Citi **Fixed Income Indices**

June 2014

Citi Pension Liability Index

The growing adoption of Liability Driven Investment (LDI) strategies in the pension funds world is evidence of plan sponsors' need to focus on liabilities and how these are impacted by changes in market factors such as rates and spreads. The Citi Pension Liability Index (CPLI) reflects the discount rate that can be used to value liabilities for GAAP reporting purposes. Created in 1994, it is a trusted source for plan sponsors and actuaries to value defined-benefit pension liabilities in compliance with the SEC's and FASB's requirements on the establishment of a discount rate. The index also provides an investment performance benchmark for asset-liability management. By monitoring CPLI returns over time, investors can gauge changes in the value of pension liabilities.

The Citi Pension Liability Index is derived from Citi's Pension Discount Curve (CPDC).

Citi Pension Discount Curve

A set of yields on hypothetical AA zero coupon bonds whose maturities range from 6 months up to 30 years. The yields of the CPDC are used to discount pension liabilities.

The CPDC is calculated based on a universe of AA rated corporate bonds from Citi's US Broad Investment-Grade Bond Index (USBIG) and the yields of Citi's Treasury model curve.

Citi Pension Liability Index

The CPLI represents the single discount rate that would produce the same present value as calculated by discounting a standardized set of liabilities using the CPDC.

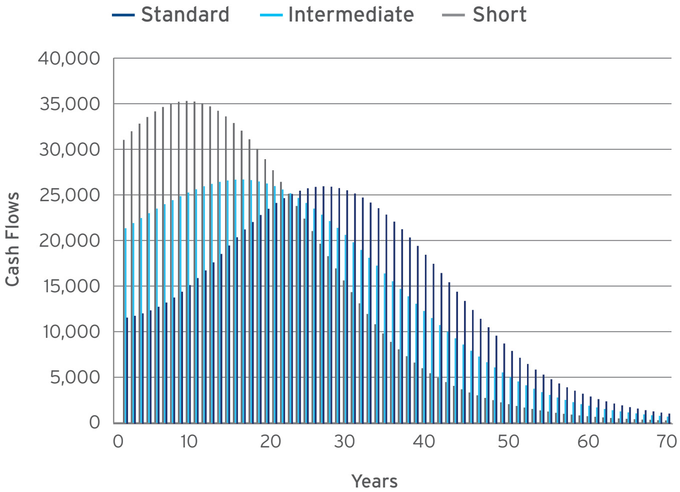
Along with the rate, monthly returns and durations for the CPLI liabilities are also made available.

A FAMILY OF INDICES

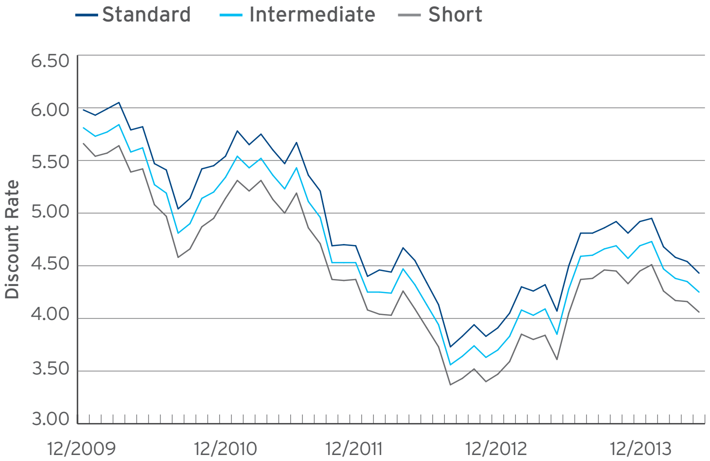
Rigorously adapting to the evolution of the pension world, with more pension plans closed to some or new entrants, the CPLI family was enlarged in 2010 with two additional discount rates calculated for pensions with shorter liabilities.

- Short CPLI: with a weighted average life (WAL) of 16.8 years, the index is comparable to a fully-closed plan
- Intermediate CPLI: with a weighted average life (WAL) of 21.2 years, the index resembles a plan that is closed to new entrants
- Standard CPLI: with a weighted average life (WAL) of 26.9 years, the index represents a fully-open plan

Relative liabilities used to calculate the three CPLIs



The three CPLIs through time



Source: Citi Research. Data as of 04/30/2014

www.yieldbook.com/citi-indices

CASE STUDY USES OF CITI PENSION DISCOUNT CURVE

Client: Pension Asset Manager

Objective: Attribute asset-liability performance to liability-specific factors

Our Solution: Liability returns are affected by factors that are specific to liability discounting methods. To better understand the impact of these factors on asset-liability performance differences, Citi produced a set of custom pension discount curves that enabled the client to attribute the returns of their liabilities to market factors, carry, credit rating changes, and discount curve rules.

Client: Pension Asset Manager

Objective: Evaluate the impact of credit rating changes on liability returns

Our Solution: Rating drift, especially issuers downgrading out of double-A, is one of the many factors that can impact liability levels. To help the client isolate the impact of upgrades or downgrades Citi produced a customized discount curve using ratings unchanged from the previous month and compared this with Citi's official Pension Discount Curve.

Client: Pension LDI Advisor

Objective: Determine the timing of asset allocation changes for a glide-path strategy

Our Solution: In a glide-path strategy, pensions shift allocations from more return-seeking assets to more liability-hedging assets as they become better funded. There are funding level triggers at which the investment mix will change. By monitoring liability values on a daily basis, using Citi's daily pension discount curves, pensions and their advisors will know when the trigger funding levels have been reached in order to adjust their investment mix accordingly.

Client: Pension Asset Manager

Objective: Evaluate the spread exposure of pension liabilities to issuers and sectors

Our Solution: Understanding the sensitivity of liabilities to spreads of issuers and the liability exposure to sectors is important to better management of asset portfolios. Citi's bespoke analysis can determine the exact exposure of pension liabilities to industry sectors and each issuer in the universe of bonds used to generate the discount curve.

ACCESS TO CPLI & CPDC

- Citi Fixed Income Indices website (www.yieldbook.com/citi-indices)
- Citi Velocity℠
- Society of Actuaries (www.soa.org)
- The CPDC and CPLI family are available on a monthly and daily basis[1]

CUSTOMIZATION

- Citi offers flexibility in customizing its family of fixed income indices to meet the most specific investment goals
- Customization options for the CPLI and CPDC include accommodating for investor-specific liability schedules, expanding the initial universe of bonds, calculating credit exposure of pension liabilities relative to CPDC, and more

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[1] Daily files are offered at a fee

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