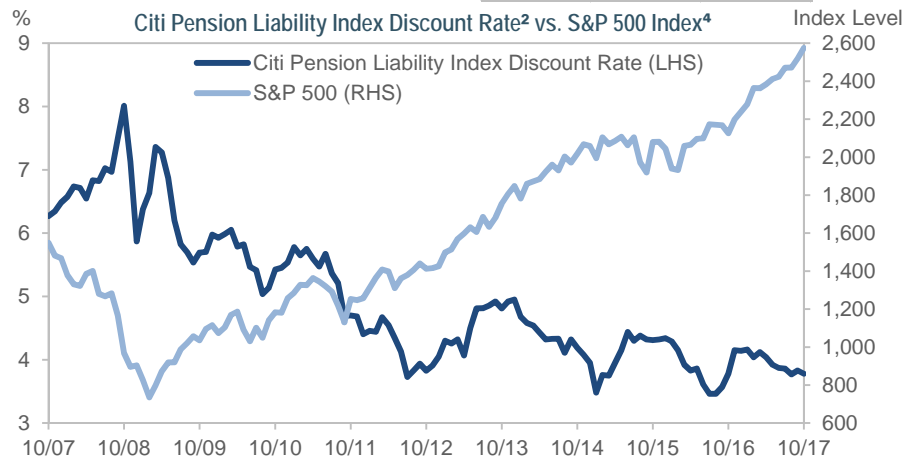


LDI Highlights

- Corporate pension funded status increased 0.4% during the month to 84.7%, as strong equity market returns outpaced a 5bps decline in discount rates.¹
 - Equity markets continued their unprecedented rise, as the S&P 500 gained 2.2% during October.⁴
- Long corporate spreads hit a new post-crisis tight of 141bps during October; strong third quarter earnings and robust demand provided a positive tailwind.³
- Long-dated corporate issuance maintained its torrid pace during October surpassing \$23 billion for the fourth straight month; since June, an estimated \$111 billion in new issue has priced.⁶

Rates Monitor	10/31/17	9/30/17	12/31/16
Citigroup Pension Discount Rate ² (%)	3.78	3.83	4.14
Bloom Barc Long Credit Yield ³ (%)	4.15	4.18	4.55
Bloom Barc Long Corporate Yield ³ (%)	4.15	4.18	4.54
Bloom Barc Long BBB Corp Yield ³ (%)	4.49	4.53	4.93
30 Year Swap Rate ⁴ (%)	2.59	2.53	2.63
Long BBB Corp. Yield ³ - Citi Pension Discount Rate ² (bps)	71	70	79

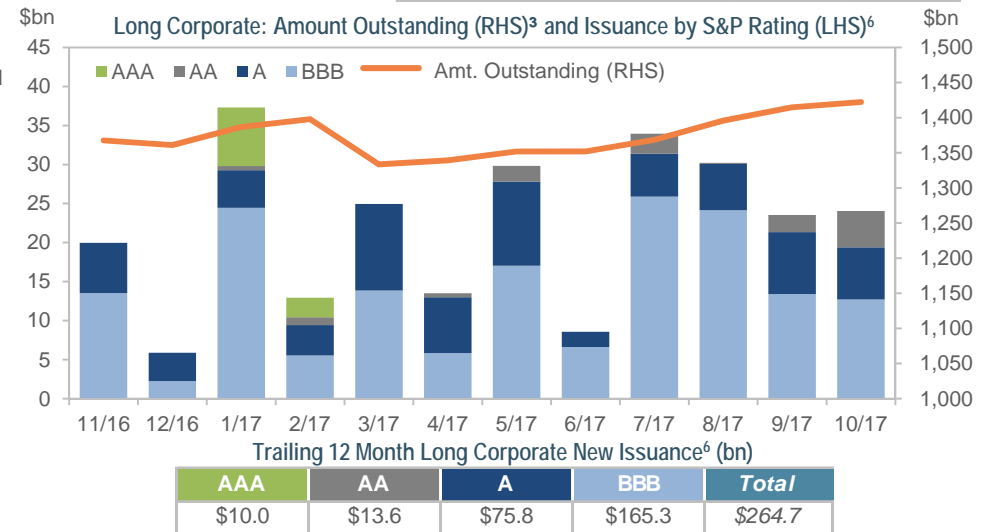

LDI MONITOR

October 31, 2017

IR+M LDI Corner: The Balance is Changing

- Cash balance plans have become an increasingly popular alternative for plan sponsors, as they look to freeze benefits and close their plans to new entrants. In many cases, ongoing accruals are concentrated in cash balance benefit structures.
- For those sponsors looking to hedge their liabilities, the smaller size of cash balance liabilities relative to historical benefits made them less of a focus in hedging discussions. However, as historical liabilities are reduced through risk transfer activities, and cash balance accruals continue, some plan sponsors are reconsidering these discussions.
- From a hedging perspective, cash balance plans can present very different challenges to final salary plans. The relationship of the discount rate to the interest crediting rate, and any floors or caps on increases, requires careful consideration. Approaching these challenges separately from those faced when considering traditional liability management may lead to more appropriate solutions for some sponsors, while others may find efficiencies through a more holistic approach.

Glidepath Monitor	10/31/17	9/30/17	12/31/16	10/31/16	10/31/14
Funded Status ¹ (%)	84.7	84.3	83.3	79.0	83.1
Long Credit Rates ⁵ (%)	4.15	4.18	4.55	4.22	4.51
Long Credit Spreads ⁵ (bps)	144	149	167	188	168
Curve ³ (Long Cred - Int. Cred) (bps)	153	159	180	195	224
Curve ³ (Long G/C - Agg) (bps)	101	107	134	141	171



¹Milliman (Historical numbers revised as of 3/31/17); ²Citigroup; ³Bloomberg Barclays; ⁴Bloomberg; ⁵Long rates and long spreads represented by Bloomberg Barclays Long Credit Index yield and spread; ⁶JP Morgan. All data in the above commentary is as of 10/31/17. Yields are represented as of the aforementioned date and are subject to change. The views contained in this report are those of IR+M and are based on information obtained by IR+M from sources that are believed to be reliable. This report is for informational purposes only and is not intended to provide specific advice, recommendations for, or projected returns of any particular IR+M product. No part of this material may be reproduced in any form, or referred to in any other publication, without express written permission from Income Research & Management.