IR+M INCOME RESEARCH + MANAGEMENT

LDI MONITOR

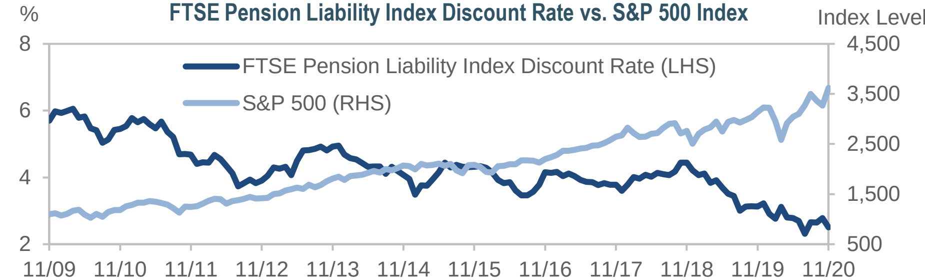
November 30, 2020

LDI Highlights

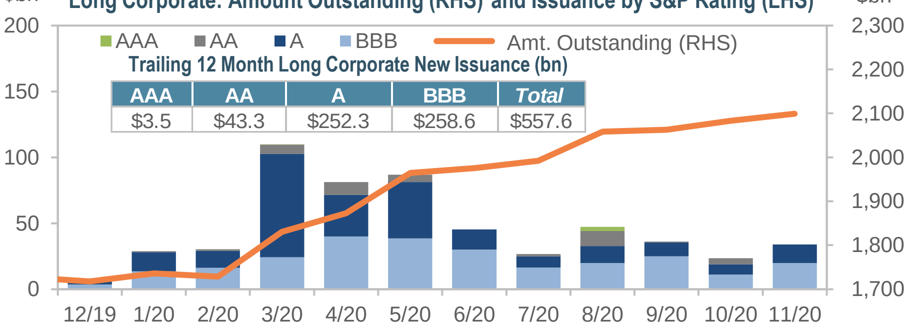
- Discount rates decreased by 0.23%, to 2.20% from 2.43%.
- The S&P 500 Index returned over 10%, surpassing previous all-time highs, amid positive vaccine developments and despite surging coronavirus cases.
- The appetite for yield was undeterred, pushing long spreads 29bps tighter and credit curves 11bps flatter, as investors extended duration for additional yield.
- Issuers took advantage of the attractive funding environment and issued $34 billion of longer-duration bonds, accounting for over 37% of total supply.

Rates Monitor	11/20	10/20	MoM Change	12/19	YTD Change
IR+M Average Plan Discount Rate (%)	2.20	2.43	(0.23)	3.00	(0.80)
Bloom Barc Long Corp Yield (%)	2.79	3.12	(0.33)	3.60	(0.81)
Bloom Barc Long Corp A+ Yield (%)	2.47	2.76	(0.29)	3.25	(0.78)
Bloom Barc Long Corp BBB Yield (%)	3.10	3.49	(0.39)	3.94	(0.84)
Long Corp Spreads (bps)	148	177	(29)	136	12
Curve (Long Corp - Int Corp) (bps)	72	83	(11)	66	6

FTSE Pension Liability Index Discount Rate vs. S&P 500 Index



Long Corporate: Amount Outstanding (RHS) and Issuance by S&P Rating (LHS)

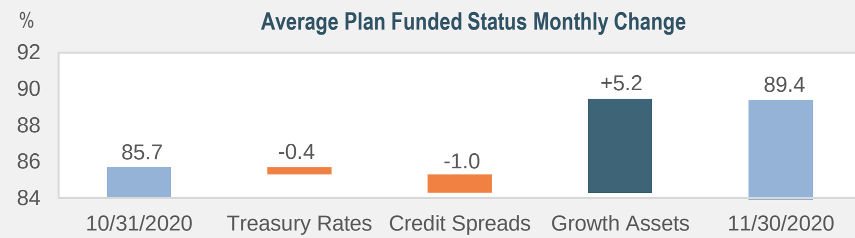


IR+M Funded Status Monitor

- Our sample average plan funded status increased by 3.7% during November, closing at 89.4% - positive growth asset returns drove the funded status higher despite lower discount rates.

Funded Status (%)	11/20	10/20	MoM Change	12/19	YTD Change
Average Plan	89.4	85.7	3.7	89.8	(0.4)
End Stage Plan	101.5	99.2	2.3	100.0	1.5
Young Plan	77.5	74.2	3.3	80.0	(2.5)

Average Plan Funded Status Monthly Change



IR+M LDI Corner: The Evolution of the Long Trading Tool Kit

- Mitigating funded status volatility is of the utmost importance in LDI strategies, and there are a variety of tools that we use to maintain duration, credit exposure, and liquidity in changing and challenging market conditions.
  - STRIPS may be an efficient solution to increase the interest rate hedge ratio using only physical bonds, especially for early stage LDI clients.
  - Derivatives can also be a cost-effective means of providing duration extension, downside protection, and efficient capital deployment.
  - Bottom-up security selection based on rigorous fundamental analysis addresses credit risk against a default-immune liability.
  - Electronic trading, spurred by stringent banking regulation post the financial crisis, has enabled traders to directly access a wider swath of counterparties, improving overall market liquidity.
  - ETFs and portfolio trades may be used to immediately gain and shed market exposure, or as an opportunistic tactical trade.
- An active fixed income manager will readily deploy these tools to seek compensatory levels of return for incremental liability tracking error risk.

IR+M DISCLOSURE STATEMENT

Disclosures:

Sources: Milliman, FTSE Russell (formerly Citigroup), Bloomberg Barclays, Bloomberg, and JPMorgan. All data in the above commentary is as of 11/30/20. 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.

IR+M Funded Status Monitor Assumptions:

Detailed methodology and assumptions for the IR+M Funded Status Monitor can be found at:
http://www.incomeresearch.com/wp-content/uploads/2020/10/IRM-Funded-Status-Monitor.pdf.

	End Stage	Average	Young
Target Liability Duration (Years)	8-10	12-14	15-17
Funded Ratio at Inception (i.e., 12/31/2019)	100.0%	89.8%	80.0%

Asset Allocations	End Stage	Average	Young
US Equity	15%	27%	38%
International Equity	5%	17%	22%
US REITS	0%	2%	5%
Private Equity	0%	4%	5%
Growth Assets Allocation	20%	50%	70%
Long Government Fixed Income	5%	10%	10%
Long Credit Fixed Income	30%	25%	10%
Intermediate Government Fixed Income	5%	5%	5%
Intermediate Credit Fixed Income	40%	10%	5%
Fixed Income Allocation	80%	50%	30%