

LDI Market Updates

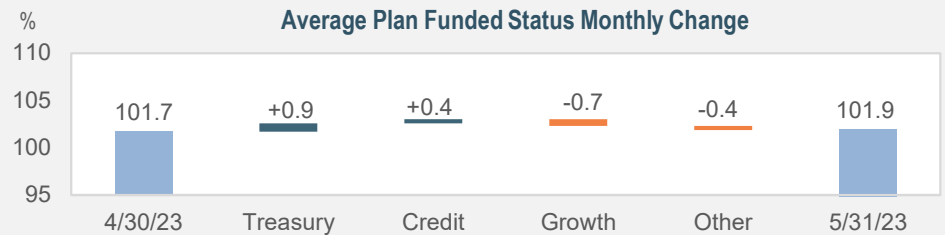
- Discount rates¹ increased by 0.23% in May, from 4.60% to 4.83%.
- Fixed income assets posted negative returns with the Bloomberg Long Corporate Index returning -2.8%; risk asset performance was mixed, with domestic equities marginally outperforming but international equities underperforming.
- Investment-grade supply came back to life in May following a slow April with \$149 billion pricing, exceeding investor expectations of \$135 billion for the month. Issuance in the long-end also picked up with \$42 billion of new long bonds issued.

Rates Monitor	05/23	04/23	MoM Change	12/22	YTD Change
IR+M Average Plan Discount Rate (%)	4.83	4.60	0.23	4.89	(0.06)
Bloomberg Long Corp Yield (%)	5.52	5.27	0.25	5.60	(0.08)
Bloomberg Long Corp A+ Yield (%)	5.19	4.94	0.25	5.26	(0.07)
Bloomberg Long Corp BBB Yield (%)	5.89	5.63	0.26	5.95	(0.06)
Long Corp Spreads (bps)	163	159	4	158	5
Curve (Long Corp - Int Corp) (bps)	38	35	3	42	(4)

IR+M Funded Status Monitor

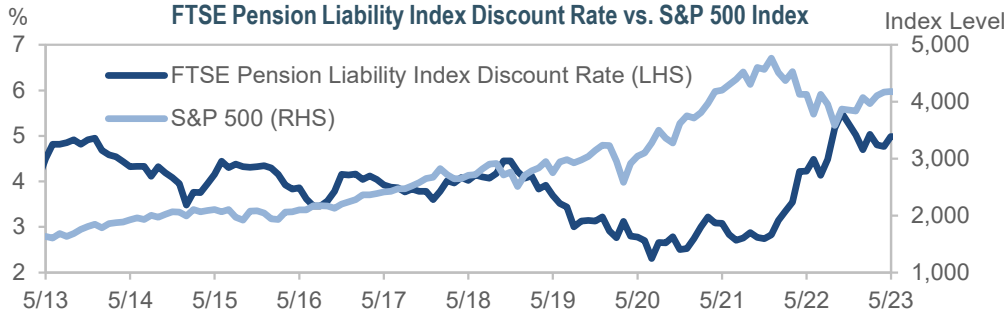
- Our sample Average Plan funded status increased by 0.2% during May, closing at 101.9%, primarily due to increase in discount rates and credit spreads.

Funded Status (%)	05/23	04/23	MoM Change	12/22	YTD Change
Average Plan	101.9	101.7	0.2	100.4	1.5
End Stage Plan	106.3	106.3	0.0	105.2	1.1
Young Plan	92.8	92.5	0.3	92.1	0.7

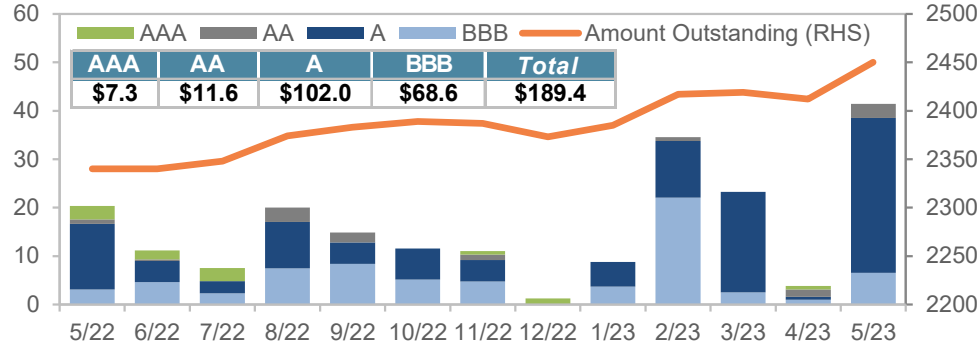


Other includes contributions, expenses, benefit accruals, and liability profile changes.

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



Long Corporate: Amount Outstanding (RHS) and Issuance by Average Rating (LHS)



IR+M LDI Corner – Use LDI to Put a Ceiling on Risks

- The protracted debt ceiling negotiations this May exacerbated volatility and uncertainty in the market. We believe that this instance of the debt ceiling “standoff” highlighted some key risks to pension plans.
- Treasury yields** increased more in the front-end than the long-end of the curve. The 1-month Treasury ended the month up 75bps while the 30-year Treasury rose by just 5bps. The disproportionate impact on the front-end of the curve could potentially expose plans to curve mismatch risk.
- Risk assets** were most impacted by debt ceiling talks, as the VIX index (which tracks the volatility in the S&P 500 index) saw its highest levels since March. Plans with higher equity exposure could face higher funded status volatility.
- US Treasury downgrade risk** remains (but is unlikely). Fitch placed the Government on negative watch in May, citing the sluggish pace of negotiations. In 2011, following a similar debt ceiling debate, S&P downgraded the US government after Congress voted to raise the ceiling. LDI strategies which focus on credit risk could be more impacted because AAA-rated Treasuries are often used to improve the quality of portfolios to better align with the AA-rated based liabilities (i.e., “quality barbell”).
- Given the potential impacts from heightened market volatility, we recommend taking an active approach to LDI to mitigate asset-liability tracking error.

¹The single effective discount rate shown is for the IR+M Sample Average Plan, calculated from the FTSE Pension Discount Curve. Long corporate issuance sourced from Bloomberg. Long issuance figures exclude 10-year bonds. The table in the long issuance chart shows the 12-month running total investment grade issuance by rating, through 5/31/2023 in USD billions. Totals may not sum due to rounding.

IR+M DISCLOSURE STATEMENT

Disclosures:

Sources: Moody's PFaroe, FTSE Russell (formerly Citigroup), and Bloomberg. All data in the above commentary is as of 05/31/2023. Yields are represented as of the aforementioned date and are subject to change. The views contained in this report are those of Income Research & Management ("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. Investing in securities involves risk of loss that clients should be prepared to bear. More specifically, investing in the bond market is subject to certain risks including but not limited to market, interest rate, credit, call or prepayment, extension, issuer, and inflation risk. "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/2023/02/IRM-Funded-Status-Monitor-Whitepaper-2023.pdf>

	End Stage	Average	Young
Target Liability Duration (Years)	7-9	10-12	13-15
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%	15%
Long Credit Fixed Income	30%	25%	15%
Intermediate Government Fixed Income	5%	5%	0%
Intermediate Credit Fixed Income	50%	10%	0%
Fixed Income Allocation	90%	50%	30%

