

In focus

Better. Stronger. Faster.

Future-proofing an LDI strategy for the market environment to come

There's an old proverb that loosely translates to *Prepare your umbrella before it rains*. We firmly believe that now is the time for plan sponsors to tune up their LDI portfolios, even though the sun is still shining. Credit market conditions, as well as structural challenges, create a need to re-design LDI portfolios to succeed in the years to come. This paper examines the changes to the investment landscape and structural inefficiencies within current LDI practices which make a more innovative approach to LDI both timely and of great consequence. Our aim is to offer insights on creating a more powerful and robust LDI portfolio. One that is powerful enough to deliver sufficient alpha to offset the downgrade-driven performance drag versus the liability, and robust enough to achieve true manager diversification that persists over different market regimes.



Seth Finkelstein, CFA
Head of US Portfolio Solutions

Introduction

It's hard for investors to be concerned about LDI portfolios since nothing alarming has happened. They have largely "delivered", particularly when their purpose is seen to be one of reducing funding volatility. We fear this has lulled investors into a false sense of security where they may not appreciate the dangers lurking just beneath the surface of their LDI portfolios, especially given the late-cycle environment we're in.

We wrote this research paper because we believe there is a profound need to rebuild LDI portfolios to endure and thrive in the environment of the next 10 years, which we believe will be characterized by:

- 1 lower returns on risky assets
- 2 elevated downgrade activity due to high leverage and shareholder-friendly maneuvers
- 3 persistent benchmark issuer concentration
- 4 structural liquidity shortages hampering the ability to buy and sell corporate bonds

This paper builds upon the extensive research Schroders introduced in prior papers—such as *the Folly of False Precision* and *Satellite/Satellite*—which detail the practical challenges and risks of hedging US pension liabilities with a multi-manager approach, and introduces a unique, multi-faceted approach to LDI portfolio construction.

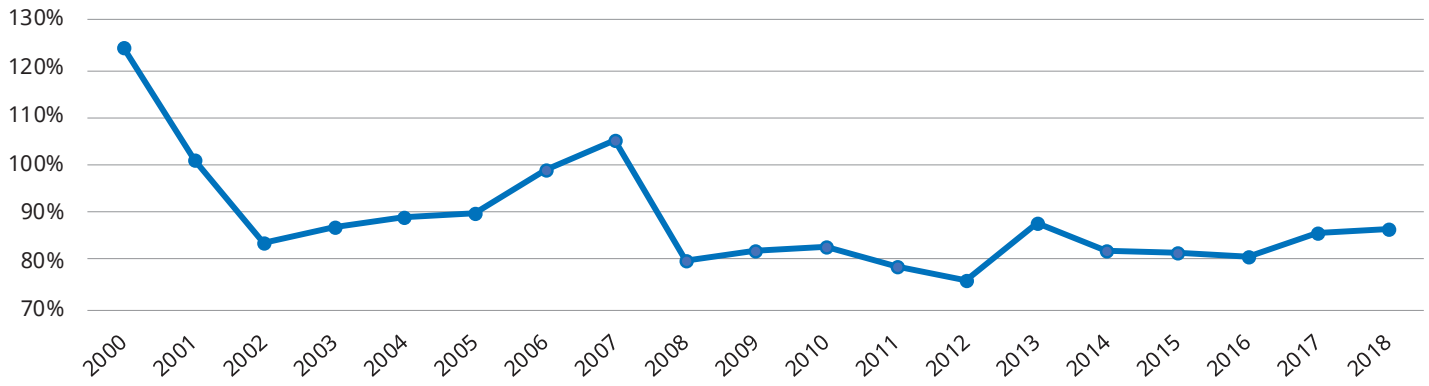
While corporate pension funded status has been relatively flat since the financial crisis (see Figure 1 on the next page), plan sponsors have enjoyed relative success with their LDI portfolios.

Any consistent underweight of AA credits over the past 10-year period has led to outperformance of a AA market benchmark closely related to a liability discount rate. These portfolios have behaved like high quality, conservative, *sleep-at-night* hedges to liability risk. Not surprisingly, investors have chosen to focus more on the portfolio risks emanating from their equity/growth exposures, given the late stage of the economic expansion and bull market.

To be clear, we are not predicting another financial crisis; however, a financial crisis is not necessary for these risk factors to instigate major problems for LDI portfolios and plan sponsors. There are few things that cause greater anxiety and draw greater scrutiny than a "safe" investment proving itself to be anything but. The greater the perception of safety, and the more capital committed, the worse is the potential fallout.

The importance of getting LDI right cannot be overstated given the sheer size of plans' allocations. Chief Investment Officer's 2018 LDI survey revealed a median allocation to LDI among plans of 48%.

Figure 1: Historical funded status for the Milliman Top 100 Corporate Pension Plans



Source: 2019 Milliman Corporate Pension Funding Study and Bloomberg

Assuming we are right about the next 10 years, how can we build a more robust LDI portfolio? For this paper, we will assume that an investor hedges as much or as little interest-rate and spread risk as he/she desires, and this does not affect the LDI investment portfolio or its liability-relative return objective. We also submit that an optimal LDI portfolio should generate enough alpha to offset the downgrade-driven performance drag versus the liability and is diversified among managers that complement one another over different market regimes.

Multi-manager portfolio construction should employ the following three techniques to arrive at an adequate group of managers that can be blended in a portfolio: 1) Quantitative analysis—examine historical excess returns, tracking errors and alpha correlations among managers to get a handle on the range of outcomes

and the stability of results over market cycles or regimes; 2) Fundamental analysis—examine the active bets managers make over time, especially their size and variability; 3) Forward-looking analysis—combine insights from #1 and #2 with what is gleaned from meetings with managers, and aim to get exposure to all the independent alpha drivers managers can employ in an active LDI portfolio.

To facilitate the portfolio construction process, Schroders has developed a proprietary “alpha matrix” which specifies these independent alpha-generating techniques and enables a plan sponsor keep track of the degree of coverage they’ve achieved with their current LDI managers. Below is a generic illustration of a completed matrix.

Figure 2: Schroders Alpha Matrix (Pure illustration)

Sources of alpha	Manager A	Manager B	Manager C	Manager D
Alpha Driver 1	Major	None	None	Minor
Alpha Driver 2	None	Minor	Major	None
Alpha Driver 3	Minor	None	None	Major
Alpha Driver 4	None	Major	Minor	None
Expected alpha (vs .BC Gov/Cred)	100 bps	200 bps	75 bps	125 bps
Expected TE (vs BC Gov/Cred)	300 bps	450 bps	150 bps	250 bps

Contribution to expected alpha

- Major
- Minor
- None

Source: Schroders. Matrix for illustration only, does not reflect any actual portfolio or model.

The body of this paper is split into three parts:

- Part 1** Takes stock of LDI investors’ current portfolios and their commitment to a liability-oriented approach
- Part 2** Discusses a series of structural and cyclical challenges that make the task of building a durable, diversified and safe LDI portfolio more difficult than investors appreciate
- Part 3** Introduces a multi-manager portfolio construction process that is uniquely fitted to LDI and aims to deliver portfolios that are better positioned for future environments

Part 1: State of LDI portfolios

Where is the market today? What has been the uptake of LDI? Have investors been expanding their LDI portfolios? To what degree are sponsors hedged on rates? Which characteristics of today's LDI portfolios make them well-suited or ill-suited to thrive in the coming environment? The answer to that final question will indicate how much a plan sponsor will have to evolve their approach to avoid unpredictable if not poor funding outcomes. In answering these questions, we drew on interactions with Schroders clients, feedback received from the consultant community and a vast amount of pension data found in places like CIO surveys, 10-K filings, and regular "pension monitoring" reports from firms such as Mercer, Milliman, Willis Towers Watson and Aon.

Over the last 10 years, the vast majority of corporate plans have embraced LDI, and those who are active have allocated nearly half of their pension assets to LDI. According to CIO Magazine's 2018 LDI Survey of 198 plans, 90% of which were plans above \$1 billion, the median allocation to LDI was 48% and the median hedge ratio was 60%.

In some cases, before the financial crisis, but in earnest post crisis, plans began converting their Core and Core Plus allocations into long duration portfolios, oftentimes retaining the same manager. As years went by, plans allocated away from equity, in favor of LDI and alternatives, and additional managers were hired. According to the CIO survey, the average plan uses three managers. Allocations seemed to have plateaued around 50% these past few years – we believe there are several structural reasons for this, but that is a topic for another paper.

We learned from plan sponsors that in many cases, the first two LDI managers were Core/Core Plus conversions and the 3rd was a new manager hired via external search. Of course, three managers is an average. Many believe five or six managers is optimal. The number of managers sponsors use notwithstanding, we believe plans are under-diversified and concentrated with just a few managers, and these managers have highly correlated investment styles with a near-perpetual overweighting to Corporates vs Treasuries and A/BBB vs AA. Therefore, it's not the number of managers used that matters, but rather how diversified they are in approach, and the levers they draw upon to add value and manage risk.

Beyond anecdotes and sponsor confirmation, how can we be certain there is a manager concentration problem? A simple examination of eVestment data on LDI/long duration managers makes this manifestly clear.

Table 1: LDI Manager Concentration

	Active and Passive AUM(\$MM)	% of Total LDI AUM
Top 3 Mgrs	459,399	45%
Top 5 Mgrs.	543,720	54%
Top 10 Mgrs	685,335	73%
Total Universe	1,057,567	
# of Managers	69	

Source: eVestment. Data as of March 31, 2019

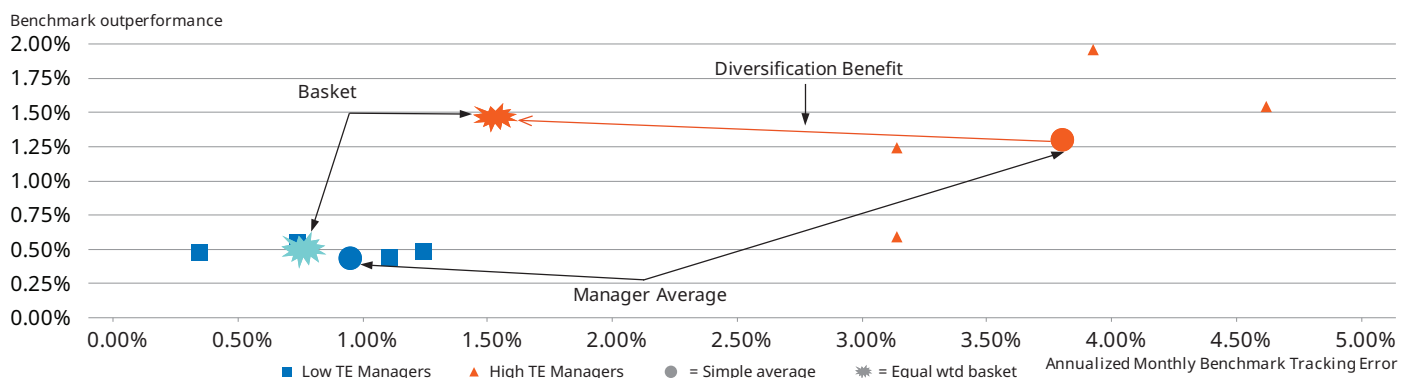
Table 1 shows that nearly 50% of all LDI assets are invested with just 3 managers! Our discussions with sponsors, large and small, have them agreeing that they likely face major concentration risk, especially given how large a portion of total assets LDI represents. However, in the absence of a crisis, action has been less than it should be. Consultants in 2019 expanded their LDI manager research to increase the size of the bench as they recognized the issue as well, and would like to advise sponsors to address it before disruptions occur.

In addition to an under-diversification of investment approach and manager risk, sponsors face the challenge of large AUM getting in the way of good execution and issuer diversification. Large managers are very challenged to deploy hundreds of billions in capital in a credit universe that we will show is mostly comprised of smaller issuers. Big asset managers are pushed into the largest issues within the credit index, competing directly with insurance companies and foreign buyers, creating massive crowding in those AA/AAA credits, with scant liquidity to get out. It follows that by owning more of the largest benchmark issuers, large managers produces lower tracking error portfolios. Thus support the belief that a plan has a very safe LDI program that is well-positioned to withstand the credit deterioration that may arise from an indebted Corporate America!

To examine the phenomenon further, we refer to Figure 3, taken from Schroder's paper, *Satellite/Satellite*. It shows how different the historical excess returns and diversification effects appear when looking at an equal-weighted basket of low tracking error managers relative to a basket of high tracking error managers. Combining high tracking error managers would seem to be an effective way to access manager diversification, resulting in a lower risk LDI portfolio. We argue that this is the path to a high information ratio LDI portfolio, rather than what today is the common practice of combining managers with low tracking errors to the Barcap Long Gov/Credit or Long Credit index, which neither delivers sufficient alpha nor offers any meaningful diversification benefit.

Figure 3: Manager excess risk /return vs. Long Government Credit Benchmark

For the 15 year period ending December 31, 2018



Source: Schroders, eVestment, Bloomberg. 15 years of monthly returns ending December 31, 2018. For illustrative purposes only. Performance shown reflects past performance which is no guarantee of future results. Strategy universe consisted of 25 funds with a 15-year history of which the lowest three benchmark tracking error managers, and four highest benchmark tracking error managers (ex Schroders), over that period were selected as the proxy for "low TE" and "high TE" managers, respectively. Reflects monthly returns rebalanced annually. Annual rebalancing. Approximately 12 bps p.a. improvement from reduced volatility – 7 bps improvement evident in low benchmark TE manager basket.

Part 2: Structural and cyclical challenges and themes

In this part of the paper, we explore several themes that we believe drive structural and cyclical challenges for LDI portfolios.

Theme 1: Cumulative effect of downgrades is larger and more persistent than investors think

While most sponsors are aware of the downgrade effect in LDI, it is worth briefly reviewing up front, as we have found many investors are surprised at the persistency and magnitude of its effects.

Simply put, downgrades are highly punitive to funded status, as they impact the value of both assets and liabilities.

Clearly a downgrade, or the price action in the period leading up to it, creates a market value loss in the asset portfolio, which is initially matched by a loss in the liability until the bond's rating drops below AA (A), causing the issue to get kicked out of the discount rate used for accounting (funding) valuation purposes. The discount rate will most likely fall, since a bond whose spread has widened gets removed from the basket. If the manager is running a low tracking error, index-like portfolio, he may need to sell this bond and crystallize the loss. As we will explain in detail, this downgrade effect is the most profound structural challenge faced by LDI investors and impacts the way portfolios need to be structured, measured, monitored and managed.

We wrote about the persistent return drag from downgrades in our 2017 paper, entitled *The Immunization Illusion*. To summarize, Figure 4 shows that downgrades and defaults would have caused an annualized performance drag of over 130 bps for a passive Long Corporate A or better duration and curve-matched credit portfolio relative to a hypothetical pension liability over time. Indexing credit locked in this downgrade-driven underperformance, even though the liability tracking error for such a duration-matched portfolio was in excess of 250 bps per annum.

The general inability to directly hedge the liability discount rate, due to its uneconomic treatment of downgrades and concentrated holdings, results in all LDI portfolios producing tracking error to the liability, even if they may have very low tracking error to a market benchmark index.

This downgrade effect is the most profound structural challenge faced by LDI investors and impacts the way portfolios need to be structured, measured, monitored and managed.

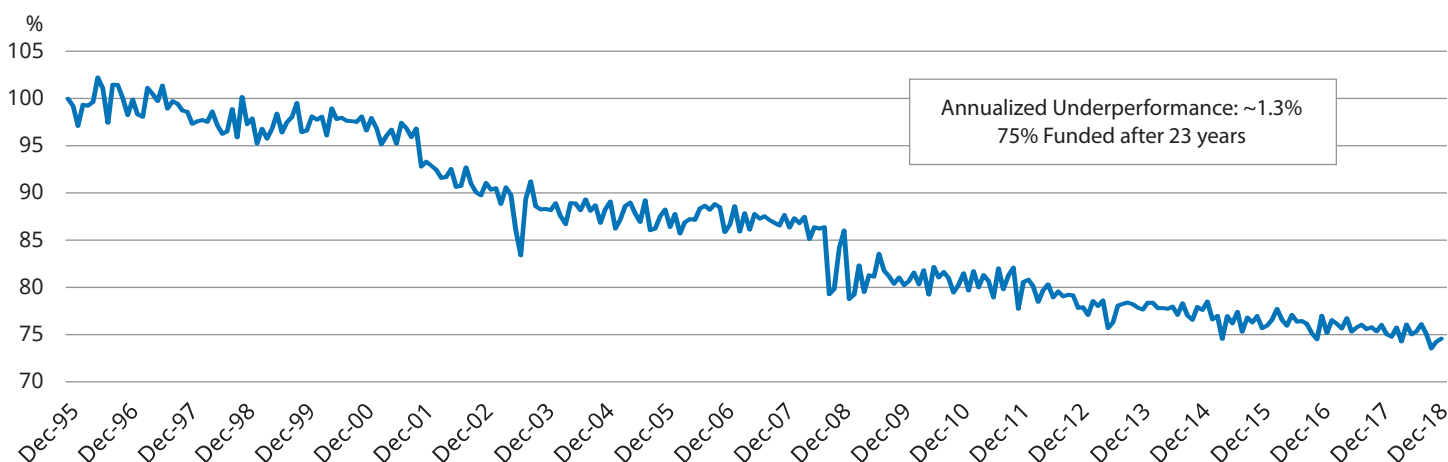
We believe that a push towards immunization and minimizing tracking error to a market benchmark only serves to lock in underperformance relative to the liability, while still producing material tracking error.

Theme 2: A long bond portfolio with high average credit quality does not equate to "safe LDI"

Worthy of placement on any Top 10 List of LDI myths is the misconception that because the theoretically lowest-risk hedging asset is a AA corporate bond, then the key to managing liability-relative risk is to maximize the allocation to investment grade credit (vs Treasuries or other off-benchmark sectors) and within that, to own as many AA credits as possible. Many LDI investors believe the easiest way to reduce risk, given where we are in the credit cycle, is to get higher and higher in average credit quality and own the largest benchmark issues in the Barclays index. Many managers do this, as it reduces the tracking error to the Barcap Long Corporate index and can accommodate their large assets under management.

There are two main flaws in this argument. First, the issuer concentration and narrowness of the AA segment of the market ensures under-diversification of issuer risk. Concentration statistics in the following table show that 74% of the Barcap Long Corporate AA+ Index is in the top 10 issuers, while for the broader Barcap Long Corporate Index, it is only 15%. This concentration problem gave rise to the extensive use of A's and BBB's in today's LDI portfolios.

Figure 4: Funded ratio of duration matched Long Corp A or Better Indexed Portfolio



Source: IRS, Society of Actuaries, Bloomberg Barclays POINT, Schrodgers as of December 31, 2018. Liability cash flows set every six months to those of the Bloomberg Barclays Long Corporate A or Better Index and remain static for start of next 5 months. Valuations use monthly full IRS yield curve (not 3 segment or HATFA). For illustrative purposes only. Actual results would vary. Past performance is no guarantee of future performance.

Table 2: Issuer concentration in high-quality, long-duration bond indices

	Bloomberg Barclays Long Corporates	Bloomberg Barclays Long Corporates AA+*
Credit		
AAA	3%	29%
AA	7%	61%
A	39%	9%
BBB	51%	-
NR		1%
Sectors		
Financials	17%	6%
Industrials	70%	87%
Utilities	12%	7%
# of Issuers	565	58
% Top 10 issuers	15%	74%
Three largest issuers	7%	40%
	Anheuser Busch	Microsoft
	Comcast	Apple
	Microsoft	Walmart

Source: Schroders, Bloomberg, as of October 31, 2019. Numbers may not sum due to rounding.*Excludes Agency, Local Authority, Sovereign and Supranational bonds.

Second, the rate of downgrades of Aa credits vs A or Baa issuers is actually higher, meaning a greater proportion of Aa credits were downgraded in the average year when looking at data back to the 1920's from Moody's on Corporate Default and Recovery Rates (See table 3). So much for the "zero risk" hedging asset. Having said this, the change in spread and price degradation from downgrades generally differs in magnitude based on rating tier, meaning spread widening for a double-A will be less than for a single A credit, but at least there are hundreds of A and BBB rated issuers among which to diversify.

With downgrade incidences largely similar across ratings categories, we cannot assume that going higher in credit quality adequately or effectively de-risks an LDI portfolio.

Table 3: Average One-Year Letter Migration Rates including defaults and recovery and adjusted for withdrawals

Moody's corporate default and recovery rates 1920-2018

From/to:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	Default
Aaa	90.90%	8.05%	0.84%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa	1.06%	89.67%	8.20%	0.75%	0.21%	0.00%	0.00%	0.00%	0.10%
A	0.11%	2.86%	90.35%	5.83%	0.64%	0.11%	0.00%	0.00%	0.10%
Baa	0.00%	0.21%	4.51%	89.26%	4.83%	0.75%	0.11%	0.00%	0.20%
Ba	0.00%	0.11%	0.56%	6.92%	82.81%	7.59%	0.78%	0.11%	1.10%
B	0.00%	0.00%	0.23%	0.68%	6.37%	81.80%	6.94%	0.57%	3.10%
Caa	0.00%	0.00%	0.00%	0.12%	0.58%	7.81%	79.25%	3.26%	7.70%
Ca-C	0.00%	0.00%	0.12%	0.00%	0.73%	3.30%	10.89%	57.16%	22.70%

Source: Moody's Corporate Default and Recovery Rates 1920-2018, Moody's Investor Service. Numbers may sum to less than 100% due to rounding.

The credit migration table tells us why we cannot build a portfolio with zero tracking error to the liability, and why the "risk-reducing" move of migrating a portfolio closer to the discount rate may be a fool's errand. We also know there is a hurdle rate of return the LDI investor faces that can't be secured through passive beta. Therefore, an indexed or enhanced-indexed bond portfolio will ensure both underperformance and liability-relative tracking error over time. With LDI allocations reaching 50% of the average pension's portfolio, they cannot be treated simply as *dead money* or pure hedging assets; rather, they must be invested to earn returns over time, and with a keen eye towards mitigating downgrade risk and capturing alpha wherever it may exist.

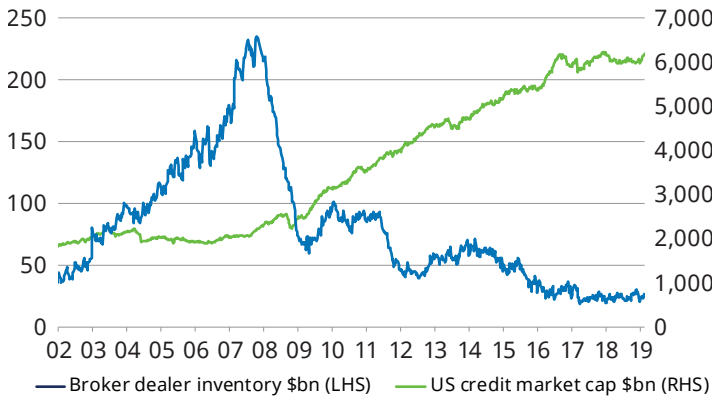
When thinking about the risks to LDI portfolios, we must consider the potential for downgrades and other credit events to be significant over the next 10 years, given how leveraged US corporations are at this point in the cycle, and how the average credit quality of the index has deteriorated to the point where over half the long corporate universe is rated BBB.

Theme 3: Impact of breadth and liquidity on credit selection

Over the last 10 years, fixed income managers with a proven credit selection capability were able to beat an ultra-high-grade credit index, in large part by emphasizing A and BBB-rated credits in a benign credit environment with substantial availability of new paper. In Part 3, we will see proof of the persistent overweight to lower-rated investment grade credits that managers have held historically.

Assuming we agree that there is a high likelihood that downgrades will increase across the board, and that the narrowness of the AA space is dangerous, couldn't these risks potentially be mitigated by diversifying across a greater number of issuers and earning idiosyncratic alpha within a generally deteriorating investment grade universe? While the short answer is "yes", there are two conditions: 1) Long duration managers must be able to buy and sell bonds at prices equal to or near the last traded price (in the absence of new information); and 2) they must be able to do so in size. The definition of liquidity has a size as well as price dimension. As noted, the top five managers in the eVestment Long Duration universe managed \$544 billion! If we eliminate the two largest providers in the top five, the next five managers, on average, oversee approximately \$42 billion each.

Figure 5: Market size vs. dealer inventory



Source: Schroders, Bloomberg, Bank of America Merrill Lynch as of December 31, 2018. Company composition is subject to change over time.

Figure 6: Investment grade trading volume as percentage of market size



Source: Federal Reserve, SIFMA, Barclays, Schroders March 2019

While most sponsors have an appreciation for the indebtedness of corporate America, it is often less understood that the ability of LDI portfolios to diversify within credit is and will continue to be severely restricted due to two key separate, but related, issues: 1) broker/dealers have drastically reduced their inventories and trading, preferring to do agency transactions; and 2) the vast majority of corporate bonds are issued by smaller borrowers. Figures 5 and 6 above show a massive decrease in broker-provided liquidity within investment grade credit.

Moreover, there is material risk that a manager's ability to navigate a deteriorating credit situation at the issuer or sector level is negatively impacted by the lack of liquidity caused by the imbalance between the market depth on a given position and the manager's holdings. This risk is elevated further if there is a concentration of managers of similar profile, investment style and investment restrictions within a multi-manager LDI framework, all of whom may search for the exit at the same time.

As we can see in Figure 7 below, 65% of the outstanding debt of the Bloomberg Barclays US Long Corporate index was comprised of the largest issuers, i.e., those with more than \$5 billion of debt outstanding. This is an obvious corollary to Table 2 but here we've extended it to cover the entire Barclays US Long Corporate Index. However, when considering number of issuers rather than market cap, we observe that over 80% of the issuers in the index have outstanding debt of less than \$5 billion. We can think of these as "small cap" issuers. For larger bond managers, these smaller issuers do not float enough debt to put on a reasonable position (say 1%), making them relatively unpurchasable and nullifying the ability to use diversification and credit selection to control risk and add value.

For larger LDI managers, smaller issuers may be inaccessible, reducing their ability to control risk through diversification.

Figure 7: Outstanding debt by issuer ticker in US \$Billion

Barclays US Long Corporate Index

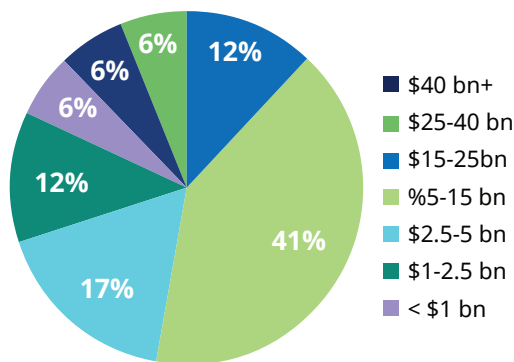
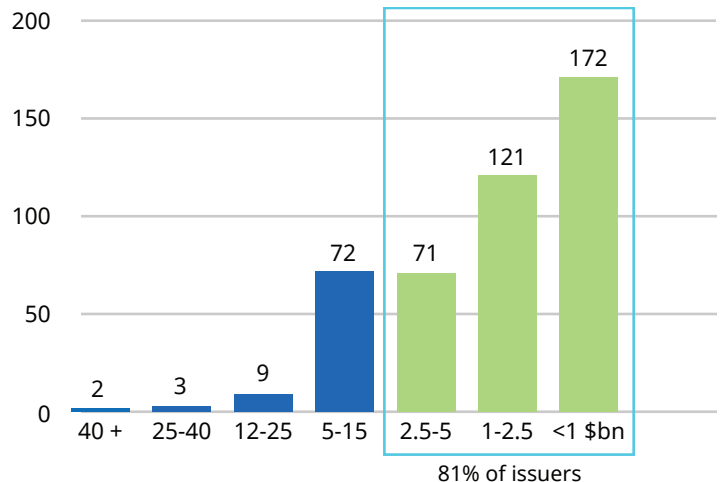


Figure 8: Number of issuer tickers by outstanding debt

Barclays US Long Corporate Index



Source: Barclays Live as of December 31, 2018. For illustration purposes only. *Index is The Barclays US Long Corporate Index

A simple exercise to quantify the challenge of size in the corporate bond market would be to calculate how much of a given issuer's bonds would need to be bought by two LDI managers of different size, if they were interested in building a 1% portfolio position (shown in Table 4). Using the Barclays US Long Corporate Index, we look at an average issuer from each subset of debtors – large and small – and run the numbers. Clearly, the manager with \$40 billion is going to face an untenable situation. This may be one reason why some of the largest managers favor off-benchmark positions or sliding down the maturity curve to intermediate credits where the supply is deeper.

Table 4: Challenge of size and liquidity

	Manager A (\$40 billion in assets)	Manager B (\$5 billion in assets)
Large issuer >\$5 billion outstanding debt (\$11.8 billion average issuer)	3.36%	0.42%
Small issuer <\$5 billion outstanding debt (\$1.5 billion average issuer)	26.64%	3.33%

Source: Barclays Live as of December 31, 2018. For illustration purposes only.
*Index is The Barclays US Long Corporate Index

Theme 4: The importance and utility of Treasuries is misunderstood

LDI investors own a mix of corporate and government bonds in their portfolios and, more often than not, use the Bloomberg Barcap Long Gov/Credit index as their primary LDI benchmark. Most hold Treasuries for their interest-rate hedging properties as well as their ability to reduce liability tracking error modestly versus a pure corporate bond portfolio. This is one reason investors don't exclusively own corporate bonds in their LDI allocations.

This is a narrow way to think about the role of Treasuries, since it only focuses on the properties within a fixed income context, ignoring the plan's allocation to return-seeking assets such as

equities. We should think about the utility of Treasuries in a holistic pension risk management context, inclusive of all assets.

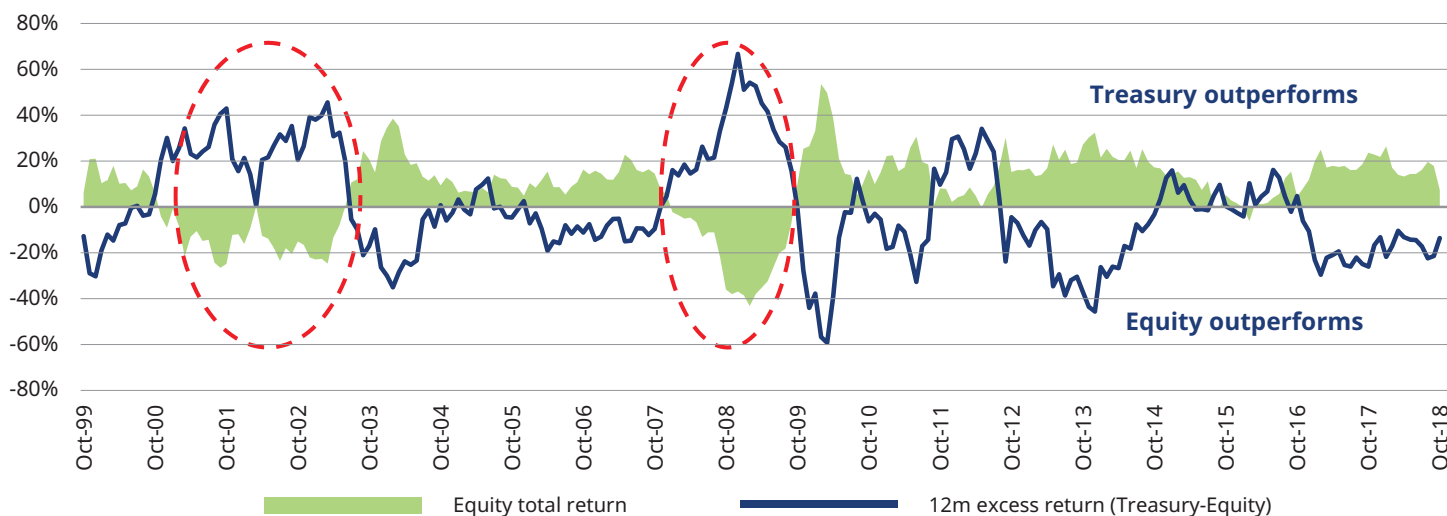
We believe there are four ways Treasuries can bring value to an LDI program:

- 1 Supply interest-rate duration for rates hedging
- 2 Offset spread beta from below-AA credit
- 3 Reduce tail risk through negative correlation to equities
- 4 Offer alpha opportunity from Treasury vs Credit decisions

To pick up on number three, the optimal allocation to Treasuries should be determined in a total pension context, considering the size of the equity (or growth) allocation and the respective plan's funded status. The available surplus risk reduction from using Treasuries can partially offset the tail risk coming from equities. Figure 9 below illustrates this tail-risk hedging effect by comparing the excess return of long Treasuries over equities to the total return of equities over time. We can see that when the equity market (shaded green) was in drawdown, Treasuries significantly outperformed equities. This is a persistent phenomenon and is why some plans now have "crisis risk offset" allocations that include long Treasuries.

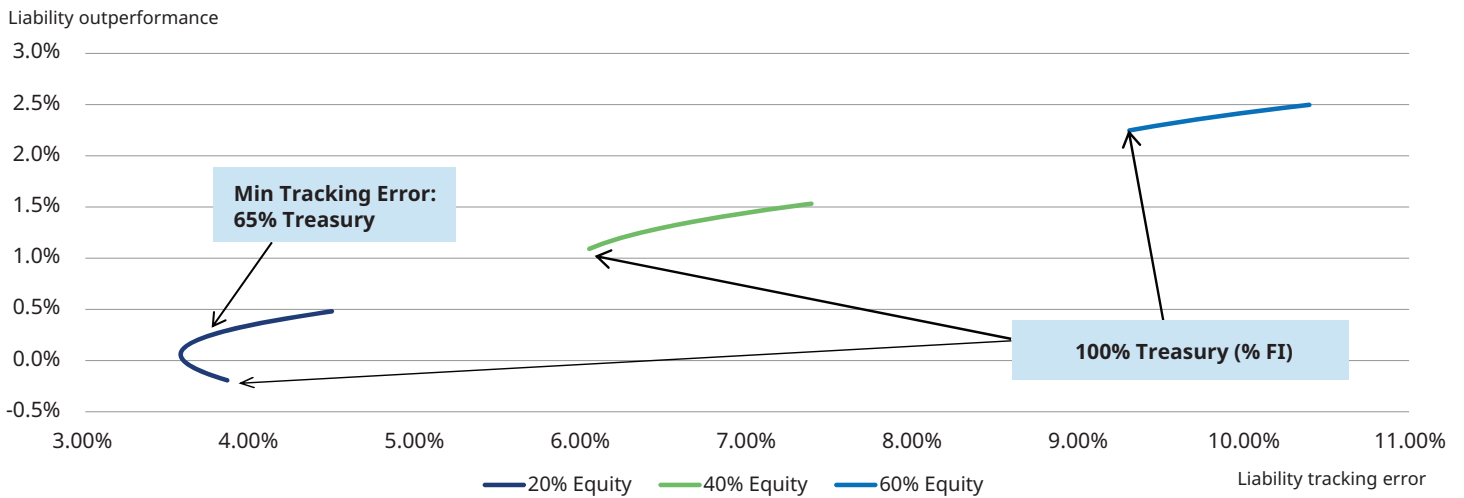
The efficient frontier on the next page (Figure 10) reflects portfolios holding growth and fixed income assets and compares liability outperformance vs liability tracking error of portfolios that own varying amounts of equity (20%, 40%, 60% on a static basis). When we get to the higher equity allocations, we see that the lowest tracking error portfolios are those that are more fully allocated to Treasuries in the LDI portion. We can see there is some diminution of return due to the longer-period outperformance of credit. These frontiers are based on a hypothetical fully-funded plan. Plans that are under-funded, in our view, may have even more reason to allocate meaningfully to Treasuries given their greater surplus risk. Of course, plans that are underfunded cannot afford to own exclusively Treasuries. Corporate bonds offer carry and alpha opportunity to help offset the ongoing costs of the liability and usually represent a more efficient hedging instrument than Treasuries, particularly if spread volatility were to become a greater driver of overall funding risk.

Figure 9: Rolling 12-month comparison of Treasury and equity returns overlaid on equity price movements



Source: Bloomberg, Schroders. Starting October 1998 through October 2018. Equity is The S&P Total Return Index. Long Treasury is The Bofa 15+ US Treasury Index. Gross of fees. Past performance is no guarantee of future performance.

Figure 10: Efficient frontier including equity, corporate bond and Treasury assets, with static allocations to equity



Source: Barclays POINT, Equities represented by the S&P 500 index, credit by the Long Corporate A+ and liability as follows: *Liability cash flows set every six months to those of the Barclays Long Corporate A or better Index and remain static for start of next 5 months. Accounting valuations use Citi pension Discount Rates (AA rated bond universe). Assumes fully-funded plan. Reflects post-crisis period: January 31, 2010 through October 31, 2019. Past performance is no guarantee of future performance.

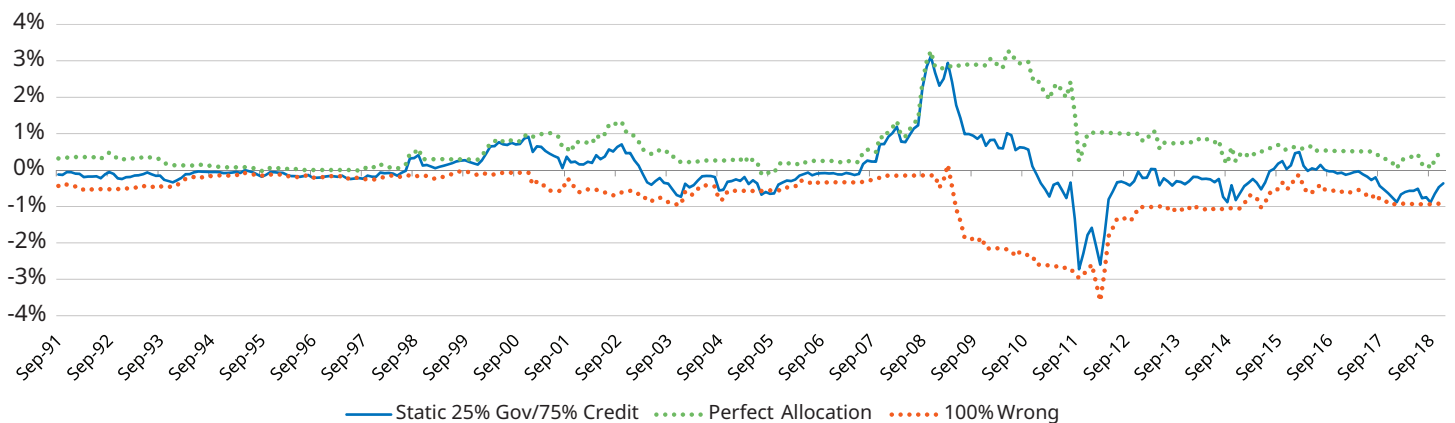
We have heard from several consultants and sponsors that plans have begun to split their LDI mandates, moving from employing active Long Gov/Credit managers to using active Long Credit managers and managing the Treasuries themselves or with a passive manager. Unfortunately, this decision reduces the degree to which risk can be managed in an LDI portfolio and also reduces the opportunity to add substantial value through tactical allocation. As previously shown, an investor simply cannot get safe enough in credit when the liability discount rate never suffers from downgrades. There are times in the credit cycle when only one thing will reduce risk in an LDI credit portfolio, and that is to shift out of credit and overweight Treasuries. Typically, neither the plan sponsor nor the passive manager is in a position to do this. Consequently, the power of the tail-risk hedge offered by Treasuries is limited to the strategic allocation to Treasuries in the total LDI allocation.

Turning our attention to alpha, in Figure 11 we compare the range of historical excess returns and risks of three hypothetical portfolios:

- 1 A portfolio with a static allocation of 25% Treasuries / 75% Long Corporate A or better credits (the blue line)
- 2 A "Perfect Allocation" assumes an investor has perfect foresight in overweighting and underweighting Treasuries relative to that 25% policy, and every 6 months the right tactical move is made (the green line)
- 3 A 100% Wrong allocation is as advertised

We can see that the range of three-year excess returns over a Long Corporate A or better benchmark for the last 30 years has been roughly +327 bps to -360 bps, with an annualized difference of -88 to +90 bps.

Figure 11: Rolling 3-year outperformance over Long Corp A or better



Annualized return over 30 year period

Period	Long Corp A+	Fixed 25% Treasury	Perfect Allocation	100% Wrong
Oct 1988 – Dec 2018	6.02%	6.04%	6.92%	5.14%

Source: Barclays POINT, Schroders September 30, 1988 to December 31, 2018. For illustrative purposes only. Reflects modeled historical results. Actual results would vary. Past performance is no guarantee of future performance.

Theme 5: Managers' risk/return profile drastically changes when viewed relative to a liability

The majority of plan sponsors use a market benchmark for their LDI portfolios: either the Barcap Long Gov/Credit Index or Barcap Long Corporate Index. Some favor more precision and use a key rate duration-matched blend of market benchmarks to address maturity mismatches between those standard benchmark indices and their liability cash flows. Either way, a liability benchmark typically serves only as a reference point rather than as a primary benchmark to which individual long-duration managers are compared. Whether or not a sponsor makes it her primary benchmark, her LDI portfolio needs to outperform the liability at an acceptable level of risk.

This has profound implications on how we build a multi-manager LDI portfolio, since the risk/return relationship of a given set of managers will appear differently when measured against a market benchmark versus a liability benchmark. We can see this

for a selection of managers in the eVestment Universe below, where their historical excess returns and tracking errors are shown relative to a long bond index in Figure 12 and hypothetical accounting liability in Figure 13.

When moving to liability space, we observe a major convergence in tracking errors while retaining the relative performance relationships among managers, therein illustrating the benefits of combining high(er) alpha/tracking error managers into a portfolio to keep pace with the liability return through alpha and achieve alpha diversification. This is a foundational principle in multi-manager LDI, and we will examine how to measure, evaluate and monitor manager relationships over time using quantitative and qualitative approaches. A further exposition on the phenomenon of high vs low tracking error managers can be found in a earlier Schroders' paper, *Satellite-Satellite*.

Figure 12: Manager excess risk/return vs. Long Government/Credit benchmark (for the 10-year period ending 12/31/18)

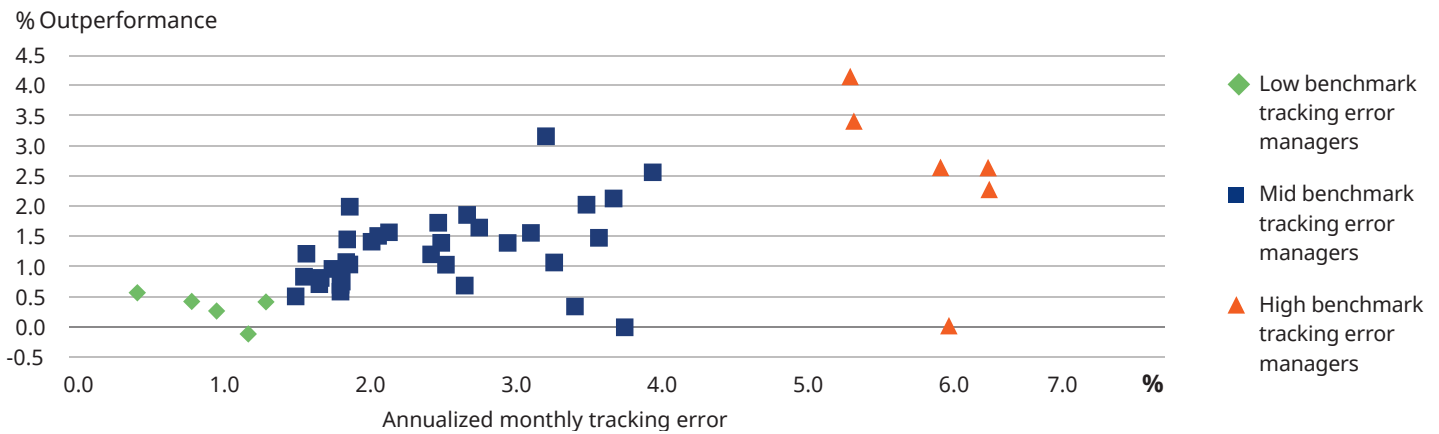
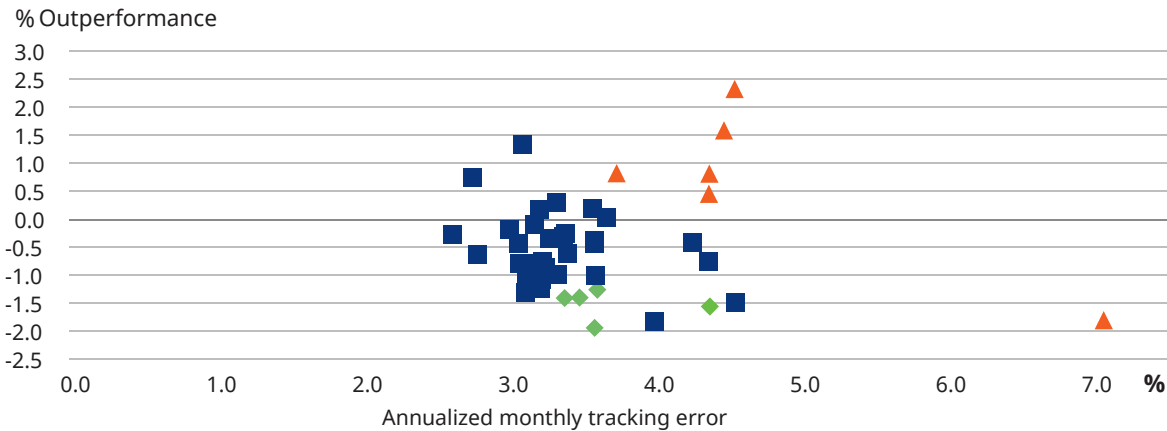


Figure 13: Manager excess risk/return vs. Hypothetical Accounting Liability (for the 10 year period ending 12/31/18)



Source: eVestment, Society of Actuaries, IRS, Schroders, ten years to December 31, 2018. All managers from eVestment with a Long Government / Credit benchmark and a 10-year track record. Hypothetical pension liability cash flows are set every six months to those of the Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting valuations use FTSE Pension Discount Rates (AA rated bond universe). Past performance is no guarantee of future performance.

Part 3: Building Robust Multi-Manager Portfolios

Overview

Having addressed the structural challenges associated with building an LDI portfolio, and the unique vulnerabilities introduced by investors' current portfolio composition, we now consider an analytical framework that will allow us to build a better LDI portfolio, which again is defined as a portfolio that:

- a) Hedges liability risk (which is a given)
- b) Earns sufficient alpha to keep up with a downgrade-insensitive discount rate
- c) Diversifies across managers that complement one another over different market regimes

Research Process

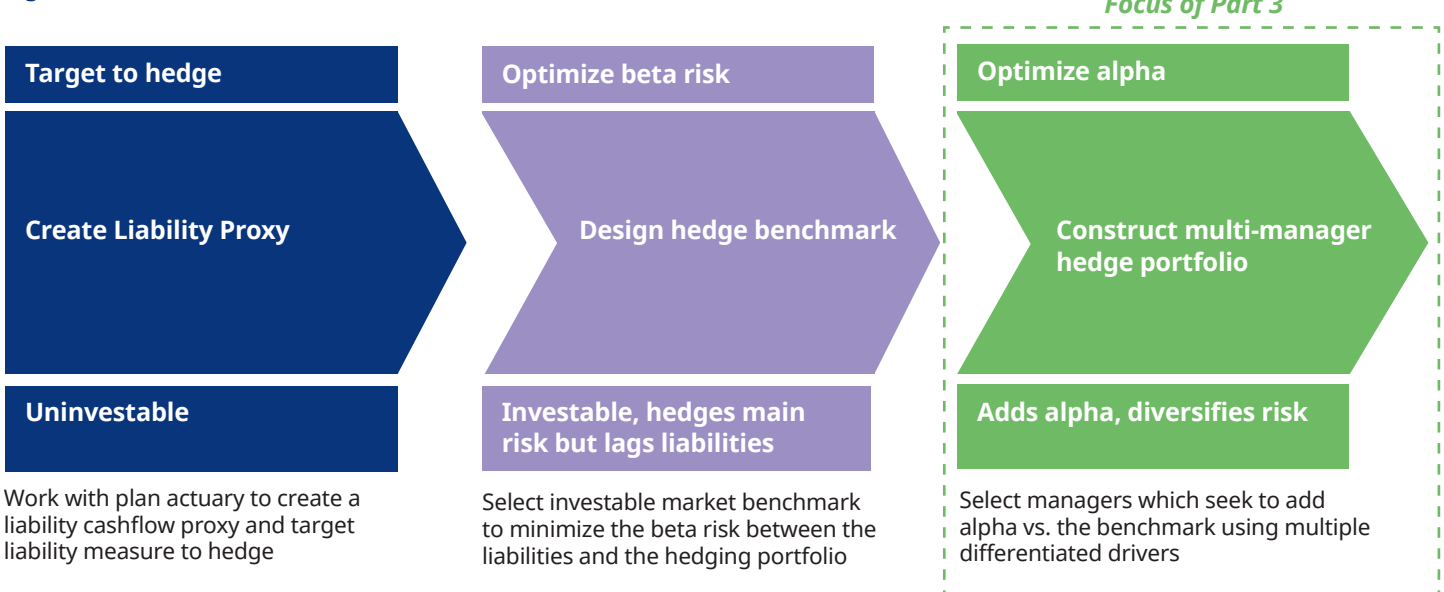
We believe a traditional manager research and portfolio construction process is just as applicable to building an LDI portfolio as it is to building a portfolio of large-cap equity or core fixed income managers. We think there are three principal techniques to use in the manager research and selection process, which also inform how we ultimately combine the managers into a total portfolio. These are:

- 1 **Quantitative analysis** – examine historical excess returns, tracking errors, and alpha correlations among managers to get a handle on the range of outcomes and the stability of results over market cycles or regimes. We want to understand whether there are regimes or regime-specific behavior to best determine how indicative of the future these historical metrics may be. Excess returns, risks and correlations should be measured against both a market benchmark and a hypothetical liability benchmark, understanding that the latter will show categorically

diminished excess returns roughly equal to the downgrade drag experienced by a corporate index versus the liability. No matter the benchmark, persistency of alpha and the stability of the tracking errors and manager correlations must be understood, since these are the key inputs into an optimization process and are the primary metrics governance bodies use to look at managers.

- 2 **Fundamental analysis** – examine historical portfolio holdings to judge the size and variability of managers' active bets across credit quality, benchmark and off-benchmark sectors, and duration. This should align with, and explain the tracking error and correlation figures, and give a sense for the degree of active management being applied over time. For example, a manager may have a high tracking error because he historically has had a consistently large overweight to Treasuries, while another manager may have a high tracking error not because of a sector bias but rather because her active weights vary considerably over time. The plan sponsor will judge which one is the more desirable active management approach. There's a good chance both may be additive to a multi-manager portfolio.
- 3 **Forward-looking assessment** – per the Fundamental Law of Active Management, sponsors should seek to hire a sufficient number of managers to access all the independent sources of alpha available in the LDI space. Clearly it is important to know exactly what these sources are to ensure coverage. Anecdotally, we have not encountered a single plan sponsor who claims to have that coverage, and most would admit that their current portfolios concentrate in a couple of active decisions at the expense of others. We can use the insights gleaned from both quantitative and fundamental analyses and augment them with thorough due diligence to understand the alpha levers each manager employs. A proprietary alpha matrix we created can be used to keep score and ensure we are maximizing our chances for success in any market environment that comes in the next 10 years.

Figure 14: Generic LDI Process



Source: Schroders. For illustration only. Does not reflect investment advice of any kind.

Applying the Approach to a Universe of LDI Managers

To illustrate the investment process we described, we've modeled a custom universe of 15 managers using the current 14 largest managers from the eVestment database, along with Schroders, which we draw on for client-specific comparisons. The total assets managed by the 15 were \$759.3 billion as of 3/31/19. We will refer to all the managers anonymously, since the process is more important than the managers; however, we thought it was beneficial to isolate the subset of active managers with whom our clients tell us they have the greatest exposure. We also wanted to ensure there was enough history to observe performance and active positioning through different market environments.

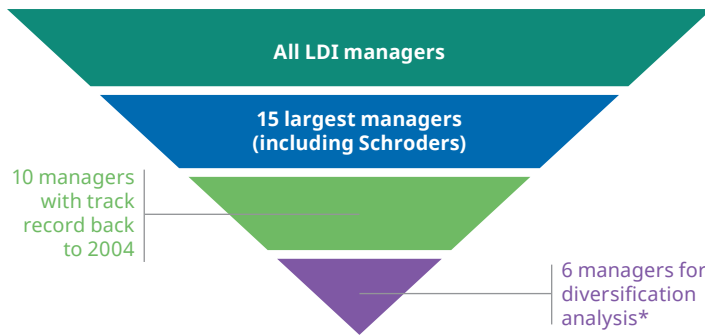


Figure 15 below is a schematic of the analysis showing the 15-year period researched (2004-2019), the various intertemporal spread regimes that prevailed, as well as the “meta regimes” of pre-crisis (June 2004-June 2007) and post crisis (June 2010-June 2019). We examined managers’ risks, returns, correlations and active bets over the discrete regimes (shown in color) to determine how stable and reliable the results were.

The appropriate candidates for an optimal LDI portfolio, under this construct, are the managers that have high alpha versus the

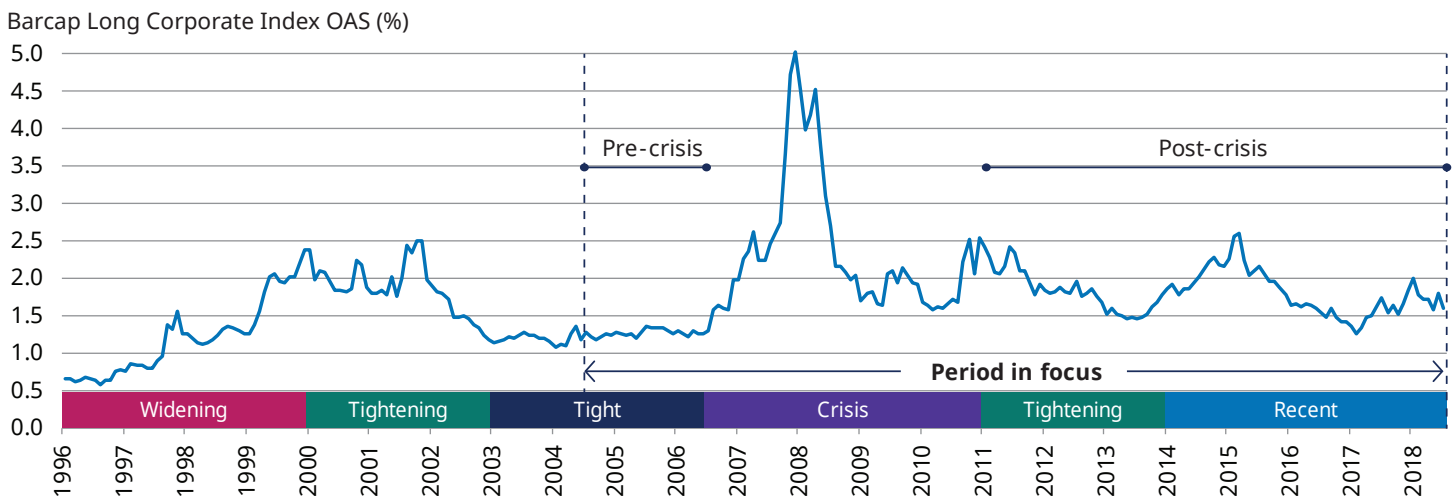
liabilities (and therefore likely exhibit a higher tracking error versus the market benchmark). We also seek the subset of managers that have low correlations with each other, as this will be a key driver of the diversification benefit of combining the managers.

The first thing to note is that the performance over the various subperiods of the managers, and indeed baskets of managers, are quite different. Figure 16 on the next page shows the excess returns and tracking errors of the managers versus the Bloomberg Barclays Long Government Credit index over the subperiods. Figure 17 on page 13 shows how the correlations of the excess returns of the managers also fluctuate depending on the period.

For example, correlations increased during the great financial crisis, when there was a general risk-off sentiment, and credit spreads increased significantly before falling again. Over this period, we also saw tracking error and outperformance of the managers versus the long-gov credit index increase substantially.

In contrast, the more recent five-year period ending June 2019 has been an environment where it was generally more difficult for investment managers to add alpha. This can be seen in the lower excess returns and tracking errors across all managers over this period. (Interestingly though, it was a period where correlations between the managers were quite dispersed, as the managers that were able to add alpha over this period stood out from the pack.) With the exception of a couple of quarters in the last five years, we’ve experienced a market of narrowing corporate bond spreads and falling volatility. Moving beyond the remarkable 2009 spread-tightening opportunities back to more normal levels, quantitative easing led to a dampening effect on market volatility, which played through to a similar dampening effect on manager alpha opportunities. Moreover, in a benign credit cycle, with a backdrop of positive domestic economic growth, idiosyncratic dispersion among credits was also limited. Credit selection opportunities should open up as the market begins to differentiate among credits in a deteriorating environment.

Figure 15: Spread regimes over which to examine the universe of LDI managers

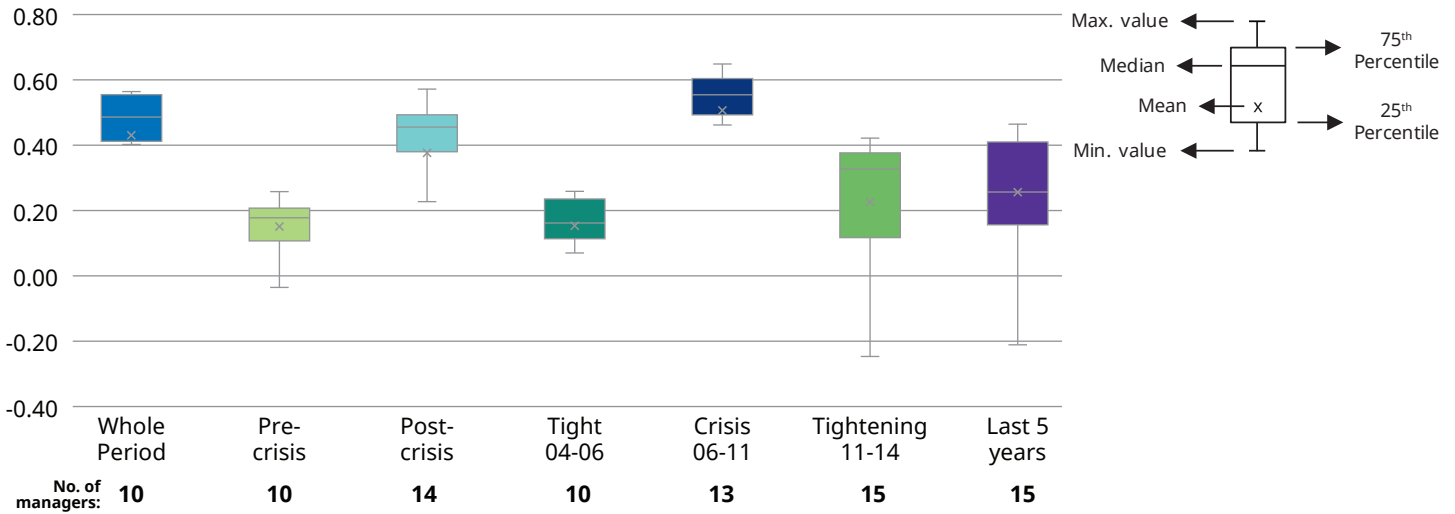


Source: Schroders, Bloomberg, Barclays POINT Highlighted periods: Whole Period (Jun-04 to Jun-19). Pre-crisis (Jun-04 to Jun-07), Post-crisis (Jun-10 to Jun-19), Tight (Jun-04 to Dec-06), Crisis (Dec-06 to Dec-11), Tightening (Dec-11 to Jun-14), Last 5 years (Jun-14 to Jun-19). Past performance is no guarantee of future performance. The views reflected are those of the Schroder US Multi-Sector team and are subject to change.

Figure 16: Annualized excess returns and tracking errors versus Barcap Long Gov/Credit benchmark

	Manager 1	Manager 2	Manager 3	Manager 4	Manager 5	Manager 6	Manager 7	Manager 8	Manager 9	Manager 10	Manager 11	Manager 12	Manager 13	Manager 14	Manager 15
Benchmark: Outperformance															
Whole period	1.89%	1.19%	0.57%	0.94%	0.61%	1.20%	0.49%			0.45%	0.89%	0.72%			
Pre-crisis	1.56%	-0.27%	0.62%	1.13%	-0.18%	0.66%	0.15%			0.22%	0.23%	0.67%			
Post-crisis	1.78%	0.79%	0.82%	0.89%	0.37%	1.01%	0.40%	0.36%	0.29%	0.63%	0.37%	0.74%		0.93%	0.58%
Tight 04-06	1.68%	-0.14%	1.05%	1.27%	-0.26%	0.86%	0.12%			0.40%	0.28%	0.90%			
Crisis 06-11	2.45%	2.26%	-0.10%	0.61%	1.07%	0.76%	1.00%	0.62%		0.20%	2.15%	0.45%		1.52%	0.43%
Tightening 11-14	3.21%	1.32%	1.90%	2.44%	1.75%	4.20%	0.25%	1.00%	1.12%	1.45%	0.13%	1.93%	1.03%	1.89%	1.22%
Last 5 years	0.79%	0.79%	0.30%	0.36%	0.03%	0.30%	0.31%	0.16%	0.02%	0.21%	0.40%	0.27%	0.28%	0.27%	0.40%
Benchmark : Tracking Error															
Whole period	2.47%	1.47%	2.66%	1.89%	1.80%	4.34%	0.34%			1.22%	1.40%	1.45%			
Pre-crisis	1.37%	0.89%	0.75%	0.56%	0.62%	1.07%	0.12%			0.85%	0.51%	0.53%			
Post-crisis	1.05%	1.22%	1.26%	1.44%	1.24%	3.16%	0.24%	0.91%	1.49%	0.48%	1.05%	1.61%		1.05%	0.74%
Tight 04-06	1.47%	0.81%	0.68%	0.59%	0.65%	1.08%	0.12%			0.89%	0.52%	0.53%			
Crisis 06-11	4.01%	2.25%	4.43%	2.86%	2.96%	7.15%	0.49%	2.19%		1.98%	2.17%	1.92%		2.44%	1.85%
Tightening 11-14	0.74%	1.06%	1.13%	1.23%	1.02%	2.70%	0.20%	0.85%	1.20%	0.32%	0.89%	1.32%	0.44%	0.94%	0.67%
Last 5 years	0.94%	0.74%	1.01%	1.27%	0.57%	1.26%	0.23%	0.72%	0.80%	0.33%	0.77%	1.28%	0.29%	1.02%	0.69%

Figure 17: Regime-dependency: Range of alpha correlations vs. Barcap Long Gov/Credit benchmark

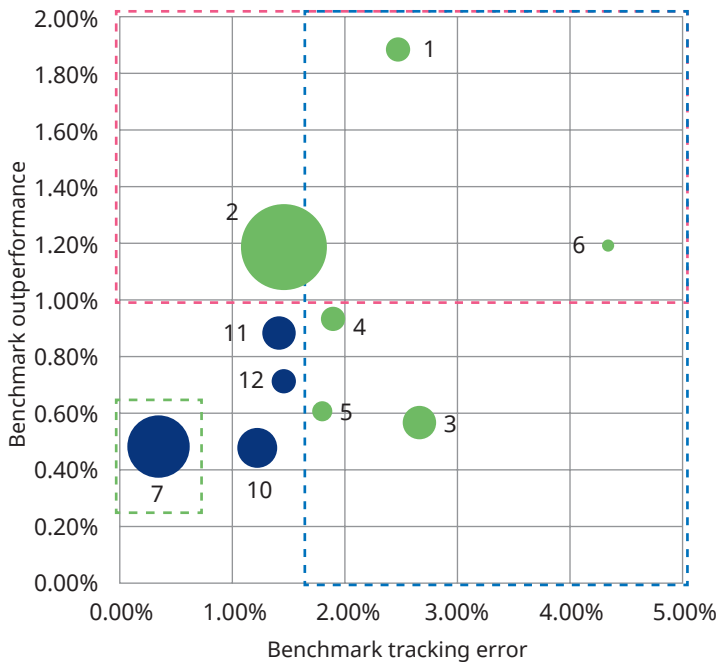


Source: eVestment, Bloomberg, Barclays POINT, Society of Actuaries, Schroders. Hypothetical pension liability cash flows are set every six months to those of Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting Liabilities use FTSE Pension Discount Rates (AA rated bond universe). Highlighted periods: Whole Period (Jun-04 to Jun-19). Pre-crisis (Jun-04 to Jun-07), Post-crisis (Jun-10 to Jun-19), Tight (Jun-04 to Dec-06), Crisis (Dec-06 to Dec-11), Tightening (Dec-11 to Jun-14), Last 5 years (Jun-14 to Jun-19). Past performance is no guarantee of future performance. Bold, italic numbers represent the number of managers within each period.

The regime dependency seen in the prior two visuals is an important backdrop to any quantitative approach and is the key reason why any quantitative analysis must be supplemented with more fundamental and forward-looking drivers.

That being said, we shall perform a more thorough analysis by selecting six managers within the universe, which are generally high alpha/high tracking error approaches, identified as Managers 1-6 in Figure 18 below. This basket is compared to a representative low tracking error manager (Manager 7).

Figure 18: Chose six managers to create a basket of high alpha/high tracking error managers



Representative strategies

- Managers 1-6 were selected as representative high outperformance and/or high tracking error strategies
- We equal-weighted these strategies for simplicity and clarity
- "Market Benchmark" or "Benchmark" refers to Barcap Long Gov/Credit
- "Liability" refers to hypothetical GAAP liability calculated by Schroders

Key:

- High outperformance (Red dashed box)
- High tracking error (Blue dashed box)
- Representative low tracking error manager (Green dashed box)
- Used for diversification analysis (Green circle)
- Size of bubble represents long-duration, fixed income AUM (Blue circle)

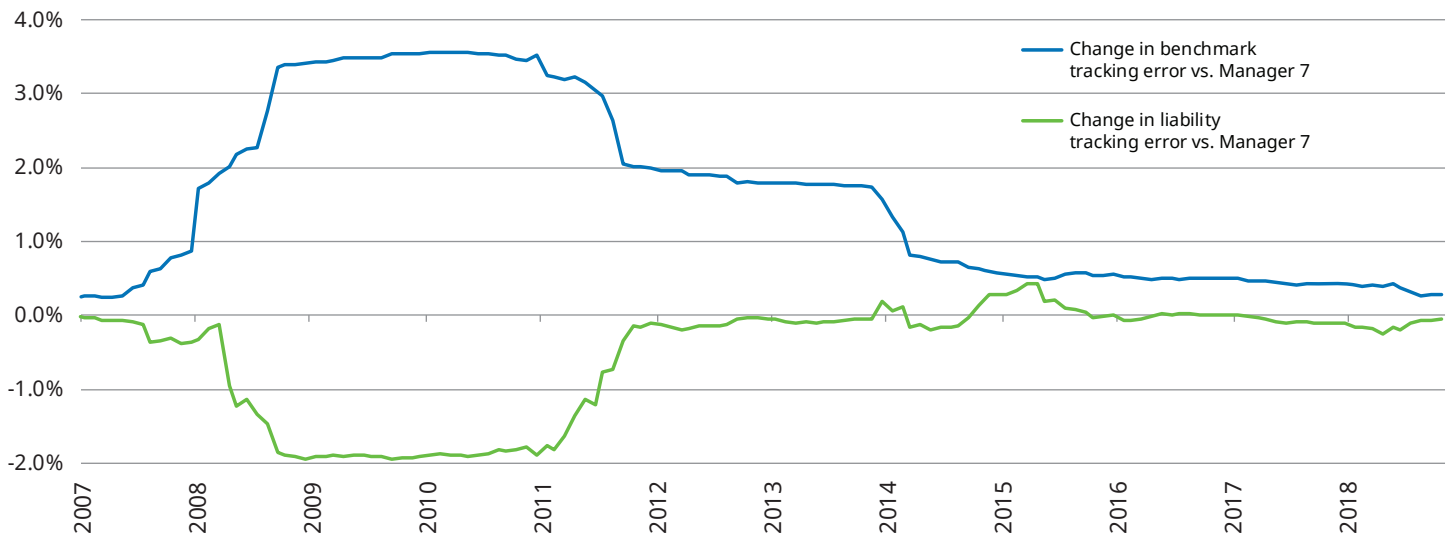
Source: eVestment, Bloomberg, Barclays POINT, Society of Actuaries, Schroders. Hypothetical pension liability cash flows are set every six months to those of the Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting Liabilities use FTSE Pension Discount Rates (AA rated bond universe). Past performance is no guarantee of future performance. Fixed income AUM as at Mar-31-2019

Our analysis of an equally-weighted basket of this subset of managers yields several insights. First, while (as we would expect) the tracking error of the multi-manager portfolio versus the market benchmark is higher, this is not the case when we measure the tracking error of the basket and low tracking error manager versus the liabilities. Indeed, as can be seen in Figure 19, when risk is measured versus the liabilities, the portfolio of six managers generally has a lower tracking error than the representative low tracking error manager (Manager 7).

Second, despite having lower tracking error to the liability, the multi-manager portfolio exhibits improved performance versus the low tracking error manager as shown in Figure 20. This would suggest the basket is more efficient in meeting the true objectives of the LDI portfolio referenced throughout this paper.

Figure 19: Differences in market and liability tracking errors

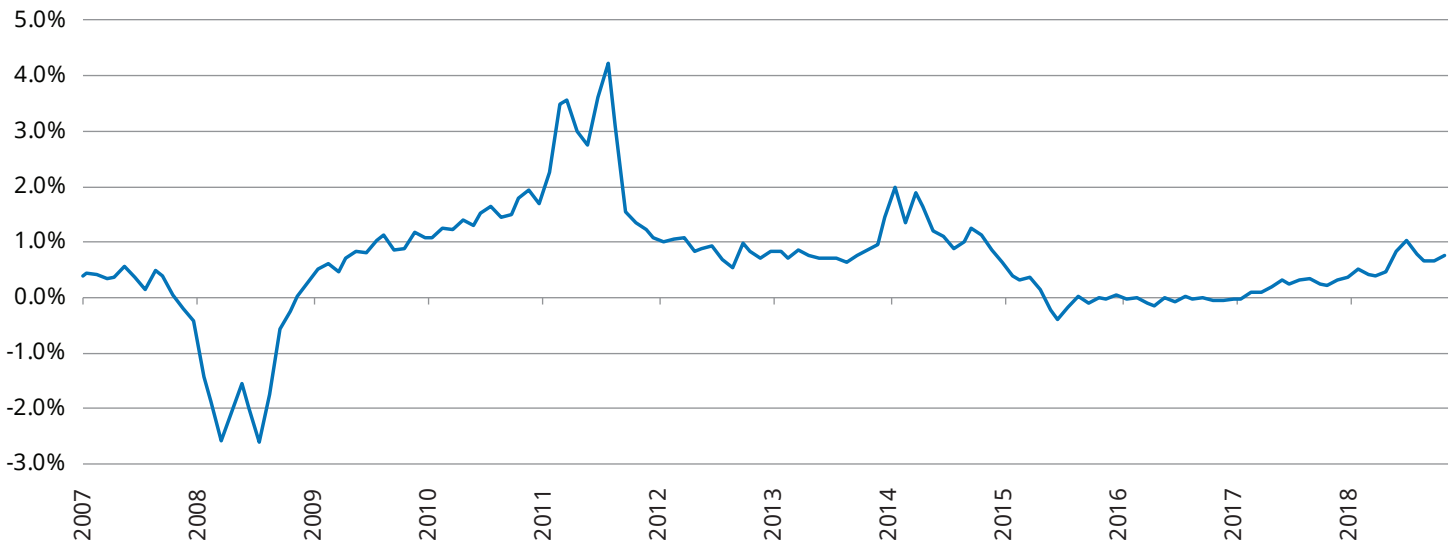
Rolling 3y tracking error (annualized) vs. Manager 7 LDI Portfolio



Source: eVestment, Bloomberg, Barclays POINT, Society of Actuaries, Schroders as at Jun-30-2019. Hypothetical pension liability cash flows are set every six months to those of the Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting Liabilities use FTSE Pension Discount Rates (AA rated bond universe). Past performance is no guarantee of future performance.

Figure 20: Differences in rolling outperformance of basket vs. low tracking error manager

Rolling 3y outperformance (annualized) vs. Manager 7 LDI Portfolio



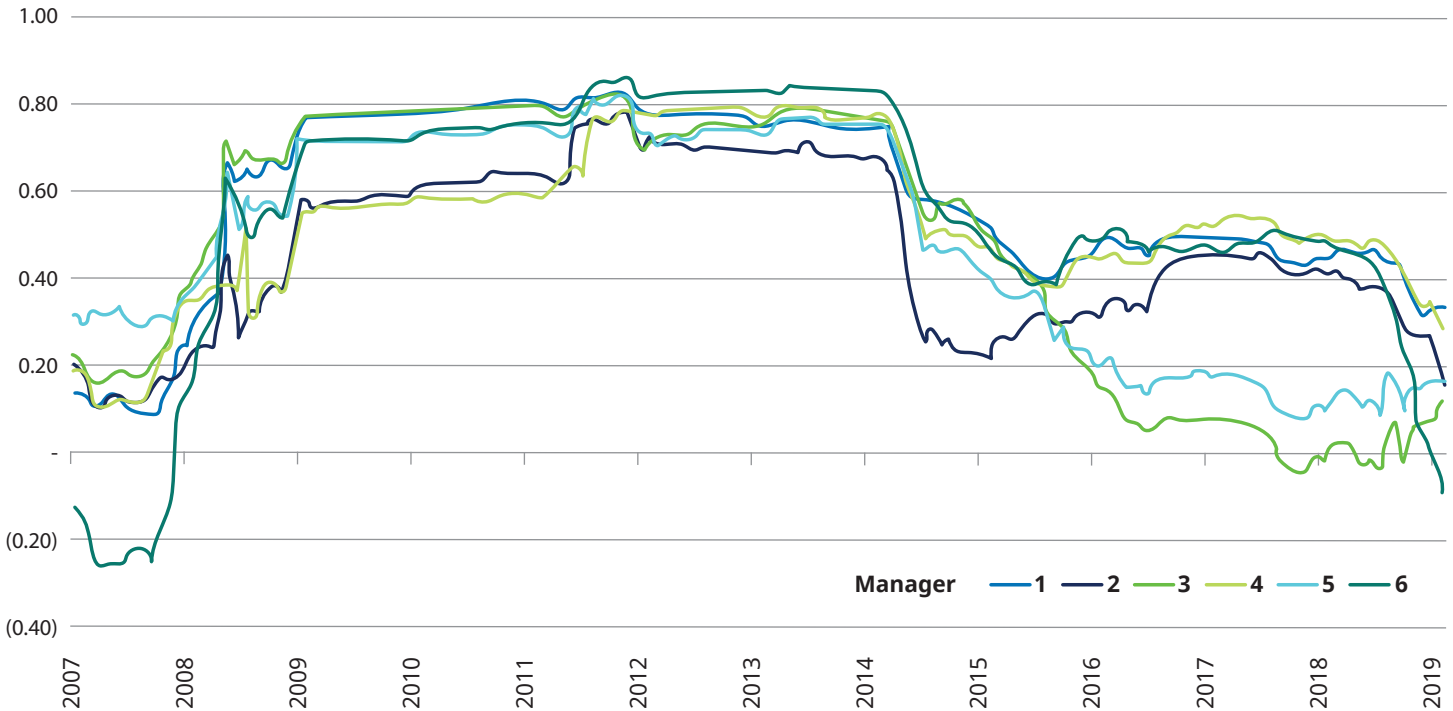
Source: eVestment, Bloomberg, Barclays POINT, Society of Actuaries, Schroders as at Jun-30-2019. Hypothetical pension liability cash flows are set every six months to those of the Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting Liabilities use FTSE Pension Discount Rates (AA rated bond universe). Past performance is no guarantee of future performance.

Finally, while both these effects are reasonably consistent over the time period, the degree changes quite a lot. As illustrated earlier, the benefit that we receive from combining these managers into a portfolio is a function of how correlated the managers excess returns are over time. As can be seen in Figure 21, the average correlations among the managers were generally less than 1,

suggesting a diversification benefit exists. Each line represents a given manager's average correlation with the other managers over rolling, three-year periods. We must note again that the correlations were unstable across regimes/different spread and economic environments.

Figure 21: Instability of rolling three-year correlations among six managers

Rolling 3-year average correlations vs. benchmark



Source: eVestment, Bloomberg, Barclays POINT, Society of Actuaries, Schroders as at Jun-30-2019. Hypothetical pension liability cash flows are set every six months to those of the Bloomberg Barclays Long Government Credit Index and remain static for start of next 5 months. Accounting Liabilities use FTSE Pension Discount Rates (AA rated bond universe). Past performance is no guarantee of future performance. The rolling 3-year correlation for each manager represents the average of the rolling 3-year correlation with each of the other managers.

This therefore leads to the very reasonable question: “How can I be confident these characteristics are going to be persistent over time, and especially over the more challenging period expected ahead?” To help address this concern, more fundamental analysis of the positions taken by managers and forward-looking analysis is needed to ensure that the basket is sufficiently diversified across (1) different drivers of alpha and (2) different parts of the credit market (e.g. small versus large debt issuers and consumer versus corporate credits).

Our analysis of the fundamental positions of managers across various active bets is shown in Figure 22 on the next page. The aim of this analysis is to identify what active positions managers were taking versus the benchmark, and the degree to which these changed over time. This helps identify alpha drivers, and also helps identify any structurally overweight positions that may be undesirable e.g. managers being structurally overweight spread risk.

As expected, the analysis revealed meaningful differences in the ways that managers have sought to add alpha. However, it also shows a generally consistent overweight in the manager universe to Credit at the expense of Treasuries, with on average, managers holding 12% less Treasuries than the Long Gov/Credit index. There are several other interesting observations, such as Manager 1 (who had the highest outperformance versus other managers in the subset) had a structural overweight to BBB's. This was revealed by an average overweight of 12% versus the benchmark and low variability in this position, quarter to quarter. Manager 10 was meaningfully underweight Treasuries consistently, close to benchmark-weighted in Credit, and consistently overweight off-benchmark sectors.

Figure 22: Active bets across all 15 managers in custom universe. Benchmark used is The Barcap Long Gov/Credit Index

Used in diversification analysis

Wider manager universe

	Manager 1	Manager 2	Manager 3	Manager 4	Manager 5	Manager 6	Low T/E Manager 7	Manager 8	Manager 9	Manager 10	Manager 11	Manager 12	Manager 13	Manager 14	Manager 15
Active Duration															
Average	-0.7	-0.4	-0.1	-0.1	1.2	-0.2	0	-0.9	0	-0.3	-0.4	-0.4	-1.3	-0.1	-0.3
Std Dev	0.3	1	0.5	0.2	1.4	0.3	0	0.1	0.3	0.2	0.2	1.3	0.2	0.7	1.1
Active Government															
Average	-17%	-3%	-18%	-23%	-21%	-11%	-2%	-8%	-8%	-13%	-9%	-17%	-4%	-8%	-20%
Std Dev	16%	14%	7%	8%	12%	31%	1%	8%	7%	15%	10%	5%	7%	8%	7%
Active IG Corporate															
Average	10%	-10%	-2%	-11%	15%	8%	-4%	4%	14%	3%	13%	0%	7%	6%	-1%
Std Dev	14%	12%	11%	17%	15%	29%	3%	5%	7%	9%	9%	7%	8%	10%	6%
Active Agencies															
Average	-2%	4%	-1%	3%	-3%	-5%	0%	1%	-2%	-3%	-2%	0%	2%	-2%	-3%
Std Dev	3%	11%	7%	7%	7%	3%	1%	7%	1%	5%	3%	2%	3%	6%	3%
Active Non Gov/ Corp															
Average	16%	21%	29%	35%	15%	12%	16%	14%	5%	18%	6%	27%	8%	11%	30%
Std Dev	9%	11%	13%	17%	9%	8%	4%	7%	2%	15%	6%	8%	3%	8%	9%
BBB Active Weight															
Average	12%	0%	1%	1%	1%	-6%	5%	1%	11%	8%	-4%	3%	-4%	6%	2%
Std Dev	4%	4%	3%	5%	6%	7%	1%	4%	7%	9%	5%	3%	9%	5%	5%

■ underweight and high variability

■ overweight and high variability

■ overweight and low variability

■ underweight and low variability

The main goal of the fundamental analysis is to get closer to the holdings and ascertain how well diversified the multi-manager portfolio is across multiple drivers of alpha. However, this depends on historical positions and needs to be supplemented with a forward-looking view.

The forward-looking part of the process is certainly informed by the fundamental analysis, but it also must rely on information gained from discussions with investment managers. There is a broad range of different alpha-generating techniques that can be deployed in LDI portfolios. The matrix below lists the main drivers and, if completed using current managers, to help a plan sponsor

quickly determine whether her existing roster of managers is comprehensive in its alpha coverage and diversification. Doing this may be the best way to initiate the LDI refresh process. The investor will know which alpha sources she is under-exposed to, and which she may be doubling up on. The quantitative and fundamental parts of the process will then equip her with the information required to assess appropriate diversification, which could drive a more efficient LDI portfolio. We believe this is the best way to set performance expectations for the coming 10 years and make clear to an investment committee why managers change and LDI portfolio re-construction make sense.

Figure 23: Schroders Proprietary Alpha Matrix

Sources of alpha	Manager A	Manager B	Manager C	Manager B
Credit Selection - opportunistic				
Credit Selection - avoid downgrades				
Structural overweight BBB				
Treasury vs Credit rotation				
Industry rotation				
Off-Benchmark Sectors				
Duration positioning				
Yield Curve positioning				
Alpha ported to Treasury exposure				

Contribution to expected alpha

- Major
- Minor
- None

Alpha Levers Defined

- **Credit selection - opportunistic:** Invest in credits where ratings upgrades are anticipated, and spreads are expected to narrow relative to similar issuers. Relatively benchmark-insensitive approach.
- **Credit selection - avoid downgrades:** Defensive style, winning by losing less than the index. The size of the active positions relative to the benchmark are small. Low tracking error approach to active credit selection.
- **Structural overweight to BBB:** the manager aims to beat the A or AA discount rates by being underweight those ratings buckets consistently. Carry and spread compression drive the opportunity set, which is now over 50% of the long credit universe.
- **Treasury vs Credit rotation:** actively shifting between credit and governments to add value or manage risk. Large tracking error decision vs Barcap Gov/Credit.
- **Industry rotation:** classic approach of overweighting and underweighting different economic sectors based on valuation and other characteristics.
- **Off-benchmark sectors:** everything from BBBs to Munis to Mortgages, often held tactically; good way to combat the challenge of size in the Corporate universe.
- **Alpha ported to Treasury exposure:** as discussed a previous paper, *Alternatives to Long Corporates in LDI*, a strategy that combines long-duration Treasury futures with a return-generating asset such as short-duration credit or floating-rate securitized. The duration hedge remains in place with the long Treasury futures, but the long corporate spread exposure is now replaced by shorter-dated assets that carry both spread and greater alpha opportunity.

Conclusion

In summary, we believe that a US pension plan's LDI portfolio can be meaningfully improved in terms of its ability to thrive in the next 10 years if a plan sponsor is willing to be decisively pro-active, even when there appears to be no trouble afoot. Autopilot is not an investment strategy. This includes addressing a myriad of structural and cyclical challenges; those related to downgrade effects and the inability for some of their managers above a certain size to access the full universe of credits.

Assuming that downgrades will increase going forward, the primary tools to offset the funding headwinds will be to diversify idiosyncratic risk by adding credits or increasing the allocation to Treasuries. The fundamental data would suggest that many of the managers cannot do the former and are unlikely to pursue the latter.

Risk is not the only factor sponsors should care about when evaluating the effectiveness of their LDI strategy. With half of pension assets in LDI, we think it's critically important to now recognize that an LDI portfolio has two missions: 1) hedge interest rate and credit spread sensitivity and 2) earn returns that can meet or exceed the discount rate. This is due to many investment forecasts calling for lower market returns going forward, after a 10-year bull market where equities quadrupled from market bottoms. Moreover, we have quantified a liability return "hurdle" that is well above 100 bps p.a., and therefore we must begin to see the multi-manager LDI portfolio as one that maximizes alpha relative to a market benchmark and uses diversification to keep the total tracking error in check. There is no zero-tracking error portfolio to the liability in any case.

The LDI multi-manager portfolio construction process must account for the drastic shifts in alpha, correlation and tracking errors from one environment to the next. This is why the fundamental and qualitative aspects of the portfolio construction process are so critical. The question of what is the optimal number of managers is answered when a plan has sufficient coverage of all active management approaches and accounts for the potential that he/she may not be perfect in manager selection.

We are optimistic about what can be accomplished if plan sponsors and their consultants take the time to future-proof their LDI portfolios. Let's ensure the portfolio that is supposed to help you sleep at night does not give you insomnia in the years to come.

Schroder Investment Management North America Inc.
7 Bryant Park, New York, NY 10018-3706

 schroders.com/us
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