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Is Your LDI Strategy Recession Ready?

U.S. corporate defined benefit pension plans have experienced marked improvements in funded status in recent years due to several factors, including:

- Accelerated voluntary contributions spurred by U.S. corporate tax reform and rising Pension Benefit Guaranty Corporation premiums;
- Higher long-term interest rates;
- Low levels of credit migration; and
- Strong equity market performance.

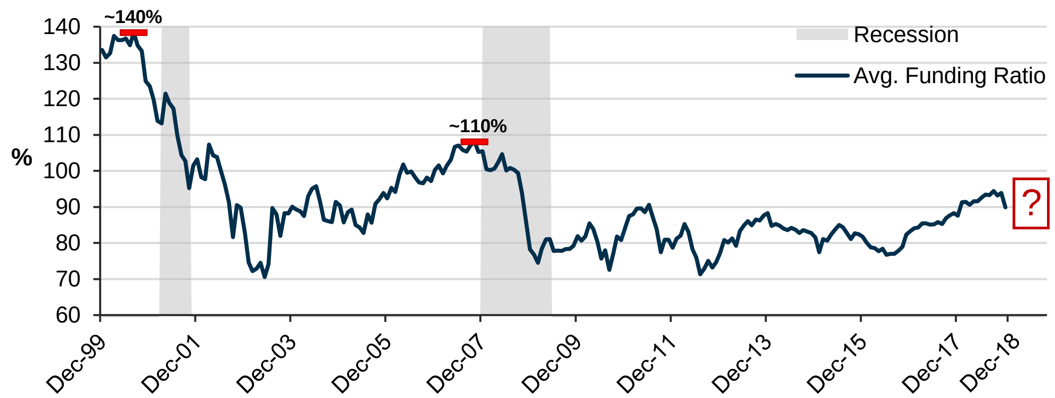
However, this helpful environment for funded status may not last forever. The current economic expansion is long in the tooth, recession probabilities are rising, and 2018's stock and bond market sell-offs have already impacted many plans' funded status.

In the past two recessions, strong funded status positions were severely eroded, as illustrated in Figure 1. What actions can plan sponsors take now to protect the gains in funded status that have been made in the past few years? In this paper, we identify the primary risks to a plan's funded status and provide practical considerations for plan sponsors.

RIDING THE ROLLERCOASTER

The aggregate funded status of U.S. corporate defined benefit plans has experienced two big plunges in the last 20 years. As shown below, both instances coincided with recessions when interest rates fell and the stock market declined. The combination proved disastrous for most plans' funded status. It is also worth noting that pre-recession aggregate funded status peaked at fairly high levels in the previous two cycles (nearly 140% in 2000 and 110% in 2007). While we can't say with certainty when the current, extended cycle will end, aggregate funded status hovered near 90% as of year-end 2018.

FIGURE 1: FUNDED STATUS OF LARGEST 100 U.S. CORPORATE PENSION PLANS



Source: Milliman, EBRI as of December 2018.

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Many pension plans are still riding the funded status rollercoaster and the question now is: How can they avoid giving back the recent gains in funded status in the next recession?

JUMPING OFF THE ROLLERCOASTER

Plotting the rollercoaster exit strategy first requires identifying the primary risks to funded status. For most corporate defined benefit pension plans, they are as follows:

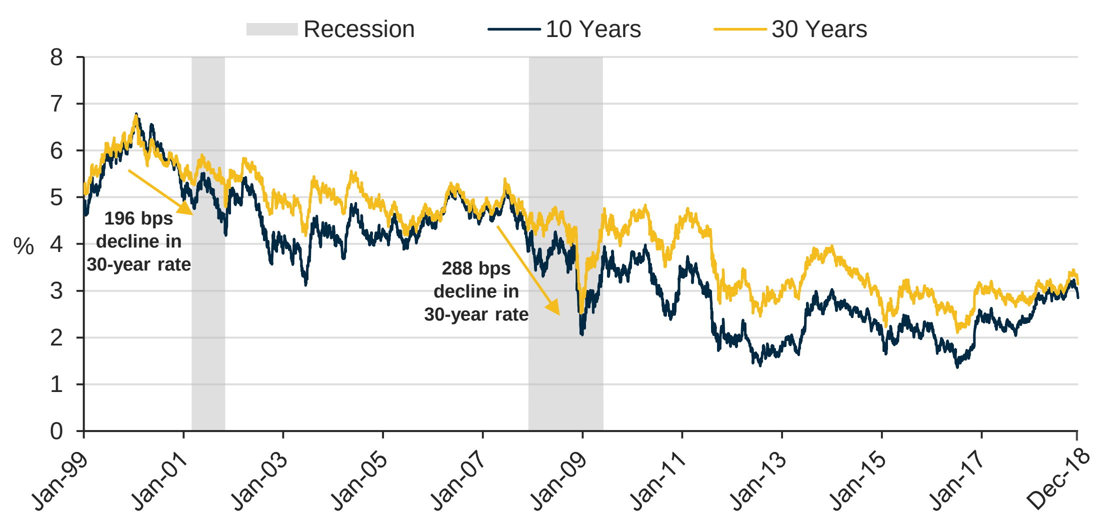
- Declining long-term U.S. interest rates (10 to 30 years)
- Tightening long-dated corporate spreads (10- to 30-year high-quality spreads)
- Credit migration in investment grade corporate bonds
- Falling risk assets (principally U.S. and international equity markets)

We will address each of these risks in turn and then share some practical steps plan sponsors can take to reduce risk and protect funded status.

• Long-Term U.S. Interest Rates

As noted earlier, interest rates fell considerably during and following the last two recessions, which contributed to the drop in funded status experienced by pension plans.

FIGURE 2: U.S. TREASURY RATES



Source: Milliman, EBRI as of December 2018.

Sample Plan's Funded Status Has Large Exposure to Declining Long-Term Interest Rates

It is uncertain how strong and robust the relationship is between interest rates and recessions. While interest rates have tended to fall during recessions in recent decades, there is no guarantee that rates will necessarily fall in future recessions; for example, in a stagflationary scenario. However, it is *very* clear that the liability duration mismatch continues to be one of the largest sources of risk that pension plans face today.

In the following example, we estimate the duration mismatch of a sample pension plan. As you can see in Figure 3, the sample plan is short about 6 years of liability duration contribution in the 10- to 30-year key rate buckets. Therefore, a 1.0% parallel shift lower in the U.S. Treasury curve would decrease the sample plan's funded status position by roughly 7%.[1]

Again, while the relationship between interest rates and recessions is uncertain, we believe a 1% shift lower in long-term rates is easy to imagine given the large peak-to-trough declines in the last two recessions, as shown above.

[1] *The 100 bps shift lower in yields reduces funded status by more than the linear duration estimate due to convexity.*

FIGURE 3: SAMPLE PENSION PLAN DURATION MISMATCH ANALYSIS

Duration Contribution		2Yr KRD	3Yr KRD	5Yr KRD	10Yr KRD	20Yr KRD	30Yr KRD
Liability	12.6	0.0	0.1	0.4	2.0	4.1	6.1
Fixed Income	6.0	0.0	0.0	0.0	0.4	2.4	3.2
Gap	**6.7**	**0.0**	**0.1**	**0.4**	**1.7**	**1.7**	**2.9**
Hedge Ratio	47%	6%	2%	3%	17%	59%	52%

For illustrative purposes only. Does not constitute investment advice and should not be used as the basis for any investment decision. Source: PGIM Fixed Income and Bloomberg Barclays. Sample plan is 90% funded, 45% fixed income allocation invested in a Long Government Credit Strategy.

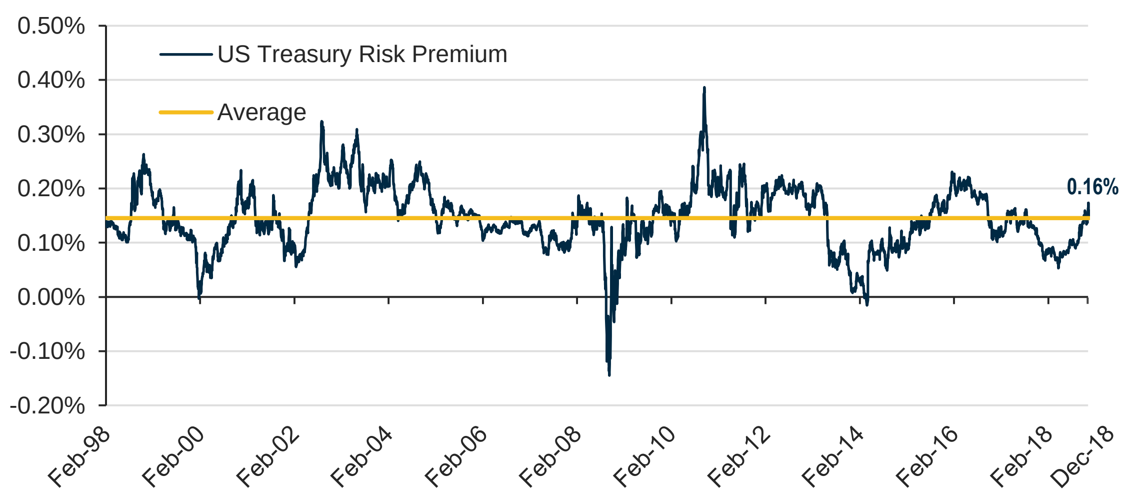
Consideration: Raise the pension plan's interest rate liability hedge ratio.

This consideration is valid independently of whether interest rates fall in the next recession, because of:

- Our longer-term view that the central tendency for the 10-year U.S. Treasury yield is around 2.5%, lower than today's level. See *"Lower Range to Drive Stealth Bull Market in Bonds"* at PGIMFixedIncome.com for more details.
- A strategic asset allocation view that the positive term risk premium in the U.S. Treasury yield curve means that a low liability hedge ratio costs funded status over the long term and is a poor use of surplus risk budget. See *"LDI: The Hidden Cost of Mismatching Duration"* at PGIMFixedIncome.com for more details.

It is also worth noting that, unlike some other asset managers and the Federal Reserve itself, our analysis reveals that the term risk premium in the yield curve is actually very positive today, as illustrated in Figure 4.

FIGURE 4: U.S. TREASURY RISK PREMIUM



Source: PGIM Fixed Income proprietary term structure model (G2+) as of December 31, 2018.

• Corporate Spread Risk[2] of Hedging Portfolio

In recent years, both the percentage of BBB-rated bonds in the Bloomberg Barclays U.S. Long Corporate Bond Index and the duration of that index have increased meaningfully. At the same time, the durations of closed and frozen pension liabilities have been shortening as plans mature. Pension liabilities have AA-rated corporate spread risk, while the long corporate index is a mixture of all investment grade ratings.

This combination of higher duration and lower quality means that the corporate spread risk of the long corporate bond index has been increasing relative to the corporate spread risk of pension liabilities. Figure 6 on the following page demonstrates this divergence using data from the long corporate index and the sample pension plan.

[2] *Defined as a measure of corporate spread risk (one standard deviation) that reflects differences in duration and volatility by sector and quality.*

FIGURE 5: DURATION AND MARKET VALUE OF U.S. LONG CORPORATE INDEX BY QUALITY

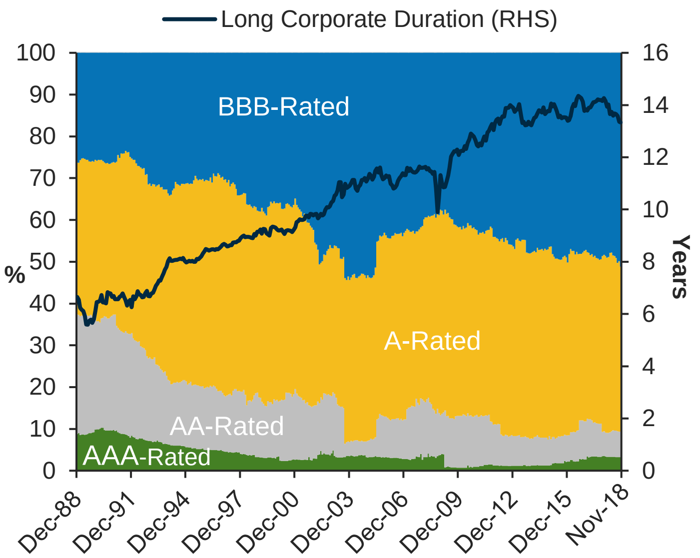
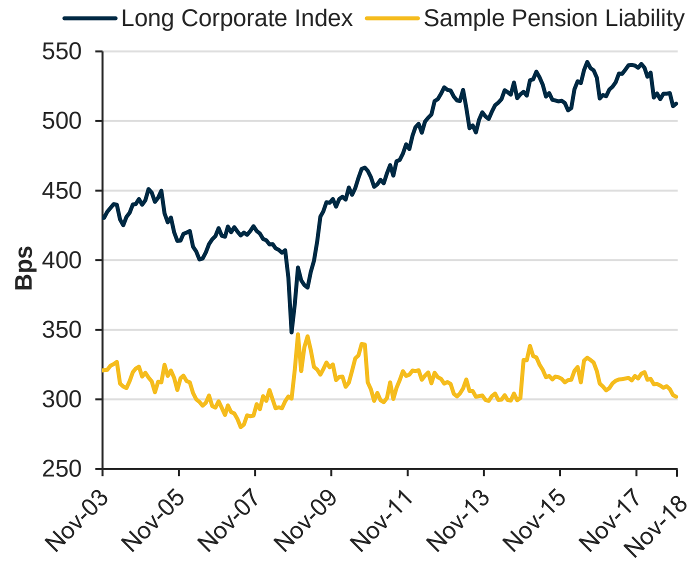


FIGURE 6: ESTIMATES OF U.S. CORPORATE SPREAD RISK



Source: Barclays Point as of November 2018. Data represents the Bloomberg Barclays U.S. Long Corporate Bond Index.

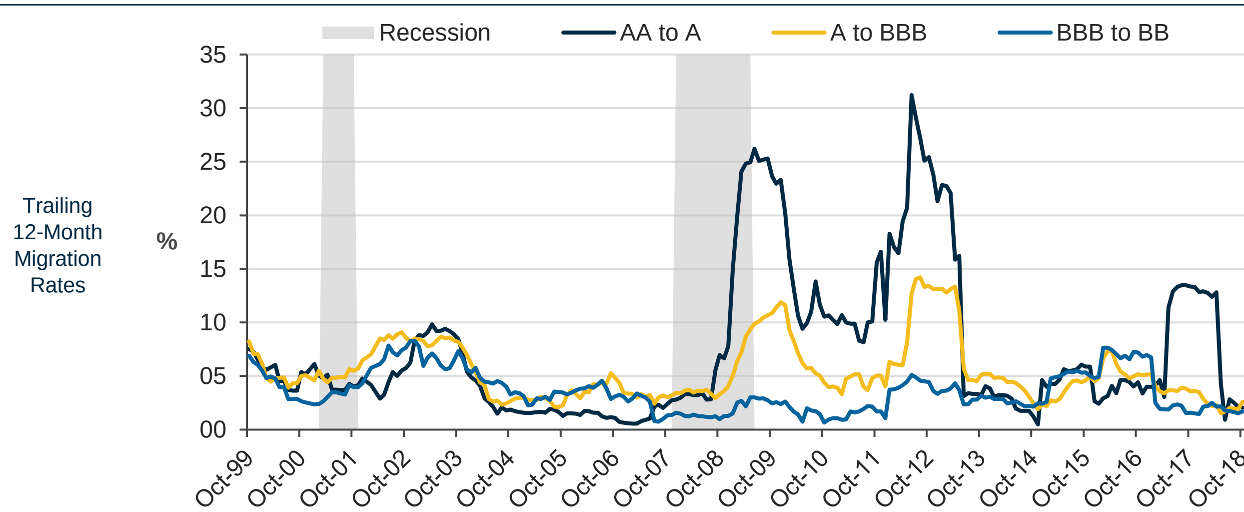
Plan sponsors need to be aware of both the elevated level of spread beta in the hedging portfolio and, more importantly, the interaction with their risk assets. These exposures are positively correlated and, as seen in past stressed market conditions, those correlations can increase.

Consideration: Stress test how the increased hedging portfolio spread beta, along with the interaction of the risk assets, may have increased funded status drawdown risk. If that drawdown risk is beyond the risk tolerance of the pension committee, consider reducing spread duration and/or risk asset exposure to help lower funded status drawdown risk.

• Credit Migration in the Corporate Market

Credit rating downgrades tend to be concentrated during (or just after) recessions. Managing credit migration is important because there is an unhedgeable basis risk between a defined benefit plan's corporate bond hedging portfolio and its liabilities. Downgraded and defaulted bonds just vanish from the actuarial discount curves. There is no such good fortune in the hedging portfolio. Downgraded bonds do not vanish. They underperform and lower the plan's funded status. This basis mismatch gives a plan's funded status an acute sensitivity to negative credit migration.

FIGURE 7: RATING MIGRATION BY CREDIT QUALITY FOLLOWING TWO MOST RECENT RECESSIONS



Source: Moody's, PGIM Fixed Income as of October 2018.

It can be difficult to hold an LDI manager accountable for the downgrade risk. Market indices can be blended to represent the systematic interest rate and credit spread risks of a pension liability, but they cannot represent the unhedgeable credit migration risk that a plan faces. If a market benchmark is used for an LDI strategy, the manager is responsible for the credit risk of their active decisions and they may not be focused on, or accountable for, the downgrade risk between the benchmark and the liabilities.

For example, consider a particular issuer that is a 3% weight in a market index. If the LDI manager is benchmarked against that index but has a negative view of that issuer, they may underweight the issuer and, for example, hold a 2% weight in the portfolio. If the issuer has a credit event and its spreads widen, the manager may attribute positive alpha to the underweight and claim it as a winner in the next portfolio review. But to the plan, any downgrade is a loser and hurts funded status. **In other words, the underweight to the manager is actually an overweight to the plan.**

Consideration: Consider the potential benefits of moving from a market benchmark to a liability cashflow benchmark. Liability benchmarks make the LDI manager responsible for *all* credit risk in the portfolio—not just their active positions relative to an index. This greater awareness of the downgrade cost faced by the plan may incent some changes in portfolio construction.

This style of benchmarking works best when combined with an investment process that emphasizes bottom-up security selection. Additionally, this benchmarking approach can encourage and enable sector diversification and allow the portfolio manager to include other non-corporate sectors (such as AAA-rated structured products) that have structurally lower downgrade risk.

• Risk Asset Allocation

The risk asset allocation decision should be distinct from the interest rate hedge ratio decision. Given the very deep and liquid interest rate and equity derivative markets, there is no reason that a plan's interest rate hedge ratio must be linked to the size of the risk asset exposure.

Many plans sponsors want to maintain some portion of risk assets for the long term for a variety of both economic and accounting reasons. Treating the interest rate decision as distinct to this risk asset allocation can help to avoid the plan's funded status risk being long risk assets and short duration. That combination hurt funded status the most in the past two recessions.

Consideration: Treat the risk allocation and interest rate hedge ratio as distinct decisions that can and should be independent of each other. Employ the full toolkit of instruments (including STRIPS and interest rate and equity derivatives) to help the plan achieve both a high interest rate hedge ratio along with the desired risk asset exposure.

CONCLUSION

Pension plans have benefited from the rise in interest rates and strong equity markets following a long period of easy monetary policy and, more recently, the 2016 presidential election, fiscal stimulus, and corporate tax reform. Now that the Federal Reserve's future policy is less certain and mid- to late-cycle indicators are on the rise, the probability of a recession is inching higher. **The fundamental question for plans now is: Should you stay on the funded status rollercoaster or move toward a recession-ready LDI strategy?** Plan sponsors interested in getting off the rollercoaster at this advantageous point can choose from one or more practical steps presented here to lower their funded status risk.

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NOTICE: IMPORTANT INFORMATION

Source(s) of data (unless otherwise noted): PGIM Fixed Income as of January 2019.

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