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To: North Carolina Supplemental Retirement Board of Trustees

From: Loren de Mey, Assistant Investment Director

Date: October 27, 2017

Subject: Discussion/Action: 403b Program Glidepath Recommendation

The North Carolina Supplemental Board of Trustees recently approved the new GoalMaker[®] models for the 401k and 457 Plans at the September 21, 2017 Board meeting. The recommendations below apply the recently approved GoalMaker models to the NC 403b Program.

As of September 30, 2017, approximately 43.4% of total NC 403b assets were in GoalMaker[®] (\$5.2 million).

The below recommended enhancements to the NC 403b GoalMaker[®] models are consistent with those recently approved for the NC 401k and NC 457 Plans, including the implementations for the asset classes across active and passive management.

GoalMaker Recommendations for the NC 403b Program

1. Recommend adopting Prudential's new GoalMaker 3x9 Model: As previously discussed with the Board, Prudential's new GoalMaker model is a "3 x 9" model. The model includes three risk settings and nine retirement target years, with six target years in the pre-retirement phase and three in the post-retirement phase.
 - a. Offers options for participants **through** retirement, by adding three age-related groupings in the post-retirement phase.
 - b. Adds additional exposure to growth assets for younger participants, while adding fixed income assets for participants approaching or in retirement.
 - c. Smooths the glidepath by adding additional age groupings so participants will experience less abrupt asset allocation changes as they move through the glidepath.
2. Recommend the following implementations for the asset classes to active and passive, consistent with the 401k/457 GoalMaker recommendations.
 - a. Fully passive for U.S. Large Cap Equity – change from current GoalMaker[®]
 - b. Fully active for Fixed Income – change from current GoalMaker[®]
 - c. Fully active for International Equity – no change from current GoalMaker[®]
 - d. Fully active for Small / Mid U.S. Equity – no change from current GoalMaker[®]
3. Recommend adding a Passive TIPS allocation
 - a. Consistent with the 401k/457 recommendation, IMD staff recommends adding a TIPS allocation to the GoalMaker[®] Model for inflation hedging purposes. The allocations to TIPS would increase for those participants approaching or in retirement.
 - b. While the PIMCO Inflation Responsive Fund does have exposure to TIPS, this Fund also has exposure to growth-oriented and higher volatility assets such as REITs, currencies, and



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commodities. Given these exposures, IMD staff does not believe it would be in the best interests of participants to materially increase the allocations to IRMAF (i.e., growth assets) as participants approach retirement.

- c. Staff also recommends adding a passive TIPS Fund as a stand-alone core menu option, consistent with the 401k/457 recommendation.

Summary of Recommendations

1. Approve moving to the new GoalMaker 3x9 Model (moving from the 3 x 4 model)
2. Approve all implementations consistent with the implementations utilized within the NC 401k/ NC 457 GoalMaker:
 - a. Fully passive for U.S. Large Cap Equity – change from current GoalMaker[®]
 - b. Fully active for Fixed Income – change from current GoalMaker[®]
 - c. Fully active for International Equity – no change from current GoalMaker[®]
 - d. Fully active for Small / Mid U.S. Equity – no change from current GoalMaker[®]
3. Add a Passive TIPS Fund to the glidepath, as well as to the Core Menu

All recommended changes to the glidepath and GoalMaker[®] portfolios that are approved by the Board are expected to be implemented by June 2018 (along with the NC 401k/ NC 457 GoalMaker changes).

Fees: The impact to fees are shown in Appendix B (modeled with current International Equity Fund) and Appendix C (modeled with Ballie Gifford International Equity Fund). Fees decrease in the aggressive models (by 2-9 basis points) due to moving to a fully passive implementation within U.S Large Cap Equity. In the moderate and conservative models, fees increase slightly (from 1-3 bps) as portfolios move down the glidepath and the fixed income allocation increases. Fees increase due to the change in moving to a fully active implementation within fixed income. The current core plus fixed income fund, the Metropolitan West Total Return Fund, has outperformed its benchmark, net of fees, by 70 basis points over the 5-year period, and by 140 basis points over the 10-year trailing year period (ending 9/30/17). If Ballie Gifford were to be used in place of MFS for international equity exposure, the fee savings would be slightly higher, given the manager's lower fee structure. This is illustrated in Appendix C.

Summary

Similar to the enhancements for the NC 401k/ NC 457 Plans, the proposed enhancements for GoalMaker[®] Model for the NC 403b Program adds value for participants by enhancing the model portfolios in several ways including: extending the glidepath through retirement; smoothing the glidepath by providing less abrupt asset allocation changes; and optimizing the active/passive mix of investment strategies. The new model portfolios add additional exposure to growth assets for younger participants, while increasing fixed income and inflation hedging allocations for those participants approaching and in retirement.



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Appendix A: Current GoalMaker allocation within the 403b Program

NC 403(b) Program Conservative Model Allocation

Conservative	C01	C02	C03	C04
	0-5 Yrs	6-10 Yrs	11-15 Yrs	16+ Yrs
Vanguard Windsor II	3%	5%	7%	9%
Vanguard 500 Index	4%	4%	7%	8%
T. Rowe Price Blue Chip Growth	3%	5%	7%	9%
DFA Small Cap Core	4%	6%	10%	14%
Global				
MFS Institutional International Equity	6%	10%	14%	22%
Metropolitan West Total Return Bond	16%	14%	12%	10%
Vanguard Total Bond Market Index	17%	14%	13%	10%
Vanguard Short-Term Bond Index Fund	40%	35%	22%	10%
PIMCO Inflation Responsive Multi-Asset	8%	8%	8%	8%

NC 403(b) Program Moderate Model Allocation

Moderate	M01	M02	M03	M04
	0-5 Yrs	6-10 Yrs	11-15 Yrs	16+ Yrs
Vanguard Windsor II	5%	7%	9%	12%
Vanguard 500 Index	5%	7%	7%	10%
T. Rowe Price Blue Chip Growth	5%	7%	9%	12%
DFA Small Cap Core	8%	10%	14%	20%
Global				
MFS Institutional International Equity	11%	14%	18%	24%
Metropolitan West Total Return Bond	13%	12%	10%	4%
Vanguard Total Bond Market Index	13%	13%	10%	5%
Vanguard Short-Term Bond Index Fund	31%	21%	14%	5%
PIMCO Inflation Responsive Multi-Asset	9%	9%	9%	9%



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NC 403(b) Program Aggressive Model Allocation

Aggressive	A01	A02	A03	A04
	0-5 Yrs	6-10 Yrs	11-15 Yrs	16+ Yrs
Vanguard Windsor II	7%	9%	11%	14%
Vanguard 500 Index	7%	7%	8%	11%
T. Rowe Price Blue Chip Growth	7%	9%	11%	14%
DFA Small Cap Core	12%	14%	18%	22%
Global				
MFS Institutional International Equity	16%	18%	23%	29%
Metropolitan West Total Return Bond	12%	10%	5%	0%
Vanguard Total Bond Market Index	12%	10%	6%	0%
Vanguard Short-Term Bond Index Fund	17%	13%	7%	0%
PIMCO Inflation Responsive Multi-Asset	10%	10%	10%	10%



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Appendix B: Recommended GoalMaker allocation (fees modeled with current International Equity Fund)

Aggressive

			Pre-Retirement						Post-Retirement		
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+
Asset Class	Fund	Fee									
Large Cap	Vanguard S&P 500	0.04%	34%	34%	32%	30%	28%	27%	25%	24%	21%
Small / Mid Cap	DFA US Small Cap	0.37%	14%	14%	14%	12%	10%	10%	8%	6%	6%
International	MFS International	0.71%	40%	40%	38%	36%	32%	24%	21%	20%	17%
Fixed Income	MetWest Total Return	0.38%	2%	2%	7%	13%	21%	27%	26%	19%	19%
Stable Value	Vanguard Short Term	0.07%	0%	0%	0%	0%	1%	3%	8%	14%	17%
Real Assets	PIMCO IRMAF	0.70%	10%	10%	9%	9%	7%	6%	4%	3%	3%
TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	0%	1%	3%	8%	14%	17%
<i>Est. Fee Savings</i>			0.09%	0.09%	0.07%	0.06%	0.04%	0.02%	0.02%	0.03%	0.02%

Moderate

			Pre-Retirement						Post-Retirement		
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+
Asset Class	Fund	Fee									
Large Cap	Vanguard S&P 500	0.04%	33%	30%	27%	24%	21%	19%	18%	16%	14%
Small / Mid Cap	DFA US Small Cap	0.37%	14%	12%	12%	10%	8%	6%	6%	4%	4%
International	MFS International	0.71%	38%	36%	32%	28%	24%	19%	15%	14%	12%
Fixed Income	MetWest Total Return	0.38%	6%	13%	21%	28%	33%	36%	34%	27%	23%
Stable Value	Vanguard Short Term	0.07%	0%	0%	0%	3%	6%	10%	14%	19%	22%
Real Assets	PIMCO IRMAF	0.70%	9%	9%	8%	7%	6%	5%	4%	4%	3%
TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	0%	2%	5%	9%	16%	22%
<i>Est. Fee Savings</i>			0.08%	0.06%	0.04%	0.02%	0.00%	-0.01%	-0.01%	0.00%	0.00%

Conservative

			Pre-Retirement						Post-Retirement		
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+
Asset Class	Fund	Fee									
Large Cap	Vanguard S&P 500	0.04%	27%	24%	20%	17%	14%	13%	11%	10%	9%
Small / Mid Cap	DFA US Small Cap	0.37%	12%	10%	8%	8%	6%	4%	4%	2%	2%
International	MFS International	0.71%	32%	28%	25%	18%	16%	12%	9%	9%	8%
Fixed Income	MetWest Total Return	0.38%	21%	31%	37%	41%	42%	41%	36%	33%	29%
Stable Value	Vanguard Short Term	0.07%	0%	0%	4%	8%	12%	17%	22%	25%	26%
Real Assets	PIMCO IRMAF	0.70%	8%	7%	6%	5%	4%	3%	3%	2%	2%
TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	3%	6%	10%	15%	19%	24%
<i>Est. Fee Savings</i>			0.04%	0.01%	-0.01%	-0.03%	-0.03%	-0.04%	-0.03%	-0.03%	-0.03%



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Appendix C: Recommended GoalMaker allocation (fees modeled with International Equity Fund change to Baillie Gifford)

Aggressive

			Pre-Retirement					Post-Retirement				
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+	
Asset Class	Large Cap	Vanguard S&P 500	0.04%	34%	34%	32%	30%	28%	27%	25%	24%	21%
	Small / Mid Cap	DFA US Small Cap	0.37%	14%	14%	14%	12%	10%	10%	8%	6%	6%
	International	Baillie Gifford	0.61%	40%	40%	38%	36%	32%	24%	21%	20%	17%
	Fixed Income	MetWest Total Return	0.38%	2%	2%	7%	13%	21%	27%	26%	19%	19%
	Stable Value	Vanguard Short Term	0.07%	0%	0%	0%	0%	1%	3%	8%	14%	17%
	Real Assets	PIMCO IRMAF	0.70%	10%	10%	9%	9%	7%	6%	4%	3%	3%
	TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	0%	1%	3%	8%	14%	17%
<i>Est. Fee Savings</i>			0.13%	0.13%	0.11%	0.10%	0.07%	0.05%	0.04%	0.05%	0.04%	

Moderate

			Pre-Retirement					Post-Retirement				
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+	
Asset Class	Large Cap	Vanguard S&P 500	0.04%	33%	30%	27%	24%	21%	19%	18%	16%	14%
	Small / Mid Cap	DFA US Small Cap	0.37%	14%	12%	12%	10%	8%	6%	6%	4%	4%
	International	Baillie Gifford	0.61%	38%	36%	32%	28%	24%	19%	15%	14%	12%
	Fixed Income	MetWest Total Return	0.38%	6%	13%	21%	28%	33%	36%	34%	27%	23%
	Stable Value	Vanguard Short Term	0.07%	0%	0%	0%	3%	6%	10%	14%	19%	22%
	Real Assets	PIMCO IRMAF	0.70%	9%	9%	8%	7%	6%	5%	4%	4%	3%
	TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	0%	2%	5%	9%	16%	22%
<i>Est. Fee Savings</i>			0.12%	0.09%	0.07%	0.05%	0.02%	0.01%	0.00%	0.01%	0.01%	

Conservative

			Pre-Retirement					Post-Retirement				
			26+	21-25	16-20	11-15	6-10	0-5	0-5	6-10	11+	
Asset Class	Large Cap	Vanguard S&P 500	0.04%	27%	24%	20%	17%	14%	13%	11%	10%	9%
	Small / Mid Cap	DFA US Small Cap	0.37%	12%	10%	8%	8%	6%	4%	4%	2%	2%
	Combined International	Baillie Gifford	0.61%	32%	28%	25%	18%	16%	12%	9%	9%	8%
	Fixed Income	MetWest Total Return	0.38%	21%	31%	37%	41%	42%	41%	36%	33%	29%
	Stable Value	Vanguard Short Term	0.07%	0%	0%	4%	8%	12%	17%	22%	25%	26%
	Real Assets	PIMCO IRMAF	0.70%	8%	7%	6%	5%	4%	3%	3%	2%	2%
	TIPS	Vanguard Short-Term TIPS	0.07%	0%	0%	0%	3%	6%	10%	15%	19%	24%
<i>Est. Fee Savings</i>			0.07%	0.04%	0.02%	-0.01%	-0.02%	-0.03%	-0.03%	-0.02%	-0.02%	