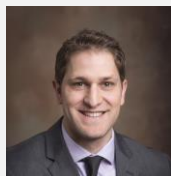




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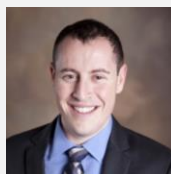
PENSION CURVE INSIDER

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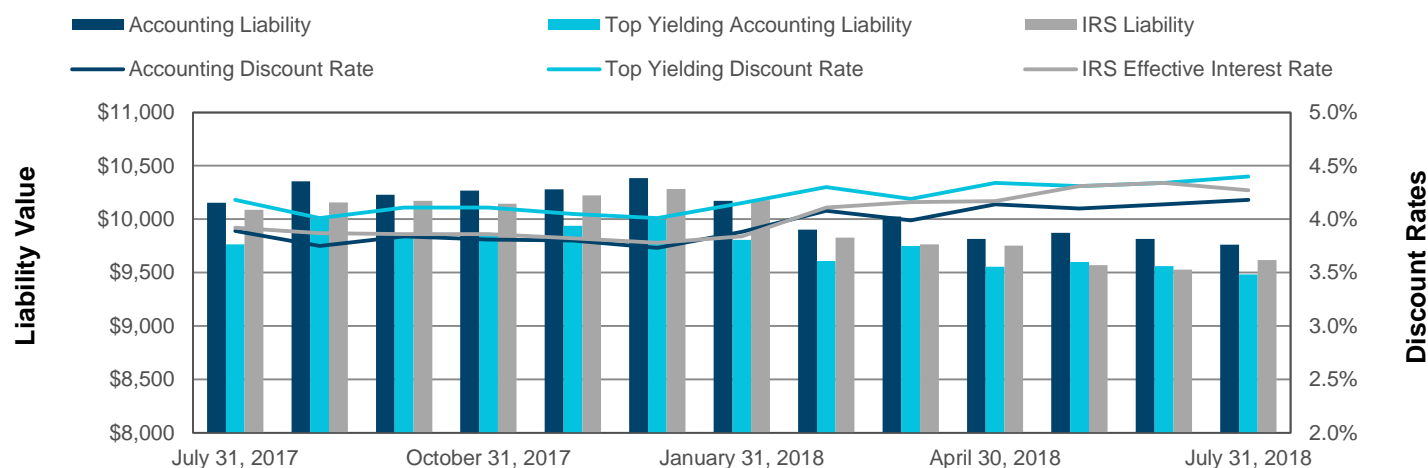
MONTHLY RECAP

Marked-to-market discount rates ticked up again in July as Treasury yields continued to rise. Both the AA-rated spot curve and the top-yielding curve increased from prior month-end. 1-month Treasuries rose the most (17 basis points) while the middle and long ends of the curve were up between 10-15 bps. Investment grade spreads finished the month lower, contracting during the second half of the month. Discount rates based on the IRS curve, with its averaging methodology, actually fell in July.

Discount rates now sit 29 basis points higher than a year ago, using the broad AA discount rate curve. Top yielding AA-rated bonds are 22 basis points higher than July 2017 and provide about 20 basis points of additional yield relative to the broader market.

New entrants into the AA-rated index were atypically high during the month as July saw another 5% of market value change eligibility. Ratings upgrades made up much of the month's movement, totaling nearly \$30B, while exiting bonds accounted for just \$2B. The Bank of Nova Scotia and Bank of Montreal were both upgraded, adding 22 bonds and \$25B in market value into the short part of the AA index. Impact on the discount curve was limited as over half the AA-rated issuance matures in less than five years. Exiting bonds from the AA index during July did not meaningfully impact the curve.

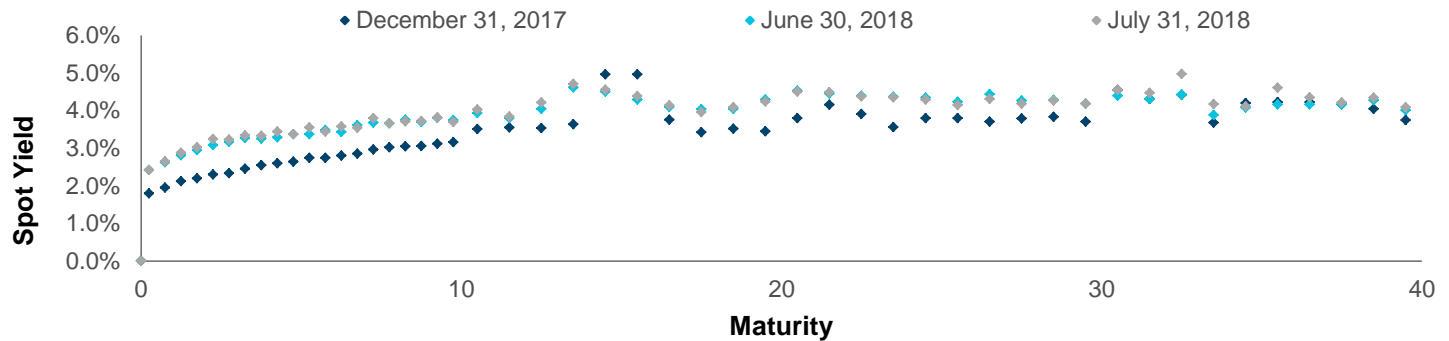
LIABILITY IMPACT



Yield Curve	Liability Value 7/31/18	Discount Rate 7/31/18	Liability Value 6/30/18	Discount Rate 6/30/18	Liability Value 12/31/17	Discount Rate 12/31/17
Accounting Yield Curve	\$9,761	4.18%	\$9,816	4.14%	\$10,386	3.73%
Top Yielding Accounting Curve	\$9,484	4.40%	\$9,562	4.34%	\$9,994	4.01%
IRS Yield Curve	\$9,617	4.27%	\$9,528	4.34%	\$10,310	3.76%

Sources: Barclays POINT, IRS, and T. Rowe Price. Sample plan cash flows have a liability of \$10,000 at 4.0% discount rate.

ACCOUNTING CURVE



Sources: Barclays POINT and T. Rowe Price

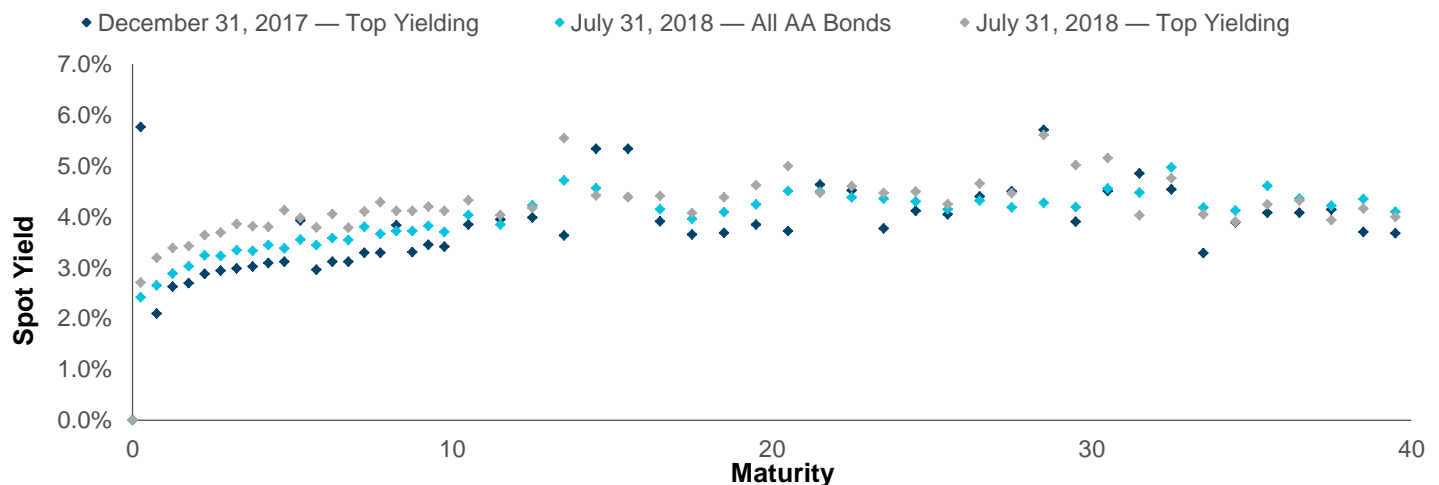
Issuer	Event	Curve Impact
Bank of Nova Scotia	Upgrade (13 bonds)	The Bank of Nova Scotia had 13 bonds upgraded during the month, with maturities at the short end of the curve between 1 and 4 years. The total market value was nearly 3% of the AA-rated index and totaled \$15B. The largest impacts on the curve were felt at the 3 and 4-year marks, as spot rates moved 2 basis points due to the bonds entering the index.
Bank of Montreal	Upgrade (9 bonds)	The Bank of Montreal was upgraded during July which allowed 9 new bonds to enter the AA-rated index. Total market value of the issues was nearly \$11B which span maturities between 2018 and 2022. Due to the short maturities, the bonds had a minimal impact on the short end of the curve.
McLaren Health	New Issue (1 bond)	McLaren Health also had a modest impact on the discount curve, albeit at the long end. McLaren's single new issue accounted for about \$300M in market value and matures in 2048. The issue pushed down the discount curve 2 bps due to limited issuance at longer durations.

Sources: Barclays POINT and T. Rowe Price

	New Issues	Other Bonds Entering	Downgrades	Other Bonds Exiting
July 2018				
Count	5	27	0	1
Market Value (\$M)	\$3,906	\$30,664	\$0	\$2,007
Market Value (%)	0.59%	4.64%	0.00%	0.30%
2018 YTD				
Count	58	62	20	18
Market Value (\$M)	\$54,398	\$61,017	\$19,085	\$21,488
Market Value (%)	8.60%	9.49%	3.14%	3.42%

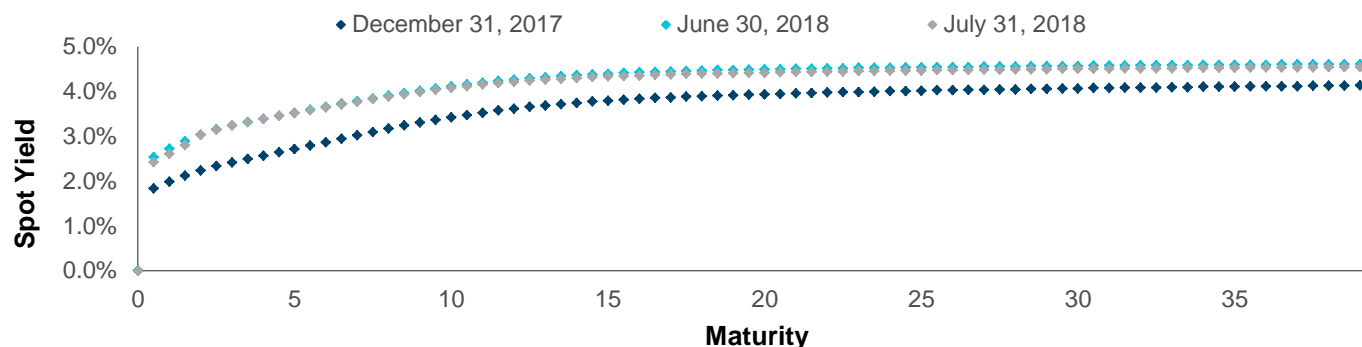
Sources: Barclays POINT and T. Rowe Price

TOP YIELDING ACCOUNTING CURVE



Sources: Barclays POINT and T. Rowe Price

IRS CURVE

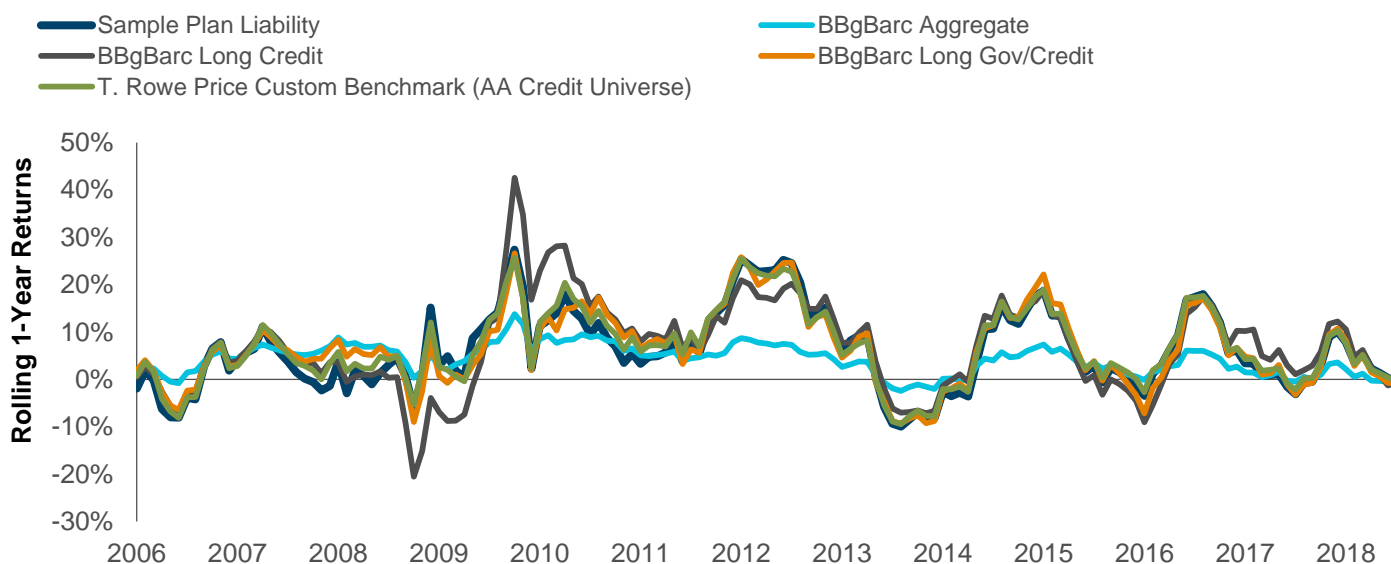


Sources: IRS and T. Rowe Price

Dates	AAA Corporate OAS	AA Corporate OAS	A Corporate OAS
June Monthly Average	50	61	94
July 2, 2018	54	64	99
July 16, 2018	46	60	93
July 31, 2018	43	54	86
July Monthly Average	49	59	93

Sources: Barclays POINT and T. Rowe Price

ONE-YEAR ROLLING RETURNS AND TRACKING ERROR



	July 2018 Return	YTD Total Return	Annual Tracking Error Relative to Liability	Average Monthly Return Difference from Liability
Hypothetical Sample Plan Liability	-0.25%	-3.97%	NA	NA
BBgBarc Aggregate	0.02%	-1.60%	6.55%	1.43%
BBgBarc Long Credit	1.50%	-4.99%	4.57%	0.93%
BBgBarc Long Gov/Credit	0.25%	-4.73%	3.17%	0.66%
Hypothetical T. Rowe Price Custom Benchmark	-0.31%	-4.00%	2.06%	0.32%

Sources: Bloomberg Index Services Ltd., T. Rowe Price; Analysis by T. Rowe Price. Performance shown in graph and tables above shown from February 1, 2005 through July 31, 2018.

Past performance cannot guarantee future results. Custom Benchmark returns do not reflect the deduction of management fees. Please refer to the disclosure at the end of the article for important additional information.

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GLOSSARY

IRS Yield Curve: Plan sponsors of qualified defined benefit pension plans use this yield curve to determine funding requirements per IRS regulations. These funding requirements are disclosed on form 5500 annually. Yields on AAA, AA, and A corporate securities determine the yield curve for discounting purposes. The yield curve is not a marked-to-market curve representing any single date, but rather an average yield over the course of the entire month. For more information on the IRS methodology, please see treasury.gov/resource-center and irs.gov/Retirement-Plans.

Accounting Yield Curve: US GAAP requires pension plan sponsors to disclose pension obligations using “fixed-income debt securities that receive one of the two highest ratings given by a recognized ratings agency”. As a proxy for bonds useable for accounting purposes, we use the constituents of BBgBarc AA credit universe to develop the accounting yield curve shown. Please see fasb.org for more information.

Top Yielding Curve: Since the US GAAP rules allow the use of a fairly broad range of securities for accounting purposes, some plan sponsors use an optimized yield curve approach to value their pension liabilities on the disclosure dates. Bonds trading at higher yields than other bonds of similar maturity tend to be used for this purpose. To quantify the effectiveness of this approach, T. Rowe Price developed a yield curve using the highest yielding bonds designed to meet SEC requirements at each node.

Annual Tracking Error Relative to Liability: Calculated as the standard deviation of return differences between a fixed income index and a set of cash flows discounted using the accounting yield curve. The liability return has two components: an interest cost component analogous to roll return on a bond, and yield change component analogous to price return on a bond. The table shows annualized ex-post tracking error.

Average Monthly Return Difference: Similar to the tracking error metric, this metric demonstrates how closely a fixed income benchmark tracks a set of liability returns. We calculate this measure by simply averaging the difference in returns over the period shown.

Sample Plan Liability: Pension plan sponsors must account for the cost of their retirement plan on their financial statements. The amount of this liability can fluctuate over time based on several factors, including benefits earned, benefits paid out, mortality experience, and most significantly, interest rates. The Sample Plan is intended to be a representative defined benefit pension plan and does not reflect the cash flows from any specific plan.

T. Rowe Price Custom Benchmark: An index of fixed income securities created using T. Rowe Price proprietary methodology that attempts to replicate interest rate exposures embedded in a pension plan’s liability structure.

To learn more, please visit troweprice.com

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The illustrations presented are hypothetical and used to demonstrate capabilities. Certain assumptions have been made for modeling purposes and with the benefit of hindsight and are unlikely to be realized. The specific issuers and bond issues mentioned in this document had significant impact on liability curves calculated using BBgBarc index universes. The modeling used for plan and benchmark development has certain inherent limitations. Benchmark construction may not reflect all material economic and market factors that could have impacted implementation or weighting decisions if the modeled plan actually existed during the time period presented. Actual T. Rowe Price Custom Benchmark characteristics, including (among other things) yield, annualized return, liability-relative tracking error and average monthly returns difference relative to plan liability may differ substantially from the hypothetical scenario presented.

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