DECEMBER 10, 2015

AGENDA ITEM 6
INFORMATION ITEM

SCHOLARSHARE INVESTMENT BOARD

Review of 2016 Asset Allocation Recommendation for the ScholarShare College Savings Plan

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 the ScholarShare College Savings Plan (Plan) to determine if any changes are necessary to continue to meet its investment objectives.

For 2016, TFI is recommending no changes to the existing asset allocation strategy for the portfolios in the Plan as outlined in its "2016 Asset Allocation Recommendations" (Exhibit A), which highlights the analysis for their recommendation, including a summary of their analysis of the Plan's age-based portfolios. The Board's investment consultant, Pension Consulting Alliance, LLC (PCA), has reviewed and analyzed TFI's recommendation and has provided a memo (Exhibit B) concurring with TFI's recommendation.

PCA and SIB staff have reviewed and concur with TFI's recommendation for no changes in 2016 to the existing asset allocation of the investment portfolios for the Plan.

Presenters

Jeremy Thiessen, Senior Director, TIAA-CREF Tuition Financing, Inc.
Eric White, Principal, Pension Consulting Alliance, LLC

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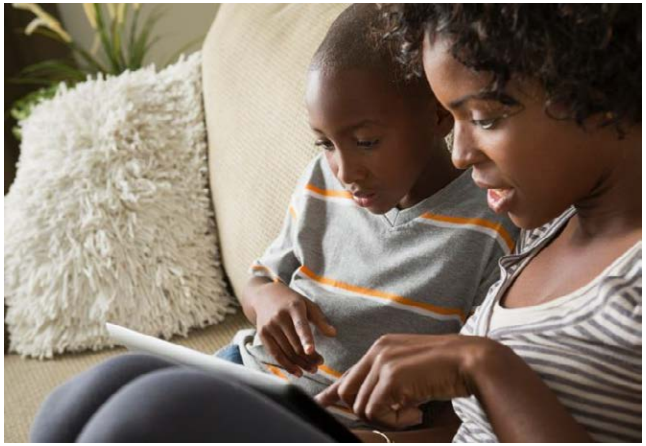
2016 Asset Allocation Recommendation



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Financial Services

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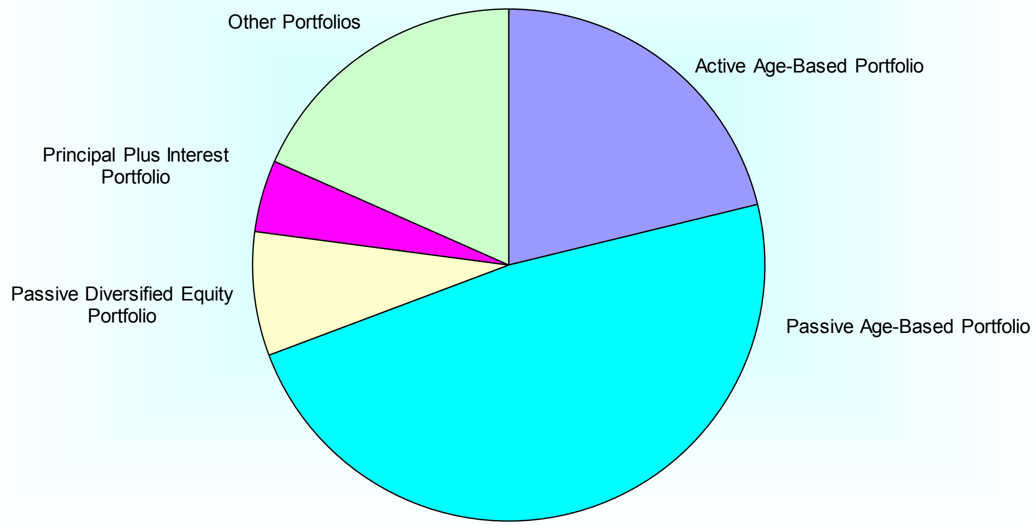
Executive Summary

- TFI has completed this year's asset allocation study to evaluate the overall reasonableness and soundness of the investment strategy for the ScholarShare Plan.
- Our evaluation focused on three levels of analysis:
    1. The allocations to broad asset classes, to determine whether to change the existing weights to these asset classes or sub-asset class components
    2. The number of asset classes, to determine whether the plan has appropriate diversification and strategic exposure to the intended capital markets
    3. The underlying funds, to determine if any changes are needed based on underperformance, management changes, or any other causes for concern
- After thoroughly reviewing the plan, TFI recommends making no changes for 2016.

Assets by Investment Option as of 09/30/2015



Portfolio	% of Assets	$ Millions	Portfolio	% of Assets	$ Millions
Passive Age-Based Portfolio	48.08%	$ 2,958	Principal Plus Interest Portfolio	4.54%	$ 279
Active Age-Based Portfolio	21.19%	$ 1,304	Other Portfolios (see below)	18.37%	$ 1,130
Passive Diversified Equity Portfolio	7.82%	$ 481			

Other Portfolios

Index U.S. Large Cap Equity Portfolio	3.38%	$ 208	Active Moderate Growth Portfolio	0.49%	$ 30
Index U.S. Equity Portfolio	3.35%	$ 206	Active Conservative Portfolio	0.47%	$ 29
Active Diversified Equity Portfolio	2.55%	$ 157	Passive Conservative Portfolio	0.46%	$ 28
Social Choice Portfolio	1.91%	$ 118	Passive Moderate Growth Portfolio	0.38%	$ 24
Active Growth Portfolio	1.52%	$ 94	Active International Equity Portfolio	0.25%	$ 15
Index International Equity Portfolio	1.42%	$ 87	Active Diversified Fixed Income Portfolio	0.25%	$ 15
Passive Growth Portfolio	1.19%	$ 73	Passive Diversified Fixed Income Portfolio	0.13%	$ 8
Index Bond Portfolio	0.62%	$ 38			

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Glide Path Evaluation Summary

- As part of our annual review of the Program, TFI tests the reasonableness of the asset allocation and structure of the Age-Based Portfolios
- This involves two steps:
  - Internal stochastic Monte Carlo simulations
  - Simulation-free stochastic model by CDI Advisors, an external investment consultant
- The following review utilizes the most recent capital market assumptions from Ibbotson Associates to validate the recommendation for the Age-Based Portfolios
- The Age-Based Portfolios seek to:
  - Achieve a reasonable rate of expected return
  - Achieve a high probability of outperforming tuition inflation
  - Minimize the potential "shortfalls" between expected returns and tuition inflation over the investment horizons

Capital Market Assumption Comparison

- Average annual return outcomes are modestly lower than last year
- This is because the lower assumptions for equities and high yield bonds outweigh the higher assumptions for other fixed income sectors.

	Large-Cap Growth	Large-Cap Value	Small-Cap Blend	Int'l Equity	Emerging Markets Equity	REITS	Core Fixed Income	Inflation Linked	High Yield	Floating Rate Notes	Funding Agreement
2014	6.13%	8.55%	8.50%	7.52%	9.77%	5.91%	3.12%	2.50%	6.45%	4.13%	2.22%
2015	5.26%	7.14%	5.98%	7.20%	8.70%	5.64%	3.19%	3.37%	4.96%	4.69%	2.54%
Net Change	**-0.87%**	**-1.41%**	**-2.52%**	**-0.32%**	**-1.07%**	**-0.27%**	**0.07%**	**0.87%**	**-1.49%**	**0.56%**	**0.32%**

- Expected tuition inflation remains similar: 4.43% vs. 4.44% last year
- TFI views lower return expectations as a reasonable and conservative approach
- See Appendix for complete return assumptions

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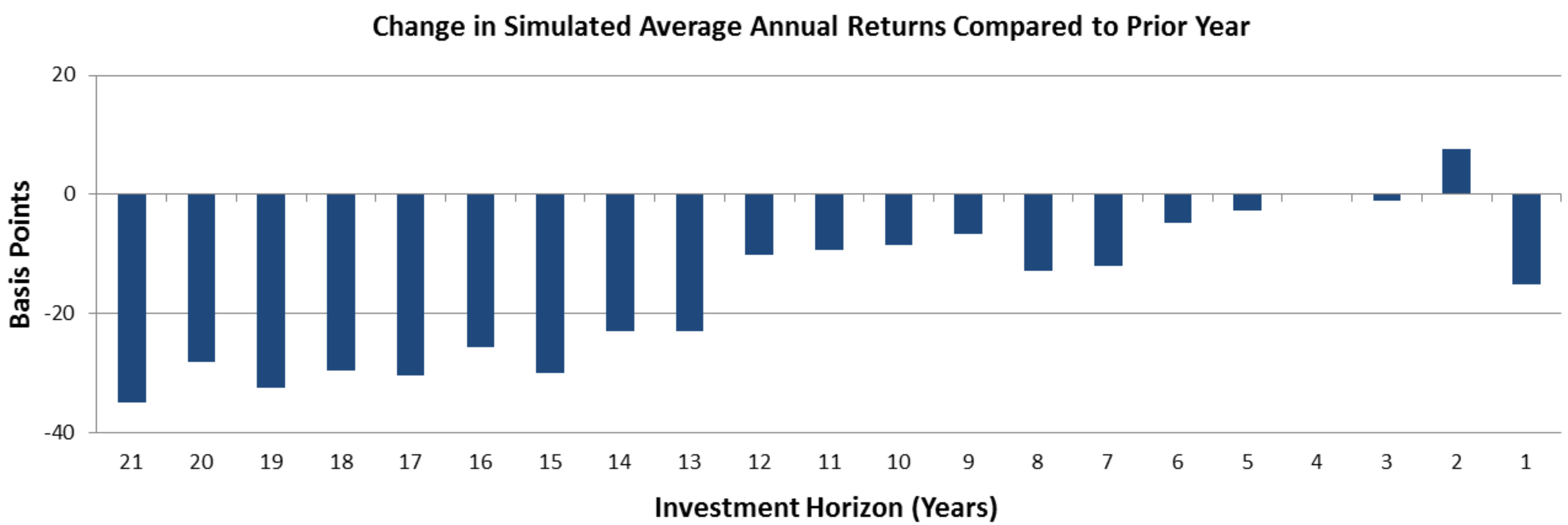
Simulation Summary

Simulation Summary: Active Age-Based Portfolio



- The new capital market assumptions result in an expected decrease in annual average returns of up to 35 basis points across the glide path versus the prior year
- This is most evident in the early years of the glide path experience as these are more equity-dependent

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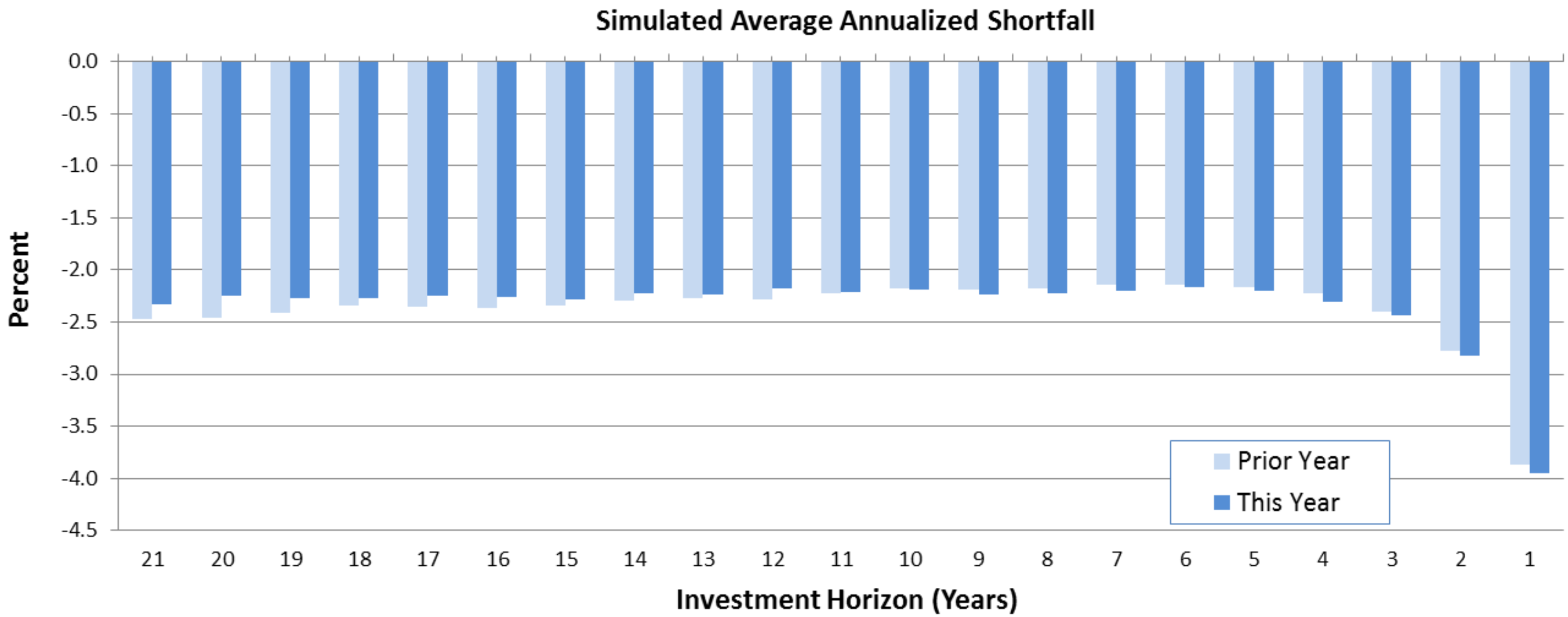
Simulation Summary: Active Age-Based Portfolio



- Despite mostly lower return expectations, simulation results showed only minor changes to average annualized shortfall (the distribution of outcomes that fail to keep pace with tuition inflation)
- Shortfalls decrease in absolute terms (improve) by up to 21 basis points for longer investment horizons, while shortfalls increase slightly (less than 10 basis points) for shorter investment horizons.

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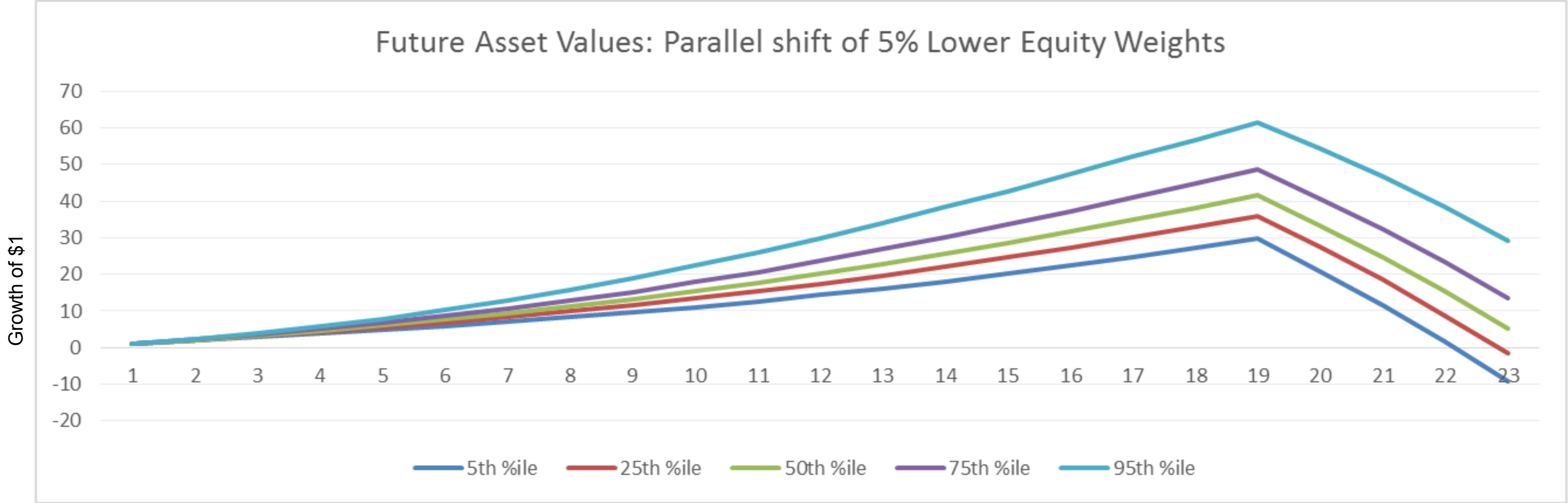
CDI (Commitment Driven Investing) Analysis

CDI Analysis: Glide Path Evaluation Summary



Source: CDI

- Given lower return expectations, TFI tested the results of altering the allocation to equities vs. fixed income
- Included many different scenarios:
  - Uniformly shifting the glide path equity allocation both up and down by 5%, 10%, and 15%
  - Steepening and flattening the equity allocation in various amounts among different age bands
- The purpose was to determine if any of these changes provided a meaningful benefit to participants

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CDI Glide Path Evaluation Summary: Parallel Shifts

Reduce Equity 5%

Future Assets Differences

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
5th %ile	-0.01	-0.02	-0.03	-0.05	-0.06	-0.08	-0.09	-0.11	-0.13	-0.15	-0.17	-0.18	-0.19	-0.20	-0.20	-0.19	-0.17	-0.14	-0.09	-0.05	-0.03	-0.01
25th %ile	0.00	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	0.00	0.01	0.03	0.06	0.10	0.14	0.20	0.27	0.36	0.43	0.48	0.52
50th %ile	0.00	0.00	0.01	0.02	0.03	0.04	0.06	0.09	0.11	0.15	0.19	0.24	0.30	0.36	0.44	0.53	0.63	0.75	0.87	0.98	1.07	1.14
75th %ile	0.01	0.02	0.04	0.06	0.09	0.13	0.17	0.23	0.30	0.37	0.46	0.57	0.68	0.81	0.95	1.10	1.27	1.44	1.62	1.79	1.94	2.06
95th %ile	0.02	0.05	0.09	0.14	0.21	0.30	0.41	0.54	0.70	0.87	1.07	1.29	1.54	1.80	2.09	2.38	2.69	2.99	3.30	3.59	3.87	4.12

Increase Equity 5%

Future Assets Differences

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
5th %ile	0.01	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.20	0.21	0.22	0.22	0.21	0.19	0.16	0.13	0.11	0.10
25th %ile	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.00	-0.02	-0.05	-0.07	-0.12	-0.17	-0.23	-0.31	-0.37	-0.43	-0.46
50th %ile	0.00	0.00	-0.01	-0.02	-0.03	-0.04	-0.06	-0.08	-0.11	-0.14	-0.18	-0.23	-0.29	-0.36	-0.43	-0.52	-0.62	-0.74	-0.86	-0.97	-1.07	-1.14
75th %ile	-0.01	-0.02	-0.04	-0.06	-0.09	-0.13	-0.18	-0.23	-0.30	-0.38	-0.47	-0.57	-0.69	-0.82	-0.97	-1.13	-1.31	-1.49	-1.69	-1.87	-2.03	-2.17
95th %ile	-0.02	-0.05	-0.09	-0.14	-0.22	-0.31	-0.42	-0.56	-0.72	-0.90	-1.12	-1.35	-1.62	-1.90	-2.22	-2.54	-2.88	-3.23	-3.58	-3.92	-4.24	-4.54

Green indicates current glide path is better

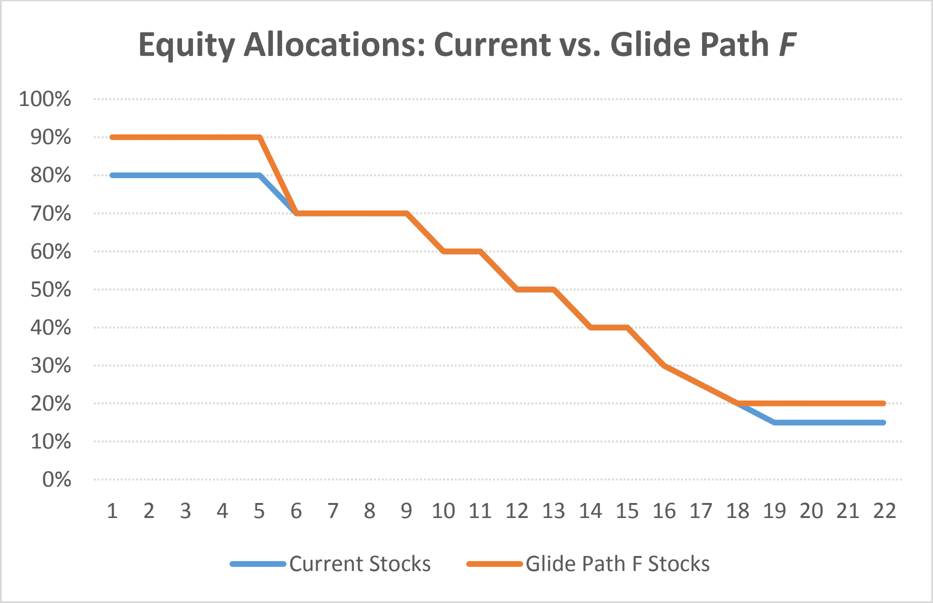
Red indicates current glide path is worse

Source: CDI

- As expected, reducing equities by 5% does not produce better overall results
- Conversely, increasing equities by 5% produces better results in most scenarios
- However, one glide path does not dominate the other
  - Reducing equities creates more favorable outcomes for lower percentile (left tail) investors, but produces worse outcomes for most other investors
  - Increasing equities creates more favorable outcomes for most investors, but makes lower percentile investors worse off, which is an important consideration for risk control

CDI Glide Path Evaluation Summary: Non-Parallel Shifts

- One scenario, "Glide Path F," provided interesting results
- The scenario was created by
  - Increasing the current equity allocation by 5% in the first age band (Ages 0-4),
  - Increasing the current equity allocation by 5% in the final age bands (Ages 15, 16, 17, and 18+), and
  - Keeping the existing allocation during the middle years



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CDI Glide Path Evaluation Summary: Non-Parallel Shifts

Future Assets Difference: Glide Path F

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
5th %ile	0.00	-0.09	-0.13	-0.17	-0.21	-0.24	-0.21	-0.17	-0.14	-0.12	-0.10	-0.08	-0.07	-0.05	-0.04	-0.03	-0.02	-0.02	-0.01	0.02	0.05	0.08	0.10
25th %ile	0.00	-0.04	-0.05	-0.06	-0.07	-0.07	-0.06	-0.04	-0.02	-0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.07	0.08	0.16	0.23	0.30	0.34
50th %ile	0.00	0.01	0.03	0.06	0.09	0.12	0.13	0.14	0.15	0.16	0.18	0.19	0.20	0.21	0.23	0.24	0.25	0.27	0.28	0.41	0.53	0.63	0.72
75th %ile	0.00	0.07	0.14	0.21	0.30	0.41	0.42	0.42	0.44	0.45	0.47	0.49	0.51	0.53	0.56	0.58	0.61	0.63	0.65	0.86	1.05	1.22	1.37
95th %ile	0.00	0.18	0.34	0.53	0.77	1.05	1.07	1.10	1.13	1.17	1.22	1.27	1.33	1.39	1.45	1.51	1.58	1.64	1.70	2.07	2.43	2.76	3.08

Source: CDI

Green indicates current glide path is better

Red indicates current glide path is worse

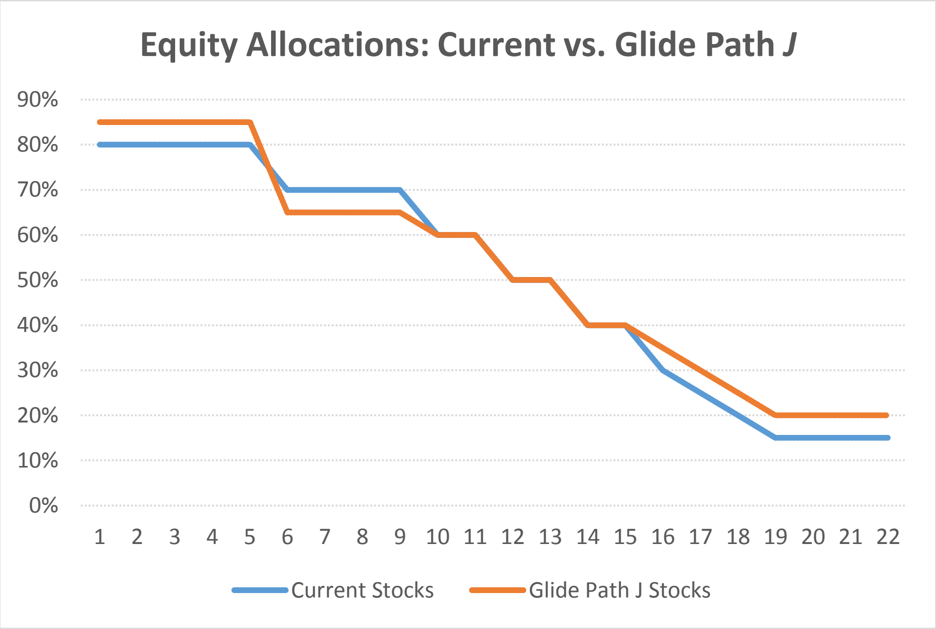
College Years (drawdown)

Proposed glide path does better over longer investment horizons in both good and bad markets

- Making these changes produces higher terminal values across the entire distribution of outcomes at the end of the glide path during the college years (drawdown period), while generating better outcomes at 50th percentile and above for all ages

CDI Glide Path Evaluation Summary: Non-Parallel Shifts

- Another glide path variation, "Glide Path J," makes an additional shift in the middle of the glide path
- This variation was created by
  - Increasing the equity allocation by 5% in the first age band (Ages 0-4),
  - Decreasing the equity allocation by 5% in the second age band (Ages 5-8), and
  - Increasing the equity allocation by 5% in the final age bands (Ages 15, 16, 17, and 18+)



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CDI Glide Path Evaluation Summary: Non-Parallel Shifts

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Future Assets Difference: Glide Path J

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
5th %ile	0.00	-0.05	-0.07	-0.08	-0.10	-0.12	-0.06	-0.01	0.04	0.09	0.08	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.06	0.09	0.12	0.15	0.17
25th %ile	0.00	-0.02	-0.02	-0.03	-0.03	-0.04	-0.02	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.05	0.10	0.17	0.25	0.32	0.39	0.44
50th %ile	0.00	0.01	0.02	0.03	0.04	0.06	0.05	0.02	0.00	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	0.05	0.15	0.27	0.40	0.52	0.62	0.71
75th %ile	0.00	0.04	0.07	0.11	0.15	0.21	0.15	0.08	0.00	-0.09	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	0.06	0.23	0.41	0.61	0.79	0.96	1.10
95th %ile	0.00	0.09	0.17	0.26	0.38	0.52	0.38	0.22	0.04	-0.18	-0.18	-0.19	-0.20	-0.21	-0.22	-0.23	0.07	0.38	0.71	1.05	1.36	1.66	1.94

Source: CDI

Green indicates current glide path is better

Red indicates current glide path is worse

Proposed glide path does better over longer investment horizons in both good and bad markets

College Years (drawdown)

- This alternative Glide Path:
  - Steepens the beginning years and essentially flattens it from age 7 to 21
  - Increases the equity allocation during the college years (drawdown)
  - Provides better outcomes across the entire distribution of outcomes from years 16 to 22, making investors better off

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CDI Glide Path Evaluation Summary

- The results of the CDI evaluation provide interesting insight and may prompt further discussion in the future, though TFI is not ready to recommend a change in the glide path at this time
- While there is evidence that altering the equity/fixed income allocation may provide some benefit, there also may be reasons for not making a shift that are worth assessing
- TFI continues to work with CDI on conducting research regarding the shape of the glide path. Initial considerations include:
  - Number of age-bands
  - Smoothed versus stepped progression
  - Equity allocations at the beginning and end of the glide path
- TFI will provide updates on our analysis to SIB Staff and PCA as we progress

Evaluation of Current Asset Allocations

Evaluation of Current Asset Allocations: Fixed Income Allocation in the Passive Portfolios

Portfolio Mixes of Core Bond, High Yield Bond and Inflation-Linked Bond

Based on Annual Returns from 1998 through 2014

Fixed Income Index or Allocation	Average Annual Return	Standard Deviation	Return Per Unit of Standard Deviation
BarCap US Agg Bond Index	5.48%	3.54%	1.55
BarCap US Treasury TIPS Index	6.93%	6.34%	1.09
BofAML US HY C Pay BB-B Constd Index	6.55%	13.69%	0.48
Current Allocation: 70% Bond Index, 20% TIPS Index & 10% BofAML US HY C Pay BB-B Constd Index	6.20%	3.84%	1.62

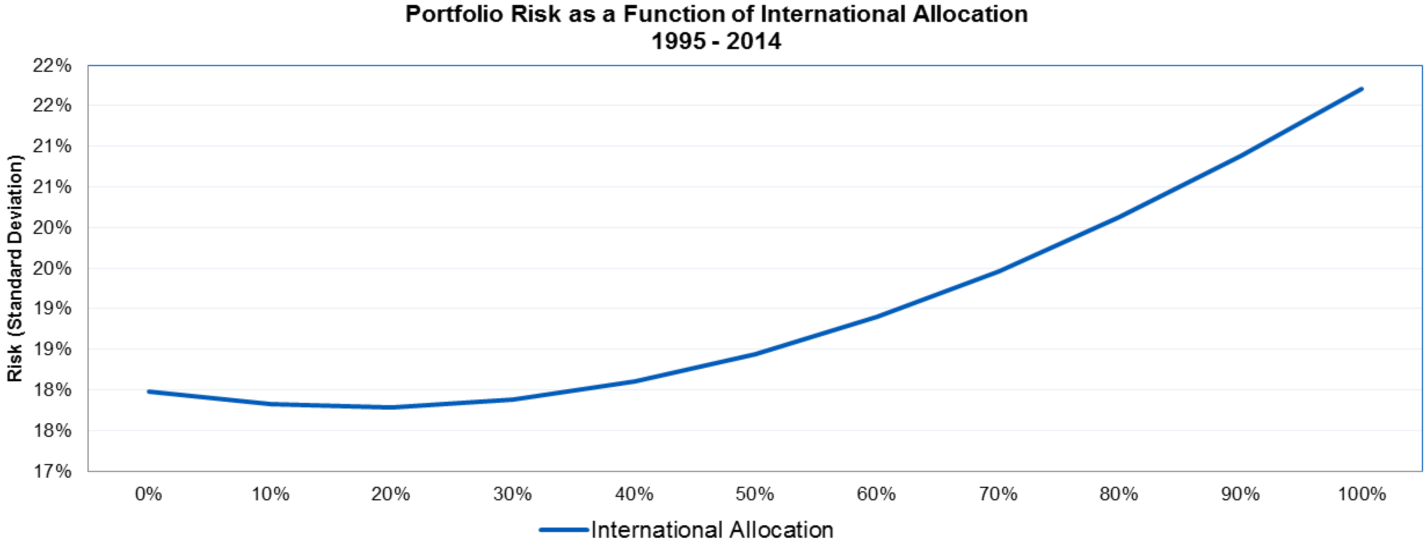
Correlation (1998 - 2014)		
	Core Bonds	
TIPS	73.59%	TIPS
High Yield	-8.11%	29.19%

The investment performance is based on the historical returns proxied by the Barclay's U.S. Aggregate Bond Index for the Bond Index Fund, Barclay's U.S. Treasury Inflation-Protected Securities Index for the Inflation-Linked Bond Fund and BofAML US HY Cash Pay BB-B Constrained Index for the High Yield Fund.

- The current allocation of 70% Core Bonds/20% TIPS/10% High Yield achieves a high level of average return with relatively low volatility
- The current allocation has the highest return per unit of standard deviation than any one fixed income index alone and strikes a reasonable balance among the fixed income classes

How much international exposure should the portfolios allocate?

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



* Russell 3000 for domestic equity, MSCI EAFE for international developed markets equity , and MSCI EM for emerging markets equity (80% develop markets and 20% emerging markets).

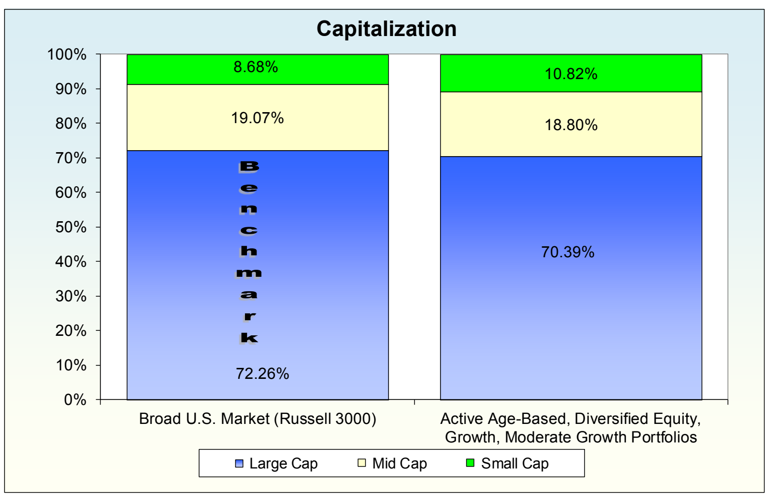
- The current allocation of 30% is appropriate

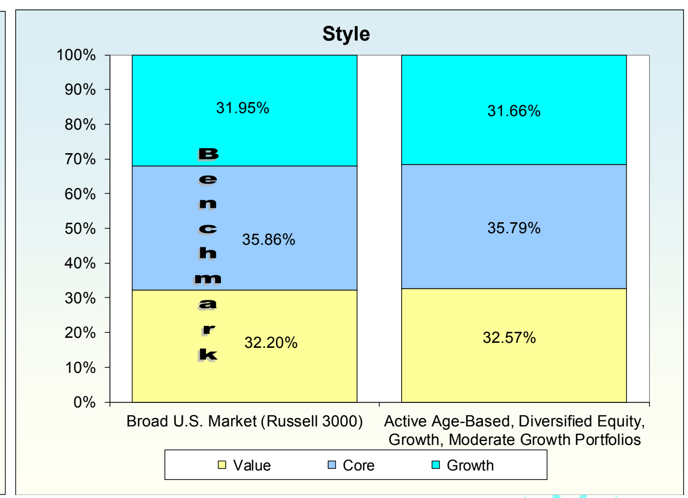
Domestic Equity Composition

- TFI reviewed the current domestic equity allocation in the Active Age-Based, Active Diversified Equity, Active Growth, and Active Moderate Growth Portfolios 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 domestic equity component of these portfolios are in line with those of the Russell 3000 Index.

Domestic Equity Composition: Market Capitalization and Style

	Asset Allocation	Capitalization Analysis				Style Analysis			
Benchmarks	**Active Age-Based, Diversified Equity, Growth, Moderate Growth Portfolios**	**Large Cap**	**Mid Cap**	**Small Cap**	**Total**	**Value**	**Core**	**Growth**	**Total**
Russell 1000 Value Index	45.00%	76.12%	21.34%	2.56%	**100.00%**	55.75%	34.84%	9.43%	**100.00%**
Russell 1000 Growth Index	45.00%	80.30%	18.74%	0.96%	**100.00%**	10.27%	37.20%	52.53%	**100.00%**
Russell Mid Cap Value Index	0.00%	21.38%	70.22%	8.40%	**100.00%**	49.87%	33.81%	16.32%	**100.00%**
Russell Mid Cap Growth Index	0.00%	33.34%	63.41%	3.25%	**100.00%**	8.54%	29.11%	62.35%	**100.00%**
Russell 2000 Index	10.00%	0.00%	7.65%	92.36%	**100.00%**	28.58%	33.71%	37.72%	**100.00%**
S&P 500 Index	0.00%	87.80%	12.12%	0.08%	**100.00%**	33.68%	37.10%	29.22%	**100.00%**
Russell 3000 Index	0.00%	72.26%	19.07%	8.68%	**100.00%**	32.20%	35.86%	31.95%	**100.00%**
Total Blended Portfolio	**100.00%**								
Broad U.S. Market (Russell 3000)		**72.26%**	**19.07%**	**8.68%**	**100.00%**	**32.20%**	**35.86%**	**31.95%**	**100.00%**
Active Age-Based, Diversified Equity, Growth, Moderate Growth Portfolios		**70.39%**	**18.80%**	**10.82%**	**100.00%**	**32.57%**	**35.79%**	**31.66%**	**100.00%**





Domestic Equity Composition: Style Box Comparison

Benchmarks	Asset Allocation: Active Age-Based, Diversified Equity, Growth, Moderate Growth Portfolios	Morningstar 9 Style Categories: Large Value	Large Core	Large Growth	Mid Value	Mid Core	Mid Growth	Small Value	Small Core	Small Growth	Total
Russell 1000 Value Index	45.00%	42.67%	26.73%	6.72%	11.55%	7.36%	2.43%	1.53%	0.75%	0.28%	**100.00%**
Russell 1000 Growth Index	45.00%	8.25%	30.50%	41.55%	1.85%	6.27%	10.62%	0.17%	0.43%	0.36%	**100.00%**
Russell Mid Cap Value Index	0.00%	6.83%	7.13%	7.42%	38.01%	24.22%	7.99%	5.03%	2.46%	0.91%	**100.00%**
Russell Mid Cap Growth Index	0.00%	1.69%	6.45%	25.20%	6.27%	21.20%	35.94%	0.58%	1.46%	1.21%	**100.00%**
Russell 2000 Index	10.00%	0.00%	0.00%	0.00%	1.03%	2.53%	4.09%	27.55%	31.18%	33.63%	**100.00%**
S&P 500 Index	0.00%	28.81%	32.50%	26.49%	4.81%	4.58%	2.73%	0.06%	0.02%	0.00%	**100.00%**
Russell 3000 Index	0.00%	23.15%	26.46%	22.65%	6.17%	6.47%	6.43%	2.88%	2.93%	2.87%	**100.00%**
Total Blended Portfolio	**100.00%**										

	Large Value	Large Core	Large Growth	Mid Value	Mid Core	Mid Growth	Small Value	Small Core	Small Growth	Total
Broad Market (Russell 3000)	**23.15%**	**26.46%**	**22.65%**	**6.17%**	**6.47%**	**6.43%**	**2.88%**	**2.93%**	**2.87%**	**100.00%**
Active Age-Based, Diversified Equity, Growth, Moderate Growth Portfolios	**22.91%**	**25.75%**	**21.72%**	**6.13%**	**6.39%**	**6.28%**	**3.52%**	**3.65%**	**3.65%**	**100.00%**

Difference in Portfolios vs. Broad Market

Active Age-Based, Diversified Equity, Growth, Moderate Growth Portfolios	Value	Core	Growth
Large Cap	-0.24%	-0.71%	-0.93%
Mid Cap	-0.04%	-0.08%	-0.15%
Small Cap	0.64%	0.72%	0.78%

Underlying Fund Review

Underlying Funds Review: TFI Watch List

Fund	Added to Watch List	Primary Reason
PIMCO Income Fund	October 2014	Management changes at PIMCO. Following Bill Gross' departure, Dan Ivascyn, the fund's co-portfolio manager, has been named the firm's Group-CIO, while remaining one of the lead portfolio managers of the fund. This fund was placed on Watch as we continue to become comfortable with this new management structure.
PIMCO Real Return Fund	October 2014	Management changes at PIMCO. Following Bill Gross' departure, Mihir Worah, the fund's portfolio manager, has been named one of the co-portfolio managers of the PIMCO Total Return Fund, while remaining the lead portfolio manager of the PIMCO Real Return Fund. This fund was placed on Watch as we become comfortable with the additional responsibilities taken on by senior members of the firm.

- If there are no significant changes to these funds or causes for concern in the next few months, we feel comfortable removing them from the internal TFI Watch List next quarter.

Active Underlying Funds

- Actively managed underlying funds are expected to underperform their benchmarks during certain market environments and conditions that affect portfolio holdings
- The long-term expectation is that these managers are able to use research and other tools to outpace their broad market over the long run in a way that compensates investors for the cost of active management
- While performance has been stellar for a few funds, and there is no major concern or cause for action at this time, TFI remains cognizant of other funds that have not performed as meaningfully
- As part of TFI's due diligence process, we will continue to monitor all underlying funds on an ongoing basis, hold meetings with fund managers, and if necessary, place funds on TFI's Watch List

Conclusions

- Despite lower return expectations this year, simulation results showed only minor changes to average annualized shortfall
- Results of sensitivity analysis in equity allocations suggest the current glide path has a reasonable likelihood of generating optimal returns, while minimizing the tail risk exposure under extreme market conditions
- Simulation results from the internal stochastic Monte Carlo simulation model and the simulation-free stochastic model validate making no changes in the Age-Based Portfolios
- The ScholarShare investment strategy has an appropriate mix of well diversified asset classes that take into account the possibility of many different financial conditions
- The current fixed income strategy of 70% Core Bonds/20% TIPS/10% High Yield achieves a high level of average return with relatively low volatility
- An equity mix of 70% domestic / 30% international provides a prudent level of risk
- Domestic equity maintains market cap and style neutrality relative to benchmark
- ***Therefore, TFI recommends no changes to the ScholarShare Program at this time***

Appendix

TIAA CREF

Current Asset Allocations

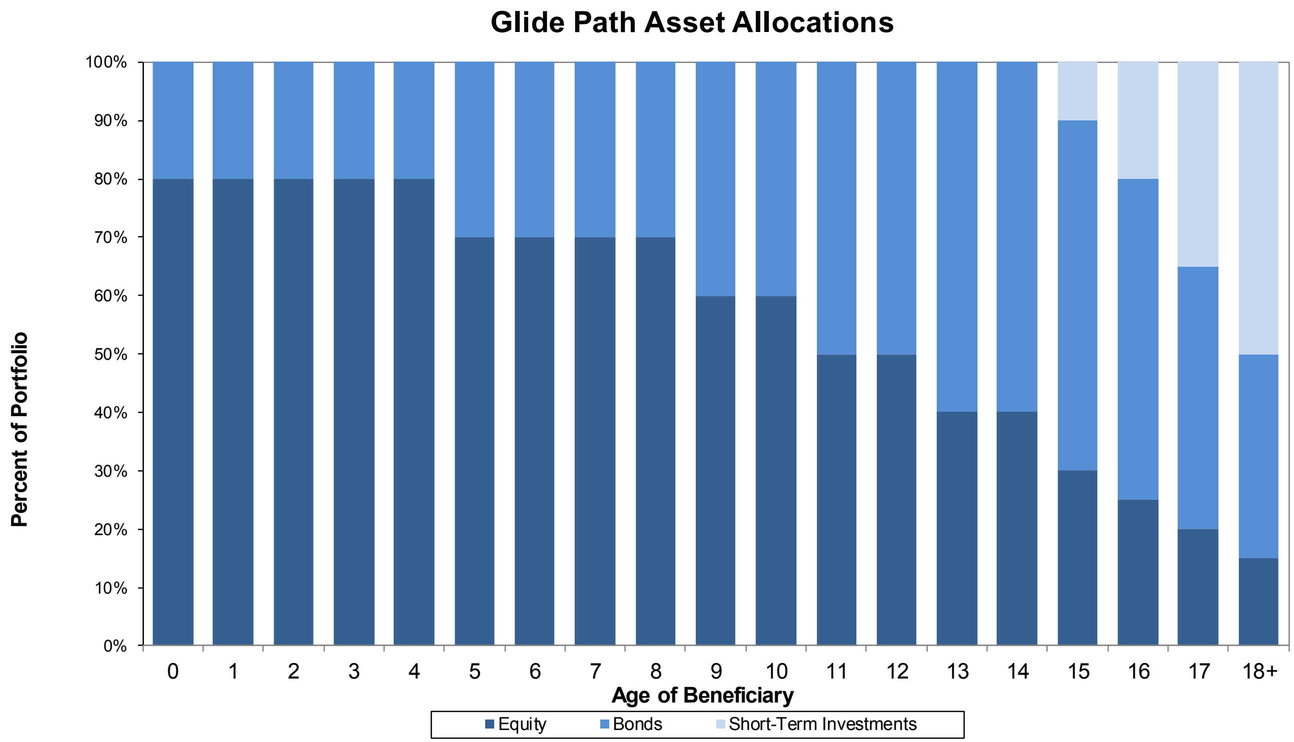
Active Age-Based Portfolio Age of Beneficiary	T. Rowe Price Instl Large Cap Growth Fund	T. Rowe Price Instl Large Cap Value Fund	TIAA-CREF Small Cap Equity Fund	TIAA-CREF Real Estate Securities Fund	DFA Large Cap International Portfolio	DFA Emerging Markets Core Equity I Portfolio	MetWest Total Return 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
Underlying Fund Fee	0.56%	0.57%	0.49%	0.52%	0.28%	0.61%	0.44%	0.45%	0.45%	0.56%	0.00%	
0 - 4	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	10.00%	4.00%	4.00%	2.00%	0.00%	0.48%
5 - 8	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	15.00%	6.00%	6.00%	3.00%	0.00%	0.48%
9 - 10	17.01%	17.01%	3.78%	4.20%	14.40%	3.60%	20.00%	8.00%	8.00%	4.00%	0.00%	0.48%
11 - 12	14.18%	14.18%	3.14%	3.50%	12.00%	3.00%	25.00%	10.00%	10.00%	5.00%	0.00%	0.47%
13 - 14	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	30.00%	12.00%	12.00%	6.00%	0.00%	0.47%
15	8.51%	8.51%	1.88%	2.10%	7.20%	1.80%	30.00%	12.00%	12.00%	6.00%	10.00%	0.42%
16	7.09%	7.09%	1.57%	1.75%	6.00%	1.50%	27.50%	11.00%	11.00%	5.50%	20.00%	0.37%
17	5.67%	5.67%	1.26%	1.40%	4.80%	1.20%	22.50%	9.00%	9.00%	4.50%	35.00%	0.30%
18 +	4.25%	4.25%	0.95%	1.05%	3.60%	0.90%	17.50%	7.00%	7.00%	3.50%	50.00%	0.23%

Passive Age-Based Portfolio

Current Asset Allocations

Underlying Fund Fee	0.05%	0.06%	0.23%	0.52%	0.12%	0.26%	0.36%	0.00%	
Passive Age-Based Portfolio 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%

Age-Based Glide Path



The beginning of the glide path invests in primarily global equities and real estate stocks to take advantage of higher expected returns in these markets for beneficiaries with longer investment horizons.

The middle of the glide path invests in primarily a mix of global equities and real estate stocks and fixed income investments, balancing the more volatile asset classes with less risky bonds for stability.

The end of the glide path invests in a large portion of short-term investments through the TC Life Funding Agreement for increased stability and liquidity just prior to college matriculation.

CDI Advisors Provides Additional Glide Path Analysis

- TFI's partnership with CDI Advisors enhances our internal glide path analysis
- The CDI model
  - Uses an outcome-driven method to review multi-period glide path designs
  - Utilizes a simulation-free valuation methodology that employs a high performance algorithm and directly incorporates the best interest of account owners
  - Incorporates fundamental aspects of financial economics, actuarial science, statistics and other scientific disciplines
  - Includes powerful analytical tools developed by Dimitry Mindlin, an actuary, investment consultant and mathematician
  - Is patent-protected

Multi- and Single Fund Active Portfolios

TIAA CREF

Current Asset Allocations

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
Underlying Fund Fee	0.56%	0.57%	0.49%	0.52%	0.28%	0.61%	0.44%	0.45%	0.45%	0.56%	0.00%	
Active Diversified Equity Portfolio	28.35%	28.35%	6.30%	7.00%	24.00%	6.00%						0.49%
Active Growth Portfolio	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	15.00%	6.00%	6.00%	3.00%		0.48%
Active Moderate Growth Portfolio	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	30.00%	12.00%	12.00%	6.00%		0.47%
Active Diversified Fixed Income Portfolio							50.00%	20.00%	20.00%	10.00%		0.46%
Active Conservative Portfolio							25.00%	10.00%	10.00%	5.00%	50.00%	0.23%
Active International Equity Portfolio					80.00%	20.00%						0.35%

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	0.18%
Principal Plus Interest Portfolio	100.00%	TIAA-CREF Life Co. Funding Agreement	0.00%

Multi- and Single Fund Passive Portfolios

Current Asset Allocations

Passive Multi-Fund Investment Portfolios

Underlying Fund Fee	0.05%	0.06%	0.23%	0.52%	0.12%	0.26%	0.36%	0.00%	
Passive Age-Based Portfolio 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%					0.10%
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%

SCHOLARSHARE
CALIFORNIA'S 529 COLLEGE SAVINGS PLAN

The Importance of Diversification: Annual Returns (in %)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Highest	34.54 EM Stocks	35.06 Real Estate	39.78 EM Stocks	5.24 Bonds	79.02 EM Stocks	27.95 Real Estate	13.56 TIPS	19.70 Real Estate	38.82 Small Cap	28.03 Real Estate
	14.02 Intl Stocks	32.59 EM Stocks	11.81 LC Growth	-2.35 TIPS	58.21 HY	26.85 Small Cap	8.28 Real Estate	18.63 EM Stocks	33.55 U.S. Stocks	13.69 S&P 500
	12.16 Real Estate	26.86 Intl Stocks	11.64 TIPS	-23.23 HY	52.53 Bank Loan	19.20 EM Stocks	7.84 Bonds	17.93 Intl Stocks	33.48 LC Growth	13.45 LC Value
	7.05 LC Value	22.25 LC Value	11.63 Intl Stocks	-29.32 Bank Loan	37.21 LC Growth	16.93 U.S. Stocks	4.98 HY	17.51 LC Value	32.53 LC Value	13.05 LC Growth
	6.12 U.S. Stocks	18.37 Small Cap	6.97 Bonds	-33.79 Small Cap	32.46 Intl Stocks	16.71 LC Growth	2.64 LC Growth	16.42 U.S. Stocks	32.39 S&P 500	12.56 U.S. Stocks
	5.26 LC Growth	15.79 S&P 500	5.49 S&P 500	-36.85 LC Value	28.34 U.S. Stocks	15.51 LC Value	2.11 S&P 500	16.35 Small Cap	23.29 Intl Stocks	4.89 Small Cap
	5.26 Bank Loan	15.72 U.S. Stocks	5.14 U.S. Stocks	-37.00 S&P 500	27.99 Real Estate	15.12 HY	1.50 Bank Loan	16.00 S&P 500	7.44 HY	5.97 Bonds
	4.91 S&P 500	11.85 HY	2.04 Bank Loan	-37.31 U.S. Stocks	27.17 Small Cap	15.06 S&P 500	1.03 U.S. Stocks	15.81 HY	5.41 Bank Loan	3.64 TIPS
	4.55 Small Cap	9.07 LC Growth	1.87 HY	-37.73 Real Estate	26.46 S&P 500	10.38 Bank Loan	0.39 LC Value	15.26 LC Growth	2.86 Real Estate	3.48 HY
	2.84 TIPS	6.89 Bank Loan	-0.17 LC Value	-38.44 LC Growth	19.69 LC Value	8.21 Intl Stocks	-4.18 Small Cap	9.76 Bank Loan	-2.02 Bonds	1.82 Bank Loan
	2.73 HY	4.33 Bonds	-1.57 Small Cap	-43.06 Intl Stocks	11.41 TIPS	6.54 Bonds	-11.73 Intl Stocks	6.98 TIPS	-2.27 EM Stocks	-2.19 EM Stocks
Lowest	2.43 Bonds	0.41 TIPS	-15.69 Real Estate	-53.18 EM Stocks	5.93 Bonds	6.31 TIPS	-18.17 EM Stocks	4.21 Bonds	-8.61 TIPS	-4.90 Intl Stocks

SCHOLARSHARE
CALIFORNIA'S 529 COLLEGE SAVINGS PLAN

Index Descriptions

Bonds	uses the 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 Barclays US Treasury 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	uses the Bank of America US HY C 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.
LC Growth	uses the Russell 1000 Growth Index, which measures the performance of Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values.
LC Value	uses the Russell 1000 Value Index, which measures the performance of Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.
Small Cap	uses the Russell 2000 Index, which consists of the smallest 2000 companies in the Russell 3000 Index, representing approximately 8% of the Russell 3000 total market capitalization.
S&P 500	is an unmanaged, market-cap-weighted index of 500 common stocks selected for their market size, liquidity and industry group representation within the U.S. equity market.
U.S. 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.

Glide Path Simulation Summary

- The following asset allocation study uses Ibbotson’s most recent capital market assumptions to reaffirm the reasonableness and soundness of the current glide path for the Active Age-Based Portfolio and Passive Age-Based Portfolio.

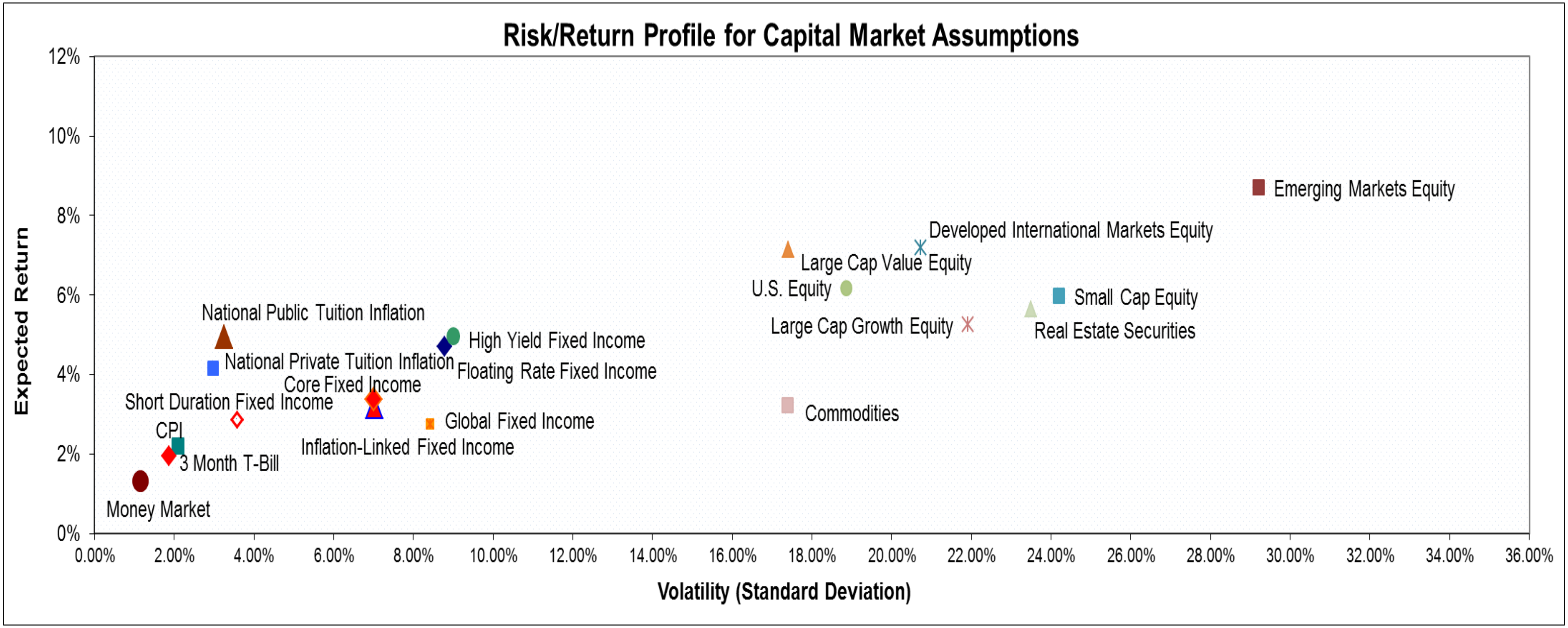
- The Age-Based Portfolios seek to achieve a reasonable rate of expected return and high probability of outperforming tuition inflation while minimizing the potential “shortfalls” between expected returns and tuition inflation over the expected investment horizons.

2015 Asset Allocation Assumptions

2015 Asset Allocation Study Assumptions

		Capital Market Assumptions (source: Ibbotson Associates)	
Variables	**Benchmarks**	**Long-Term Returns (Geometric Mean)**	**Volatility (Standard Deviation)**
U.S. Equity	Russell 3000 Index	6.18%	18.87%
Large Cap Growth Equity	Russell 1000 Growth Index	5.26%	21.92%
Large Cap Value Equity	Russell 1000 Value Index	7.14%	17.41%
Small Cap Equity	Russell 2000 Index	5.98%	24.19%
Developed International Markets Equity	MSCI EAFE Index	7.20%	20.73%
Emerging Markets Equity	MSCI Emerging Markets Index	8.70%	29.20%
Core Fixed Income	Barclays Capital U.S. Aggregate Bond Index	3.19%	7.02%
Floating Rate Fixed Income	Credit Suisse Leveraged Loan Index	4.69%	8.79%
Global Fixed Income	Citigroup World Government Bond Index	2.74%	8.42%
High Yield Fixed Income	BofAML US HY BB/B Cash Pay Index	4.96%	9.00%
Inflation-Linked Fixed Income	Barclays Capital U.S. Treasury Inflation-Protected Securities Index	3.37%	7.01%
Short-Term Inflation-Linked Fixed Income	Barclays Capital U.S. 0-5 Year TIPS Index	2.47%	3.60%
Short Duration Fixed Income	Barclays Capital U.S. 1-3 Year Government/Credit Bond Index	2.86%	3.57%
Commodities	Bloomberg Commodity Index	3.23%	17.38%
Real Estate Securities	FTSE NAREIT All Equity REITs Index	5.64%	23.49%
CPI	Consumer Price Index - All Urban Consumers	2.20%	2.11%
3 Month T-Bill	BofAML US Treasury Bill 3 Mon Index	1.94%	1.87%
Money Market	iMoneyNet Money Fund Report Averages All Taxable	1.31%	1.15%
TC Life Funding Agreement	Funding Agreement	2.54%	3.30%
Additional Variables (sources: The College Board and TIAA-CREF Tuition Financing, Inc.)			
National Private Tuition Inflation		4.15%	2.99%
National Public Tuition Inflation		4.94%	3.25%

Risk / Return Profile for Capital Market Assumptions



Tuition Inflation Forecasting

Tuition Inflation Forecasting

Tuition data are sourced from the 2014 College Board Trends in Tuition Pricing.

Private 4-year Tuition Inflation:
T(t) = 0.023001+ i(t) + 0.012321 * S(t-1) + 0.167471 * B(t) + 0.22729 * R(t-1) - 0.20046 * GDP + e1(t)

Expected Value = 4.15%

Public Tuition Inflation:
T(t) = 0.049011+ i(t) - 0.00604 * S(t-1) + 0.245667 * B(t) + 0.104967 * R(t-1) - 0.94042 * GDP + e2(t)

Expected Value =4.94%

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 (Barclays Capital 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 (2.5%) 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 2.07%,
e2(t) is the random error term following a logistic distribution (-0.01%, 0.01%) with a zero mean and standard deviation of 2.28%

Regression is based on data from 1977-2014.

For 2014-2015 school year, average tuition and fees were: $7,142 for all in-state public colleges and $31,231 for private 4-year colleges; based on most recent data 70% enrolled in public colleges and 30% enrolled in private colleges. The enrollment-weighted average tuition and fees for all colleges were $14,368.70 = $7,142 * 70% + $31,231 * 30%. The forecasted enrollment-weighted average tuition and fees for year 1 are $15,005 = $7,142* (1+4.94%) * 70% + $31,231* (1 + 4.15%) * 30%. Therefore, the public / private enrollment weighted tuition inflation rate for year 1 is: 4.43% = $15,048.13 / $14,368.70 -1

Correlation Matrix (Expected Relationship Among Asset Classes)

	TC Life Funding Agreement	Barclays Cap. U.S. Aggregate Bond Index	Barclays Cap. U.S. TIPS Securities Index	BofAML US HY BB/B Cash Pay Index	S&P/LSTA Performing Loan Index	FTSE NAREIT All Equity REITs Index	Russell 3000 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											
Barclays Cap. U.S. Aggregate Bond Index	0.88	1.00										
Barclays Cap. U.S. TIPS Securities Index	0.77	0.74	1.00									
BofAML US HY BB/B Cash Pay Index	0.54	0.47	0.42	1.00								
S&P/LSTA Performing Loan Index	-0.21	0.00	0.32	0.94	1.00							
FTSE NAREIT All Equity REITs Index	0.35	0.14	0.26	0.54	0.56	1.00						
Russell 3000 Index	0.34	0.17	0.15	0.62	0.61	0.59	1.00					
Russell 1000 Value Index	0.39	0.23	0.16	0.64	0.57	0.66	0.90	1.00				
Russell 1000 Growth Index	0.28	0.13	0.12	0.55	0.58	0.47	0.89	0.81	1.00			
Russell 2000 Index	0.27	0.08	0.14	0.55	0.58	0.69	0.86	0.84	0.79	1.00		
MSCI EAFE Index	0.26	0.12	0.17	0.51	0.63	0.54	0.71	0.69	0.66	0.65	1.00	
MSCI Emerging Markets Index	-0.02	-0.16	0.04	0.40	0.70	0.41	0.56	0.51	0.54	0.56	0.62	1.00

Results of Monte Carlo Simulation: Active Age-Based Portfolio

	Asset Allocations									
Bene's Age	Large Cap Growth	Large Cap Value	Small Cap Equity	Real Estate Securities	Int'l Equities	Emerging Market Equities	Core Fixed Income	Inflation-Linked Bond	Floating Rate	Funding Agreement
0	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%
1	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%
2	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%
3	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%
4	22.68%	22.68%	5.04%	5.60%	19.20%	4.80%	14.00%	4.00%	2.00%	0.00%
5	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	21.00%	6.00%	3.00%	0.00%
6	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	21.00%	6.00%	3.00%	0.00%
7	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	21.00%	6.00%	3.00%	0.00%
8	19.85%	19.85%	4.40%	4.90%	16.80%	4.20%	21.00%	6.00%	3.00%	0.00%
9	17.01%	17.01%	3.78%	4.20%	14.40%	3.60%	28.00%	8.00%	4.00%	0.00%
10	17.01%	17.01%	3.78%	4.20%	14.40%	3.60%	28.00%	8.00%	4.00%	0.00%
11	14.18%	14.18%	3.14%	3.50%	12.00%	3.00%	35.00%	10.00%	5.00%	0.00%
12	14.18%	14.18%	3.14%	3.50%	12.00%	3.00%	35.00%	10.00%	5.00%	0.00%
13	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	42.00%	12.00%	6.00%	0.00%
14	11.34%	11.34%	2.52%	2.80%	9.60%	2.40%	42.00%	12.00%	6.00%	0.00%
15	8.51%	8.51%	1.88%	2.10%	7.20%	1.80%	42.00%	12.00%	6.00%	10.00%
16	7.09%	7.09%	1.57%	1.75%	6.00%	1.50%	38.50%	11.00%	5.50%	20.00%
17	5.67%	5.67%	1.26%	1.40%	4.80%	1.20%	31.50%	9.00%	4.50%	35.00%
18	4.25%	4.25%	0.95%	1.05%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%
19	4.25%	4.25%	0.95%	1.05%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%
20+	4.25%	4.25%	0.95%	1.05%	3.60%	0.90%	24.50%	7.00%	3.50%	50.00%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Investment Horizon (in years)	Average Annual Return over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investment Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of Non-Negative Return	Annualized Shortfall
21	4.45%	2.26%	4.43%	51.12%	60.14%	97.62%	-2.33%
20	4.48%	2.25%	4.43%	50.34%	60.52%	97.66%	-2.25%
19	4.42%	2.27%	4.43%	50.28%	61.22%	97.04%	-2.27%
18	4.42%	2.29%	4.43%	49.86%	60.86%	97.38%	-2.28%
17	4.38%	2.31%	4.43%	49.58%	61.06%	96.50%	-2.25%
16	4.31%	2.32%	4.43%	47.64%	60.36%	96.76%	-2.26%
15	4.24%	2.38%	4.43%	46.62%	59.18%	96.10%	-2.28%
14	4.25%	2.39%	4.43%	46.62%	61.50%	96.28%	-2.23%
13	4.18%	2.40%	4.43%	45.70%	60.24%	95.68%	-2.24%
12	4.16%	2.39%	4.43%	44.60%	61.88%	95.34%	-2.18%
11	4.08%	2.41%	4.43%	43.86%	61.14%	95.42%	-2.22%
10	4.06%	2.40%	4.43%	43.56%	63.10%	95.40%	-2.19%
9	4.03%	2.42%	4.43%	43.50%	63.42%	95.30%	-2.23%
8	3.86%	2.43%	4.43%	39.68%	64.28%	94.26%	-2.22%
7	3.84%	2.39%	4.43%	39.14%	66.30%	94.94%	-2.20%
6	3.80%	2.36%	4.43%	38.58%	70.36%	94.66%	-2.17%
5	3.74%	2.41%	4.43%	38.14%	74.76%	93.88%	-2.20%
4	3.68%	2.48%	4.43%	38.10%	79.82%	93.40%	-2.30%
3	3.65%	2.80%	4.43%	37.60%	86.26%	90.24%	-2.44%
2	3.78%	3.36%	4.43%	40.84%	93.14%	87.76%	-2.82%
1	3.62%	4.67%	4.43%	41.10%	98.74%	77.62%	-3.95%

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

Results of Monte Carlo Simulation: Passive Age-Based Portfolio

	Asset Allocations							
Bene's Age	Domestic Equities	Int'l Equities	Emerging Market Equities	Real Estate Securities	Core Fixed Income	Inflation-Linked Bond	High Yield Fund	Funding Agreement
0	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
1	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
2	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
3	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
4	50.40%	19.20%	4.80%	5.60%	14.00%	4.00%	2.00%	0.00%
5	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%
6	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%
7	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%
8	44.10%	16.80%	4.20%	4.90%	21.00%	6.00%	3.00%	0.00%
9	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	0.00%
10	37.80%	14.40%	3.60%	4.20%	28.00%	8.00%	4.00%	0.00%
11	31.50%	12.00%	3.00%	3.50%	35.00%	10.00%	5.00%	0.00%
12	31.50%	12.00%	3.00%	3.50%	35.00%	10.00%	5.00%	0.00%
13	25.20%	9.60%	2.40%	2.80%	42.00%	12.00%	6.00%	0.00%
14	25.20%	9.60%	2.40%	2.80%	42.00%	12.00%	6.00%	0.00%
15	18.90%	7.20%	1.80%	2.10%	42.00%	12.00%	6.00%	10.00%
16	15.75%	6.00%	1.50%	1.75%	38.50%	11.00%	5.50%	20.00%
17	12.60%	4.80%	1.20%	1.40%	31.50%	9.00%	4.50%	35.00%
18	9.45%	3.60%	0.90%	1.05%	24.50%	7.00%	3.50%	50.00%
19	9.45%	3.60%	0.90%	1.05%	24.50%	7.00%	3.50%	50.00%
20+	9.45%	3.60%	0.90%	1.05%	24.50%	7.00%	3.50%	50.00%

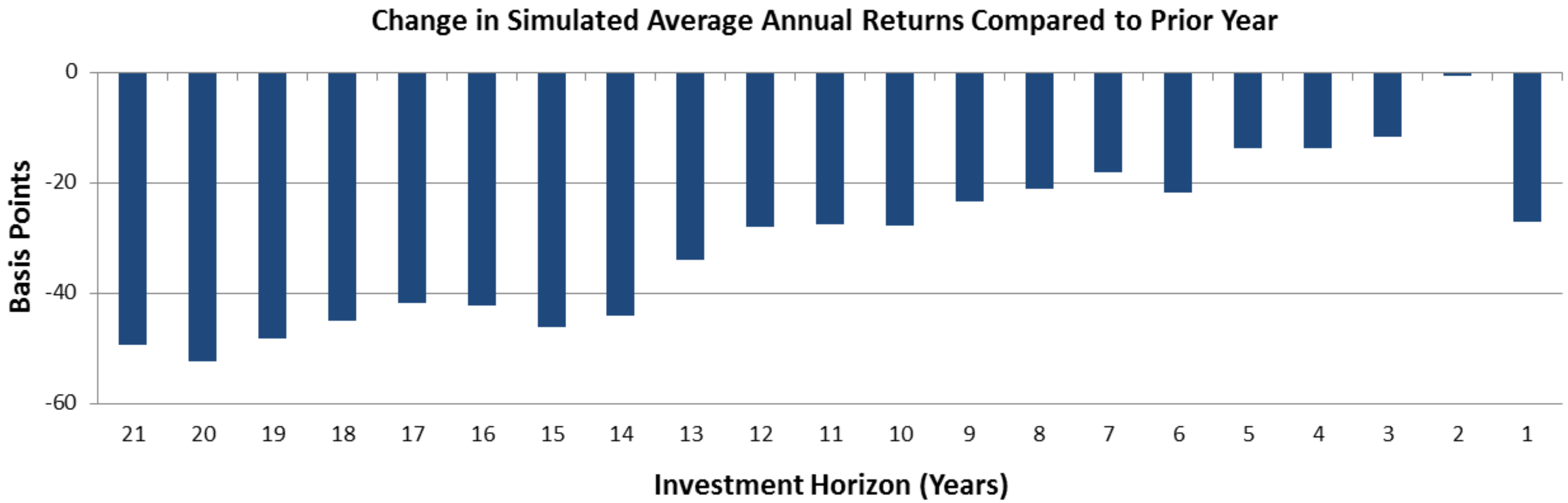
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Investment Horizon (in years)	Average Annual Return over Investment Horizon	Standard Deviation of Returns over Investment Horizon	Average Annual Tuition Inflation over Investmen t Horizon	Probability of Exceeding Tuition Inflation	Probability of Achieving 90 cents per Dollar of Future Tuition	Probability of Non-Negative Return	Annualized Shortfall
21	4.51%	2.47%	4.43%	51.44%	59.84%	96.40%	-2.49%
20	4.41%	2.47%	4.43%	49.84%	58.66%	96.04%	-2.52%
19	4.40%	2.52%	4.43%	49.08%	58.58%	95.84%	-2.51%
18	4.41%	2.33%	4.43%	48.38%	61.08%	96.70%	-2.22%
17	4.34%	2.45%	4.43%	48.06%	60.40%	96.10%	-2.38%
16	4.30%	2.50%	4.43%	47.68%	58.96%	95.88%	-2.47%
15	4.29%	2.50%	4.43%	47.60%	59.66%	95.68%	-2.41%
14	4.25%	2.50%	4.43%	46.88%	59.70%	95.46%	-2.38%
13	4.17%	2.49%	4.43%	46.18%	60.08%	95.26%	-2.39%
12	4.19%	2.46%	4.43%	46.02%	61.28%	95.94%	-2.31%
11	4.13%	2.50%	4.43%	45.22%	61.46%	95.04%	-2.33%
10	4.03%	2.43%	4.43%	42.68%	60.94%	95.48%	-2.26%
9	4.02%	2.45%	4.43%	42.56%	63.08%	94.94%	-2.28%
8	3.95%	2.43%	4.43%	41.86%	64.68%	94.78%	-2.25%
7	3.88%	2.45%	4.43%	39.82%	66.30%	94.58%	-2.26%
6	3.77%	2.40%	4.43%	38.78%	69.30%	94.82%	-2.24%
5	3.78%	2.48%	4.43%	38.38%	73.36%	93.82%	-2.26%
4	3.73%	2.57%	4.43%	37.88%	79.14%	93.16%	-2.34%
3	3.73%	2.85%	4.43%	38.94%	85.44%	91.52%	-2.50%
2	3.75%	3.35%	4.43%	41.42%	92.72%	86.88%	-2.91%
1	3.70%	4.83%	4.43%	42.88%	98.36%	77.54%	-4.00%

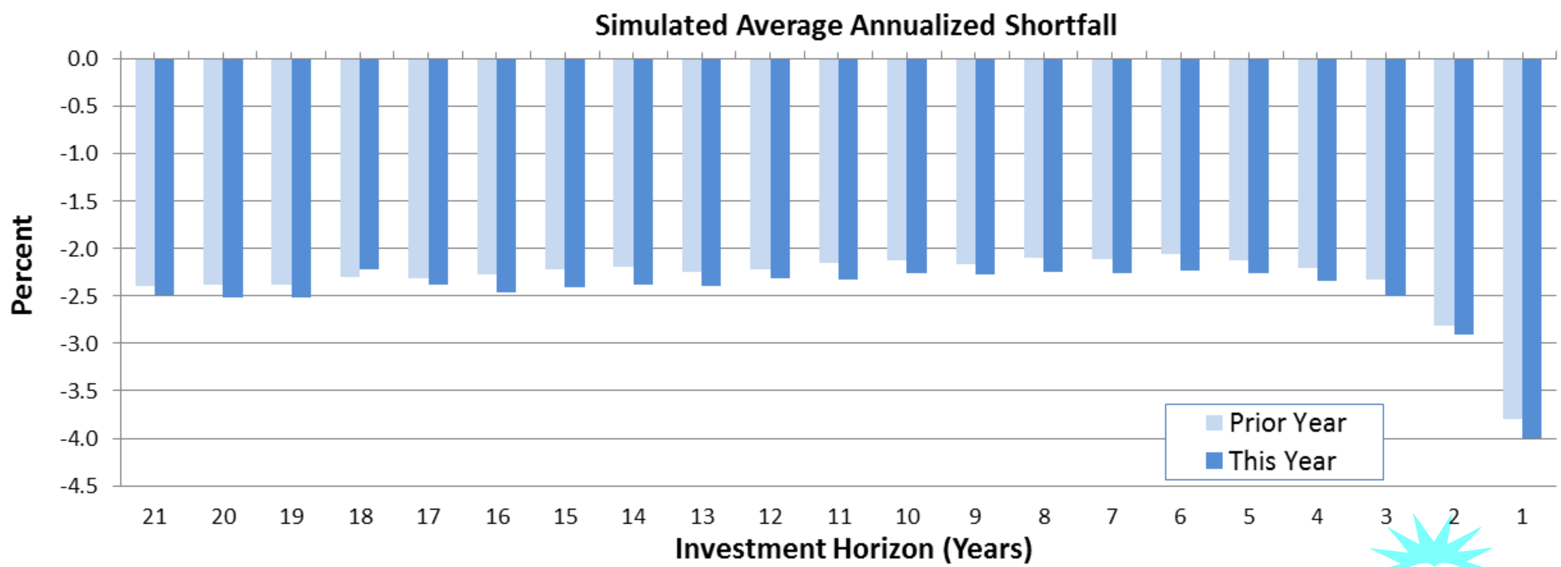
***Annualized Shortfall is the expected annual percentage difference between tuition inflation and returns among all scenarios that fail to exceed tuition inflation.**

Definitions

- **(1) Expected Return.** The average of a distribution of possible annualized investment returns over an investment horizon of n years generated by Monte Carlo simulation. The returns are based on the assumption that each year money will be invested according to the asset class allocation assigned to the beneficiary's age as the beneficiary ages the asset allocation will move to a more conservative allocation.
- **(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 Monte Carlo simulation.
- **(4) Probability of Exceeding Tuition Inflation.** The likelihood that the annualized investment return exceeds average tuition inflation rate over an investment horizon of n years, out of all the possible trials simulated by 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.

Simulation Summary: Passive Age-Based Portfolio





SCHOLARSHARE
CALIFORNIA'S 529 COLLEGE SAVINGS PLAN

Underlying Funds

U. S. Equities	International and Emerging Markets Equities	Fixed Income	Short-Term and Cash Equivalents	Alternative Assets
Index Funds				
T-C Equity Index Fund	T-C International Equity Index	T-C Bond Index		
	T-C Emerging Markets Equity Index			
Active Funds				
T. Rowe Price Large-Cap Growth	*DFA Large-Cap Int'l*	*MetWest Total Return Bond*	T-C Life Funding Agreement	T-C Real Estate Securities
T. Rowe Price Large-Cap Value	*DFA Emerging Markets Core Equity 1*	*PIMCO Real Return*		
T-C Small-Cap Equity		*PIMCO Income*		
		T. Rowe Price Floating Rate		
		T-C Inflation-Linked Bond		
		T-C High Yield		

Colored italics are non-proprietary funds.

PCA | PENSION CONSULTING ALLIANCE

MEMORANDUM

Date: November 2, 2015

To: ScholarShare Investment Board (SIB)

From: Pension Consulting Alliance, LLC (PCA)

CC: Eric White, CFA – PCA; Kay Ceserani – PCA

RE: **Review of TFI Recommendation for 2016 Asset Allocation**

Summary

SIB Staff requested that PCA review TIAA-CREF Tuition Financing, Inc.'s (TFI) annual review and recommendation for the 2016 asset allocation for the ScholarShare College Savings Plan (Plan) which highlighted their analysis behind the recommendation for no changes. Overall, PCA concurs with TFI's analysis and believes the current glidepath is well optimized. ***PCA recommends the SIB accept TFI's recommendation of no changes to the asset allocation.***

Background

SIB Staff requested that PCA review TIAA-CREF Tuition Financing, Inc.'s (TFI) annual review and recommendation for the 2016 asset allocation for the ScholarShare College Savings Plan (Plan) which highlighted their analysis behind the recommendation for no changes. TFI believes their current glidepaths are sound and that they 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.

TFI provided a detailed summary of their analysis for both the actively managed and passively managed age-based portfolios. The analysis showed the expected return and standard deviation of the different portfolios, as well as the likelihood of the portfolios' returns falling short of the rate of tuition inflation.

TFI lowered their capital market return assumptions for a number of asset classes within the Program. This included a lowered estimate for domestic and international equites across all sub-asset classes, with the largest reduction in small cap equities. In contrast, PCA maintained our estimate for domestic equities and slightly increased our estimate by 0.3% for international equities. That being said, PCA's and TFI's capital market assumptions for equities remain quite close (<0.75% difference). TFI's return assumption for domestic equities went from slightly higher than PCA's 2014 estimate to slightly below PCA's 2015 estimate. Despite TFI's reduction in their international equities return assumption, PCA's return assumption is still slightly below (0.3%) TFI's estimate. PCA's assumption for fixed income is approximately (0.5%) less than TFI's estimate of 3.2%. While PCA's and TFI's real estate assumptions are identical at 5.6%.

Capital market assumptions underpin all simulation analysis therefore the similarities in return assumptions result in similar simulation outcomes despite the differences in simulation methodology. PCA's slightly higher return assumption than TFI's for domestic equities washes out in the earlier portions of the glidepath due to PCA's slightly lower assumptions for international equites, resulting in quite similar expected outcomes. Our lower return assumptions in fixed income slightly lowers our return assumptions for the intermediate to latter portions of the glidepath but given the large role of the funding agreement in the latter portion of the glidepath our estimates tend to converge. Overall, PCA's simulation estimates remain largely the same between 2014 and 2015 thus we do not show quite as large a decline in expected returns from 2014 to 2015 given our lower return expectations in 2014 than TFI.

Similar to TFI, PCA analyzed what the impact would be of altering the glidepath's equity allocation. Our findings are in line with those of TFI in that increasing equities improves the outcome of investors on average given the relatively large spread between expected returns for equities versus fixed income. However, due to the significantly higher volatility of equities outcomes for investors who are on the left side of the distribution (those with below average expected returns), significantly worse expected outcomes are produced. Given this, PCA agrees that the equities allocation should not be increased. On the reverse, reducing equities lowers expected outcomes for the majority of investors and only improves outcomes for those investors on the far left side of the expected return distribution. In addition, PCA also agrees that the diversification benefit of investing in international equities is already maximized and any further increase to international equities would increase overall volatility.

Conclusion

PCA finds TFI's analysis of their glidepaths to be comprehensive and insightful, and uses consistent and reasonable inputs to develop their conclusions. PCA, therefore, concurs with TFI's recommendation for no changes.

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