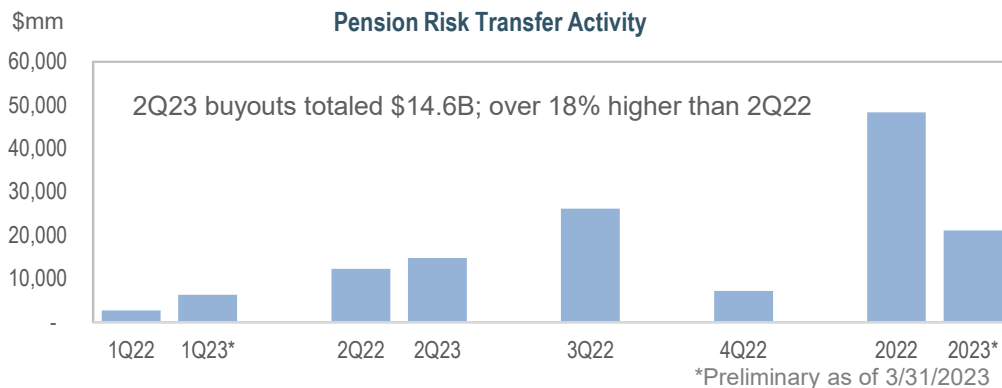
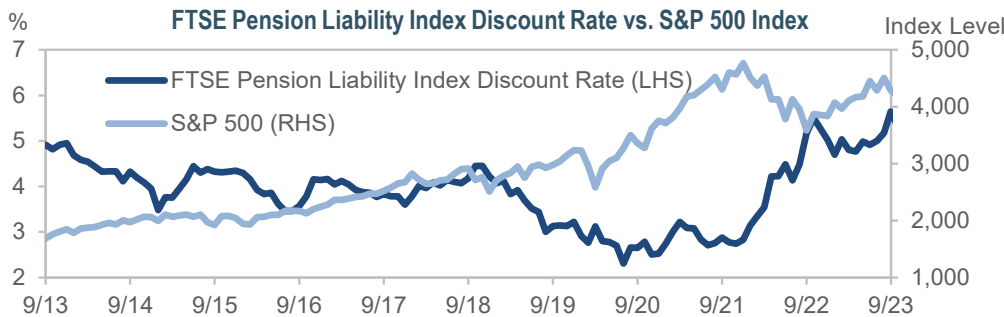


**LDI Market Updates**

- The discount rate<sup>1</sup> increased by 48bps to end the month at 5.55%.
- Volatility ticked back up in September, and stocks suffered their worst-performing month of 2023 as the S&P 500 fell 4.87%. The Bloomberg Long Corporate index yield rose by 46bps to end the month at 6.13%.
- Issuance returned to market after a quiet August, with investment-grade issuers bringing \$124 billion of new supply in September. The long end saw \$13.5 billion of new bonds, accounting for just over 10% of total issuance.

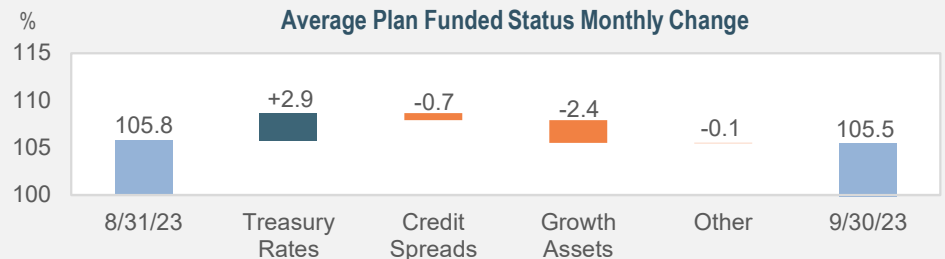
Rates Monitor	09/23	08/23	MoM Change	12/22	YTD Change
IR+M Average Plan Discount Rate (%)	5.55	5.07	0.48	4.89	0.66
Bloomberg Long Corp Yield (%)	6.14	5.67	0.47	5.60	0.54
Bloomberg Long Corp A+ Yield (%)	5.86	5.37	0.49	5.26	0.60
Bloomberg Long Corp BBB Yield (%)	6.48	6.02	0.46	5.95	0.53
Long Corp Spreads (bps)	134	139	(5)	158	(24)
Curve (Long Corp - Int Corp) (bps)	19	32	(13)	42	(23)



**IR+M Funded Status Monitor**

- Our sample Average Plan funded status decreased by 0.3% during September, closing at 105.5% due to a decline in growth assets, offset by higher rates.

Funded Status (%)	09/23	08/23	MoM Change	12/22	YTD Change
Average Plan	105.5	105.8	(0.3)	100.4	5.1
End Stage Plan	106.9	107.5	(0.6)	105.2	1.7
Young Plan	96.7	96.8	(0.1)	92.1	4.6



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

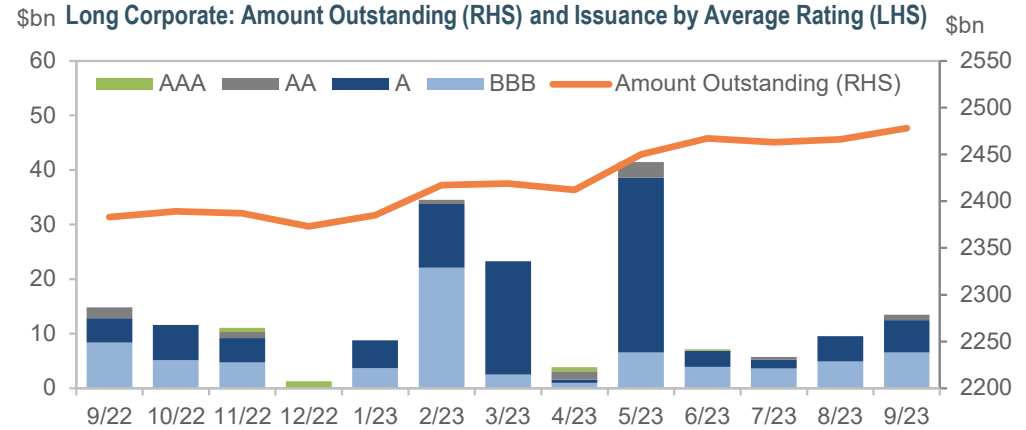
**IR+M LDI Corner – Is your Pension Plan Recession Ready?**

- As consensus estimates for the probability of a recession have been higher than a coin-flip for most of the year, we believe that plan sponsors and asset managers can take proactive measures in preparation for a market downturn.
- During recessionary periods, fixed income tends to outperform equities. Fixed income is also better correlated with liabilities, helping to limit funded status drawdowns.
  - The long corporate index outperformed the S&P 500 over each of the previous four recessions by an average of 17%.
  - During the Great Financial Crisis (GFC) of 2007/08, the S&P 500 dropped by as much as 53% from its previous peak, whereas the long corporate index had a much smaller (and shorter) maximum drawdown of 23%.
- Corporate spreads tend to widen beyond historical averages in times of recession, presenting an attractive entry point. While short-lived, the long corporate index widened to 502bps during the GFC, vs. historical averages of 150-180bps.
  - The spread between AA (i.e., liability basis) and lower quality bonds also widened. We believe active LDI managers should invest beyond the AA universe for diversification and to improve excess returns, but diligent bottom-up security selection is critical to mitigate idiosyncratic risk and the likelihood of downgrade or default.
- While a recession remains uncertain, we believe active management helps our LDI clients navigate complex market dynamics at any phase in the business cycle.

<sup>1</sup>The single effective discount rate for the IR+M Average Sample Plan, calculated from the FTSE Pension Discount Curve. Pension Risk Transfer data sourced from LIMRA. Long corporate issuance sourced from Bloomberg. Long issuance figures exclude 10-year bonds. Totals may not sum due to rounding. Long corporate index refers to the Bloomberg US Long Corporate Index.

### Third Quarter 2023 Corporate Issuance

- Heightened market volatility and higher rates kept many issuers on the sidelines in the third quarter.
  - Issuance in the long end totaled just under \$29 billion for the quarter. This was significantly below the total long end issuance both in the previous quarter as well as the third quarter of 2022.
- Long duration supply accounted for under 9% of the total investment grade issuance in the third quarter. In the post-pandemic era, the proportion of long duration issuance to the total investment grade issuance has steadily declined.
  - Currently, issuers are more inclined to focus on the short end of the curve as they see opportunities to refinance in the near term rather than lock in higher rates for longer.
- The small amount of issuance was well absorbed by strong demand in the long end as deals were multiple times oversubscribed.



Trailing 12 Month Long Corporate New Issuance (bn)

AAA	AA	A	BBB	Total
\$3.1	\$7.8	\$96.2	\$64.8	\$171.8

### Largest Long-Dated USD Investment Grade Deals

Ticker	Issuer Name	Maturity (yrs)	Issue Date	Average Rating	Amount Issued (\$bn)	Yield at Issue (%)	Spread at Issue (bps)	Concession to Outstanding (bps)	Order Book (\$bn)	Oversubscription Level (times)
ENBCN	Enbridge Inc	60	9/18/2023	BBB-	2.0	8.38	398	N/A	6.0	3.0
OKE	ONEOK Inc	30	8/10/2023	BBB	1.8	6.66	217	-5.0	8.2	4.7
BATSLN	BAT Capital Corp	20	7/31/2023	BBB	0.8	7.08	285	25.0	4.8	6.3
		30	7/31/2023	BBB	1.0	7.08	305	25.0	5.5	5.5
INTU	Intuit Inc	30	9/12/2023	A-	1.3	5.56	120	-5.0	7.6	6.1
CPGX	Columbia Pipelines Operating Co LLC	30	8/2/2023	BBB+	1.3	6.06	235	Debut	5.8	4.6
MMC	Marsh & McLennan Cos Inc	30	9/6/2023	A-	1.0	5.72	135	0.0	3.3	3.3
SUMIBK	Sumitomo Mitsui Financial Group Inc	20	7/6/2023	A-	1.0	6.18	195	20.0	4.0	4.0
BRKHEC	MidAmerican Energy Co	31	9/5/2023	AA-	1.0	5.85	147	2.0	5.5	5.5
ALVGR	Allianz SE	30	8/30/2023	A+	1.0	6.35	217	5.0	3.8	3.8
NSC	Norfolk Southern Corp	30	7/31/2023	BBB+	1.0	5.39	137	7.0	3.8	3.8
TMUS	T-Mobile USA Inc	30	9/11/2023	BBB	1.0	6.01	163	-4.5	5.8	5.8
COP	ConocoPhillips Co	30	8/8/2023	A-	1.0	5.57	135	10.0	5.1	5.1
GILD	Gilead Sciences Inc	30	9/7/2023	BBB+	1.0	5.57	120	0.0	5.8	5.8

Long corporate issuance sourced from Bloomberg. Long issuance figures exclude 10-year bonds.

# IR+M DISCLOSURE STATEMENT

## Disclosures:

Sources: Moody's PFaroe, FTSE Russell (formerly Citigroup), LIMRA, and Bloomberg. Unless otherwise stated, all data in the above commentary is as of 09/30/2023. 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
<b>Target Liability Duration (Years)</b>	7-9	10-12	13-15
<b>Funded Ratio at Inception (i.e., 12/31/2019)</b>	100.0%	89.8%	80.0%
<b>Asset Allocations</b>	<b>End Stage</b>	<b>Average</b>	<b>Young</b>
<b>US All Cap Equity</b>	8%	27%	38%
<b>International Equity</b>	2%	17%	22%
<b>US REITS</b>	0%	2%	5%
<b>Private Equity</b>	0%	4%	5%
<b>Growth Assets Allocation</b>	10%	50%	70%
<b>Long Government Fixed Income</b>	5%	10%	15%
<b>Long Credit Fixed Income</b>	30%	25%	15%
<b>Intermediate Government Fixed Income</b>	5%	5%	0%
<b>Intermediate Credit Fixed Income</b>	50%	10%	0%
<b>Fixed Income Allocation</b>	90%	50%	30%