

The Pension Plan Conundrum: De-risking Amid Interest Rate Uncertainty

By Ankit Agarwal, CFA, VP, Director of LDI and Solutions

KEY TAKEAWAYS

- We worry that pension plans' de-risking decisions may be delayed, with partial or no action on glide path triggers. Why might there be a delay? Pension funds may be hoping for higher long-term interest rates and have potential misconceptions about their impact on pension plans.
- We discuss two ideas that we believe are misconceptions about the future path of long-term interest rates, their impact on pension liabilities and why plan sponsors should generally not hold back from acting on the current funding ratio trigger or from implementing an LDI framework.
- In our view, the LDI framework with a strategic glide path provides pension plans with a systematic de-risking methodology and, irrespective of the views on interest rates, can be a valuable tool in the quest for optimal asset allocation.

Now that the Federal Open Market Committee (FOMC) has started raising the federal funds rate from historic lows, we worry that pension plans' de-risking decisions may be delayed, with partial or no action on glide path triggers.

Why might there be a delay? Pension funds may be hoping for higher long-term interest rates and may have potential misconceptions about the impact of interest rates on pension plans.

We believe that for plan sponsors focused primarily on reducing the volatility of a plan's funding ratio, following a systematic liability-driven investing (LDI) framework with a glide path designed to increase allocation to liability-hedging assets (LHA) with an increasing funding ratio may be an appropriate course of action. We also believe that LHA should be designed holistically, taking allocation to risk-seeking assets (RSA) into consideration. ([See LDI: Taking A Holistic, Practical Approach](#)).

In this paper, we will look at two ideas that we believe are misconceptions about the future path of long-term interest rates, their impact on pension liabilities and why plan sponsors should generally not hold back from acting on the current funding ratio trigger or from implementing an LDI framework.

MISCONCEPTIONS:

1. Rising short-term interest rates will lead to a proportionate rise in long-term rates.
2. Rising rates will certainly reduce the present value of liabilities and increase a plan's funding ratio.



The Effect of Rising Short-Term Interest Rates on Long-Term Rates Is, at Best, Hard to Predict

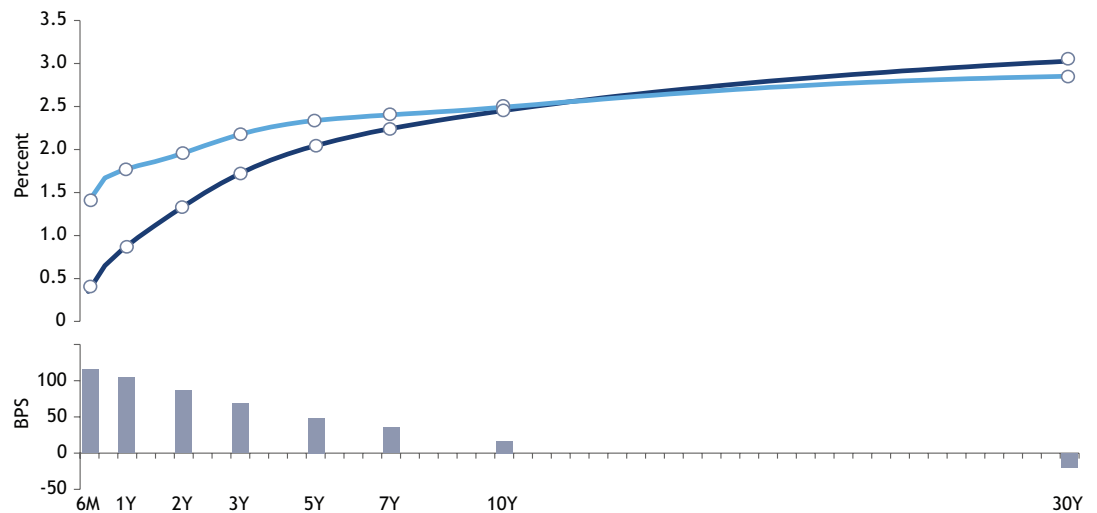
The FOMC has increased the fed funds rate by 125 basis points (bps) since the start of the current hiking cycle, and the fed funds rate is projected to rise further by the end of 2018.ⁱ We agree that short-term interest rates are on the rise, and an appropriate estimate for short-term rates in the near future would be higher rather than lower.

However, we are not confident about the impact of the FOMC's hiking cycle on long-term interest rates. If recent history is any indication, a rise in short-term rates tends to compress the term premium, leading to a small or no rise in long-term interest rates. During the last two hiking cycles (July 1999 to July 2000; June 2004 to August 2006), long-term interest rates only went up marginally; so far, the current hiking cycle has followed a similar pattern.

The graph below highlights how the shape of the Treasury yield curve has changed during the current hiking cycle. The flattening of the yield curve is evident, with a marginal decrease in the long-term interest rates.

THE FLATTENING TREASURY YIELD CURVE
Source: Bloomberg, data as of November 30, 2017.

■ 11/30/2015
■ 11/30/2017
■ Difference



The Impact of Rate Hikes and Cuts on Pension Plans Varies Greatly

With 10-year Treasury rates range bound between roughly 2.0–2.5%, the downside risk for a pension plan in adding duration is limited to Treasury interest rates falling to 0%,ⁱⁱ while the upside is unlimited. Historically, 10-year Treasury rates reached their highest level ever back in September 1981, rising to almost 16%.

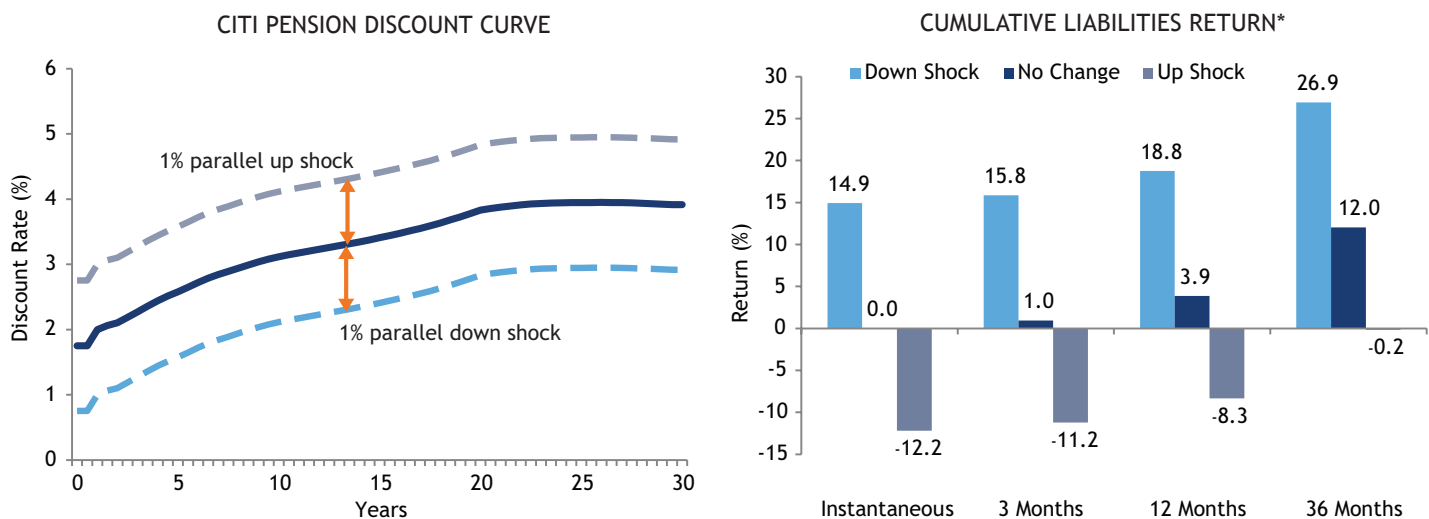
The risk/reward for adding duration looks asymmetric from a Treasury interest rate perspective. However, carry and the convexity of pension cash flows skew the return distribution. The present value of pension cash flows tends to change at a much faster clip when rates fall than when rates rise.

On the following page, we have calculated the change in the present value of a hypothetical liability cash flowⁱⁱⁱ due to parallel shocks in the Citigroup pension-discount curve over various time horizons. For example, in order to calculate the cumulative return of liabilities due to an instantaneous shock, we computed the ratio of present values of liability cash flows using the current curve and the shocked curve.



Similarly, to calculate the cumulative return of liabilities over 36 months, we shocked the curve in equal monthly steps. We then computed the ratio of the present value of liability cash flows using the current curve and the shocked curve each month. This series was cumulated to generate the cumulative liabilities return over 36 months.

IMPACT OF PENSION DISCOUNT CURVE SHOCKS ON LIABILITIES



*Liabilities return calculated using a cash flow of 14-year duration on 11/30/2017
Source: Citigroup, Russell Standard Cash Flow Generator, Bloomberg, Loomis Sayles analysis.
Data and analysis as of 11/30/2017.
Past performance is no guarantee of future results.

A Few Key Observations Based on This Analysis:

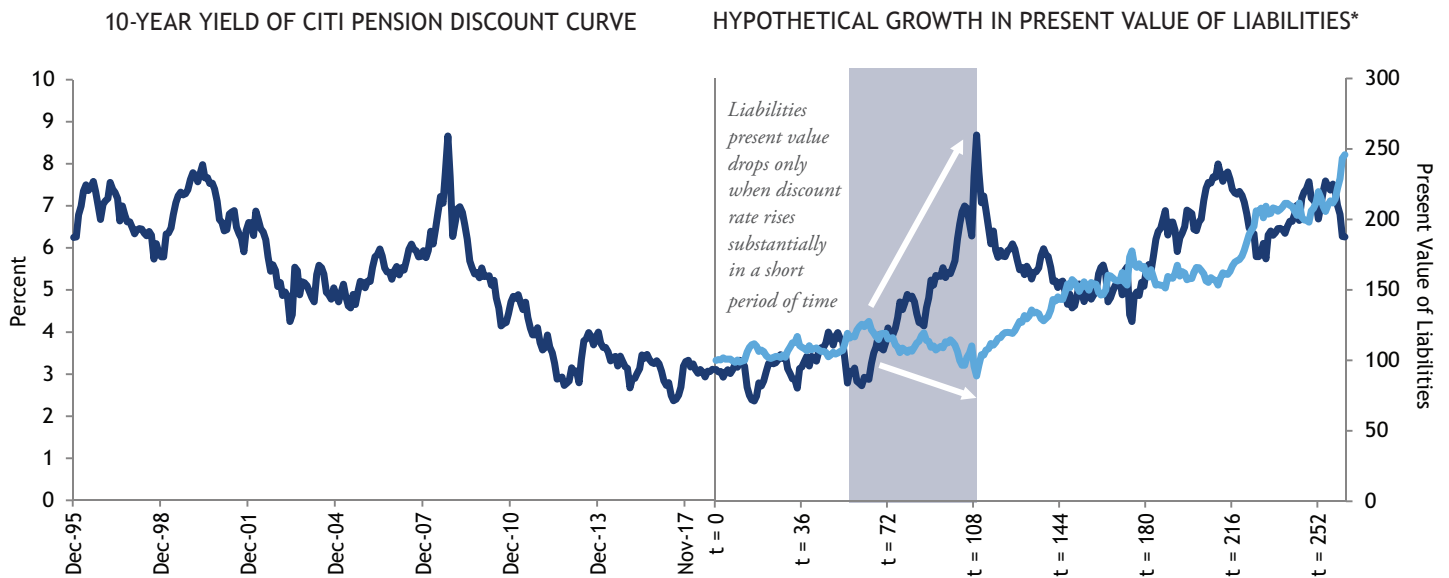
1. When the discount curve is shocked instantaneously, the impact of a 100-bp rate decrease on liability cash flows is not identical to a 100-bp rate increase. The magnitude of return differs by almost 3 percentage points when rates drop versus when they rise. Since the shock is instantaneous, the difference in returns is driven primarily by the convexity of pension cash flows
2. If a similar shock of 100 bps happens in equal steps over a longer period, the difference between returns gets magnified. For example, a comparison of a 100-bp rise and a 100-bp fall over a period of 36 months results in a difference of 27 percentage points between the liabilities return.
3. For rising rates to create a meaningful impact for any pension plan, the rise has to be substantial and instantaneous. A hypothetical 100-bp instantaneous rise in the discount curve would decrease the present value of liabilities by 12.2%, while the same shock propagated over a period of 36 months would lead to no change in the present value of liabilities.

Based on this analysis, we can conclude that as a time horizon expands, carry tends to dominate the liability returns.



To further highlight the impact of carry on liability returns, we did an analytical experiment of calculating liability returns assuming the Citigroup pension discount curve has retraced its course. The graph below on the left shows the 10-year yield of the Citigroup pension discount curve from December 1995 to November 2017, and the graph on the right shows the growth in the present value of a hypothetical liability cash flow starting at 100 assuming retracement of the Citigroup pension discount curve.

AN ANALYTICAL EXPERIMENT



*Hypothetical liabilities return calculated using a cash flow of 14-year duration on 11/30/2017
Source: Citigroup, Russell Standard Cash Flow Generator, Bloomberg, Loomis Sayles analysis.
Data and analysis as of 11/30/2017.

A Few Key Observations Based on This Analysis

1. The present value of pension cash flows can go up even in a rising rate environment. In this experiment, the retracement of the Citigroup pension discount curve results in the 10-year yield going up to 6.2% starting from 3.2%, but instead of dropping in value, liability present value increased significantly.
2. Timing plays a crucial role in taking advantage of rising rates; the benefit in terms of reduced present value of pension cash flows comes especially at times when rates rise quickly. The highlighted region above indicates a window where increasing the interest hedge ratio by plan sponsors would have resulted in a meaningful funding ratio benefit to the plans.
3. As rates go up, so does the carry. The accumulation of carry over a long period can lead to growth in liability present value even if rates are on the rise. This experiment highlights this impact. The present value of liabilities has grown hypothetically at an annualized compounded rate of 3.96% during the period of this experiment. Attribution of this return in change and carry highlights the impact of carry, which contributed 5.59% annually, while the change component was -1.63% due to rising yields.



Stick to What You Know Best

While it is hard to argue with the fact that interest rates are historically low, we tend to believe that predicting the future path of interest rates, and most importantly long-term interest rates, can be a fruitless endeavor fraught with pitfalls. It is not obvious to us that the next move in long-term interest rates will be up, and we believe arguments can be made to justify scenarios that suggest rates will remain unchanged, or go down further, or go up.

Our belief is that for pension plans with a long-term horizon, a decision-making process firmly grounded in risk management focused on reducing surplus plan volatility provides an appropriate approach. The LDI framework with a strategic glide path can provide pension plans with a systematic de-risking methodology and, irrespective of the views on interest rates, can be a valuable tool in the quest for optimal asset allocation.

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Endnotes

- ⁱAs of January 2018; current interest rate hiking cycle began in December 2015.
- ⁱⁱWe acknowledge that for a period in 2016, Sovereign Treasury rates, mainly German 10-year and Japanese 10-year yields, dropped below 0%. We cede that in the presence of these instances, 0% is not the empirical lower bound. However, there are practical limitations in rates falling much below 0%. For the purpose of this discussion, we have controlled for this variable.
- ⁱⁱⁱWe have ignored the interplay between Treasury rates and spread for the purpose of this analysis and have only used the shock in Treasury rates to represent the shock to liability discount curve. We have also ignored the impact on a plan's asset allocation and focused on the liabilities return for this analysis.

Disclosure

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