



LDI Solutions

# PENSION CURVE INSIDER

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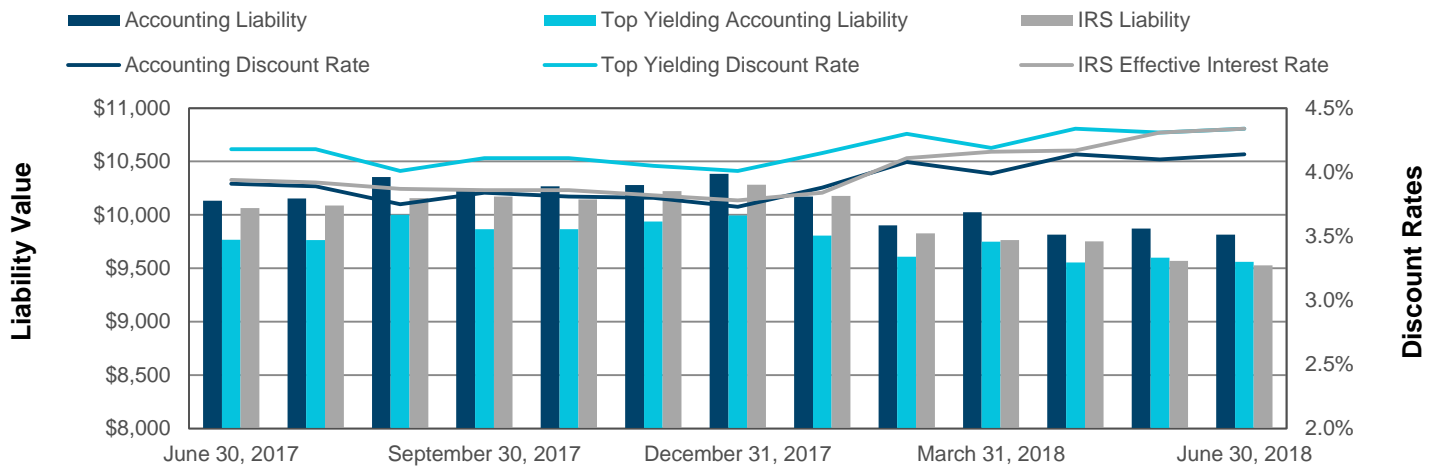
## MONTHLY RECAP

Discount rates moved up modestly in June despite the Treasury curve continuing to flatten. Both the AA-rated spot curve and the top-yielding curve increased from prior month-end. Short and mid-durations rose meaningfully while the long end of the curve fell off from prior month-end. Investment grade spreads increased month over month across all qualities.

Discount rates now sit 19 basis points higher than a year ago, using the broad AA discount rate curve. Top yielding AA-rated bonds are 14 basis points higher than May 2017 and provide about 20 basis points of additional yield relative to the broader market.

Index turnover was unusually high during the month as over 5% of market value changed eligibility during June. Entries into the AA index made up the majority of the month's turnover, totaling over \$30B while removals accounted for just \$2.4B. Wal-Mart's new issues had a large effect across the AA-rated curve, totaling nearly \$11.8B in market value and spanning maturities between 2 and 30 years. BlackRock and UBS's upgrades impacted the curve at shorter maturities as over \$9B entered the index. Exiting bonds from the AA index during June did not meaningfully impact the curve.

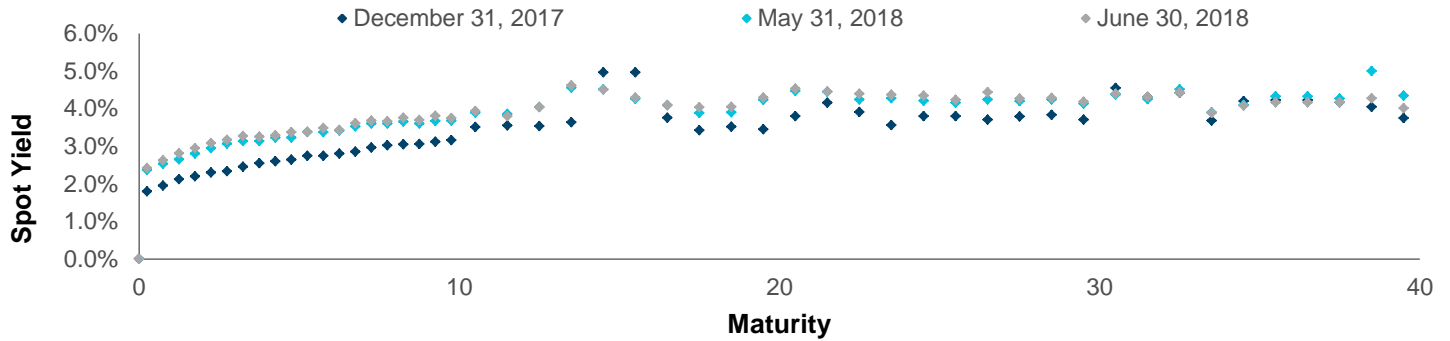
## LIABILITY IMPACT



Yield Curve	Liability Value 6/30/18	Discount Rate 6/30/18	Liability Value 5/31/18	Discount Rate 5/31/18	Liability Value 12/31/17	Discount Rate 12/31/17
<b>Accounting Yield Curve</b>	\$9,816	4.14%	\$9,873	4.10%	\$10,386	3.73%
<b>Top Yielding Accounting Curve</b>	\$9,562	4.34%	\$9,601	4.31%	\$9,994	4.01%
<b>IRS Yield Curve</b>	\$9,528	4.34%	\$9,570	4.31%	\$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

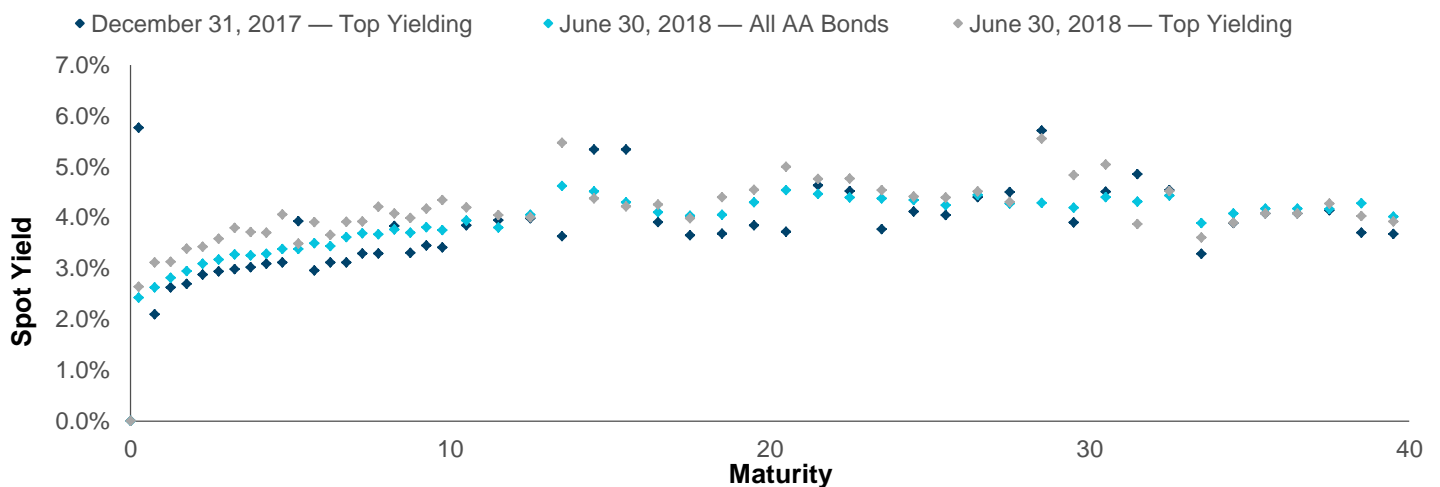
Issuer	Event	Curve Impact
<b>Wal-Mart</b>	New Issue (6 bonds)	Wal-Mart issued 6 new bonds in June, with maturities ranging between 2 and 30 years. The total market value was nearly 2% of the AA-rated index and amounted to about \$12B. The largest impacts on the curve were felt at the long end as the 10,20, and 30-year spot rates dropped between 3 and 7 basis points because of the new issues.
<b>BlackRock</b>	Upgrade (5 bonds)	BlackRock was upgraded during June which allowed 5 new bonds to enter the AA-rated index. Total market value of the issues was about \$4B and had a modest impact on the middle part of the curve.
<b>UBS</b>	Upgrade (3 bonds)	UBS also benefitted from an upgrade during the month as 3 issues entered the index. Market value topped \$5B and maturities hit the short end of the curve, moving spot rates at the 1 and 2-year marks by only 1 to 2 basis points.

Sources: Barclays POINT and T. Rowe Price

	New Issues	Other Bonds Entering	Downgrades	Other Bonds Exiting
<b>June 2018</b>				
<b>Count</b>	12	12	0	3
<b>Market Value (\$M)</b>	\$15,902	\$14,389	\$0	\$2,439
<b>Market Value (%)</b>	2.49%	2.25%	0.00%	0.38%
<b>2018 YTD</b>				
<b>Count</b>	53	35	20	17
<b>Market Value (\$M)</b>	\$50,493	\$30,352	\$19,085	\$19,481
<b>Market Value (%)</b>	8.01%	4.85%	3.14%	3.11%

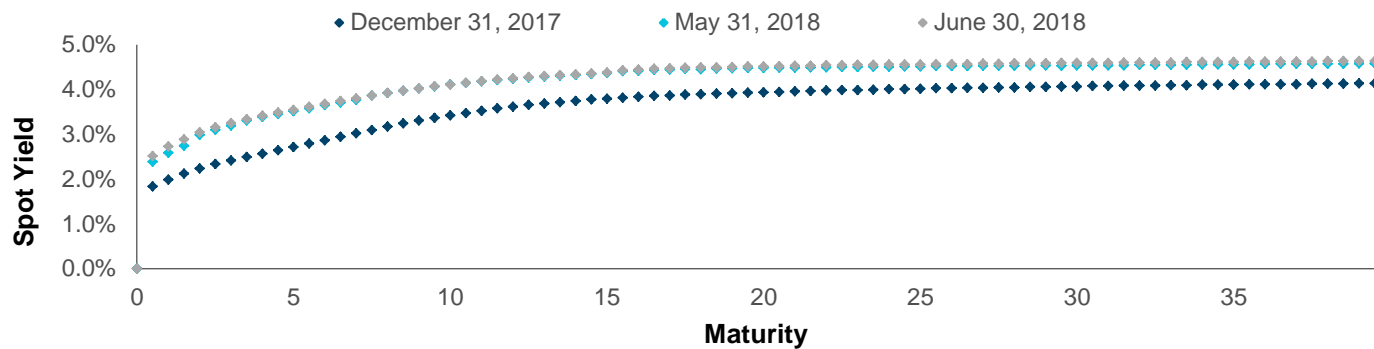
Sources: Barclays POINT and T. Rowe Price

### TOP YIELDING ACCOUNTING CURVE



Sources: Barclays POINT and T. Rowe Price

### IRS CURVE

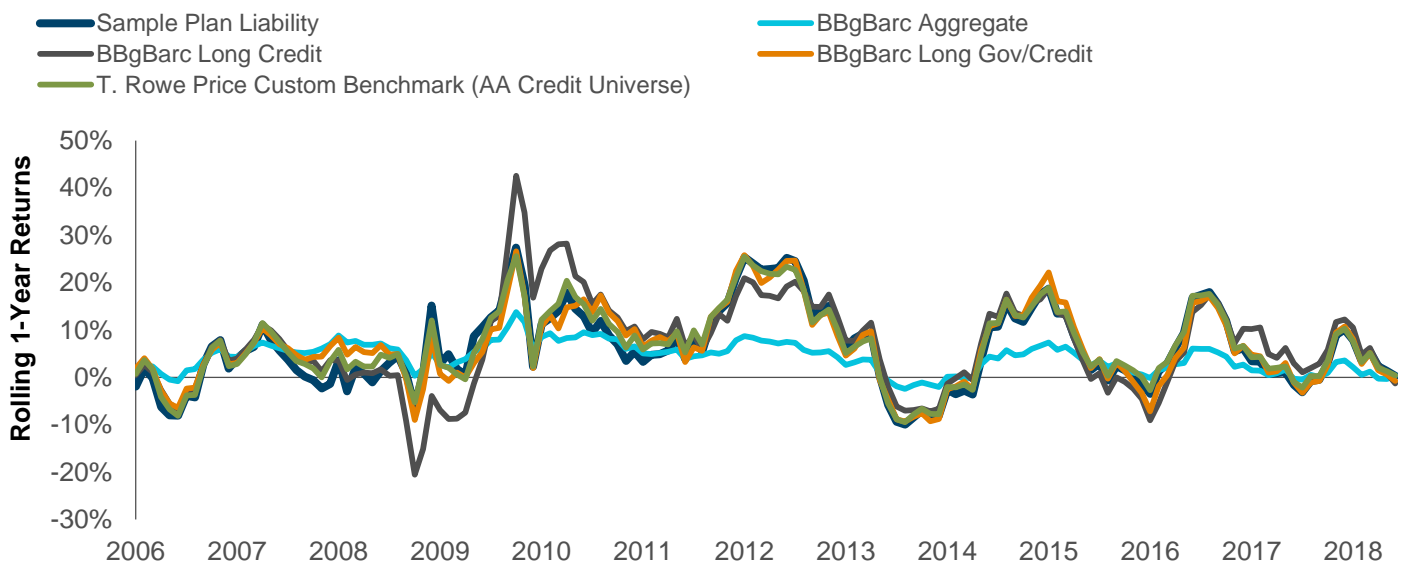


Sources: IRS and T. Rowe Price

Dates	AAA Corporate OAS	AA Corporate OAS	A Corporate OAS
<b>May Monthly Average</b>	47	56	87
<b>June 1, 2018</b>	47	59	91
<b>June 15, 2018</b>	49	59	91
<b>June 29, 2018</b>	52	64	98
<b>June Monthly Average</b>	50	61	94

Sources: Barclays POINT and T. Rowe Price

### ONE-YEAR ROLLING RETURNS AND TRACKING ERROR



	June 2018 Return	YTD Total Return	Annual Tracking Error Relative to Liability	Average Monthly Return Difference from Liability
<b>Hypothetical Sample Plan Liability</b>	-0.26%	-3.73%	NA	NA
<b>BBgBarc Aggregate</b>	-0.12%	-1.62%	6.57%	1.44%
<b>BBgBarc Long Credit</b>	-1.19%	-6.39%	4.56%	0.92%
<b>BBgBarc Long Gov/Credit</b>	-0.62%	-4.97%	3.18%	0.66%
<b>Hypothetical T. Rowe Price Custom Benchmark</b>	-0.25%	-3.93%	2.07%	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 June 30, 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](https://www.treasury.gov/resource-center) and [irs.gov/Retirement-Plans](https://www.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](https://www.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](https://www.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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