INCOME RESEARCH + MANAGEMENT

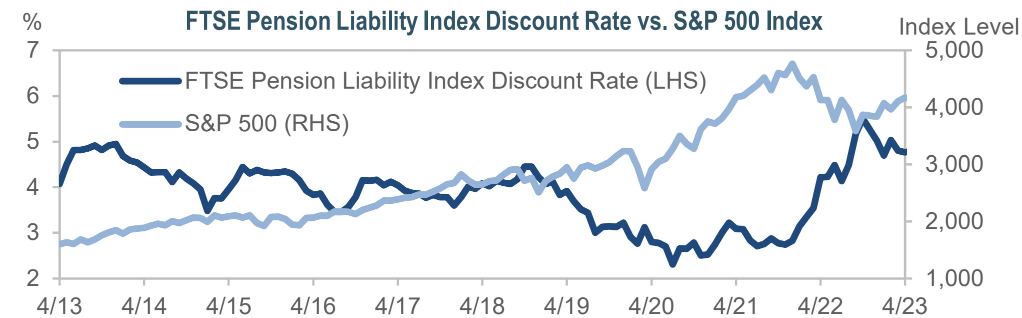
LDI MONITOR

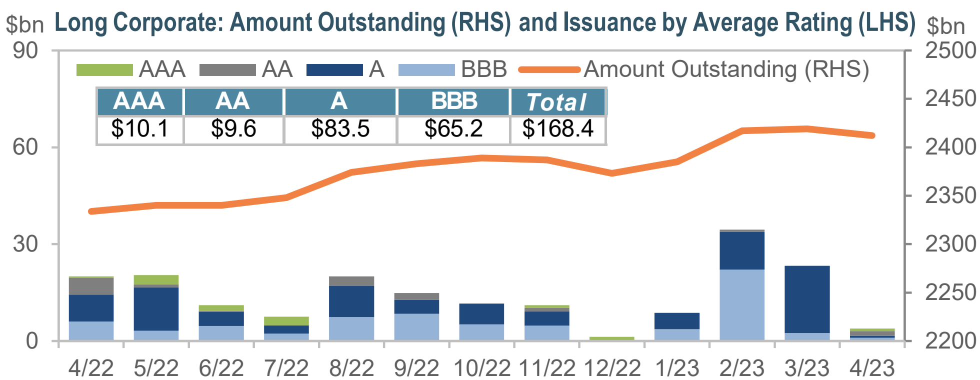
April 30, 2023

LDI Market Updates

- Discount rates decreased by 0.05% in April, from 4.65% to 4.60%.
- Both growth and fixed income assets grew in April as the S&P 500 returned 1.46% and the Bloomberg Long Corporate Index returned 0.75% during the month.
- Following an abnormally quiet month of supply in March, investment-grade issuance fell short of expectations again in April; $66 billion of new bonds priced, well below the $100 billion that investors priced in, and long-end issuance only accounted for $4 billion of the total investment-grade issuance.

Rates Monitor	04/23	03/23	MoM Change	12/22	YTD Change
IR+M Average Plan Discount Rate (%)	4.60	4.65	(0.05)	4.89	(0.29)
Bloomberg Long Corp Yield (%)	5.27	5.29	(0.02)	5.60	(0.33)
Bloomberg Long Corp A+ Yield (%)	4.94	4.97	(0.03)	5.26	(0.32)
Bloomberg Long Corp BBB Yield (%)	5.63	5.62	0.01	5.95	(0.32)
Long Corp Spreads (bps)	159	160	(1)	158	1
Curve (Long Corp - Int Corp) (bps)	35	33	2	42	(7)

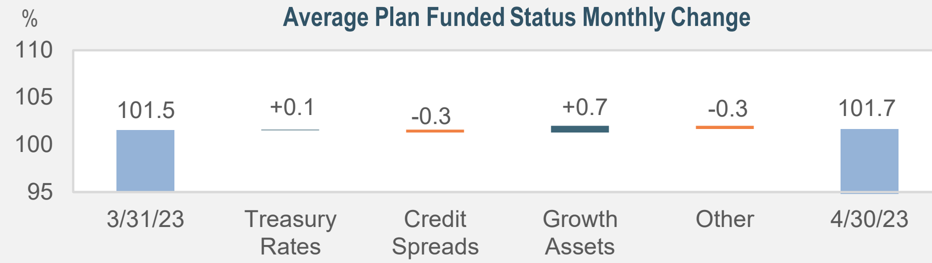




IR+M Funded Status Monitor

- Our sample Average Plan funded status increased by 0.2% during April, closing at 101.7%, mainly due to positive growth asset returns, offset by lower discount rates.

Funded Status (%)	04/23	03/23	MoM Change	12/22	YTD Change
Average Plan	101.7	101.5	0.2	100.4	1.3
End Stage Plan	106.3	106.1	0.2	105.2	1.1
Young Plan	92.5	92.7	(0.2)	92.1	0.4



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

IR+M LDI Corner – Opaque Side Effects of Higher Rates on Longs

- Higher rates can have a wider range of impacts outside of just negative marked-to-market returns in fixed income. Asset managers and plan sponsors alike should review the new market landscape set as a result.
- **Dollar prices across long bonds are historically low.** This creates dislocations active managers can take advantage of through security selection. Lower dollar priced bonds can trade with meaningfully lower spreads to otherwise identical bonds because of their attractiveness in case of default.
- **Size of the long corporate market has shrunk.** Higher rates make bringing long-duration deals more costly for issuers. Long supply has been limited as a result and the market value of the universe has fallen by over $600 billion.
- **Hedges could have changed.** With limited supply and higher rates, the duration of the Bloomberg Long Corporate index has shortened considerably. LDI benchmark durations do not always move in lock-step with asset benchmarks – the year-to-date change in durations was 0.30 vs. 0.41yrs for the Bloomberg Long Corporate index and our Average Plan, respectively.
- We recommend employing a dynamic LDI strategy that relies on active management and evolves with market conditions. Plans should regularly review efficacy of hedges and adjust benchmarks accordingly, while fixed income managers should look to capitalize on these dislocations.

The single effective discount rate shown is for the IR+M Average Sample Plan, calculated from the FTSE Pension Discount Curve. Long corporate issuance sourced from Bloomberg. Long issuance figures exclude 10-year bonds. 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 04/30/2023. 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%