

Slaying The 3D Beast:

Liability-Driven Investing For Defined Benefit Pension Plans

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CUTWATER ASSET MANAGEMENT

Introduction

Typically when we think of the term 3D, we think of science fiction movies—monsters coming to life while we, the audience watch as the world we know transforms into a scary place. The Great Recession of the past few years loomed large on all of our screens leaving no viewer unscathed, and the world as we knew it very much changed.

At Cutwater, we have come to refer to this incredible upheaval as a new kind of 3D: destruction, deficits and demographics.

"Destruction": A dramatic decline of asset values in investment portfolios resulting from improper risk-taking, the building of those portfolios without consideration of liabilities and the unexpectedly high levels of correlation among asset classes around the globe.

"Deficits": The shortfalls created from the combination of the sudden reduction in asset values with the gradual inflation of liabilities brought on by several years of historically low interest rates and decades of living beyond our means.

"Demographics": The growing population of the United States that represents a transition from savers to "dis-savers" - with the additional trait of living longer (a good thing, but referred to as "longevity risk" in this context), which puts us all face-to-face with the challenge of making good on past promises.

The confluence of these three events constitutes a real-life monster that threatens companies' and governments' abilities to meet liabilities. We now find ourselves in a brave new world where the old rules no longer apply and where we now need to carefully examine this new landscape in order to approach investing in an intelligent and successful manner going forward.

Gone are the days of judging success or failure based on returns versus a benchmark. It is time to (finally) consider clients' investment portfolios in the context of their liabilities. This is the essence of Liability Driven Investing (LDI): incorporating an understanding of the liability into the asset allocation decision.

The team at Cutwater Asset Management truly understands the complexities of implementing a liability driven investing strategy—enough so that we are able to responsibly move to a new and innovative model that will truly address the market's and our clients' current and very real situations.

The fact is, we have always taken a real world approach, which is why we've successfully managed over \$80 billion of LDI assignments over the past 17 years for a diverse client base, including state and local governments, financial institutions and insurance companies.

We also specialize in developing strategies to accommodate evolving liability profiles. We utilize a comprehensive and integrated approach to liability driven investing and have developed sophisticated proprietary LDI models that can be tailored to our clients' unique circumstances. These industry-leading models optimize the investment profile to meet liquidity demands, immunize liabilities, and enhance yield. Furthermore, we apply our proprietary state-of-the-art stochastic model and Risk Analysis Manager (RAM) to assign probabilities of the desired outcome for a given investment strategy versus a liability stream through time. We believe this quantitative analysis is unique and better informs the fundamental portfolio construction decisions that we develop through our disciplined process.



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In the coming months, our clients can expect research papers and commentaries on various important topics. Today, we would like to focus on one particular area of importance: liability driven investing for defined benefit pension plans.

Background

The global market crisis revealed serious flaws in pension fund management strategies, which traditionally relied on investment returns generated by large equity allocations to fund future liabilities.

Operating under the assumption that equities historically outperform fixed income, plan sponsors typically allocated 60-70% to equity investments and counted on them to be the primary drivers of portfolio performance. Fixed income investments were focused on the short and intermediate part of the curve in core and core plus total return strategies and typically represented a 20-30% allocation. Largely missing from this equation was any real consideration of how or if the assets making up these portfolios matched up with the future liabilities of the pension plans.

Comfortable Assumptions Took Hold

This optimistic analysis of asset returns and correlations, combined with a rather long expansionary cycle, produced overconfidence and led plan sponsors into a number of misguided assumptions:

- ▶ The lengthy expansionary economic cycle from the early 1990's to 2007 produced strong long-run average equity returns, which created overconfidence about the downside of large allocations to equities. Furthermore, historical equity market declines tended to be short-term in nature, as the markets recovered quickly.
- ▶ Interest rates were perceived to be low from a historical perspective, which discouraged plan sponsors from increasing their allocation to fixed income securities.
- ▶ Many alternative asset classes, which tended to represent between 5-10% of plan portfolios, were viewed as diversifying agents, as their performance was perceived to be uncorrelated to equities.

Plan sponsors analyzed asset-allocation decisions by focusing on projected long-term returns and correlations of various asset classes, with little consideration given to the plan's liabilities. And everyone was comfortable with the actuarial techniques that smoothed over the volatility of returns in a given year.

What Changed?

The "Great Recession" of 2008 shattered many of the assumptions that plan sponsors had come to rely on. For starters, most plans were heavily weighted in equities given their historical double-digit returns. While this strategy once served pension plans well, the dramatic decline in 2008 (the S&P 500 fell nearly 40%) effectively erased all prior years' gains and then some in one fell swoop, creating unfunded liabilities almost overnight. Further complicating matters was the significant decline in interest rates, which became a double-edge sword for pension plans. On the one hand, fixed income total return strategies such as core and core plus generally produced a positive return for the year (the Barclays Aggregate Index returned 5.24%). However, since fixed income securities represented only 20-30% of the overall investment portfolio, these modest gains were quickly overwhelmed by the severity of the equity decline. Additionally, since the pension liabilities were typically much longer duration than the fixed income portfolio, the present value of the liabilities increased much more than the assets, further amplifying the unfunded balance.

As if all that weren't enough, the correlation of virtually all asset classes converged. For example, "diversified" alternative investments became highly correlated with equities and lost significant value, adding to the destruction of investment portfolios. The entire construct of an equity-centric portfolio diversified with non-correlative alternative assets fell apart, leaving plan sponsors holding the pieces. The final indignity in this unfortunate sequence of events: the decline in corporate profits that followed the weakening of the global economy, which impaired companies' ability to meet higher pension funding requirements out of current revenues.



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The Impact

As a result, many pension plans were exposed as being seriously underfunded. The increased funding requirements severely strained corporate budgets and earnings, since plans could no longer afford the asset / liability mismatches of the past. By year-end 2008, the median funded status of the largest U.S. companies' pension plans fell to 72%, down from 94% in 2007 (they have since rebounded a bit to a funded status in the low 80's). In dollar terms, at year-end 2008, aggregate pension plan liabilities of about \$1.5 trillion exceeded assets by over \$300 billion.

New Rules & Regulations

In response to volatility in the funded status levels of many plans in the early 2000's, Congress passed the Pension Protection Act of 2006 (the "PPA"). When fully phased in, the law will require plan funding to be equal to 100% of the plan's liabilities (the 100% funding target will be phased in at 92% in 2008, 94% in 2009, 96% in 2010, and 100% in 2011 and later years). Any unfunded liability must be amortized in annual installments over seven years. Sponsors of severely underfunded plans that are at risk of defaulting on their obligations will be required to fund their plans according to special rules that will result in higher employer contributions to the plan (and may be subject to additional penalties).

The PPA also requires plans to discount future liabilities using a double-A rated corporate yield curve, using rates that correspond to the estimated cash flows of the obligations. This replaces an actuarially smoothed process that observed the four-year average of corporate bond rates. The most commonly used discount curve is the Citigroup Pension Liability Index.

On the asset side, The PPA narrows the range for actuarial valuations and reduces the maximum smoothing period to two years. Under the prior law, a plan sponsor could determine the value of a plan's assets using the average over a five-year period, which can differ from the current market value of those assets.

Therefore, the new rules reduced the ability of plan sponsors to smooth over assets and liabilities actuarially and compelled underfunded plans to close their funding deficit.

Enter Liability-Driven Investing

Since the risks of pension plans have been transformed from long-term in nature to short-term (in the form of the volatility of the funded status), it has become necessary to analyze both assets and liabilities. The answer is the construction of an asset / liability management approach that seeks to optimize a defined-benefit plan's funded status. This requires a dramatic change of investment style from total return-based to liability-driven investing.

LDI is defined as any strategy that incorporates an understanding of the liability into every asset-allocation decision. In the context of a pension plan, an LDI strategy invests in assets that move in sync with the targeted liability, thus controlling changes to the funded status. That is because of two simple factors: a) the value of pension liabilities move inversely to interest rates, and b) the value of bonds also move inversely to interest rates. An LDI strategy focuses, therefore, on finding the right bonds to match the interest-rate sensitivity of the pension liability.

The implementation of an LDI strategy can deliver critical benefits to pension plans. The first benefit is a decrease in funded status volatility (the standard deviation of the funded status). This is achieved by a) matching the profiles of assets to those of plan liabilities, thus ensuring that valuations will move in tandem as a result of fluctuations in interest rates and other market factors, and b) decreasing asset return volatility (the standard deviation of the expected return on the plan's portfolio), largely by shifting portfolio investments from equities to fixed income. The reduction of funded status volatility will in turn decrease the volatility in expected contributions for plan sponsors.



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By significantly reducing year-to-year volatility in the funded status and contribution requirements, an LDI strategy helps minimize or even eliminate a significant source of external risk for plan sponsors. These risks are rising rapidly in terms of their strategic significance for companies:

- ▶ Demographic trends are not friendly to plan sponsors, whose companies need to fund liabilities that are increasing with the aging of the population and workforce;
- ▶ Whereas companies could traditionally defer or spread pension contributions along a long-term horizon, PPA funding requirements will eventually require companies to make timely contributions to meet mandated ratios;
- ▶ After the phasing in of FAS 158, fluctuations in pension funding status and the valuation of plan assets and liabilities will be reflected on both corporate balance sheets and income statements.

Therefore, the traditional risks that were viewed as long-term in nature have been transformed into short-term imperatives. For many companies, the introduction of such large and unpredictable variables into the calculus of short-term performance represents an unacceptable level of risk. LDI strategies can provide an effective solution.

Risks & Considerations

Implementing and managing an LDI strategy involves certain risks. The table below displays some of these risks and how the investment manager should address them:

Risk	Description	Mitigant(s)
Market Timing	Interest rates are currently near historical lows	Gradual implementation of the investment strategy; Credit spreads still very wide to historical averages
Credit Risk	The risk of significant market value deterioration or default	Constructing a high quality, liquid and diverse investment portfolio; potentially using derivatives to extend asset duration
Interest Rate Risk	Resulting from asset/liability duration mismatches	Managing asset and liability partial (key rate) durations within an acceptable range



Sample Solutions

Below are examples of pension LDI strategies that pension plans should consider:

- ▶ Increase the plan's allocation to long-duration fixed income securities, benchmarked against the Barclays Long Government/Credit Index

The benefit of this approach is that it moves in the right direction in terms of extending the duration of the asset portfolio (providing a better match with liabilities) and will be more correlated to the Citigroup Pension Liability Index (the discount curve typically used for pension liabilities). However, it is still based on an asset-related benchmark and does not directly address the plan's actual liabilities.

- ▶ Invest all or a portion of the plan's assets in a fixed income portfolio that matches the overall and partial durations of the liabilities

Simplistically, this approach attempts to immunize and optimize the investment portfolio against changes in the liabilities as a result of interest rate movements. The benefit of this approach is that asset and liability valuations should move in tandem as interest rates change, thus minimizing the funded status volatility. Derivatives can also be utilized to match durations on an overlay basis.

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When evaluating how much risk the investment manager should take in the asset portfolio, the plan sponsor should also consider the plan's unique circumstances, including:

- **Funded status:** Fully funded plans should seek lower-risk strategies.
- **Demographics of the plan population:** A plan with many retirees calls for more bonds.
- **Size of the plan relative to size of the company:** The bigger the plan, the greater the potential impact on balance sheets and cash of the company.
- **Financial strength of the company:** Strong companies may want to fully fund their plans and reduce investment risk.
- **Corporate structure:** Publicly traded companies may be more sensitive to financial volatility than privately held companies.

Conclusion

The damage inflicted by the "3D" beast in 2007 and 2008 laid bare fundamental flaws in pension fund management, many of which were rooted in plan sponsors' basic focus on portfolio assets and valuations, as opposed to the relationship of those assets to plan liabilities. Plan sponsors should dedicate themselves to correcting past mistakes and managing the huge source of risk that defined benefit pension plans represent. Underfunded and volatile defined benefit plans are monsters that will devour companies and governments if ignored. It is time to slay the beast.

An investment manager's ability to understand and analyze a pension plan's liabilities can help the sponsor customize an investment strategy that is the right fit for that plan. Cutwater, with its vast experience in managing assets versus liabilities in multiple formats, is ideally qualified to show plan sponsors and their consultants how to evaluate LDI strategies and choose the one that is best tailored for their needs. ■

ABOUT THE AUTHOR



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Mr. Wilson joined the firm in 1999 and is a managing director responsible for the Liability Driven Investment business segment. His background includes structuring and managing complex asset/liability programs, utilizing multiple strategies in different currencies. During his career, he has developed innovative solutions for clients seeking to optimize their business profile, generate value, de-risk or manage liquidity. He possesses strong capabilities in treasury management, structuring and capital modeling, risk management and hedging. Mr. Wilson has a bachelor's degree in economics from the University of Albany and a master's degree in finance from Fordham University. He holds the designation of Chartered Financial Analyst (CFA) through the CFA Institute and is a member of the New York Society of Security Analysts.

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