

---

**JUNE 14, 2018**

**AGENDA ITEM 3  
INFORMATION ITEM**

**SCHOLARSHARE INVESTMENT BOARD**

*Review of Emerging Market Debt Asset Class for ScholarShare 529*

---

***Background***

At the ScholarShare Investment Board (SIB or Board) meeting on December 14, 2017, the program manager, TIAA-CREF Tuition Financing, Inc. (TFI), provided a review of the asset allocation of the investment portfolios for ScholarShare 529 (Plan) and a general overview of a new asset class, “Emerging Market Debt.” Due to the complexity associated with the introduction of this asset class, SIB staff requested additional analysis of this new asset class, which was presented by the Board’s investment consultant, Pension Consulting Alliance, LLC (PCA) at the April 4, 2018 SIB meeting.

As a follow-up, TFI has provided its Emerging Market Debt (EMD) presentation (Exhibit A), outlining details on how the EMD asset class would fit into the existing ScholarShare 529 investment offering, including the portfolios that would be affected, the proposed asset allocation, the duration and yield, changes in fees, and volatility. Additionally, PCA has provided its analysis of TFI’s presentation on the EMD asset class (Exhibit B), which includes a review of the asset allocation and the impact on expected risk and return and fees. Finally, as requested by the Board, SIB’s 529 industry consultant, AKF Consulting Group (AKF), provided a review of the prevalence of the EMD asset class within the direct-sold 529 plan industry (Exhibit C).

Following a review of these analyses, SIB staff, its consultants, and TFI, all agree that although there are positive attributes associated with EMD as an asset class, at this time, there does not appear to be sufficient identifiable improvement associated with the addition of the EMD asset class to the overall ScholarShare 529 investment offering. Therefore, after carefully considering all aspects contained in the analyses of the EMD asset class produced for this proposal, including the lack of positive change in expected portfolio risk-adjusted returns, higher fees, and a challenging market environment for EMD, SIB staff and its consultants agree to recommend no changes to the existing asset allocation of the investment portfolios for the Plan at this time.

***Presenters***

Jeremy Thiessen, Senior Director, TIAA-CREF Tuition Financing, Inc.  
Eric White, Principal, Pension Consulting Alliance, LLC  
Andrea Feirstein, Managing Director, AKF Consulting Group



## Emerging Market Debt

Prepared by TIAA-CREF Tuition Financing Inc.

June 14, 2018



BUILT TO PERFORM.

CREATED TO SERVE.



### Recall from prior meetings:

#### December 2017

- Emerging markets debt is a compelling asset class for a low-yield environment
  - U.S. Core Bond environment looking less attractive
  - Increased yield per unit of duration

#### April 2018

- PCA educational session on Emerging Market Debt
  - Strong economic growth from emerging countries
  - Large segment of the global bond market
  - Attractive yields relative to other bond segments
  - Compelling Sharpe Ratios (risk adjusted returns)
  - Diversification benefits

For this meeting:

June 2018

- Complete the conversation on Emerging Market Debt (EMD) as an informational item:
  - The asset class continues to have certain attractive features, however
    - Current macro challenges in the U.S. and abroad may result in an unfavorable entry point
      - Rising U.S. interest rates and dollar strength
      - Geopolitical uncertainty
      - Lower risk-adjusted returns as a result of lower EMD performance, higher volatility, and a higher risk-free rate
    - An already strong program creates a high hurdle to add a new asset class, so there is no immediacy to make a change
  - **TFI recommends holding off on adding EMD to ScholarShare**

The following pages contain some closing thoughts on EMD as informational items only, not as a proposal for change

# Informational: Passive Age-Based Portfolio with EMD



Underlying Fund Fee	0.05%	0.06%	0.21%	0.51%	0.12%	0.26%	0.36%	0.65%	N/A*		
Age of Beneficiary	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	Emerging Markets Debt Asset Class ***	T-C Life Funding Agreement	Weighted Average Fund Fee**	Change in Weighted Average Fund Fee
0 - 4	50.40%	19.20%	4.80%	5.60%	12.60%	4.00%	2.00%	1.40%	0.00%	0.12%	0.01%
5 - 8	44.10%	16.80%	4.20%	4.90%	18.90%	6.00%	3.00%	2.10%	0.00%	0.13%	0.01%
9 - 10	37.80%	14.40%	3.60%	4.20%	25.20%	8.00%	4.00%	2.80%	0.00%	0.14%	0.01%
11 - 12	31.50%	12.00%	3.00%	3.50%	31.50%	10.00%	5.00%	3.50%	0.00%	0.15%	0.02%
13 - 14	25.20%	9.60%	2.40%	2.80%	37.80%	12.00%	6.00%	4.20%	0.00%	0.16%	0.02%
15	18.90%	7.20%	1.80%	2.10%	37.80%	12.00%	6.00%	4.20%	10.00%	0.15%	0.02%
16	15.75%	6.00%	1.50%	1.75%	34.65%	11.00%	5.50%	3.85%	20.00%	0.14%	0.02%
17	12.60%	4.80%	1.20%	1.40%	28.80%	9.00%	4.50%	2.70%	35.00%	0.11%	0.01%
18 +	9.45%	3.60%	0.90%	1.05%	24.50%	7.00%	3.50%	0.00%	50.00%	0.07%	0.00%

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

\*\*\* The expense ratio for the T-C EMD Fund is used as a proxy.

- New EMD asset class is sourced from the Bond Index fund (see Appendix for current)
  - Active Age-Based and Multi-Fund Portfolios contain underlying funds that currently utilize EMD
  - Therefore, only the passive portfolios are being considered for change
- Allocation to EMD is eliminated from the 18+ age band to preserve low volatility profile
- Increase in weighted average fund fees are limited between 0 and 2 bps

# Informational: Passive Multi-Fund and Single Fund Investment Portfolios with EMD



## Passive Multi-Fund Investment Portfolios

Underlying Fund Fee	0.05%	0.06%	0.21%	0.51%	0.12%	0.26%	0.36%	0.65%	N/A*		
Investment Portfolios	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	Emerging Markets Debt Asset Class ***	T-C Life Funding Agreement	Weighted Average Fund Fee**	Change in Weighted Average Fund Fee
Passive Diversified Equity Portfolio	63.00%	24.00%	6.00%	7.00%						0.09%	0.00%
Passive Growth Portfolio	44.10%	16.80%	4.20%	4.90%	18.90%	6.00%	3.00%	2.10%		0.13%	0.01%
Passive Moderate Growth Portfolio	25.20%	9.60%	2.40%	2.80%	37.80%	12.00%	6.00%	4.20%		0.16%	0.02%
Passive Diversified Fixed Inc Portfolio					63.00%	20.00%	10.00%	7.00%		0.21%	0.04%
Passive Conservative Portfolio					31.50%	10.00%	5.00%	3.50%	50.00%	0.10%	0.02%
Index International Equity Portfolio		80.00%	20.00%							0.09%	0.00%

## Passive Single Fund Investment Portfolios

Investment Portfolios	Percent Allocation	Underlying Mutual Fund	Fund Fee
Index Bond Portfolio	100.00%	TIAA-CREF Bond Index Fund	0.12%
Index U.S. Large Cap Equity Portfolio	100.00%	TIAA-CREF S&P 500 Index Fund	0.06%
Index U.S. Equity Portfolio	100.00%	TIAA-CREF Equity Index Fund	0.05%

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

\*\*\* The expense ratio for the T-C EMD Fund is used as a proxy.

- Changes to Multi-Fund Portfolios follow the same approach as the Age-Based Portfolios
- Results in change of weighted average fund fees of 1 to 4 bps

# Informational: Passive Age-Based Portfolio Duration and Yield



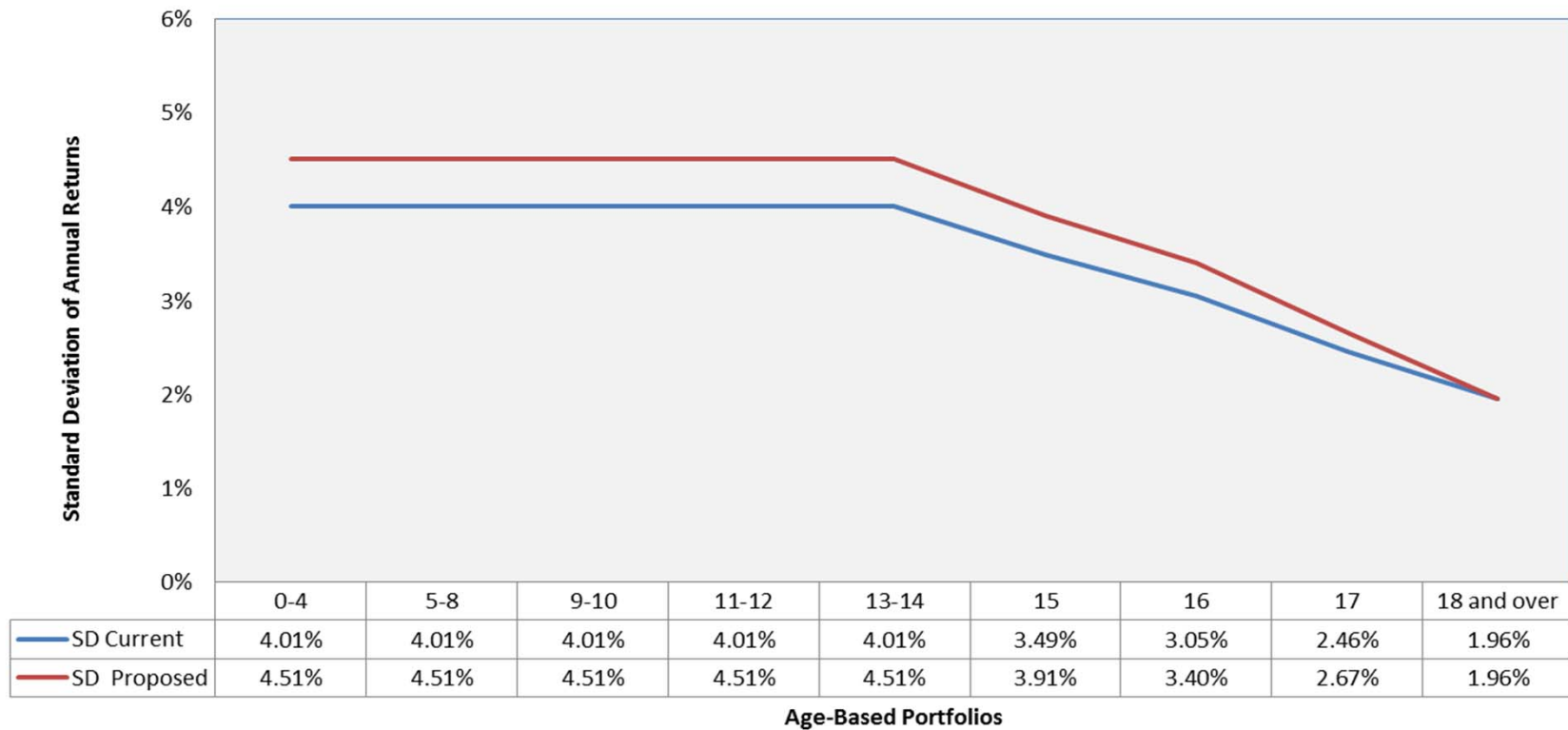
Interest Rate Sensitivity of Fixed Income and Short-Term Investments							
Beneficiary's Age	TIAA-CREF Bond Index Fund	TIAA-CREF Inflation-Linked Bond Fund	TIAA-CREF High Yield Fund	Emerging Markets Debt	TC Life Funding Agreement	Weighted Average Yield (%)	Weighted Average Duration (Years)
Yield	3.17	2.75	6.11	6.52	1.30		
Option-Adjusted Duration*	6.06	4.99	3.76	6.37	0.00		
Current Passive Age-Based Portfolio							
0-4	70.00%	20.00%	10.00%	0.00%	0.00%	3.38	5.62
5-8	70.00%	20.00%	10.00%	0.00%	0.00%	3.38	5.62
9-10	70.00%	20.00%	10.00%	0.00%	0.00%	3.38	5.62
11-12	70.00%	20.00%	10.00%	0.00%	0.00%	3.38	5.62
13-14	70.00%	20.00%	10.00%	0.00%	0.00%	3.38	5.62
15	60.00%	17.14%	8.57%	0.00%	14.29%	3.08	4.81
16	51.33%	14.67%	7.33%	0.00%	26.67%	2.83	4.12
17	39.38%	11.25%	5.63%	0.00%	43.75%	2.47	3.16
18 and over	28.82%	8.24%	4.12%	0.00%	58.82%	2.16	2.31
Proposed Passive Age-Based Portfolio							
0-4	63.00%	20.00%	10.00%	7.00%	0.00%	3.61	5.64
5-8	63.00%	20.00%	10.00%	7.00%	0.00%	3.61	5.64
9-10	63.00%	20.00%	10.00%	7.00%	0.00%	3.61	5.64
11-12	63.00%	20.00%	10.00%	7.00%	0.00%	3.61	5.64
13-14	63.00%	20.00%	10.00%	7.00%	0.00%	3.61	5.64
15	54.00%	17.14%	8.57%	6.00%	14.29%	3.28	4.83
16	46.20%	14.67%	7.33%	5.13%	26.67%	3.00	4.13
17	36.00%	11.25%	5.63%	3.38%	43.75%	2.58	3.17
18 and over	28.82%	8.24%	4.12%	0.00%	58.82%	2.16	2.31

\*As of 3/31/18

- Proposed allocation results in minimal increase to portfolio duration
- Expected yield increases



**Volatility: Fixed Income & Cash Equivalents  
(Standard Deviation of Yearly Returns from 2008-2017)**



- Modest increase in expected volatility (standard deviation)
- Age 18+ expected volatility is preserved given no allocation to EMD

\* The JPM EMBI Global Diversified Index is used as a proxy for the EMD asset class.  
FOR INSTITUTIONAL INVESTOR USE ONLY. NOT FOR USE WITH OR DISTRIBUTION TO THE PUBLIC..



## Conclusion



The allocation to EMD is designed to achieve the following:

- Maintain portfolio duration that is lower than broad benchmark
- Increase expected yield to balance lower duration/yield
- Moderate any increase in expected volatility
- Keep expected increase to weighted average fund fees minimal

**However, given current market conditions, TFI recommends making no asset class changes at this time**

# Appendix

## Current Passive Age-Based Portfolio



Underlying Fund Fee	0.05%	0.06%	0.21%	0.51%	0.12%	0.26%	0.36%	N/A*	
Age of Beneficiary	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	Weighted Average Fund Fee**
0 - 4	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%	0.11%
5 - 8	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%	0.12%
9 - 10	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	0.00%	0.13%
11 - 12	31.50%	12.00%	3.00%	3.50%	35.00%	10.00%	5.00%	0.00%	0.13%
13 - 14	25.20%	9.60%	2.40%	2.80%	42.00%	12.00%	6.00%	0.00%	0.14%
15	18.90%	7.20%	1.80%	2.10%	42.00%	12.00%	6.00%	10.00%	0.13%
16	15.75%	6.00%	1.50%	1.75%	38.50%	11.00%	5.50%	20.00%	0.12%
17	12.60%	4.80%	1.20%	1.40%	31.50%	9.00%	4.50%	35.00%	0.10%
18 +	9.45%	3.60%	0.90%	1.05%	24.50%	7.00%	3.50%	50.00%	0.07%

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

- Current Passive Age-Based option offers a cost-effective solution to access diversified portfolios

# Informational: Passive with EMD vs. Current Passive



Age of Beneficiary	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	Emerging Markets Debt Asset Class ***	T-C Life Funding Agreement
0 - 4	0.00%	0.00%	0.00%	0.00%	-1.40%	0.00%	0.00%	1.40%	0.00%
5 - 8	0.00%	0.00%	0.00%	0.00%	-2.10%	0.00%	0.00%	2.10%	0.00%
9 - 10	0.00%	0.00%	0.00%	0.00%	-2.80%	0.00%	0.00%	2.80%	0.00%
11 - 12	0.00%	0.00%	0.00%	0.00%	-3.50%	0.00%	0.00%	3.50%	0.00%
13 - 14	0.00%	0.00%	0.00%	0.00%	-4.20%	0.00%	0.00%	4.20%	0.00%
15	0.00%	0.00%	0.00%	0.00%	-4.20%	0.00%	0.00%	4.20%	0.00%
16	0.00%	0.00%	0.00%	0.00%	-3.85%	0.00%	0.00%	3.85%	0.00%
17	0.00%	0.00%	0.00%	0.00%	-2.70%	0.00%	0.00%	2.70%	0.00%
18 +	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Passive Multi-Fund and Single Fund Portfolios	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	Emerging Markets Debt Asset Class ***	T-C Life Funding Agreement	TIAA-CREF S&P 500 Index Fund
Passive Diversified Equity Portfolio	0.00%	0.00%	0.00%	0.00%						
Passive Growth Portfolio	0.00%	0.00%	0.00%	0.00%	-2.10%	0.00%	0.00%	2.10%		
Passive Moderate Growth Portfolio	0.00%	0.00%	0.00%	0.00%	-4.20%	0.00%	0.00%	4.20%		
Passive Diversified Fixed Inc Portfolio					-7.00%	0.00%	0.00%	7.00%		
Passive Conservative Portfolio					-3.50%	0.00%	0.00%	3.50%	0.00%	
Index International Equity Portfolio										
Index Bond Portfolio					0.00%					
Index U.S. Large Cap Equity Portfolio										0.00%
Index U.S. Equity Portfolio	0.00%									

# Current Passive Multi-Fund and Single Fund Investment Portfolios



## Passive Multi-Fund Investment Portfolios

Underlying Fund Fee	0.05%	0.06%	0.21%	0.51%	0.12%	0.26%	0.36%	N/A*	
Age of Beneficiary	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	Weighted Average Fund Fee**
Passive Diversified Equity Portfolio	63.00%	24.00%	6.00%	7.00%					0.09%
Passive Growth Portfolio	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%		0.12%
Passive Moderate Growth Portfolio	25.20%	9.60%	2.40%	2.80%	42.00%	12.00%	6.00%		0.14%
Passive Diversified Fixed Income Portfolio					70.00%	20.00%	10.00%		0.17%
Passive Conservative Portfolio					35.00%	10.00%	5.00%	50.00%	0.09%
Index International Equity Portfolio		80.00%	20.00%						0.09%

## Passive Single Fund Investment Portfolios

Investment Portfolios	Percent Allocation	Underlying Mutual Fund	Fund Fee
Index Bond Portfolio	100.00%	TIAA-CREF Bond Index Fund	0.12%
Index U.S. Large Cap Equity Portfolio	100.00%	TIAA-CREF S&P 500 Index Fund	0.06%
Index U.S. Equity Portfolio	100.00%	TIAA-CREF Equity Index Fund	0.05%

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

- Current passive static options offer a cost-effective solution to access a variety of different types of strategies that span the full range of risk spectrum

## Informational: Fee Impact of adding emerging markets debt



<b>Investment Portfolio</b>	<b>Current Weighted Average Underlying Fund Fee (in bp)</b>	<b>Proposed Weighted Average Underlying Fund Fee (in bp)</b>	<b>Difference</b>
Passive Ages 0-4	11	12	1
Passive Ages 5-8	12	13	1
Passive Ages 9-10	13	14	1
Passive Ages 11-12	13	15	2
Passive Ages 13-14	14	16	2
Passive Ages 15	13	15	2
Passive Ages 16	12	14	2
Passive Ages 17	10	11	1
Passive Ages 18+	7	7	0
Passive Growth Portfolio	12	13	1
Passive Moderate Growth Portfolio	14	16	2
Passive Diversified Fixed Inc Portfolio	17	21	4
Passive Conservative Portfolio	9	10	2

\* The expense ratio for the T-C Emerging Markets Debt Fund is used as a proxy for the emerging markets debt asset class.

- Portfolios have modest fee impact of less than 0 to 4 bps

## Active Age-Based Portfolio (No changes)



Underlying Fund Fee	0.56%	0.57%	0.42%	0.51%	0.23%	0.53%	0.38%	0.45%	0.50%	0.56%	N/A*	
Active Age-Based Portfolio Age of Beneficiary	T. Rowe Price Instl Large Cap Growth Fund	T. Rowe Price Instl Large Cap Value Fund	TIAA-CREF Small Cap Equity Fund	TIAA- CREF Real Estate Securities Fund	DFA Large Cap International Portfolio	DFA Emerging Markets Core Equity I Portfolio	MetWest Total Return Bond Fund	PIMCO Real Return Instl Fund	PIMCO Income Instl Fund	T. Rowe Price Instl Floating Rate Fund	T-C Life Funding Agreement	Weighted Average Fund Fee**
0 - 4	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	10.00%	4.00%	4.00%	2.00%	0.00%	0.46%
5 - 8	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	15.00%	6.00%	6.00%	3.00%	0.00%	0.46%
9 - 10	17.01%	17.01%	3.78%	4.20%	14.40%	3.60%	20.00%	8.00%	8.00%	4.00%	0.00%	0.46%
11 - 12	14.18%	14.18%	3.14%	3.50%	12.00%	3.00%	25.00%	10.00%	10.00%	5.00%	0.00%	0.45%
13 - 14	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	30.00%	12.00%	12.00%	6.00%	0.00%	0.45%
15	8.51%	8.51%	1.88%	2.10%	7.20%	1.80%	30.00%	12.00%	12.00%	6.00%	10.00%	0.40%
16	7.09%	7.09%	1.57%	1.75%	6.00%	1.50%	27.50%	11.00%	11.00%	5.50%	20.00%	0.36%
17	5.67%	5.67%	1.26%	1.40%	4.80%	1.20%	22.50%	9.00%	9.00%	4.50%	35.00%	0.29%
18 +	4.25%	4.25%	0.95%	1.05%	3.60%	0.90%	17.50%	7.00%	7.00%	3.50%	50.00%	0.22%

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

- Current Active Age-Based option offers an effective solution to access diversified portfolios with potential excess returns
- Because most active fixed income funds typically include emerging markets debt in the portfolios as part of their strategic asset allocation, it is not necessary to insert a dedicated EMD fund



# Active Multi-Fund and Single Fund Investment Portfolios (No changes)



## Active Multi-Fund Investment Portfolios

Underlying Fund Fee	0.56%	0.57%	0.42%	0.51%	0.23%	0.53%	0.38%	0.45%	0.50%	0.56%	N/A*	
Active Age-Based Portfolio Age of Beneficiary	T. Rowe Price Instl Large Cap Growth Fund	T. Rowe Price Instl Large Cap Value Fund	TIAA-CREF Small Cap Equity Fund	TIAA-CREF Real Estate Securities Fund	DFA Large Cap International Portfolio	DFA Emerging Markets Core Equity I Portfolio	MetWest Total Return Bond Fund	PIMCO Real Return Instl Fund	PIMCO Income Instl Fund	T. Rowe Price Instl Floating Rate Fund	T-C Life Funding Agreement	Weighted Average Fund Fee**
Active Diversified Equity Portfolio	28.35%	28.35%	6.30%	7.00%	24.00%	6.00%						0.47%
Active Growth Portfolio	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	15.00%	6.00%	6.00%	3.00%		0.46%
Active Moderate Growth Portfolio	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	30.00%	12.00%	12.00%	6.00%		0.45%
Active Diversified Fixed Income Portfolio							50.00%	20.00%	20.00%	10.00%		0.44%
Active Conservative Portfolio							25.00%	10.00%	10.00%	5.00%	50.00%	0.22%
Active International Equity Portfolio					80.00%	20.00%						0.29%

## Active Single Fund Investment Portfolios

Investment Portfolios	Percent Allocation	Underlying Mutual Fund	Fund Fee
Social Choice Portfolio	100.00%	TIAA-CREF Social Choice Equity Fund	0.19%
Principal Plus Interest Portfolio	100.00%	TIAA-CREF Life Co. Funding Agreement	N/A*

\*The T-C Life Funding Agreement is not a retail mutual fund, and as such, has no explicit fee.

\*\*Includes a 0.00% underlying fund fee for the T-C Life Funding Agreement.

- Current active static options offer an effective solution to access a wide spectrum of portfolios with potential excess returns from active management

 **TIAA** 100 YEARS

CREATED TO SERVE.

BUILT TO PERFORM.

**Date:** May 31, 2018  
**To:** ScholarShare Investment Board (SIB)  
**From:** Pension Consulting Alliance, LLC (PCA)  
**CC:** Eric White, CFA – PCA; Kay Ceserani – PCA  
**RE:** TFI Emerging Market Debt Proposal Review

---

## Summary

Over the last several months the SIB has received formal presentations on the Emerging Market Debt (EMD) asset class from TIAA Tuition Financing, Inc. (TFI) and PCA. The initial December 2017 presentation by TFI gave a high-level introduction to the asset class and highlighted the potential benefits of adding EMD to the ScholarShare College Savings Plan (the Plan) asset allocation. At the April 2018 SIB meeting, PCA provided a more in-depth presentation focusing on the background of the asset class, the different types of EMD, the rationale for potential investment, and the associated risks. For this memo we modeled the impact of including EMD on the different portfolios at the allocation weight provided by TFI.

Our analysis showed a small increase in expected return as well as a corresponding increase in volatility. Both outcomes make intuitive sense as EMD has a higher expected return than core fixed income but also has a materially higher expected volatility and correlation to other risky assets. When taken together, the higher expected risk offsets the higher expected returns. As a result, the Plan is not improved on a risk-adjusted standpoint but would be moving along the risk-return spectrum as a tradeoff is made between risk and return. Another consideration we looked at was the cost of EMD funds, which are significantly higher than core fixed income funds. TFI's analysis showed a 1 to 4 basis point increase in expected fees across the different investment options. We think that those estimates might be on the low side if a non-proprietary fund is selected. We would note that an increase in fees on a direct plan is counter to the trend of the industry and would set the Plan apart from peers in a negative sense if fees are to be increased.

## Background

At the December 2017 SIB meeting TFI gave a presentation highlighting the potential benefits of adding EMD to the Plan asset allocation. Per the SIB's direction, Staff requested that PCA provide additional due diligence of the asset class, which was provided in April 2018. The current step in the evaluation process is to move from a general analysis of EMD to specifically how an allocation would impact the Plan itself. In order to do so TFI provided proposed allocation ranges so that both TFI and PCA could model the impact of adding EMD to the portfolios. The proposed

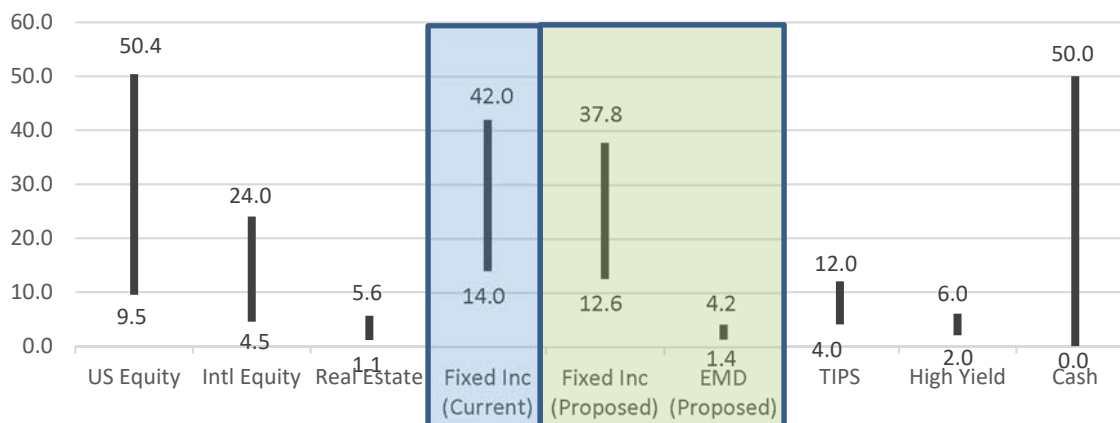
allocation shifts assets out of Core Fixed Income and into EMD in all the passive age bands except portfolio 18+ and passive multi-fund investment portfolios with an allocation to fixed income.

TFI did not provide an allocation for EMD within the actively managed portfolio. TFI's rationale for doing so is based on the fact that the active fixed income managers already have EMD as a part of their opportunity set from which to select investments. Having dedicated EMD exposure in addition to this flexibility would result in the potential for EMD to become a disproportionate weight within the overall portfolio and result in an allocation in excess of what TFI deems prudent.

The following is a brief review of key elements of TFI's allocation proposal.

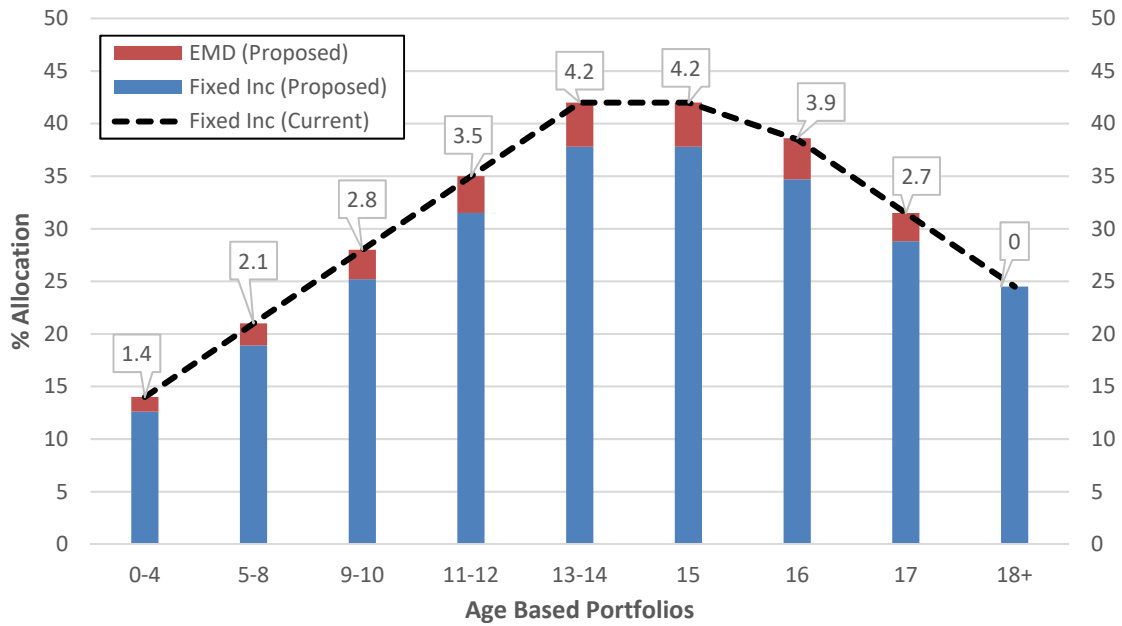
The following Exhibit highlights the asset allocation ranges for the passive age based portfolios. TFI's proposal only impacts the portfolios' fixed income allocations, which currently range from 14.0% to 42.0%. The addition of EMD to the glidepath is accomplished by reducing the allocation to Core Fixed Income by approximately 10% for each age band; allocation shifts range from 1.4% to 4.2%.

**Glidepath Allocation Ranges**



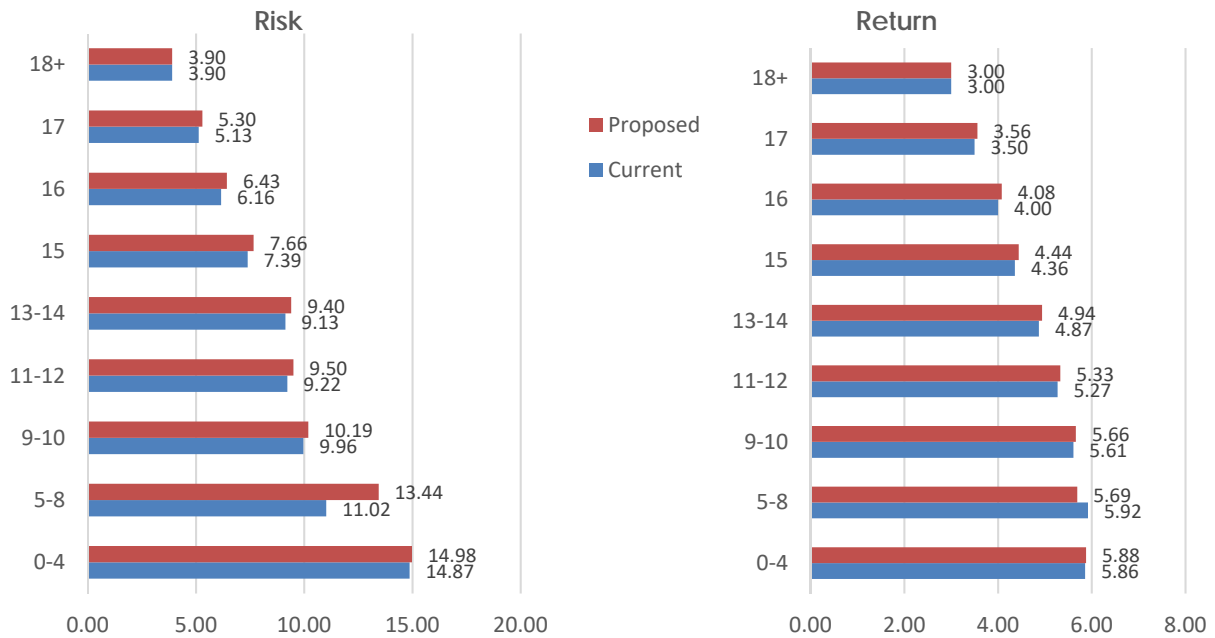
The chart on the following page highlights the proposed allocation for each age band.

### TFI EMD Allocation Proposal



### Impact on Expected Risk and Return

The expected return for the proposed portfolios remained the same or slightly improved across the glidepath, except for portfolio 5-8 which had a lower expected return. However, portfolios also experienced a corresponding increase in expected risk.



From a risk-adjusted standpoint our modeling does not show an improvement from the addition of EMD. The increases in return are completely offset by the increases in volatility. This results in near identical Sharpe ratios (a measure of risk-adjusted performance) across each of the age bands.

PCA judges potential change to the Plan based on its efficiency from a risk-reward standpoint. We measure this improvement using the Sharpe ratio and look for material improvement in order to have confidence that the gain in efficiency is substantial enough to overcome the noise inherent in modelling future returns. In the case of EMD, we see mixed efficiency results with the result only seen at the third or fourth decimal point. This indicates the proposed allocation and the current allocation produce the same overall level of efficiency, which means the choice to allocate to EMD would be a tradeoff between risk and return and not an overall improvement to the Plan.

Impact on Fees

According to TFI, the addition of an EMD fund to the Plan will increase the weighted average fund fees by 1 to 4 basis points. TFI used the TIAA EMD fund as a proxy for an EMD fund in its fee analysis, with a net expense ratio of 65 basis points, which is materially higher than the TIAA Bond Index fund’s fee of 12 basis points.

**Weighted Average Underlying Fund Fee in Basis Points**

Portfolio	Current	Proposed	Difference
0-4	11	12	1
5-8	12	13	1
9-10	13	14	1
11-12	13	15	2
13-14	14	16	2
15	13	15	2
16	12	14	2
17	10	11	1
18+	7	7	0
Passive Diversified Equity	9	9	0
Passive Growth	12	13	1
Passive Moderate Growth	14	16	2
Passive Diversified Fixed Inc	17	21	4
Passive Conservative	9	10	1
Index International Equity	9	9	0

We do note, there are over 100 EMD funds with an institutional share class currently tracked in Morningstar and that the TIAA EMD fund is one of the least expensive fund options. The Morningstar median fee is 90 basis points with the 25<sup>th</sup> to 75<sup>th</sup> percentile segment ranging from

approximately 79 basis points to 97 basis points. As a result, TFI's analysis likely underestimates the potential fee impact if a non-proprietary fund is selected.

While there are some lower cost passive options available, we would argue that EMD is an asset class where active management is preferred. This has to do with the perverse nature of capitalization weighted benchmarks that passive funds are designed to track. Due to capitalization weighting schemes, the more debt a country has outstanding the larger it's weight within the benchmark. In other words, as a country increases its debt burden, worsening its credit worthiness, the index increases its weight to that country and will inversely lower its weight to countries that improve their financial condition by reduced borrowings.

## **Conclusion**

PCA analyzed the potential impact of adding EMD to the fixed income allocation of the passive portfolio options. In doing so we utilized proposed allocation ranges provided by TFI and PCA's 2018 10-year capital market assumptions within our mean-variance optimization model. The outcome of our modeling indicates that the addition of EMD would increase the expected return of the portfolios and correspondingly increase the volatility of the portfolios. Taken together the result does not improve the portfolios on a risk adjusted-basis but instead creates a risk versus return tradeoff. Along with the performance impact, PCA also looked at the impact on portfolio level fees. TFI estimates the addition of an EMD fund to the Plan will increase the weighted average fund fees by 1 to 4 basis points. However, TFI used a proprietary fund with a substantially below average fee. If a non-proprietary fund is used, the weighted average fees could be materially higher.

It's PCA's view the positive attributes of EMD as an asset class are overshadowed by the lack of identifiable improvement to the overall portfolio given the lack of positive change in expected portfolio risk-adjusted returns and a higher fee profile. These attributes, coupled with an increasingly challenging market environment for EMD, diminish the merits of the addition of EMD at this time.



*DISCLOSURES: This document is provided for informational purposes only. It does not constitute an offer of securities of any of the issuers that may be described herein. Information contained herein may have been provided by third parties, including investment firms providing information on returns and assets under management, and may not have been independently verified. The past performance information contained in this report is not necessarily indicative of future results and there is no assurance that the investment in question will achieve comparable results or that the Firm will be able to implement its investment strategy or achieve its investment objectives. The actual realized value of currently unrealized investments (if any) will depend on a variety of factors, including future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs and the timing and manner of sale, all of which may differ from the assumptions and circumstances on which any current unrealized valuations are based.*

*Neither PCA nor PCA's officers, employees or agents, make any representation or warranty, express or implied, in relation to the accuracy or completeness of the information contained in this document or any oral information provided in connection herewith, or any data subsequently generated herefrom, and accept no responsibility, obligation or liability (whether direct or indirect, in contract, tort or otherwise) in relation to any of such information. PCA and PCA's officers, employees and agents expressly disclaim any and all liability that may be based on this document and any errors therein or omissions therefrom. Neither PCA nor any of PCA's officers, employees or agents, make any representation of warranty, express or implied, that any transaction has been or may be effected on the terms or in the manner stated in this document, or as to the achievement or reasonableness of future projections, management targets, estimates, prospects or returns, if any. Any views or terms contained herein are preliminary only, and are based on financial, economic, market and other conditions prevailing as of the date of this document and are therefore subject to change.*

*The information contained in this report may include forward-looking statements. Forward-looking statements include a number of risks, uncertainties and other factors beyond the control of the Firm, which may result in material differences in actual results, performance or other expectations. The opinions, estimates and analyses reflect PCA's current judgment, which may change in the future.*

*Any tables, graphs or charts relating to past performance included in this report are intended only to illustrate investment performance for the historical periods shown. Such tables, graphs and charts are not intended to predict future performance and should not be used as the basis for an investment decision.*

*All trademarks or product names mentioned herein are the property of their respective owners. Indices are unmanaged and one cannot invest directly in an index. The index data provided is on an "as is" basis. In no event shall the index providers or its affiliates have any liability of any kind in connection with the index data or the portfolio described herein. Copying or redistributing the index data is strictly prohibited.*

*The Russell indices are either registered trademarks or tradenames of Frank Russell Company in the U.S. and/or other countries.*

*The MSCI indices are trademarks and service marks of MSCI or its subsidiaries.*

*Standard and Poor's (S&P) is a division of The McGraw-Hill Companies, Inc. S&P indices, including the S&P 500, are a registered trademark of The McGraw-Hill Companies, Inc.*

*CBOE, not S&P, calculates and disseminates the BXM Index. The CBOE has a business relationship with Standard & Poor's on the BXM. CBOE and Chicago Board Options Exchange are registered trademarks of the CBOE, and SPX, and CBOE S&P 500 BuyWrite Index BXM are servicemarks of the CBOE. The methodology of the CBOE S&P 500 BuyWrite Index is owned by CBOE and may be covered by one or more patents or pending patent applications.*

*The Barclays Capital indices (formerly known as the Lehman indices) are trademarks of Barclays Capital, Inc.*

*The Citigroup indices are trademarks of Citicorp or its affiliates.*

*The Merrill Lynch indices are trademarks of Merrill Lynch & Co. or its affiliates.*

*FTSE is a trademark of the London Stock Exchange Group companies and is used by FTSE under license. All rights in the FTSE indices and/or FTSE ratings vest in FTSE and/or its licensors. No further distribution of FTSE data is permitted with FTSE's express written consent.*



## MEMORANDUM

**TO:** JULIO MARTINEZ, EXECUTIVE DIRECTOR  
STANLEY ZETO, DEPUTY EXECUTIVE DIRECTOR  
SCHOLARSHARE INVESTMENT BOARD

**FROM:** AKF CONSULTING GROUP

**DATE:** JUNE 4, 2018

**RE:** PRESENCE OF EMERGING MARKET DEBT IN DIRECT-SOLD 529 PLANS

### INTRODUCTION AND SCOPE OF RESEARCH

In the December 2017 ScholarShare Investment Board (“SIB” or “Board”) meeting, TIAA-CREF Tuition Financing, Inc. (“TFI”) asked the Board to consider the addition of an Emerging Market Debt (“EMD”) fund to certain portfolios in the ScholarShare 529 Plan. According to TFI’s preliminary analysis, exposure to EMD would provide yield benefits with minimal increases in fees, risk and duration in the affected Portfolios. Following an overview presentation about the EMD asset class at the April 2018 SIB meeting, SIB Staff asked AKF Consulting Group to research the prevalence of dedicated EMD funds across direct-sold 529 Plans (“529 Direct Plans” or “Direct Plans”). To that end, this memo identifies investment options that include an allocation to EMD, the underlying EMD funds, underlying fund fees and Morningstar fund ratings. Per the SIB Staff request, our count of EMD funds only includes “dedicated” funds and not funds with partial exposure to EMD. For example, an international bond fund with 30% exposure to Emerging Markets would not be included in our count.

### RESEARCH RESULTS AND OBSERVATIONS

Our research is based upon our review of the offering documents available as of May 23, 2018 for the 60 Direct Plans available nationwide. Underlying fund fee data and Morningstar Medal and Star Ratings for the specific funds reflect Morningstar.com as of May 23, 2018.

Based on our research, the chart on the following page summarizes the presence of dedicated EMD funds across 529 Direct Plans:

ate	Program Manager	Fund Name	Underlying Fund Fee	Investment Options Included In:	Morningstar Fund Rating	
					Medal	Star
<b>AZ DE MA NH</b>	Fidelity	Fidelity New Markets Income (FNMIX)	0.82%	2 Age-based 2 Static	Silver	4/5
<b>MD<sup>1</sup></b>	T. Rowe Price	T. Rowe Price Emerging Markets Bond (PREMX)	0.92%	1 Static	Bronze	4/5
<b>VA</b>	Virginia College Savings Plan	Stone Harbor Emerging Market Debt (SHMDX)	0.69%	1 Age-based 3 Static	Not rated	3/5
<b>WA</b>	Sunday (BNY)	Vanguard Emerging Markets Government Bond Index (VGAVX)	0.32%	3 Age-based 5 Static	Not rated	3/5
<b>7 Plans</b>	<b>4 Program Managers</b>	<b>4 Unique Funds</b>	<b>0.32-0.92%</b>	<b>17 Options<sup>2</sup></b>	--	--

Source: Plan offering documents and Morningstar.com as of May 23, 2018

Based upon the chart above, we offer the following observations:

- Seven Plans or 12% of Direct Plans – represented by just four unique Program Managers – include exposure to dedicated EMD funds:
  - Four of the seven are identical Fidelity-managed Plans in Arizona, Delaware, Massachusetts and New Hampshire
  - The remaining three Plans are managed by T. Rowe Price (Maryland), Virginia College Savings Plan (Virginia) and Sunday (Washington)
- Across these seven Plans, 29 investment options include dedicated EMD funds as underlying investments:
  - All investment options are asset allocation strategies representing 12 age-based options and 17 static options
  - There are no dedicated EMD individual options currently offered in Direct Plans
- Four unique EMD funds are included as underlying investments:
  - The Fidelity (FNMIX) and T. Rowe Price (PREMX) Funds are proprietary to the Program Manager
    - These two Funds have high Morningstar Medal and Star Ratings but are higher priced (0.82% and 0.92%, respectively) than the Funds included in Virginia and Washington (0.69% and 0.32%, respectively)

<sup>1</sup> We note that the T. Rowe Price-managed national Plan in Alaska does not include a dedicated EMD fund. It does, however, include exposure to an Emerging Market stock fund in the age-based and static options (which the Maryland Plan also includes)

<sup>2</sup> We count the Fidelity Options just once (e.g., two age-based and two static options, not eight of each) since the asset allocation is identical in all four Plans. The number of investment options with EMD exposure is 29 when we count the four Fidelity Plans individually, which explains references below to “29 investment options”



Messrs. Martinez and Zeto, June 4, 2018

- Virginia and Washington each include non-proprietary EMD Funds
  - These funds are not as well-rated by Morningstar but are also relatively less expensive than the Fidelity and T. Rowe Price Funds

## CONCLUSION

Based upon our research, inclusion of dedicated EMD funds in 529 Direct Plans is not industry standard. That said, it is worth noting that the Gold-rated Virginia Plan, the Silver-rated Maryland Plan and the Bronze-rated Arizona, Delaware, Massachusetts and New Hampshire Plans all include EMD funds in their asset allocation strategies. It is also interesting that the newly launched Washington DreamAhead Plan includes the EMD allocation, particularly since Sunday is the newest entrant to the roster of 529 Program Managers. In this context, if TFI and SIB Staff were to revisit the inclusion of an EMD fund in the ScholarShare Plan, it would not be alone in the industry. To this end, any future consideration should also include the potential fee, performance and other quantitative and qualitative impacts of this change.

We welcome the opportunity to discuss any part of our research in more detail. Thank you.