INCOME RESEARCH + MANAGEMENT

LDI MONITOR

October 31, 2022

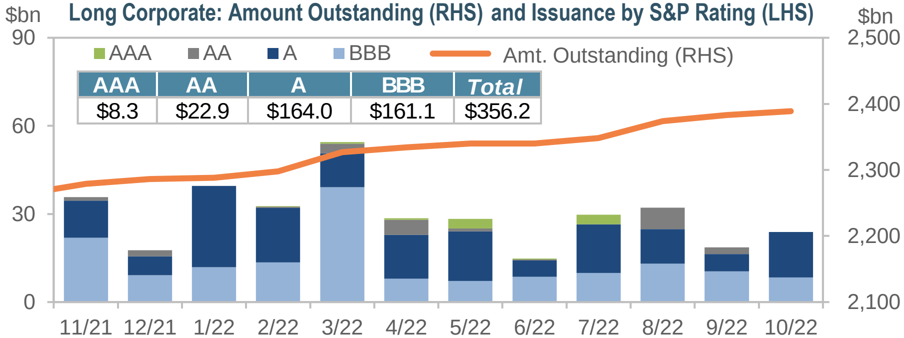
LDI Market Updates

- Discount rates increased by 0.30% in October, from 5.06% to 5.36%, and growth assets outperformed with the S&P 500 returning nearly 8%.
- Long corporate issuance totaled just under $25 billion during the month.
- The amount of Treasury STRIPS outstanding – an indicator of LDI demand – rose by $9 billion, the highest monthly increase since March 2021.
  - Long spreads tightened 13bps month-over-month given strong investor demand.

Rates Monitor	10/22	09/22	MoM Change	12/21	YTD Change
IR+M Average Plan Discount Rate (%)	5.36	5.06	0.30	2.61	2.75
Bloomberg Long Corp Yield (%)	6.13	5.91	0.22	3.10	3.03
Bloomberg Long Corp A+ Yield (%)	5.77	5.52	0.25	2.87	2.90
Bloomberg Long Corp BBB Yield (%)	6.49	6.31	0.18	3.32	3.17
Long Corp Spreads (bps)	185	198	(13)	130	55
Curve (Long Corp - Int Corp) (bps)	39	58	(19)	61	(22)

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 4.8% during October, closing at 102.5%; positive growth asset returns and higher discount rates increased the funded status.

Funded Status (%)	10/22	09/22	MoM Change	12/21	YTD Change
Average Plan	102.5	97.7	4.8	101.9	0.6
End Stage Plan	105.7	104.7	1.0	106.8	(1.1)
Young Plan	96.4	89.5	6.9	92.2	4.2

Average Plan Funded Status Monthly Change

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

IR+M LDI Corner – LDI ≠ Leverage in the US

- In the UK, tax cuts and tightening of monetary policy pushed rates higher in September. UK pensions using swaps liquidated Gilts to meet margin calls, further exacerbating market conditions. We do not expect a significant market disruption to occur in the US due to a confluence of factors:
  - Derivatives are less common in the US because the liability discount rate is based on a high-quality corporate bond rate. US sponsors can access a larger physical universe for hedging (e.g., corporate bonds, Treasuries, and STRIPS) and maintain decent liquidity. Conversely, UK liability discount rates are Gilts-based and the physical Gilts market lacks sufficient supply.
  - UK sponsors most commonly utilize cleared swaps where margin calls must be met in cash, leading to forced sales of less liquid assets. The US has more flexibility in the types of assets that can be posted for collateral.
  - With the popularity of DC plans, corporate pensions and any related LDI comprise a smaller portion of the US economy versus the UK.
- We do not anticipate the same magnitude of instability in the US, but we believe this serves as a lesson in the hidden risk of leveraged capital efficient investment strategies and the value of stress tests for setting margin buffers. With the UK being a significant foreign investor of US long bonds, we will also continue to closely monitor how and if the UK environment may bleed into US bond markets.

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 10/31/22. 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%