Designing Better LDI Portfolios: Avoiding Pitfalls of Traditional Approaches

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INTRODUCTION

The key to designing better liability driven investment (LDI) portfolios lies in incorporating both investor objectives and the attributes of the investment sector into the strategy design. Traditional fixed income approaches have typically relied on the choice of a market-based benchmark and whether to take an active or passive approach. This was not an issue in the past when the popular benchmarks, such as the Barclays Capital Aggregate Bond Index, were diversified and fairly generic. However, as investors further segment the fixed income market to achieve their specific objectives, the pitfalls of both traditional benchmarks and conventional active/passive approaches become alarmingly apparent. Here we explore our approach to constructing LDI-driven fixed income portfolios, which seeks to avoid these pitfalls. We focus our discussion on a sector which has received much attention recently in hedging pension liabilities: the high quality long corporate sector.

The high quality long corporate sector has become particularly important as more and more corporate pension plans and consultants implement liability driven investment strategies. They have found that the best way to reduce funded status volatility is by holding a significant portion of their assets in high quality, very long duration corporate bonds because their liabilities are typically valued using high quality long corporate bond yields.

We describe here the methodology and rationale for an approach which we feel meets the investment objectives of most corporate pension plans looking to gain exposure in long corporate bonds, and also incorporates the attributes of the desired sector in its design. It differs from the traditional reliance on market capitalization and ratings that are employed in traditional benchmark and portfolio construction. It also incorporates the benefits of a passive strategy by being systematic and repeatable, but without the major drawbacks associated with indexing (e.g. reliance on market capitalization and subjective ratings). Finally, it has the benefits of active management without a major drawback: namely, the temptation to stretch for yield. It does this by incorporating investor objectives and the characteristics of the investment sector in designing the strategy.

INVESTMENT SECTOR CHARACTERISTICS

First, let's examine the characteristics of the desired investment sector that will drive the type of investment strategy that is pursued. As a basis for discussion and analysis we will use 20+ year corporate bonds rated single A and higher. It is instructive to look at measures of risk and return in this sector, and contrast them with the high yield corporate bond sector, for example. You can see in *Figure 1* that the high quality long corporate bond sector that is most relevant for corporate pensions is actually a fairly homogeneous sector, especially compared to the high yield sector shown in *Figure 2*, which has a very diverse opportunity set in terms of both risk and reward opportunities. This type of homogeneity would tend to push one towards an index-like strategy and away from an alpha-generating strategy simply because it may be difficult to add significant value by selecting among securities which, on the surface, look so much alike. One could stop right there and decide to just index to the market benchmark–the traditional approach; however, it is important to examine the ramifications of indexing in this sector and factor that into the portfolio construction decision.

Figure 1: Little Differentiation Among Bonds in the High Quality Long Corporate Space

Data Source: Barclays Capital U.S. Credit Corporate 20+ Year ex-Baa Index Securities as of 10/29/2010

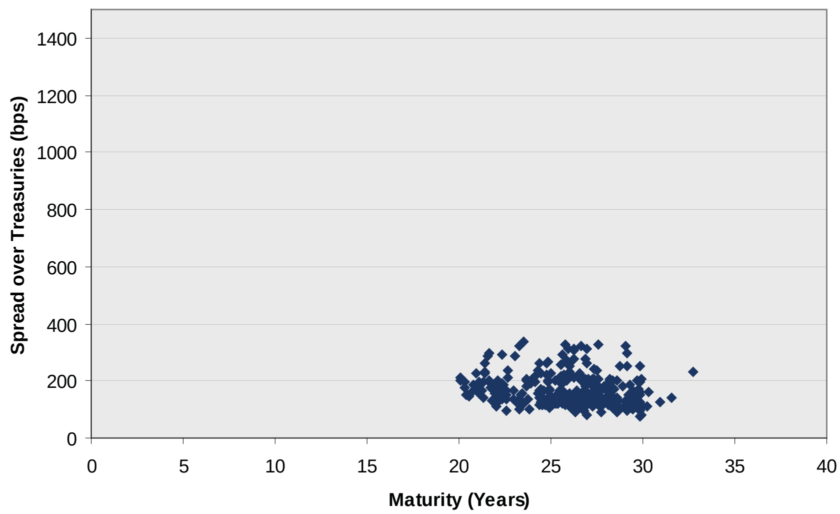
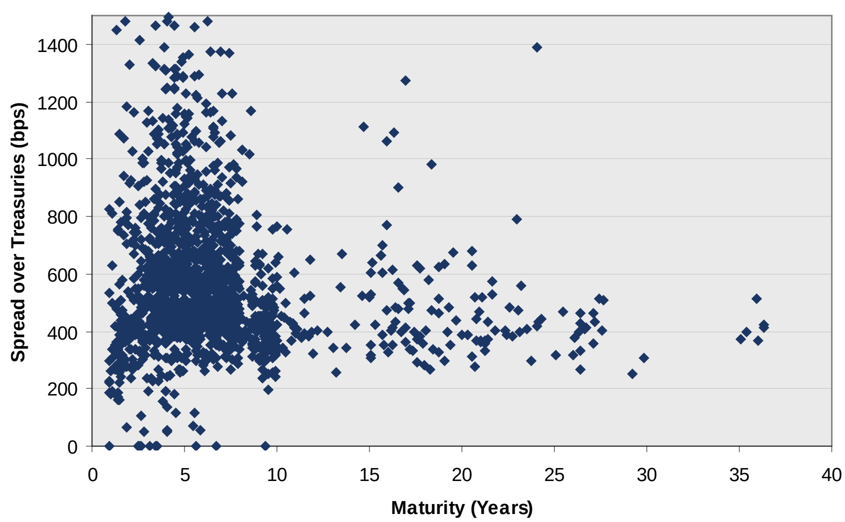


Figure 2: High Yield Space Provides Richer Opportunity Set for Alpha Generation

Data Source: Barclays Capital High Yield Index Securities as of 10/29/2010



DRAWBACKS TO AN INDEX STRATEGY IN CORPORATE BONDS

Based on the characteristics we see in this sector, there may be a temptation to simply index. However, implementing a strategy designed to track traditional fixed income indices can be suboptimal because of the index construction methodology. An example in corporate bonds makes this clear. The indices have specific inclusion criteria, some of which are not market-based. For example, for inclusion in a typical investment grade index, a bond must be investment grade (BBB rated or higher), of a certain size of issue and fixed rate, and with a maturity of greater than one year. These rules are to some extent arbitrary, but index funds must buy and sell securities in order to comply with these index rules or their funds will not track. There is typically no investment reason, in our investment space for example, to sell securities simply because they fall just below 20.0 years in maturity. A 19.9-year bond would still be a perfectly reasonable investment to meet the LDI objective. However, index managers must still sell bonds that cross this threshold, or their portfolios will eventually be out of balance.

Additionally, the index reliance on credit ratings to determine inclusion, combined with market cap weighting, can result in perverse economic results when a pure index methodology is followed. An example makes this clear. Typically, most corporate bonds above a certain credit rating and size are included in the index. One could imagine a scenario in which a hypothetical AAA-rated company continues to issue bonds until it leverages itself right out of an investment-grade rating, and right out of the index. An index fund would have to buy this company's bonds as they are issued, and keep buying them even as they are downgraded. The performance of the company's bonds will suffer as the market recognizes the company's increasingly levered situation, but the index funds will keep buying, right up until the point where the rating agencies eventually, subjectively, decide that the company is not investment grade. At that point the index managers would then have to promptly liquidate all the bonds they had been buying.

This reliance on market capitalization and ratings becomes more problematic as the investment focus becomes narrower. For corporate pension plans looking to invest in highly-rated long corporate bonds, issuer concentration becomes a significant problem because of the confluence of large issuers in the telecommunications and finance sectors. (*See Figure 3.*) As the table shows, the top ten issuers (out of 137) comprise over 35% of this index. If there is a problem with one of these large issuers, there are serious ramifications for an index portfolio.

Figure 3: Top Ten Issuers Comprise over 35% of Index

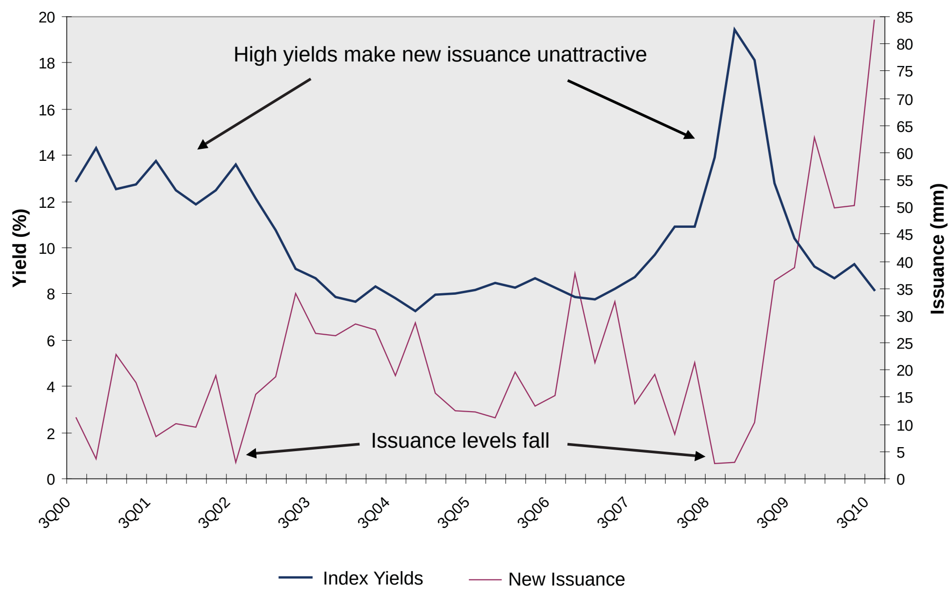
Data Source: Barclays Capital U.S. Credit Corporate 20+ Year ex-Baa Index as of September 30, 2010

	Issuer Name	Exposure (%)
1	AT&T	6.8
2	GENERAL ELECTRIC CAPITAL CORP	5.3
3	VERIZON	3.7
4	CITIGROUP INC	3.6
5	GOLDMAN SACHS GROUP LP	3.5
6	WAL-MART STORES INC	3.1
7	HSBC	2.9
8	JPMORGAN CHASE & CO	2.7
9	WELLS FARGO	2.3
10	CONOCO PHILIPS	2.1
	Total	**35.8**

Additionally, being constrained to the index often forces managers to buy securities and increase exposure to sectors at the most inopportune time. For example, when yields are low and spreads are tight, issuers are incented to issue more debt at lower costs. This incentive is greatest for issuers who are the riskiest and who benefit most when spreads are compressed. Index managers then have to buy more of these riskier issuers when compensation for risk is lowest. Recently, high yield and investment grade corporate bond issuance has increased in the current tighter spread and lower yield environment, while new issuance tends to slow when spreads and rates are wider and higher. Please see *Figure 4*.

Figure 4: New Issuance and Yield Levels (High Yield Bonds)

Data Source: Barclays Capital High Yield Index



Note these benchmark difficulties apply even to active managers. Active managers choose the amount of exposure to a particular issuer and by definition do not have to follow the index. However, by having the index as a benchmark, active managers will still be making bets relative to the benchmark, and will necessarily view their positions *relative* to the benchmark. So, even if an active manager does not like a particular issuer, he or she may still hold a significant allocation to it in order to avoid taking a huge underweight position *versus the index*. In this way, the benchmark exerts influence on the investment process and the portfolio even in an active approach. If the benchmark has drawbacks, it will affect even an active manager who has been given the freedom to deviate from it.

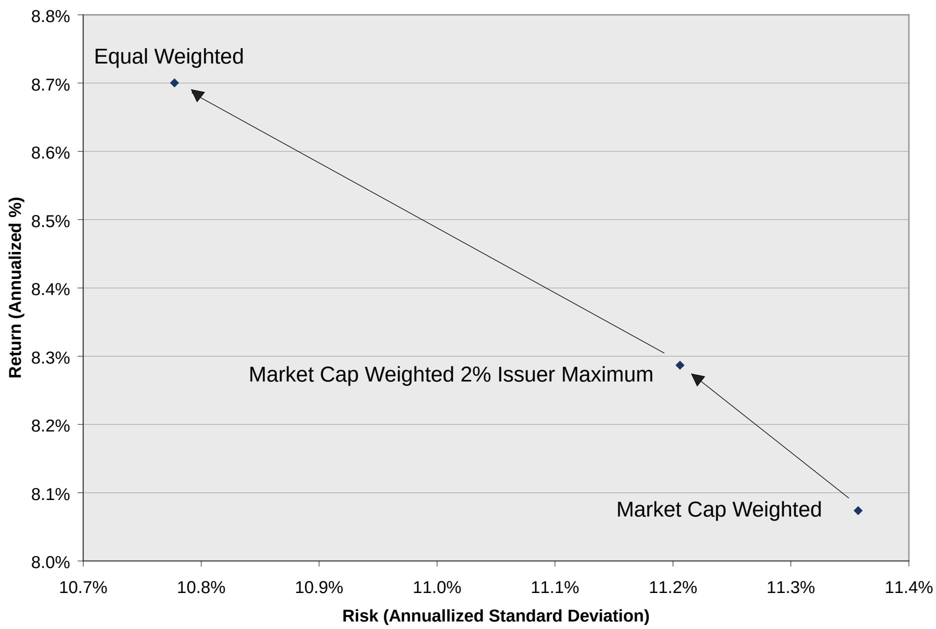
Of course creating a benchmark based on qualitative or even quantitative measurements is difficult, which is why the typical index rules rely on objectively identifiable attributes, even if they have drawbacks. However, investors should not tolerate their manager hewing to a sub-optimal benchmark because, as we have described, the less desirable characteristics of that benchmark will flow through to the portfolio during its construction. Anytime a manager, as part of his or her investment process and rationale, can use the phrase "I had to buy it because it was part of the benchmark," the resultant portfolio will incorporate, to some extent, the less-desirable benchmark characteristics. An ideal approach would focus on creating a portfolio that would gain exposure to the sector in the most efficient manner possible, without these pitfalls.

ALTERNATIVES TO CAP WEIGHTING INDICES

One alternative is to naively weight the issuers equally in the benchmark. This takes both issuer's size and proclivity towards leverage out of the equation, and gives a broad diversified sampling of corporate exposures. This means that bigger issuers have their influence reduced while smaller issuers have theirs boosted. The benefit of this approach can be seen by looking historically at the return of the market-weighted high quality long corporate index compared to its equal-weighted and market cap-limited counterparts. As you can see in *Figure 5*, limiting or removing the influence of market capitalization in this space has resulted historically in higher returns and less volatility. By definition, equal weighting increases the diversification of the portfolio by boosting exposure to smaller issuers at the expense of larger issuers. Even this is not a perfect approach, though. Bigger issuance can mean higher leverage and risk; however, bigger issuance can be a byproduct of simply being a larger company.

Figure 5: Reducing Issuer Concentration and Market Cap Reliance Has Resulted in Higher Returns with Less Risk Historically

Data Source: Barclays Capital U.S. Credit Corporate 20+ Year ex-Baa Indices (Equal Weighted, Market Cap Weighted 2% Issuer Maximum, and Market Cap Weighted from 2/2000-8/2010)



Equal weighting certainly addresses some of the concerns about the drawbacks of market weighting, but it raises some additional concerns as well. Is smaller necessarily better from a credit quality perspective? By definition, all other things being equal (in particular and especially firm size and volatility), a company with less debt in the index will be less levered and less risky than the same company would be with more debt. But things are rarely equal. An equal-weighting or capped-weighting approach can potentially mean shifting exposures away from large firms with low leverage and low volatility (i.e., big safe companies that have a lot of debt in absolute terms but still low leverage and volatility), to smaller but highly-leveraged, high-volatility companies. If issuer credit quality is a concern, then additional measures must be incorporated into the portfolio design. This is where the investor objectives play a role.

INVESTOR OBJECTIVES IN HIGH QUALITY LONG CORPORATE EXPOSURE

Most corporate pension plans want to hedge their liabilities with efficient exposure to the high quality long corporate segment of the market. Their focus is primarily on efficient diversified exposure for hedging purposes, as opposed to trying to add incremental value. To obtain that exposure consistently, the investment process should be implemented in a systematic way. In some sense, the very definition of the exposure you will obtain is based on the rules, or rather the approach, that is put in place to guide the strategy. It is essentially taking the indexing approach to the next level. It starts with index-type rules and then layers on a process that is designed to mitigate the negative aspects of indexing, yet still gain the desired systematic exposure.

However, avoiding downgrades and defaults is also especially important to corporate pensions as the discount rate that is used to value their liabilities is essentially default free. The discount rates are typically based on averages of corporate bond yields for relevant sectors of the yield curve. One characteristic of these averages is that when a company is downgraded and removed from inclusion in the average, there is no negative impact to the liabilities (as there would be to a portfolio which held that security). In fact, because securities removed from consideration typically have higher yields (because of the downgrades or defaults), the removal of these bonds from the average can actually lower the average yield used to discount the liabilities. This has the strange effect of actually increasing the value of the liabilities as they are discounted at the new lower rate (brought about because of the removal of a high yielding downgraded issuer). *See Figure 6*.

Figure 6: Hypothetical Example-Downgrade Double Whammy [1]
Portolio Loses Value, While Liabilities Increase

Data Source: Mellon Capital Management

	Step 1: Original Portfolio	Step 2: Bond 8 Impaired but Not Downgraded	Step 3: Bond 8 Defaults
Bond #	Yield	Yield	Yield
1	5.2	5.2	5.2
2	5.3	5.3	5.3
3	5.3	5.3	5.3
4	5.3	5.3	5.3
5	5.4	5.4	5.4
6	5.5	5.5	5.5
7	5.6	5.6	5.6
8	5.7	10.7	
9	5.8	5.8	5.8
10	5.9	5.9	5.9
Average Yield	**5.50**	**6.00**	**5.48**
Liability Valuation	**100.00**	**95.00**	**100.22**
Portfolio Value	**100.00**	**95.00**	**94.00**
Notes	*Fully Funded Plan with Duration of 10 for assets and liabilities*	*Bond 8 is impaired so the price drops reducing the portfolio value. Also, the yield rises on Bond 8 increasing the average yield used for discounting liabilities, so Liability Valuation also falls*	*Bond 8 defaults and the price drops to 40, reducing the portfolio value to 94. Bond 8 is also removed from the discount rate calculation (no longer single A-rated). Removing Bond 8's high yield from the average yield calculations brings the discounting rate down, which actually **increases** the liability valuation.*

Because this is a high quality sector there is relatively little upside to be gained from picking winners, but much potential benefit from avoiding downgrades and defaults with the associated large downside risk. So if one of the investment goals is to mitigate the downside risk associated with downgrades and defaults, an additional step beyond an index approach is required in order to avoid (a) investing blindly just because an issuer happens to be in the index, and (b) having the weight of the investment determined arbitrarily, whether that be cap weighted, capped, or equal weighted. What is really needed is a way to shift exposure to safer companies in a systematic way, independent of the ratings and size. Such an approach is desirable because of the attributes of the sector (homogeneous) and the investment objective of gaining consistent exposure and avoiding downgrades and defaults.

SOLUTION

We have seen the positive impact of taking a more equal-weighted approach by either capping the issuer exposure or using pure equal-weighted approach. This clearly goes a long way towards removing the extreme issuer concentration concerns, or the pathological result obtained when a corporation issues debt to the point of being downgraded out of the index. This diversifying approach has to be part of the solution in order to increase the diversification and minimize the negative aspects of having very high issuer concentration. However, this does nothing to

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approach has to be part of the solution in order to increase the diversification and minimize the negative aspects of having very high issuer concentration. However, this does nothing to address the second objective of avoiding defaults and downgrades that we identified. Adding an independent ratings assessment of credit quality and risk, independent of the ratings agencies, will also be important to mitigating the risk of downgrades and defaults.

In this situation it makes sense to construct a portfolio that seeks to identify riskier securities and avoid them, even if they are a large part of the index. Note that the objective in this case is to obtain efficient exposure to high quality long corporate bonds. Because the investment space is so narrowly focused, we believe the focus in this situation must be on downgrade and default risk, as opposed to adding a few extra basis points in yield from buying relatively cheap securities that are actually priced quite closely together because they are so high in the quality spectrum (single A and higher). The fact that they are all such high quality does not create the kind of relative value dispersion required to add significant value without taking large, risky, undiversified active bets. For a corporate pension plan that is trying to hedge its liabilities, the need is to avoid downgrades and defaults because their liability valuation is not subject to downgrade or default.

In our view, the recommended approach in this case would be to create a diversified exposure portfolio of securities that has the desired characteristics (20+ years maturity, single A and higher), but does not have the issuer concentration or strict reliance on ratings as do the classical benchmarks. Most important, this approach would actively seek to avoid issuers more likely to be downgraded or to default. This "active" component would focus the active credit assessment on risk control and downgrade avoidance as opposed to stretching for yield or trying to extract relative value in a rather homogeneous sector.

A SYSTEMATIC APPROACH TO LDI: MATCHING OBJECTIVES TO PORTFOLIO CONSTRUCTION

This is an example of a very different approach to investing than the traditional focus on market-weighted and ratings-defined benchmarks, and on information ratio-focused active strategies. In this approach, the investment objectives and the market attributes drive the investment strategy taken.

We believe that each situation should be defined by the nature of the investment objective, and by the attributes of the particular investment sector. In this case the objectives (efficient exposure to long duration high quality corporate bonds, and low downgrade and default risk), and the investment sector attributes (high quality, low spread dispersion, high issuer concentration), led us to the approach we described.

Other objectives and attributes may lead to other approaches such as traditional indexing or traditional active management approaches. However, each situation must be evaluated independently with the investor objectives and the investment space guiding the approach.

BIOGRAPHY

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Lowell J. Bennett is Managing Director and Fixed Income Strategist at Mellon Capital Management. With over 24 years of investment and finance experience, Lowell is actively involved in the refinement and implementation of current strategies and the development of new strategies by providing fixed income knowlege and expertise. He articulates fixed income strategies and developments to clients, and works with them to fashion practical viable investment solutions to meet their needs. Lowell launched and managed the Enhanced Collateral and Active Bond Funds, and implemented the first fixed income term structure at Mellon Capital. As an industry expert, Lowell has been featured in numerous industry articles. He serves on the Mellon Capital Fiducuary Committee, and is a member of the CFA Institute and CFA Society of San Francisco. He received his B.S.I.E and M.B.A. from Stanford University.

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