IR+M INCOME RESEARCH + MANAGEMENT

LDI MONITOR

December 31, 2023

2023 LDI Environment Review

Our Average Plan funded status increased by 5.5% to 105.9% during 2023 – Growth asset returns as well as higher discount rates helped push funded statuses higher in 2023.

Discount rates decreased over the course of the year– Our Average Plan discount rate declined by 20bps in 2023, to 4.69%.

- Yields were volatile throughout 2023, with long corporate yields reaching as high as 6.60% in October before closing the year at 5.22%.

Long corporate spreads tightened by 42bps, from 158bps to 116bps – Long corporate spreads continued to be anchored by lack of steady supply throughout the year.

- Credit curves closed 16bps tighter year-over-year, driven by demand for long bonds.

2023 saw the smallest share of long corporate bond issuance since 2011– Long-duration supply totaled $164 billion, 13% of total issuance in 2023, compared to 21% and 26% in 2022 and 2021, respectively.

- Similar to 2022, issuance was front-loaded in 2023 – over 70% of corporate bonds in the long end were issued in the first half of the year.

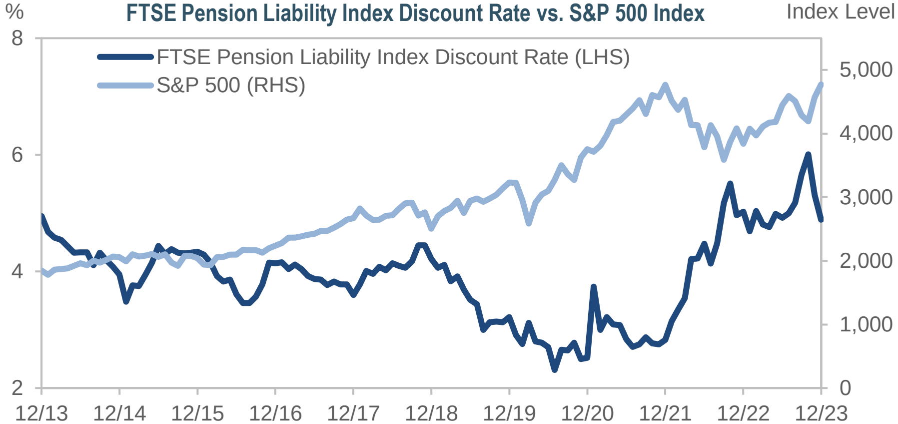
Positive equity returns were a tailwind for funded statuses –The S&P 500 returned 24% in 2023, bouncing back from a -19% return in 2022.

- Equity markets were bolstered by positive economic data surrounding inflation, increased consumer confidence and dovish signals from the Fed, particularly in the latter half of the year.

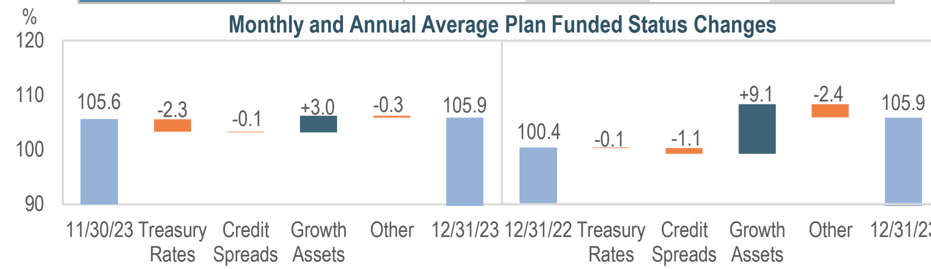
Rates Monitor	12/23	11/23	MoM Change	12/22	YTD Change
IR+M Average Plan Discount Rate (%)	4.69	5.19	(0.50)	4.89	(0.20)
Bloomberg Long Corp Yield (%)	5.22	5.74	(0.52)	5.60	(0.38)
Bloomberg Long Corp A+ Yield (%)	4.98	5.48	(0.50)	5.26	(0.27)
Bloomberg Long Corp BBB Yield (%)	5.51	6.05	(0.54)	5.95	(0.44)
Long Corp Spreads (bps)	116	113	3	158	(42)
Curve (Long Corp - Int Corp) (bps)	26	14	12	42	(16)

Funded Status (%)	12/23	11/23	MoM Change	12/22	YTD Change
Average Plan	105.9	105.6	0.3	100.4	5.5
End Stage Plan	108.4	107.5	0.9	105.2	3.2
Young Plan	95.2	95.9	(0.7)	92.1	3.1

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



Monthly and Annual Average Plan Funded Status Changes



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

2022 vs. 2023 Pension Risk Transfer Activity

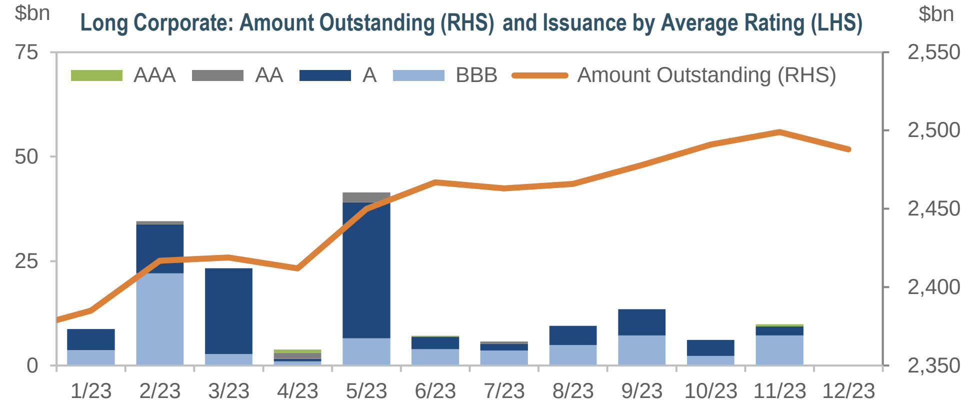
*Preliminary as of 9/30/2023

The single effective discount rate shown is for the IR+M Average Sample Plan, calculated from the FTSE Pension Discount Curve. Pension Risk Transfer data sourced from LIMRA. Totals may not sum to rounding.

Fourth Quarter 2023 Corporate Issuance

- Long issuance was very light in the fourth quarter with only one new deal priced during the month of December.
  - Long supply totaled roughly $16 billion in 4Q 2023, compared to over $42 billion issued in 4Q 2022 and $87 billion in 4Q 2021.
- 2023 issuance of $164 billion in the long end was just over half of last year's total issuance of $323 billion.
- New issue concessions across corporate deals were 8.5bps in 2023, moderately lower than 2022's average of 13bps.
- Long corporate spreads tightened from 158bps to 116bps due to persistent demand coupled with lack of new supply.

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



Trailing 12 Month Long Corporate New Issuance (bn)

AAA	AA	A	BBB	*Total*
$1.5	$5.3	$91.7	$65.5	$164.0

Largest Long-Dated USD Investment Grade Corporate Deals

Ticker	Issuer Name	Maturity	Issue Date	Average Rating (M/S&P/Fitch)	Amount Issued ($bn)	Yield at Issue (%)	Spread at Issue (bps)	Concession to Outstanding (bps)	Order Book ($bn)	Oversubscription Level (times)
RTX	RTX Corp	30	11/6/2023	BBB+	1.8	6.43	217	3.0	9.4	5.4
ISPIM	Intesa Sanpaolo SpA	30	11/20/2023	BBB	1.5	7.82	325	15.0	3.6	2.4
ENBCN	Enbridge Inc	30	11/6/2023	BBB+	1.3	6.71	187	9.5	4.9	3.9
BMY	Bristol-Myers Squibb Co	30	10/30/2023	A	1.3	6.27	122	-5.5	5.4	4.3
		40	10/30/2023	A	1.3	6.40	135	-7.5	5.7	4.6
CARR	Carrier Global Corp	30	11/15/2023	BBB-	1.0	6.21	152	-15.5	11.3	11.3
SJM	J M Smucker Co/The	20	10/11/2023	BBB	0.8	5.92	217	7.5	4.2	5.6
		30	10/11/2023	BBB	1.0	6.55	180	5.0	5.9	5.9
ED	Consolidated Edison Co of New York Inc	30	11/20/2023	A-	0.9	5.97	138	-5.5	4.5	5.0
BAYNGR	Bayer US Finance LLC	30	11/16/2023	BBB	0.8	6.88	225	0.0	5.6	7.5
DUK	Duke Energy Florida LLC	30	11/6/2023	A	0.7	6.25	142	2.0	2.9	4.1
NSC	Norfolk Southern Corp	40	11/20/2023	BBB+	0.6	5.97	138	0.0	4.3	7.2
AJG	Arthur J Gallagher & Co	30	10/30/2023	BBB	0.6	6.85	178	3.0	3.4	5.7
SPG	Simon Property Group LP	30	11/6/2023	A-	0.5	6.74	190	10.0	1.9	3.8

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

LDI Environment from 2023 into 2024

2023 provided investors with another challenging year that included a mini-banking crisis, narrow avoidance of a Government shutdown, a US credit rating downgrade, and geopolitical conflicts amid ongoing rate volatility. Interest rates fluctuated throughout the year as the Federal Reserve (Fed) attempted to tame inflation, and discount rates ultimately ended the year slightly lower. After a tough 2022, the S&P500 fully recovered and experienced a strong fourth quarter rally moving funded statuses higher across all our sample plans.

With many pensions nearing or at fully funded status, we saw more interest from clients in our Intermediate Credit solutions as overall duration needs shortened. We also partnered with many sponsors who sought more precise hedging strategies addressing curve and credit spread risk. Pension risk transfer activity took a dip in 2023 as large plans remained sidelined, seemingly enjoying the favorable market environment and their pension's positive impact to corporate financials. We anticipate continued gradual de-risking in 2024 as market volatility and recession fears are expected to persist. We also expect demand for fixed income to linger as the asset class can serve as a valuable source of liquidity especially while yields remain at attractive levels.

Technical Factors

- Higher funded statuses should encourage more derisking into fixed income from corporate pensions. Life insurers and foreign investors will also supplement captive demand in the long end.
  - The US continues to be the majority corporate debt issuer in the long end, with over 70% of total 2023 long duration debt domiciled in the US.
- M&A activity may escalate if rates fall. New investment grade supply is projected to be in line with 2023. However, long supply is expected to be limited at current high coupon levels with issuers preferring to issue in the short end.

Long Corporate spreads at 116 bps remain tight to historical averages and are more likely to result in negative forward excess returns.

Regulatory Environment

- Total estimated Special Financial Assistance (SFA) for distressed multiemployer plans is expected to total about $80 billion of which at least 67% must be invested in investment grade fixed income. To date, 104 plans have been approved with total aid totaling $54 billion.
- The Department of Labor's recommended modifications to fiduciary obligations when selecting an annuity provider for pension risk transfers are anticipated imminently. More stringent disclosures regarding an insurer's ownership structure and use of reinsurance may be a headwind for termination costs.

Upcoming elections in 2024 may bring partisan issues back to the forefront including permissibility of ESG investing in retirement plans.

Fundamental Factors

- Inflation pressures are expected to wane in 2024. The market is predicting 6 cuts of 25bps each in 2024; volatility may result if Fed action and market opinion do not converge.
- EBITDA growth, which turned negative in the second and third quarters, and refinancing at higher rates will further push interest coverage ratios lower. Overall leverage is also gradually growing.
- Shareholder dividends have been proactively reduced on fears of slowing growth and economic uncertainty.

Fundamentals are weakening, but the market is pricing in a successful "soft landing" in 2024.

Portfolio Positioning For 2023

- Long Corporate spreads are well below historical average levels and we believe they do not offer enough compensation for the increased fundamental concerns and uncertainty going forward.
  - We remain cautious with an overweight to cash and Treasuries and an underweight to spread duration.
- We materially de-risked portfolios over the course of 2023 by opportunistically rotating up-in-quality; we trimmed lower-rated, cyclical names and added high-quality, durable bonds. We believe prudent security selection can generate alpha in this challenging environment.

While our hurdle to add risk is high given tight spreads, we continue to scour the market for opportunities to increase quality or liquidity.

Heightened volatility in interest rates and broader markets is expected to continue in 2024. We will continue to help our clients hedge their plan liabilities and manage funded status risk through our practical approach to LDI.

Disclosures:

Sources: Moody's PFaroe, FTSE Russell (formerly Citigroup), LIMRA and Bloomberg. Unless otherwise stated, all data in the above commentary is as of 12/31/2023. 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%

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