IR+M INCOME RESEARCH + MANAGEMENT

# LDI MONITOR

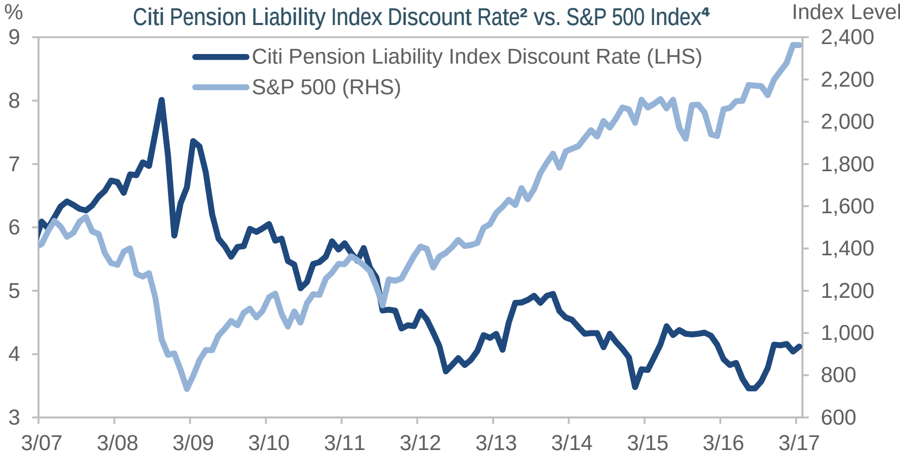
March 31, 2017

## LDI Highlights

- Corporate pension funded status improved modestly during March, moving 1.5% higher to 85.3%, and reaching levels last seen during the fall of 2015.[1]
    - Rising discount rates drove liability valuations lower, while equity markets were mostly unchanged on the month.
- Long corporate yields and spreads continue to trade in a narrow range as activity has been muted with demand and supply just offsetting each other while many buyers wait out higher rates.
- Robust long corporate issuance during March brought the 1Q17 total to roughly $75 billion, the highest first quarter on record.[6]
- Approximately $71 billion in bonds exited the Bloomberg Barclays Long Corporate Index during March, as an Index rule change raised the minimum size for eligible bonds from $250 to $300 million.[3]

| Rates Monitor | 3/31/17 | 2/28/17 | 12/31/16 |
|---|---|---|---|
| Citigroup Pension Discount Rate[2] (%) | 4.12 | 4.04 | 4.14 |
| Bloom Barc Long Credit Yield[3] (%) | 4.51 | 4.43 | 4.55 |
| Bloom Barc Long Corporate Yield[3] (%) | 4.51 | 4.43 | 4.54 |
| Bloom Barc Long BBB Corp Yield[3] (%) | 4.88 | 4.80 | 4.93 |
| 30 Year Swap Rate[4] (%) | 2.65 | 2.63 | 2.63 |
| Long BBB Corp. Yield[3] – Citi Pension Discount Rate[2] (bps) | 76 | 76 | 79 |

Citi Pension Liability Index Discount Rate[2] vs. S&P 500 Index[4]




## IR+M LDI Corner: Three Common Questions To Ask Your LDI Manager

*Q: How can we outperform our liabilities without adding funded status volatility?*

A: We believe that bottom-up security selection is paramount, and allows us to efficiently add value to LDI portfolios while still hedging the macro drivers of funded status movements.

*Q: Is now a good time to increase the hedge ratio of my plan?*

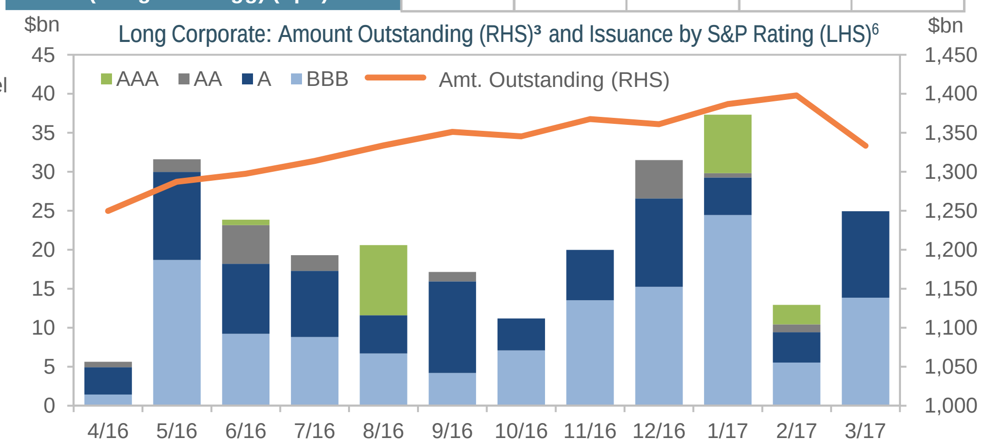
A: In 2016, many plan sponsors experienced a decline in funded status early in the year, followed by a rebound in late November. Given the potential volatility for 2017, we believe that locking in some of the post-election gains is a prudent move.

*Q: Does the potential for a rising rate environment change your views?*

A: As a bottom-up manager, we focus on conducting sound credit analysis, and not on predicting interest rates or timing market moves. We believe that, regardless of the economic environment, plan sponsors benefit more from the additional term premium and risk-reduction advantages of longer-duration assets, which help increase portfolios' hedge ratios.

| Glidepath Monitor | 3/31/17 | 2/28/17 | 12/31/16 | 3/31/16 | 3/31/14 |
|---|---|---|---|---|---|
| Funded Status[1] (%) | 85.3 | 83.8 | 83.3 | 78.6 | 84.8 |
| Long Credit Rates[5] (%) | 4.51 | 4.43 | 4.55 | 4.56 | 4.85 |
| Long Credit Spreads[5] (bps) | 168 | 164 | 167 | 223 | 155 |
| Curve[3] (Long Cred - Int. Cred) (bps) | 182 | 180 | 180 | 210 | 254 |
| Curve[3] (Long G/C - Agg) (bps) | 127 | 128 | 134 | 157 | 197 |

Long Corporate: Amount Outstanding (RHS)[3] and Issuance by S&P Rating (LHS)[6]




Trailing 12 Month Long Corporate New Issuance[6] (bn)

| AAA | AA | A | BBB | *Total* |
|---|---|---|---|---|
| $19.7 | $16.9 | $90.6 | $128.7 | *$255.9* |

[1]Milliman (Historical numbers revised as of 3/31/17); [2]Citigroup; [3]Bloomberg Barclays; [4]Bloomberg; [5]Long rates and long spreads represented by Bloomberg Barclays Long Credit Index yield and spread; [6]JP Morgan