Prospective Funded Status Volatility

The recent negative performance of most risk assets, coupled with dramatically lower interest rates, has had the obvious effect of reducing funded status for most corporate defined benefit pension plans. Though perhaps less obvious, dramatically higher prospective volatilities have material implications for both asset allocation and interest rate hedging strategies.

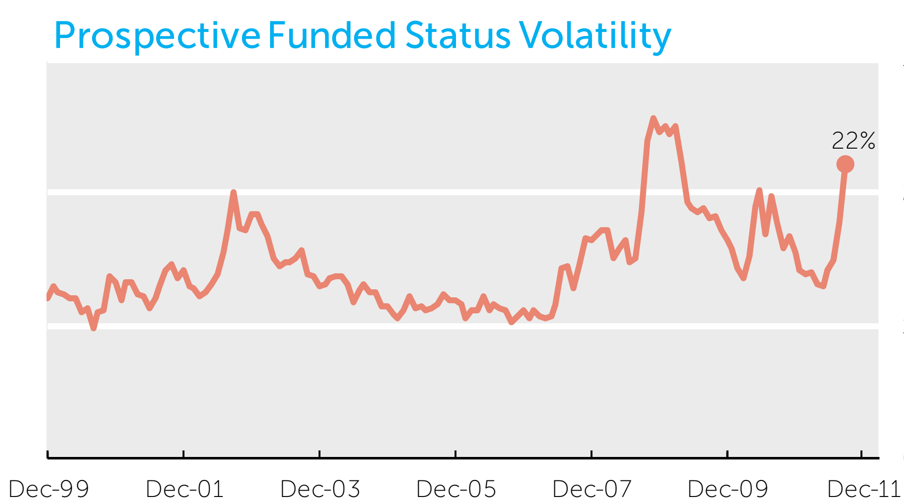
Funded status of most US pension plans has fallen substantially in recent months, with liability discount rates 75bps lower and global equity values down by ~15%. In total, the average pension plan has probably seen a decline of 10%-20% in its funded status in the third quarter of 2011.

Less publicized is an increase in the expected funded status volatility of as much as 70% over the same period. Since asset allocation targets are generally set, in part, based on expected funded status volatility, a change of this magnitude may move a plan outside its intended funded status risk budget. Common rebalancing rules are likely to exacerbate this issue, both because of an increase in risk assets as well as a decrease in the portion of the liability being hedged, due to a reduction in fixed income. Current market conditions may warrant reconsidering such policies and potentially adjusting rebalancing trades to reflect this increased market risk.

Estimating Prospective Funded Status

Understanding pension plan risk requires a parallel appreciation of volatility estimates for both assets and liabilities. The key drivers of funded status volatility are derived from estimates of general interest rate volatility, spread volatility and risk asset (e.g., equity) volatility. For ease of exposition, in the examples that follow we consider a hypothetical fully funded plan with a 60% allocation to global equity and a 40% allocation to long governments/credit. Though overly simplified compared to typical large plan asset allocations (e.g., no allocation to alternatives), this plan provides a reasonable metric for assessing the relative size of funded status risk over time.

Our estimates of prospective, annualized funded status volatility for this hypothetical plan since 1999 are illustrated below.



We refer to this series as "Prospective Funded Status Volatility" as it has been developed to measure expected future volatility rather than historical volatility. To this end, we use

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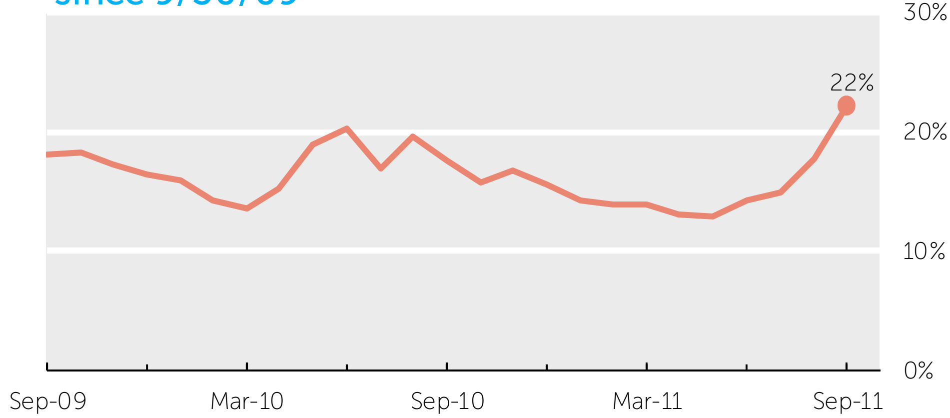
option market implied volatilities to estimate the market's future risk. The absence of a liquid market for correlations requires that we rely on historical correlation estimates. We believe this measure provides a useful, albeit not perfect, prospective estimate of funded status volatility.

Recent Changes in Funded Status Volatility

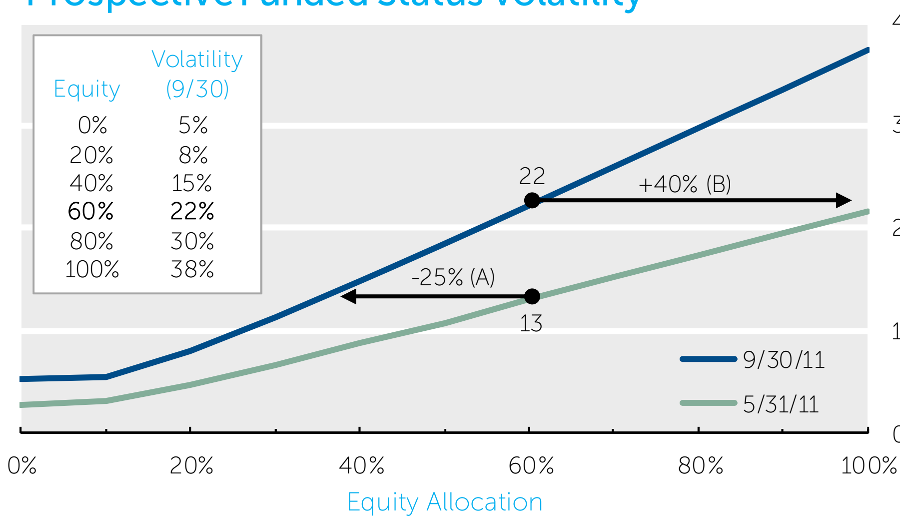
Funded status volatility, as indicated below, has increased dramatically over the last few months. In fact, plan wide volatility has increased approximately 70% from its recent lows of approximately 13% in May 2011. At its current level, a one standard deviation movement in funded status over the next year would be +/- 22% (of plan liabilities). In other words, a plan with a deficit of 20% would have a 1 in 3 chance of seeing the deficit either eliminated or more than doubled over the next year.

Prospective Funded Status Volatility since 9/30/09



To provide another perspective, we estimate the change in asset allocation that would be required to reestablish a funded status volatility of 13%. Under current market conditions, reallocating 25% from risk assets to long bonds would be required to maintain a funded status volatility of 13% (See arrow A below). Alternatively, the recent boost in market volatility has increased funded status volatility similarly to a 40% reallocation from bonds to risk assets, under prior market conditions (See arrow B below).

Prospective Funded Status Volatility



Conclusion

In our experience, plan fiduciaries would be unlikely to approve a 25-40% shift in asset allocation and a 70% increase in funded status volatility without careful study. This seems true even if expected return increased correspondingly. Perhaps similar attention should be given to an equivalent change in risk due to changes in market conditions. Rebalancing rules that target specified asset allocations can result in dramatically different risk profiles, depending on prevailing risk estimates. To the extent current volatility measures are radically different (either higher or lower) from when policies were set, adjustments in target asset allocations may very well be warranted.

Appendix

Data sources:

- Sources include Barclays Capital, JP Morgan, Citigroup and Bloomberg

Assumptions:

- The liability is discounted using the Citigroup Pension Discount curve.
- The portfolio is rebalanced monthly to a 60% MSCI All Country World Index, 20% Barclays Capital Long Treasury Index, and 20% Barclays Capital Long Credit Index.
- The plan is fully funded.
- Equity volatility observations are estimated based on one year MSCI ACWI implied option volatility.
- General rate volatility observations are estimated based on one year implied volatility on a thirty year treasury bond.
- Liability and portfolio spread volatility is estimated based on current spread levels and historical spread percent-volatility.
- Correlations are based on five year rolling history.

Selected NISA Papers

Our papers can be found on the Library section of our website at www.nisa.com/library.

- *Break-even Yield Curve* (August 2011)
- *Dynamic Liability Driven Investing (July 2011)*
- *Interest Rate Hedges (May 2009)*
- *Considerations Surrounding Corporate Bonds in Pensions (December 2008)*

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