April 2018

Insights

Liability-driven investment strategies can be shockingly simple

What defined benefit plans need to know

Our 15-plus years of managing liability-driven investment (LDI) programs for U.S. corporate defined benefit (DB) plans have taught us some major lessons:

- Highly effective LDI approaches can be shockingly simple.
- Success requires a partnership between consulting actuary and investment team.
- LDI programs are individualized to client objectives and risk posture.
- LDI is not an allocation, rather a total portfolio paradigm.

LDI in the United States

Currently, LDI appears both complex and fraught with competing, or even incompatible, objectives. We believe high fees for complex strategies are mistaken as "sophisticated cure-alls." The reality is that regardless of your investment strategy's complexity, if you have not had adequate interest rate exposure to combat a consistently declining rate environment, your plan's funded status has suffered, and your deficit is larger than planned, even with record equity market levels.

How can plan sponsors contemplate liability hedging if costs are prohibitive and results are muted? Many can't. But we have found that liability hedging should be neither onerous nor expensive. We believe we have found an achievable and effective path to building a robust liability-driven framework in a total portfolio solution. It brings to bear a philosophy and process that focuses on client context, emphasizes information flow "fluidity" between the consulting actuary and investment fiduciary, and seeks to minimize costs.

The reality is that regardless of your investment strategy's complexity, if you have not had adequate interest rate exposure to combat a consistently declining rate environment, your plan's funded status has suffered, and your deficit is larger than planned, even with record equity market levels.

Willis Towers Watson

Figure 1. **Aligning investment structure with client context** **For illustrative purposes only**

Plan funded status	< 80%	80% – 90%	90% – 100%	> 100%
Total plan return objective	Liability +4% – 5%	Liability +3% – 4%	Liability +2% – 3%	Liability +1% – 2%
Return seeking opportunity set	▪ Equity ▪ Credit ▪ Diversifiers ▪ Illiquids	▪ Equity ▪ Credit ▪ Diversifiers ▪ Illiquids	▪ Equity ▪ Credit ▪ Diversifiers ▪ Illiquids selectively	▪ Equity ▪ Credit ▪ Diversifiers
Liability hedging objective	▪ Hedge overall interest rate exposure	▪ Hedge overall interest rate exposure ▪ Review key rate exposures	▪ Hedge overall interest rate exposure ▪ Add focus on credit spreads ▪ Review key rate exposures	▪ Hedge overall rates and credit ▪ Add focus on key rate exposures
Hedging opportunity set	▪ STRIPS/Treasuries ▪ Derivatives ▪ Long credit	▪ STRIPS/Treasuries ▪ Derivatives ▪ Long credit	▪ STRIPS/Treasuries ▪ Derivatives ▪ Intermediate and long credit	▪ STRIPS/Treasuries ▪ Derivatives ▪ Short, intermediate and long credit

The above return targets are intended to be illustrative based on plan sponsors with time horizons of 10 years. A custom return and hedge target is required based on each client's time horizon, funding policy and risk tolerances.

Client context is key

Every investment decision needs to be supported by solid process and execution. The results you get are only as good as the information you have and the investment process you apply. LDI is no different. We believe it requires a coordinated effort among the plan's fiduciaries, corporate stakeholders and the consulting actuary to articulate and document the objectives, risk tolerances and time horizon for a plan, and to build a robust investment strategy to help achieve those objectives. The strategy also must have a review framework to ensure flexibility as markets, plan risks and the plan sponsor circumstances change and evolve.

We believe the total portfolio approach to LDI investing requires a new way of describing objectives, risk postures, constraints and how to measure progress to goals. Objectives are described in a liability plus target and a risk posture, typically declining as plans become better funded. Constraints are applied to include and exclude opportunities in the investment toolkit, for both hedging tools and return-generating asset classes. We feel progress is measured in terms of liability relative returns achieved, funded status drawdown potential (forward looking risk), and progress toward plan targets of funded status, liability reduction, and participant retirement security.

Figure 1 illustrates our framework to develop a total portfolio LDI solution.

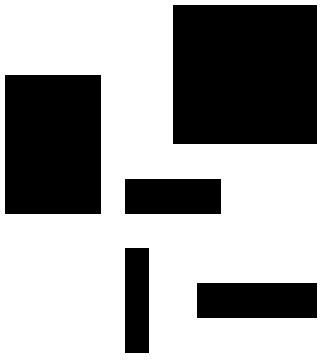


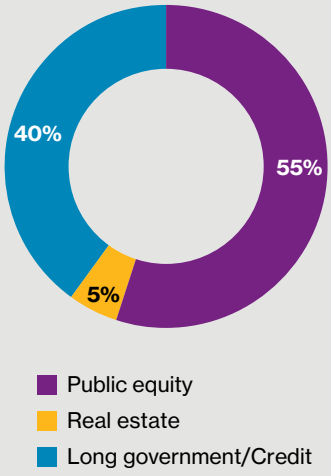
Figure 2. **Plan risk profile and dashboard**

For illustrative purposes only

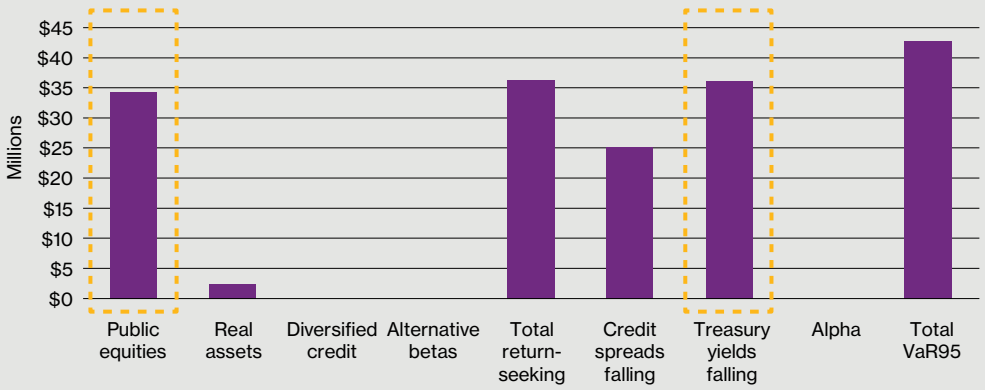
Typical plan summary

PBO	$307M
Funded status	85%
Plan status	Closed

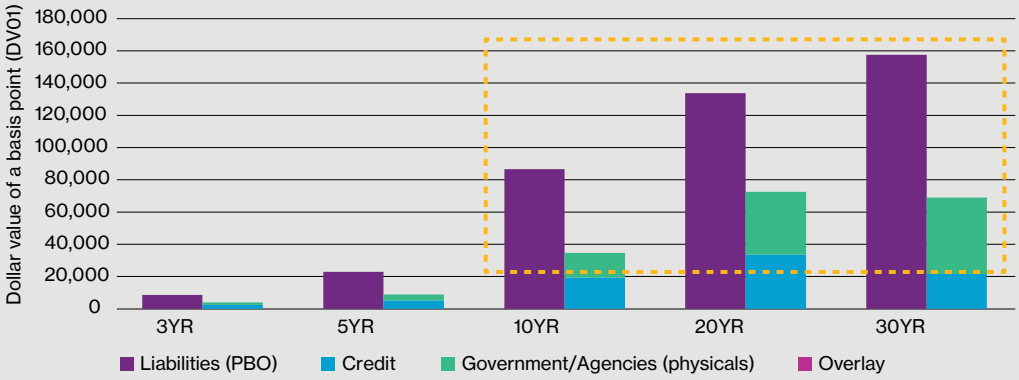
Typical portfolio



VaR attribution



Key rate exposure



Source: Willis Towers Watson March 2018 Capital Market Assumptions

Expected returns are based on Willis Towers Watson's Capital Market Assumptions as of March 2018. Worst case is a 1-in-20 probability (VaR95). Return distributions incorporate fat tails, and correlations between return-seeking asset classes increase when fat-tail events occur. The example portfolio does not imply a guarantee of future performance or risk reduction. Willis Towers Watson model results and assumptions may not be realized.

An efficient total portfolio solution

Once key objectives around the plan's goals and milestones (e.g., plan termination or hibernation) are understood, as well as how to attain the end goal within the context of critical risks, a total portfolio solution is built. Given our focus on total portfolio solutions and risk, drawdown of funded status is best measured using value at risk (VaR – 1-in-20 decrease in plan funded status) to illustrate how we manage plans in an LDI framework. In *Figure 2,* we provide an example of the VaR attribution, i.e., the sources of funded status risk for a typical client situation with a fairly simple investment strategy.

As we just illustrated, we have found a plan's risk profile is driven more by a potential equity market sell-off, and a potential decline in the overall level of interest rates, rather than a decrease in credit spreads. You can also see via the key rate chart that the majority of the plan's interest rate risk is at the long end of the yield curve (10-plus years). This is largely dictated by the current shape of the yield curve and today's world of tight credit spreads, but it is also driven by plan design and actuarial assumptions used to build the plan's expected benefit payments. Often we see strategies in the marketplace focused on long duration corporate mandates as the bulk of the liability hedging allocation. While we recognize that pension discount rates are derived from market-based corporate bond curves and that plans contemplating termination via an annuity purchase would be wise to own corporate credit, we believe narrowing the opportunity set to investment-grade, long-term corporate credit has several shortcomings:

- It ignores the makeup of the overall portfolio and its liability-relative risk profile. Specifically we believe it fails to consider the inherent correlation between equities and corporate bonds, and that owning portfolios with heavy equity and corporate bond weights may subject the plan to concentrations of risk unnecessarily.

- It continues to have considerable basis risk given the uninvestable nature and the narrow quality focus (AA or better) of the corporate bonds used to derive the plan discount rate.
- It is capital intensive, given its shorter duration relative to Treasuries, STRIPs (Separate Trading of Registered Interest and Principal of Securities) and derivative instruments. Smaller allocations of assets to interest rate hedging objectives can free capital to achieve other investment exposures to increase returns and/or control other risks.

Additionally, we believe building the hedge out of corporate bonds fails to provide protection in an economic slowdown or "flight to quality" scenario when you need it the most.

We maintain that the last place you want surprises is in the hedging part of your portfolio. During the financial crisis, in the fourth quarter of 2008, we saw discount rates drop over 100 bps, while credit spreads spiked 90 bps. This combination of events resulted in losses relative to the liability for investors with a heavy credit component in their liability hedging allocations.

We also believe that for most client situations, strategy should be focused on maximizing duration exposure consistent with a client's objectives, focusing on the total level of interest rate exposure and reducing excessive reliance on equity risk to generate returns in excess of liability growth (see **Breaking the style box: Diversifying by risk premia**). *Figure 3* illustrates how this total portfolio solution, "capital efficient," compares with the "typical portfolio" we examined in Figure 2. By using more capital-efficient implementation methods, we're able to accomplish the goals of increasing the potential liability relative return by 50 bps, while reducing the liability relative risk by almost 40%.

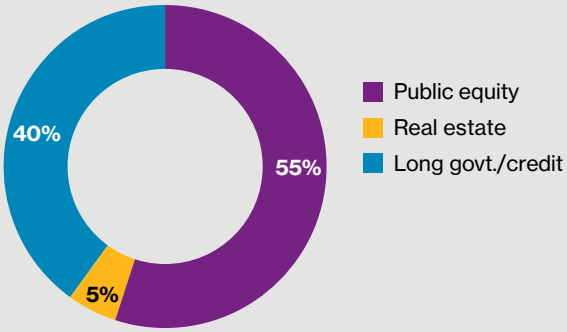
It is important to note here that we don't ignore the funded status risk associated with credit spread compression. Credit spread exposure is important, but we believe often it is more efficiently accessible through higher-yielding return-seeking assets than through investment-grade corporate bonds, especially for clients who have large funding gaps and need to be as efficient with the capital as they can be. We believe they should focus on hedging overall yield levels as the primary component of their hedging strategy.

Our holistic approach helps allow us to account for credit spread risk at the total portfolio level. This allows client portfolios to track movements of discount rate corporate spreads without an over-reliance on corporate bonds themselves.

Figure 3. **Potential benefits of capital efficiency and focused hedging**

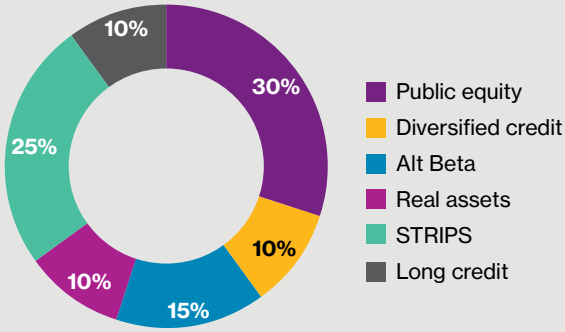
For illustrative purposes only

Typical portfolio



Capital-efficient hedge

Capital-efficient hedge, use additional capital to diversify return drivers



	Typical	Capital efficient
10-year expected return (annualized, net of fees)	**5.1%**	**5.6%**
Value at risk ("worst case" funded status change)	**($47.7M)**	**($29.0M)**
Hedge ratio %	**43%**	**53%**

Source: Willis Towers Watson March 2018 Capital Market Assumptions

Expected returns are based on Willis Towers Watson's Capital Market Assumptions as of March 2018. Worst case is a 1-in-20 probability (VaR95). Return distributions incorporate fat tails, and correlations between return-seeking asset classes increase when fat-tail events occur.

Estimated hedge ratio based on plan liability duration of 11.5 years. The example portfolio does not imply a guarantee of future performance or risk reduction. Willis Towers Watson model results and assumptions may not be realized.

Fees based on plan size of $260M. Investment fees include administrative fees where appropriate.

Cost management

We believe minimizing costs is critical to the implementation of an appropriate hedge. This may seem obvious, but not every investor is aware of the additional access points brought to market within the past five years. Our work with the investment management community to align interests with investors helps enable us to continue our development of new vehicles with a potentially lower cost than what is available "off the shelf."

Cost metrics begin with the price of an investment product. However, the additional opportunity cost and transactions costs can significantly dwarf investment management fees charged for managing these types of portfolios. Often, for plans that have an endgame, being able to take advantage of windows of opportunity may greatly reduce the time frame to achieving the desired outcome and do so more efficiently. Doing this successfully we believe requires managing a portfolio dynamically and having a framework that takes into consideration high transaction costs in the long bonds space.

As referenced above, we believe a well-orchestrated risk management plan and review framework that considers all assets owned by the plan is extremely important for liability hedging. Too frequently, plan sponsors associate LDI as a liability with a stagnant set of cash flows. We disagree. Rather, we view total portfolio management as a dynamic process that considers a plan's evolving risks through a total asset and liability framework. Liabilities evolve with markets, time and client circumstances, just as the relative attractiveness of various asset classes changes over time. To be successful, we believe LDI programs need to be dynamic and evolve in a total portfolio context.

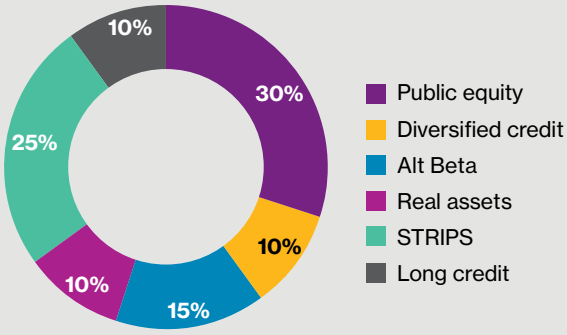
A better way forward

We feel U.S. pension plan sponsors typically have not maximized the capital efficiency of their investment programs, as they often impose constraints on the use of derivatives or leverage for liability hedging and risk management purposes. These tools, when properly designed, should not be categorically ignored, given the risk and return improvements they can provide. For example, *Figure 4* illustrates the potential return improvement and the risk reduction achieved on a VaR basis (drawdown of funded status) by adding a derivative overlay to a diversified total portfolio solution.

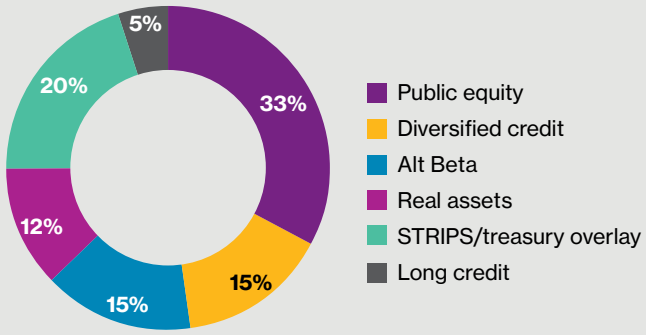
Figure 4. **Benefits of derivative overlay**

For illustrative purposes only

Capital-efficient hedge
Capital-efficient hedge, use additional capital to diversify return drivers



Maximized diversity and efficient hedge
Use derivative overlay to further improve capital efficiency, reduce risk and improve returns



	Typical	Capital-efficient hedge	Maximized diversity and efficiency
10-year expected return (annualized, net of fees)	**5.1%**	**5.6%**	**6.0%**
Value at risk ("worst case" funded status change)	**($47.7M)**	**($29.0M)**	**($24.5M)**
Hedge ratio %	**43%**	**53%**	**60%**

Source: Willis Towers Watson March 2018 Capital Market Assumptions

Expected returns are based on Willis Towers Watson's Capital Market Assumptions as of March 2018. Worst case is a 1-in-20 probability (VaR95). Return distributions incorporate fat tails, and correlations between return-seeking asset classes increase when fat-tail events occur.

Estimated hedge ratio based on plan liability duration of 11.5 years. The example portfolio does not imply a guarantee of future performance or risk reduction. Willis Towers Watson model results and assumptions may not be realized.

Fees based on plan size of $260M. Investment fees include administrative fees where appropriate.

To be consistent with our original premise that successful LDI can be shockingly simple, there are several pooled derivative solutions available in the market today. We use them every day to seek to build out more robust liability hedging solutions for our clients.

As stated above, LDI needs to be considered more broadly and holistically. We truly believe that once all the plan's assets are considered, a truer picture of liability risk management will likely be attained and managed successfully.

If a plan is hindered by internal decisions or is not closely monitored in relation to the markets, it may make sense to outsource (Portfolio management: Willis Towers Watson delegated investment services). Potentially lower-cost investment vehicles and outsourced implementation through delegation bring quality liability hedging within reach.

In conclusion, we believe plan sponsors should:

- Utilize unique plan considerations to assess key risks
- View LDI as a risk management plan to reaching plan objectives
- Shift focus from "should we hedge" and "percent fixed income" to a risk-focused framework when discussing hedging
- Maximize efficiency of capital and the investment opportunity set through derivatives and Treasury-based instruments
- Look to simplify, streamline costs, and potentially outsource implementation and monitoring

About Willis Towers Watson

Willis Towers Watson (NASDAQ: WLTW) is a leading global advisory, broking and solutions company that helps clients around the world turn risk into a path for growth. With roots dating to 1828, Willis Towers Watson has over 40,000 employees serving more than 140 countries. We design and deliver solutions that manage risk, optimize benefits, cultivate talent, and expand the power of capital to protect and strengthen institutions and individuals. Our unique perspective allows us to see the critical intersections between talent, assets and ideas – the dynamic formula that drives business performance. Together, we unlock potential. Learn more at willistowerswatson.com.

willistowerswatson.com/social-media