IR+M INCOME RESEARCH + MANAGEMENT

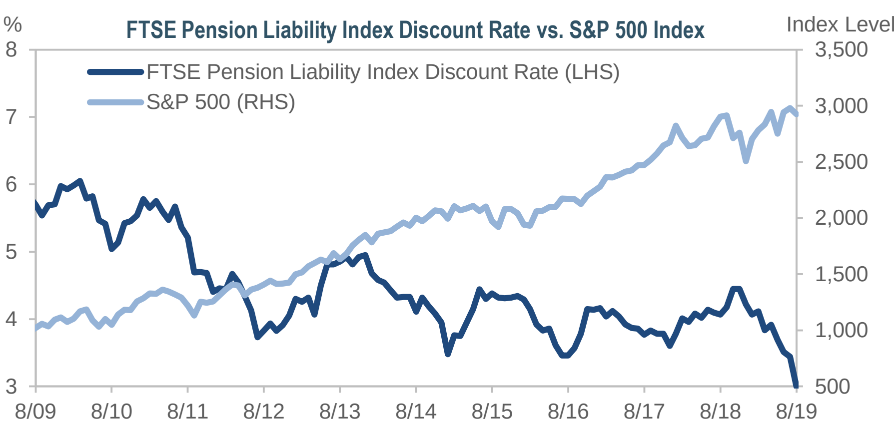
LDI MONITOR

August 31, 2019

LDI Highlights

- Corporate pension funded status fell by 3.9% during August, closing the month at 83.8%.
  - The decline was primarily driven by a dramatic decrease in long yields, which led to a 0.44% drop in discount rates.
  - Falling equity prices also contributed to a worsening average funded status, as the S&P 500 Index returned -1.8% in August.
- Long duration supply totaled over $18 billion, below the 2019 monthly average of $25 billion but in line with the five-year August average.
- Despite light supply, long corporate spreads moved in sympathy with a risk-off tone and widened 16bps to 170bps.
- Over $4 billion of 20+ year Treasury bonds were stripped in August, the highest total since October 2018.

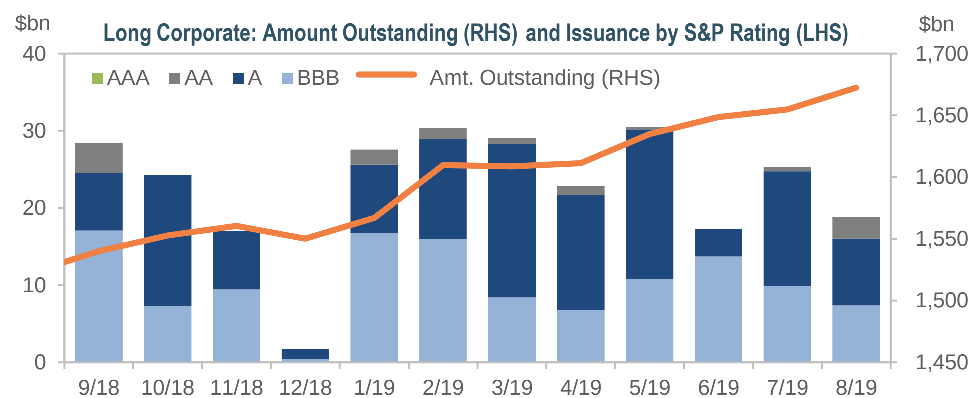
Rates Monitor	8/31/19	7/31/19	12/31/18
FTSE Pension Liability Discount Rate (%)	3.00	3.44	4.22
Bloom Barc Long Corporate Yield (%)	3.52	3.90	4.91
Bloom Barc Long Corporate A+ Yield (%)	3.09	3.50	4.40
Bloom Barc Long Corporate BBB Yield (%)	3.91	4.27	5.36
30 Year Swap Spread (bps)	-42	-38	-17



IR+M LDI Corner: Getting Active With Convexity

- With the pronounced drop in long yields in August, the duration of many indices extended due to positive convexity, or the change in duration as rates move.
  - The durations of the FTSE Pension Liability Indexes extended by 0.5 to 0.8 years. Comparatively, the durations of the Bloomberg Barclays Long Corporate and Long Credit Indexes both extended 0.3 years.
- The convexity of individual pension plans can vary based on participant options, however, general liability indices can be used as proxies. With liability indices extending more than market indices, it suggests liabilities may be more positively convex than market indices commonly used by plan sponsors.
- For sponsors looking to reduce funded-status volatility, we believe it is important to consider the impact of convexity. Market indices work well to capture most duration changes relative to plan liabilities. However, actively managing portfolio convexity can help plan sponsors maintain a better hedge throughout their de-risking journey.

Glidepath Monitor	8/31/19	7/31/19	12/31/18	12/31/15
Funded Status (%)	83.8	87.7	89.4	81.7
Long Corporate Spreads (bps)	170	154	200	227
Curve (Long Corp - Int. Corp) (bps)	77	69	69	88



Trailing 12 Month Long Corporate New Issuance (bn)

AAA	AA	A	BBB	*Total*
$0.0	$13.0	$136.6	$123.8	$273.3

Sources: Milliman (Historical numbers revised as of 3/31/19), FTSE Russell (formerly Citigroup), Bloomberg Barclays, Bloomberg, and JPMorgan

All data in the above commentary is as of 8/31/19. Yields are represented as of the aforementioned date and are subject to change. The views contained in this report are those of IR+M and are based on information obtained by IR+M from sources that are believed to be reliable. This report is for informational purposes only and is not intended to provide specific advice, recommendations for, or projected returns of any particular IR+M product. No part of this material may be reproduced in any form, or referred to in any other publication, without express written permission from Income Research & Management. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.