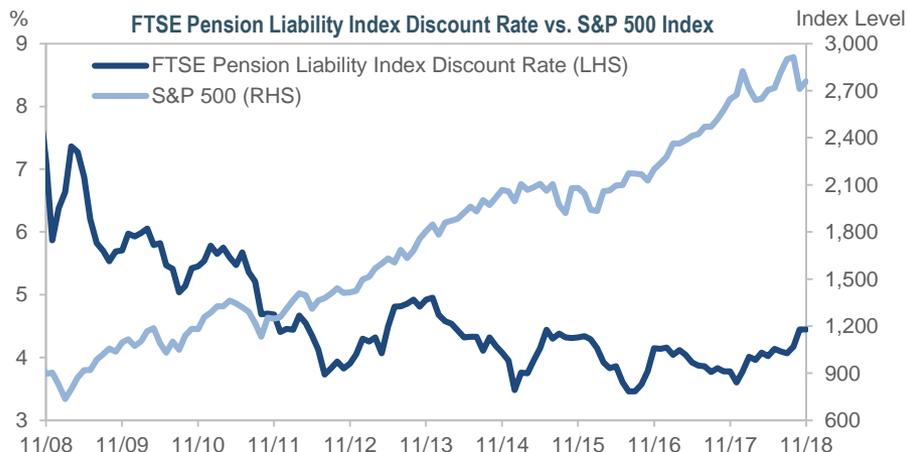


LDI Highlights

- Corporate pension funded status improved by 0.3% during November to close the month at 93.7%.
 - The increase was driven by solid equity-market performance, as the S&P 500 Index returned 2% during November.
 - Discount rates held steady at 4.45%, as widening corporate spreads offset falling Treasury yields.
- Issuance slowed during the month, as long-duration supply amounted to approximately \$17 billion.
- Volatility in corporate credit markets persisted, and long corporate spreads widened by 18bps to 184bps, the widest level since November 2016.
- Spread curves flattened modestly, as the difference between long corporate and intermediate corporate spreads narrowed from 70bps to 67bps.

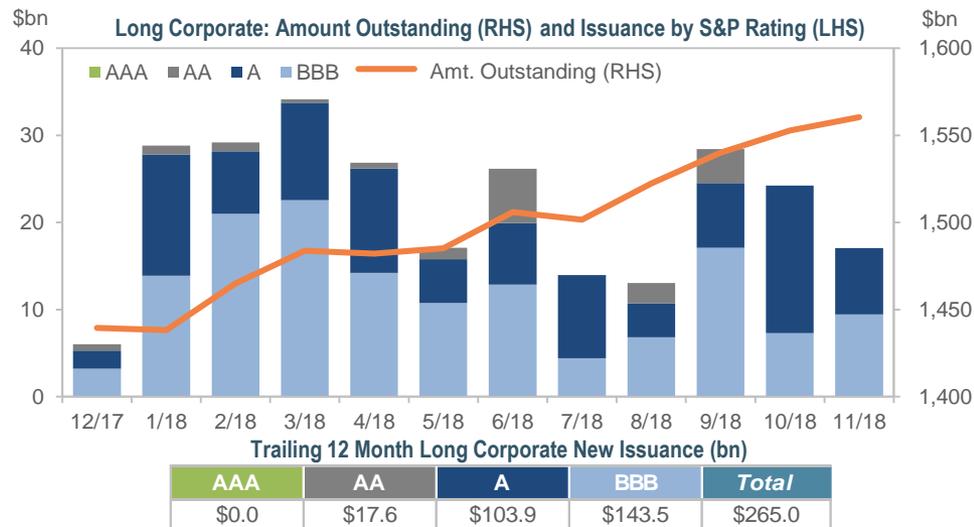
Rates Monitor	11/30/18	10/31/18	12/31/17
FTSE Pension Liability Discount Rate (%)	4.45	4.45	3.60
Bloom Barc Long Corporate Yield (%)	5.05	4.98	4.02
Bloom Barc Long Corporate A+ Yield (%)	4.63	4.64	3.69
Bloom Barc Long Corporate BBB Yield (%)	5.50	5.32	4.37
30 Year Swap Spread (bps)	-16	-10	-20



IR+M LDI Corner: Less is More – A Practical Approach to Late-Stage LDI

- IR+M’s approach to LDI is to offer practical solutions that address the biggest drivers of funded status volatility at any time throughout the LDI journey.
- Curve risk, relating to non-parallel movements in interest rates, tends to be a minor driver of volatility, except for late-stage plans looking to minimize funded-status risk.
- As more plans consider end-game options, we are increasingly looking at fine-tuned solutions. For sponsors that wish to retain control over their plans, these types of strategies can be an effective alternative to a buyout strategy.
- Curve risk can usually be addressed by hedging specific key-rate exposures, as this approach hedges the majority of the curve risk while maintaining a degree of active management freedom within the portfolio.
- For sponsors looking to fully immunize their plans by aligning fixed-income proceeds with liability cashflows, they should consider a practical hybrid solution of immunizing short-term cashflows and key-rate hedging longer-dated ones.

Glidepath Monitor	11/30/18	10/31/18	12/31/17	12/31/14
Funded Status (%)	93.7	93.4	87.6	81.5
Long Corporate Spreads (bps)	184	166	137	186
Curve (Long Corp - Int. Corp) (bps)	67	70	64	79



Sources: Milliman (Historical numbers revised as of 3/31/18), FTSE Russell (formerly Citigroup), Bloomberg Barclays, Bloomberg, and JPMorgan. All data in the above commentary is as of 11/30/18. 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.