Markets Equities	Fixed Income	Short-Term and Cash Equivalents	Alternative Assets
Index Funds				
T-C Equity Index	T-C International Equity Index	T-C Bond Index		<i>Vanguard Real Estate Index</i>
T-C S&P 500 Index	T-C Emerging Markets Equity Index	<i>Vanguard Short-Term Inflation-Protected Securities Index</i>		
	Nuveen ESG Emerging Markets Equity ETF	Nuveen ESG U.S. Aggregate Bond ETF		
		Nuveen ESG High Yield Corporate Bond ETF		
Active Funds				
<i>T. Rowe Price Large-Cap Growth</i>	<i>DFA Large-Cap Int'l</i>	<i>MetWest Total Return Bond</i>		T-C Life Funding Agreement
<i>T. Rowe Price Large-Cap Value</i>	<i>DFA Emerging Markets Core Equity 1</i>	<i>PIMCO Real Return</i>		
T-C Quant Small-Cap Equity	T-C Social Choice International Equity	<i>PIMCO Income</i>		
T-C Social Choice Equity		<i>Vanguard High Yield Corporate</i>		
		<i>T. Rowe Price Floating Rate</i>		

Italicized funds are non-propietary. Highlighted funds are recommended and not yet implemented.

Fee Overview

ScholarShare 529 Portfolios	Plan Manager Fee	Board Administrative Fee	Estimated Expenses of an Investment Portfolio's Underlying Investments	Total Annual Asset-Based Fees
Active Enrollment Year Investment Portfolios				
2038/2039 Enrollment Portfolio Active	0.01%	0.05%	0.33%	0.39%
2036/2037 Enrollment Portfolio Active	0.01%	0.05%	0.33%	0.39%
2034/2035 Enrollment Portfolio Active	0.01%	0.05%	0.34%	0.40%
2032/2033 Enrollment Portfolio Active	0.01%	0.05%	0.34%	0.40%
2030/2031 Enrollment Portfolio Active	0.01%	0.05%	0.34%	0.40%
2028/2029 Enrollment Portfolio Active	0.01%	0.05%	0.35%	0.41%
2026/2027 Enrollment Portfolio Active	0.01%	0.05%	0.36%	0.42%
2024/2025 Enrollment Portfolio Active	0.01%	0.05%	0.32%	0.38%
2022/2023 Enrollment Portfolio Active	0.01%	0.05%	0.24%	0.30%
Enrollment Year Portfolio Active	0.01%	0.05%	0.18%	0.24%
Passive Enrollment Year Investment Portfolios				
2038/2039 Enrollment Portfolio Passive	0.01%	0.00%	0.06%	0.07%
2036/2037 Enrollment Portfolio Passive	0.01%	0.00%	0.06%	0.07%
2034/2035 Enrollment Portfolio Passive	0.01%	0.00%	0.07%	0.08%
2032/2033 Enrollment Portfolio Passive	0.01%	0.00%	0.07%	0.08%
2030/2031 Enrollment Portfolio Passive	0.01%	0.00%	0.07%	0.08%
2028/2029 Enrollment Portfolio Passive	0.01%	0.00%	0.07%	0.08%
2026/2027 Enrollment Portfolio Passive	0.01%	0.00%	0.07%	0.08%
2024/2025 Enrollment Portfolio Passive	0.01%	0.00%	0.06%	0.07%
2022/2023 Enrollment Portfolio Passive	0.01%	0.00%	0.05%	0.06%
Enrollment Year Portfolio Passive	0.01%	0.00%	0.04%	0.05%
ESG Enrollment Year Investment Portfolios				
2038/2039 Enrollment Portfolio ESG	0.01%	0.05%	0.23%	0.29%
2036/2037 Enrollment Portfolio ESG	0.01%	0.05%	0.23%	0.29%
2034/2035 Enrollment Portfolio ESG	0.01%	0.05%	0.22%	0.28%
2032/2033 Enrollment Portfolio ESG	0.01%	0.05%	0.22%	0.28%
2030/2031 Enrollment Portfolio ESG	0.01%	0.05%	0.22%	0.28%
2028/2029 Enrollment Portfolio ESG	0.01%	0.05%	0.21%	0.27%
2026/2027 Enrollment Portfolio ESG	0.01%	0.05%	0.20%	0.26%
2024/2025 Enrollment Portfolio ESG	0.01%	0.05%	0.18%	0.24%
2022/2023 Enrollment Portfolio ESG	0.01%	0.05%	0.13%	0.19%
Enrollment Year Portfolio ESG	0.01%	0.05%	0.09%	0.15%

ScholarShare 529 Portfolios	Plan Manager Fee	Board Administrative Fee	Estimated Expenses of an Investment Portfolio's Underlying Investments	Total Annual Asset-Based Fees
Multi-Fund Portfolios				
Active Diversified Equity Portfolio	0.01%	0.05%	0.32%	0.38%
Active Growth Portfolio	0.01%	0.05%	0.34%	0.40%
Active Conservative Portfolio	0.01%	0.05%	0.19%	0.25%
Active International Equity Portfolio	0.01%	0.05%	0.22%	0.28%
Passive Diversified Equity Portfolio	0.01%	0.00%	0.06%	0.07%
Passive Growth Portfolio	0.01%	0.00%	0.07%	0.08%
Passive Conservative Portfolio	0.01%	0.00%	0.04%	0.05%
Index International Equity Portfolio	0.01%	0.00%	0.08%	0.09%
Single Fund Portfolios				
Social Choice Equity Portfolio	0.01%	0.05%	0.18%	0.24%
ESG International Equity Portfolio	0.01%	0.05%	0.40%	0.46%
ESG Bond Portfolio	0.01%	0.05%	0.15%	0.21%
Index Bond Portfolio	0.01%	0.00%	0.08%	0.09%
Index U.S. Equity Portfolio	0.01%	0.00%	0.05%	0.06%
Principal Plus Interest Portfolio ⁽⁶⁾	0.00%	0.00%	0.00%	0.00%



TIAA-CREF Tuition Financing, Inc.

BUILT TO PERFORM.

CREATED TO SERVE.

MEMORANDUM

TO: ScholarShare Investment Board (SIB)
FROM: Meketa Investment Group (“Meketa”)
DATE: December 7, 2021
RE: 2021 Annual Review

Summary

Meketa reviewed TIAA-CREF Tuition Financing, Inc.’s (TFI) annual review and recommendation for the ScholarShare 529 (Plan) 2022 asset allocation, which highlights their analysis behind the recommendation for no changes given the recently approved Plan lineup changes associated with the Program Manager RFP. Meketa concurs with TFI’s analysis and believes the glidepath approved through the Program Manager RFP process is well optimized. ***Meketa recommends the SIB accept TFI’s recommendation of no additional changes to the asset allocation.***

Background

SIB Staff requested that Meketa review TFI’s annual review and recommendation for the 2022 asset allocation for the ScholarShare 529 (Plan), which highlights TFI’s analysis behind the recommendation for no changes. TFI believes the glidepaths approved as part of the 2021 Program Manager RFP are 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, TFI believes that the Plan changes resulting from the approval of the TFI Program Manager RFP response will meet the following objectives:

- Expand the Plan’s ESG offering by including an all-new ESG enrollment-date option, and additional single-fund ESG investment options for the international equity and U.S. core bond markets.
- Reduce participant fees in both the Active and Passive portfolios by introducing allocations to low-cost Vanguard and TIAA-CREF funds and by increasing the passive management component of the Active portfolios.
- Streamline the Multi-Fund Portfolios from five to three, to facilitate the decision-making process and holistically scale the investment menu.

Meketa believes the changes associated with the 2021 Program Manager RFP accomplish all stated objectives.

Expanded ESG Lineup – ESG investing is unequivocally one of the largest trends within the investment management industry. Investors are increasingly desiring to align their investment dollars and their

views on the environment, equity, inclusion, and stakeholder rights among other values. ESG oriented funds allows participants to better align these values with their invested assets. The inclusion of an ESG enrollment-date option and an expanded lineup of single-fund ESG investment options will position ScholarShare 529 as a leader in this rapidly expanding and increasingly important segment of the investment universe.

Fee Reduction – The fee reduction is largely centered on lowering the costs of the Active enrollment-date portfolios and to a lesser extent the Passive enrollment-date options and the multi-fund portfolios. The fee reduction was driven by two changes: 1.) the introduction of lower cost Vanguard funds and 2.) the reallocation of some assets within the Active enrollment-date portfolios to passively managed funds. The introduction of the Vanguard funds is a strong addition to Plan as they bring lower-cost fees and a well-recognized brand. In addition, the inclusion of some passively managed funds within the Active Enrollment-date portfolios is positive as it lowers fees with only a minimal reduction in potential outperformance. This is due to TFI targeting the most efficient asset classes for the inclusion of passive management. Given the efficiency of certain asset classes (i.e., large cap US equities) there is only a modest opportunity set for adding value through active management. As such, the degree of added value by active managers within efficient asset classes is relatively minor compared with less efficient asset classes (i.e., emerging market equities). As a result, adding in some passive management to these efficient asset classes can materially lower fees without materially diminishing the potential added value by the portfolio as a whole. Overall, we believe the reduction in fees will further enhance participant’s experience and increase the Plan’s competitive position in the industry while maintaining the risk/return profile and capital market exposure of the current portfolios.

Multi-fund Portfolio Reduction –The streamlining of the multi-fund portfolios should simplify and better delineate the fund lineup. This should reduce participant decision fatigue while still allowing for them to match their personal return objectives and risk tolerance using one or a combination of multi-fund portfolios.

Glidepath Asset Allocation Review

Meketa has reviewed the asset allocation of the enrollment-based portfolios for validity and soundness. 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 special consideration for 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. Based on our analysis, the approved enrollment-based portfolios are efficient (return for risk incurred) and sound (protective against 529s unique risks).



	TIAA-Active	TIAA-Passive
5 Percentile Return	9.73%	9.64%
25 Percentile Return	7.03%	6.95%
Expected Return	5.19%	5.12%
75 Percentile Return	3.39%	3.32%
95 Percentile Return	0.85%	0.78%
Expected Standard Deviation	11.48%	11.45%
Probability of Exceeding 5% Tuition Inflation	52.88%	51.76%
Probability of Exceeding 3% Tuition Inflation	79.43%	78.68%
Median Sharpe Ratio	0.34	0.33
Expected Worst Year	-37.21%	-36.95%
Expected Worst Year (Last 8 years)	-24.78%	-24.77%
Expected Worst Year (Last 4 years)	-14.18%	-14.21%

Conclusion

Meketa finds TFI's analysis to be comprehensive and insightful and uses consistent and reasonable inputs in developing their conclusions. Meketa agrees that the current 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.