INCOME RESEARCH + MANAGEMENT

LDI MONITOR

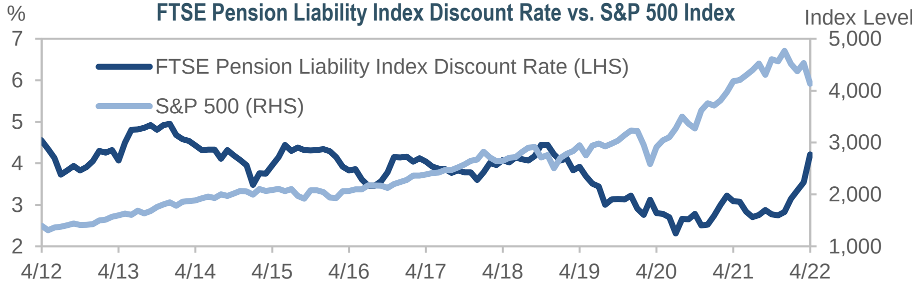
April 30, 2022

LDI Market Updates

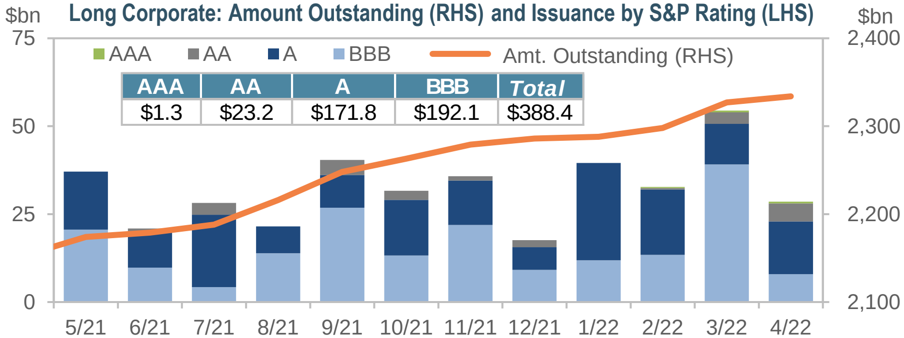
- Discount rates increased by 0.66% in April, from 3.42% to 4.08%.
- Recent economic releases reflected the US economy's underlying strength, but sentiment soured on continued tensions between the West and Russia, unease over the impact of Covid lockdowns in China, and elevated inflation readings.
- Long corporate issuance totaled roughly $29 billion, as higher yields and increased volatility weighed on the primary market. Spreads widened 19bps, from 155bps to 174bps, on the weaker market tone.

Rates Monitor	04/22	03/22	MoM Change	12/21	YTD Change
IR+M Average Plan Discount Rate (%)	4.08	3.42	0.66	2.61	1.47
Bloomberg Long Corp Yield (%)	4.80	4.03	0.77	3.10	1.70
Bloomberg Long Corp A+ Yield (%)	4.45	3.72	0.73	2.87	1.58
Bloomberg Long Corp BBB Yield (%)	5.14	4.33	0.81	3.32	1.82
Long Corp Spreads (bps)	174	155	19	130	44
Curve (Long Corp - Int Corp) (bps)	61	63	(2)	61	0

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



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

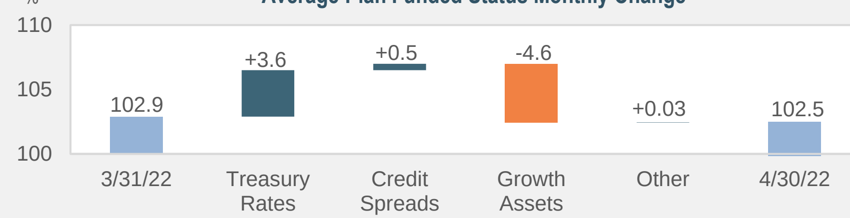


IR+M Funded Status Monitor

- Our sample Average Plan funded status decreased by 0.4% during April, closing at 102.5%; despite higher discount rates, negative growth asset returns pushed the funded status slightly lower.

Funded Status (%)	04/22	03/22	MoM Change	12/21	YTD Change
Average Plan	102.5	102.9	(0.4)	101.9	0.6
End Stage Plan	105.8	106.3	(0.5)	106.8	(1.0)
Young Plan	95.4	94.9	0.5	92.2	3.2

Average Plan Funded Status Monthly Change



Other includes contributions, expenses, benefit accruals, and liability profile changes.

IR+M LDI Corner – Taxable Munis: Not Exactly a Backwater…

- As discussed in our blog, taxable municipals, though commonly overlooked in LDI strategies, may deserve consideration given they are relatively high quality, have a low correlation to corporates, and see healthy long-end supply.
- Most taxable munis are rated AA or above, which aligns well with the high-quality corporate discount rate basis. The higher quality nature also corresponds with lower spread volatility. While this may be attributed in part to lower liquidity, we believe the inefficiency in trading taxable munis can offer attractive market opportunities, especially given continued Fed uncertainty.
  - Like long securitized, taxable munis can act as a diversifier to long corporates due to their relatively low correlation.
  - Taxable munis have an average maturity of 14 years, and there are numerous 30-year and century bonds available in the taxable muni universe.
- A taxable municipal allocation can be accomplished via an out-of-benchmark strategic or tactical allocation. A tactical strategy gives managers flexibility to add to the sector when it is attractive relative to corporates, while a strategic standalone allocation helps tackle concentration concerns in corporates. We welcome the opportunity to discuss whether either approach is appropriate for your LDI solution.

The single effective discount rate shown is for the IR+M Average Sample Plan, calculated from the FTSE Pension Discount Curve. 2022 long corporate issuance sourced from Bloomberg, all prior months sourced from JP Morgan. Totals may not sum due to rounding.

IR+M DISCLOSURE STATEMENT

Disclosures:

Sources: Moody's PFaroe, Milliman, FTSE Russell (formerly Citigroup), Bloomberg, and JPMorgan. All data in the above commentary is as of 4/30/22. 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 but IR+M makes no guarantee as to the accuracy or completeness of the underlying third-party data used to form IR+M's views and opinions. This report is for informational purposes only and is not intended to provide specific advice, recommendations, or projected returns for 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®" and Bloomberg Indices are service marks of Bloomberg Finance L.P. and its affiliates, including Bloomberg Index Services Limited ("BISL"), the administrator of the index (collectively, "Bloomberg") and have been licensed for use for certain purposes by IR+M. Bloomberg is not affiliated with IR+M, and Bloomberg does not approve, endorse, review, or recommend the products described herein. Bloomberg does not guarantee the timeliness, accurateness, or completeness of any data or information relating to any IR+M product. Moody's Analytics PFaroe® product used by IR+M includes market data and other information sourced from third parties under license. Certain licensors require Moody's Analytics to make disclosures to, or to obtain acknowledgements or agreements from, IR+M and parties receiving the information from IR+M, which is effected by the disclosures and disclaimers available at https://static.pfaroe.com/DisclosuresAndDisclaimers/index.html.

IR+M Funded Status Monitor Assumptions:

Detailed methodology and assumptions for the IR+M Funded Status Monitor can be found at:
https://www.incomeresearch.com/wp-content/uploads/2022/02/IRM-Funded-Status-Monitor-Whitepaper-2022.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 All Cap Equity	8%	27%	38%
International Equity	2%	17%	22%
US REITS	0%	2%	5%
Private Equity	0%	4%	5%
Growth Assets Allocation	10%	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	50%	10%	5%
Fixed Income Allocation	90%	50%	30%