Rocaton

INSIGHTS

# *Expanding the LDI Tool Kit:* Alternatives to Long Corporate Bonds

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## EXECUTIVE SUMMARY

* Long corporate and government bonds have been the predominant asset classes that plan sponsors have used in an effort to hedge their pension liabilities.
* Hedging is an imperfect exercise. Further, the effectiveness is curtailed due to defaults and downgrades as both explicitly impact asset performance but do not adversely affect pension liability values.
* While long high quality bonds serve as a natural hedge to pension liabilities, diversification is an important tenet of investing in liability hedging portfolios just as it is in growth portfolios.
* Investors may want to consider exploring certain asset classes that have a reasonable correlation to the liability discount curve, yet may provide higher or comparable returns and importantly offer diversification benefits to corporate credit risk. Figure 1, below, details asset classes that can be used as a substitute or complement to long corporate bonds.
* The balance of this Insights will expand on the characteristics of these asset classes. While the paper does not provide details on long corporate or government bonds, we recognize that these asset classes will be the cornerstone of a liability hedging portfolio.

Figure 1: Long Duration Asset Classes for Consideration in an LDI Portfolio

| | | Long Duration Alternatives | | | | |
|---|---|---|---|---|---|---|
| Characteristics | Long Corporates | Long Taxable Munis[2] | CMOs | Commercial Mortgage Lending | Private Infrastructure Lending | Corporate Private Placements |
| Size of Market (mm)[1] | $1,248,527 | $231,628 | ~$300 billion in Long Duration CMOs is outstanding | $3.2 trillion (largely held by banks, insurance companies, and CMBS investors) | ~$15 billion in annual issuance | ~$50 billion in annual issuance |
| Average Credit Quality | A3/BAA1 | AA3/A1 | Underlying Collateral typically AAA | A/BBB | Deals not always rated. Deals that are rated tend to be BBB. | Deals are typically not rated by public rating agencies. BBB rated corporate credit risk. |
| Option Adjusted Spread | 186 bps | 153 bps | Can offer 100 bps over Treasuries (highly dependent on timing of cash flows) | 100 - 200 bps premium to similar maturity Treasuries | ~50 bps premium over similar quality publicly traded corporate bonds. | ~50-75 bps premium over similar quality publicly traded corporate bonds. |
| Duration or Average Life | 13.8 | 11.9 | Varies given type of security. However, CMO Z bonds can have an average life of 15—20 years at issuance. | ~5-7 | Average Life of ~15 years. | Average Life at issuance ~10 years. |

Source: Barclays, Babson Capital, BofA, JP Morgan, MetLife. As of December 31, 2014.
1 The size of the market for each long duration asset class is representative of the market value for the index that is used as a proxy.
2 The Barclays Long Credit Index includes taxable municipals; however the size of the taxable municipal market within the Barclays Long Credit Index is smaller than the market size of ~$232 billion stated above.

## Introduction

Along with long government bonds, long corporate bonds have been the predominant asset class that plan sponsors have used in an effort to hedge their pension liabilities. Corporate bonds are a natural hedge for several reasons 1) the curve used to discount liabilities is composed of high quality corporate bonds, 2) cash flows on long corporate bonds are highly certain in advance (ignoring defaults and optionality), 3) the default rate on the long corporate bond index has been low for most of its history, and 4) the market is relatively large (approximately $1.2 trillion as of December 2014) and has frequent new issuance.

Although long corporate bonds are well suited to hedge pension liabilities, hedging is an imperfect exercise due to actuarial risk (e.g. mortality assumptions, retirement, lump sum features, etc.) and the methodology that is used to construct liability discount curves, which is composed exclusively of AA rated corporate bonds. In addition to the imperfect nature of corporate bonds as a liability hedge, Rocaton believes that there are several other factors that encourage plan sponsors to explore other long duration assets as a complement to their current LDI program.

* Lending to companies for an extended period can be a risky proposition, which is potentially exacerbated by the pace of technological change. Secondly, given the incentive to maximize shareholder wealth, there may be a misalignment of interests between bondholders and corporate management.
* The credit quality of the Long Corporate universe, as measured by the Barclays Long Corporate Index, has generally trended lower over time. Currently, BBBs make up approximately 47% of the index.

Figure 2: Barclays Long Corporate Index: Credit Quality

| Credit Quality | % of Index As of 12/31/2014 | % of Index As of 12/31/1994 |
|---|---|---|
| AAA | 1.3% | 5.6% |
| AA | 7.1% | 15.8% |
| A | 45.2% | 47.3% |
| BBB | 46.5% | 31.3% |

Sources: Barclays

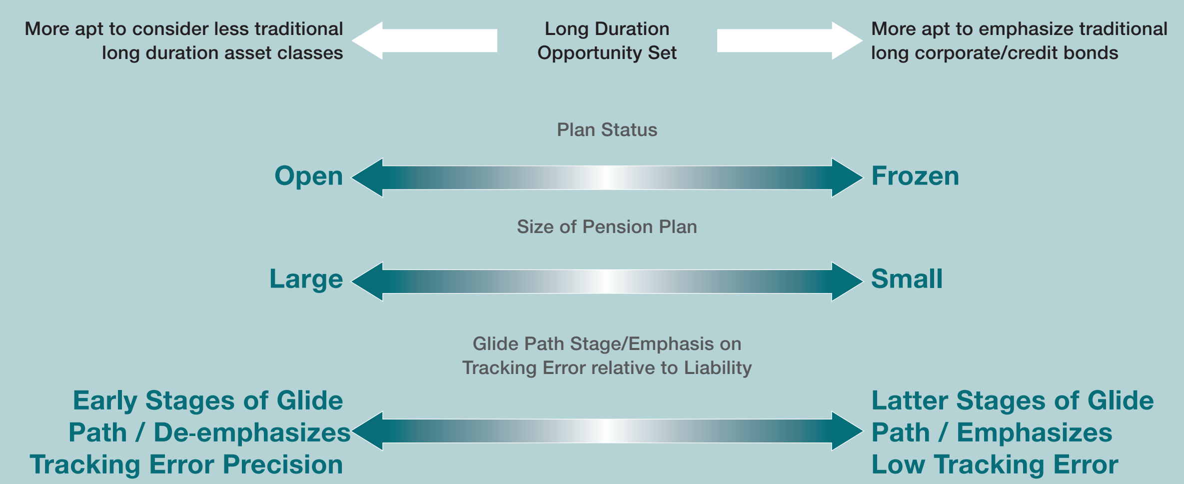
* The long corporate universe is concentrated, with the top 10 issuers constituting almost 20% of the index.
* Long corporate bonds exhibit positive convexity as long as spreads do not widen as interest rates fall. Widening credit spreads can result in negative convexity in falling interest rate environments which, of course, reduces the price gain associated with holding long bonds when rates fall.

* The diversification benefits of a long corporate/credit program with multiple managers is limited to some extent given the limited number of issuers.

* Supply and demand imbalances may arise given the strong demand of corporate pension plans de-risking and/or lower new issue supply if we move to a higher rate environment.

The degree to which plan sponsors consider non-corporate long duration assets should be guided by their plan's specific circumstances and objectives. Some of these factors are the plan's status (e.g. frozen, closed, open), size of pension plan, and where the plan is on its glide path stage.

Figure 3:
Key Investment Strategy Considerations



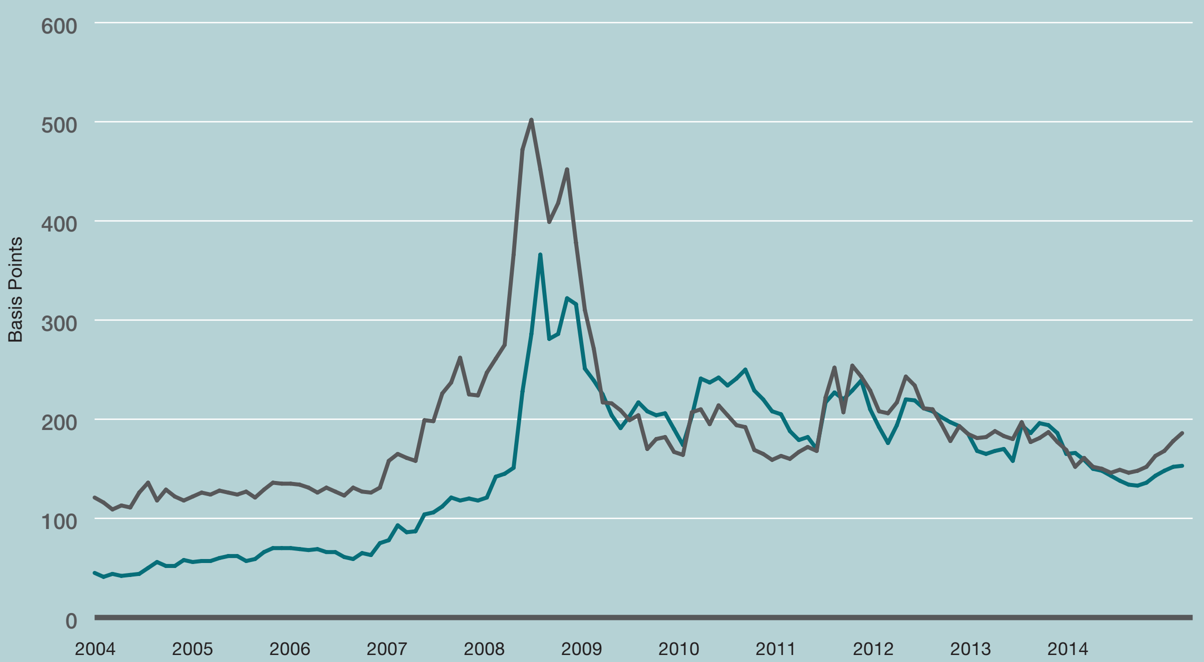

Defining the opportunity set is an essential step in determining what the optimal mix of long duration assets should be. It is worth noting that, although long corporates make up the majority of the Barclays Long Credit Index, approximately 20% of the index is currently composed of non-corporate credit. The largest segments of the non-corporate credit market are sovereigns (e.g. Turkey, Mexico, Brazil) and taxable municipals. Although the table that discusses the long duration alternatives in the executive summary is not exhaustive, we believe it represents opportunities that some plan sponsors should explore. While these alternatives may not meet all of the objectives outlined below, these assets generally should seek to:

1. Have a reasonable correlation to the liability discount curve.
2. Offer potential for higher or comparable returns to long corporate bonds.
3. Provide diversification to corporate credit risk.
4. Provide a "safer" form of credit risk, given potential for government guarantees, strong covenants, or high quality collateral, etc.
5. Appeal to an insurance company within the context of pension annuitization. Although this topic is beyond the scope of this paper, some of the asset classes put forward may be more attractive to an insurer than others. For example, transferring private placement corporate bonds, commercial mortgages and/or infrastructure bonds may present certain challenges.

### Municipals

Although taxable municipals make up a portion of the long credit index, we would submit that taxable municipals may be underutilized by long credit managers. Since 1986, nearly 70% of all taxable municipal bonds issued each year were issued with a 10-year or longer maturity.[1] In addition to having a duration profile that fits well within a long duration mandate, relative to corporates, municipals typically exhibited lower default rates and higher recoveries when defaults occur. Further, at times both taxable and even tax-exempt municipals have demonstrated a yield advantage over comparable quality corporate bonds and have exhibited less spread widening than corporates in risk-off environments.

Figure 4:
Long Corporate OAS vs. Long Taxable Municipal OAS




Legend:
Long Corporate
Long Taxable Municipals

Sources: Barclays

Taxable municipals bonds currently account for approximately 10% of the Barclays U.S. Long Credit Index. This is in large part due to the introduction of the Build American Bond (BABs) program in 2009 which took municipal representation in the index from approximately 5% to over 13% between the beginning of 2009 and the end of 2010 when BAB issuance stopped. While it is likely that this segment of the market will gradually shrink as a part of the long credit index over time, there continues to be other index-eligible taxable municipal issuance in the market, and a large opportunity set of non-index eligible municipals that have a longer than 10-year maturity. Taxable municipal bonds are issued for refundings, non-public purposes, and pension funding. The Barclays Long Taxable Municipal Index is comprised of approximately 40% State and Local GO bonds, with the balance being revenue bonds including transportation, water and sewer, power, higher education, and other special tax issuance.[2]

1 Source: Galliard

2 Source: Barclays

In periods of market dislocation, long tax-exempt municipals also may be considered in a long credit mandate. For example, there have been recent periods (early 2011 and the summer of 2013) when the yield on long tax-exempt municipals exceeded or was very competitive with long corporates. While this is not always the case, allowing a manager the flexibility to take advantage of these market anomalies provides further opportunity to diversify the portfolio with high quality assets.

Liquidity and trading volume in the taxable municipal market has dramatically improved in recent years, however, the universe still remains much smaller than the corporate bond market. Further, many investors are choosing to hold onto their current positions, given the lack of further BAB issuance, and their desire to maintain exposure to the sector. As such, sourcing and populating a diversified taxable municipal portfolio may be challenging. Clients with the scale to invest in long duration mandates via separate accounts could create a custom benchmark (e.g. 80% long corporate/20% municipals) and allow the manger to build a taxable municipal position over time and draw capital when and if municipals cheapen relative to corporates.

### Long Dated CMOs

Collateralized Mortgage Obligations (CMOs) redirect the cash flows of the underlying collateral, typically agency pass-through securities, into different tranches that are expected to receive cash flows at varying times. For example, collateral with an intermediate duration can be split into two bonds, one with a short duration and one with a long duration. CMOs were developed to offer investors a wider range of duration and yield profiles than what was available via the pass-through market. The unique cash flow patterns of each CMO tranche allow investors to tailor their mortgage exposure to meet a range of investment objectives, given different classes can have different risk/return characteristics. Although there are several different types of CMOs with long duration/average lives, the following provides several different types of securities that would most likely be part of manager's opportunity set. This list is by no means exhaustive.

1. *Sequential* – The collateral is split into several different tranches to accommodate weighted average life demands. Both scheduled amortization and prepayments are used to pay off the first tranche. Once the first tranche is paid off, all principal cash flows are used to pay off the second tranche. Interest payments are allocated to all of the tranches based on the principal outstanding. Investors interested in extending duration would purchase the last tranche.
2. *Z Bonds* – Long term bonds structured so that the security does not pay coupons until it begins to pay down its principal. The principal balance of a Z bond increases by the stated coupon amount on each payment date. Once the earlier tranches in the CMO structure have been retired, the Z bond stops accruing and pays principal and interest until it is paid off. During the accrual period, a Z bond's principal increases at a compound rate, in effect avoiding reinvestment risk. Recently issued Z bonds can have an average life of approximately 20 years.

3. *Inverse Floater* – CMOs can create a floater and inverse floater from a fixed rate tranche. For example, a fixed rate tranche that pays a 6% coupon could be broken up into two tranches, one that pays LIBOR (floater) and another that pays 12% - 1 Month LIBOR (inverse floater). The inverse floater benefits when rates move down. Although it is beyond the scope of this paper, an inverse floater can be structured so that it provides leveraged exposure to interest rates. Inverse floaters allow investors to extend duration, potentially speculate on rate moves and the speed of prepayments, and typically offer higher yields than other mortgages given their price volatility.

CMOs are complex securities that allow investors to tailor mortgage exposure to meet a range of objectives. Given that agency CMOs are backed by agency MBS, there is little credit risk and, therefore, they may outperform corporates in risk-off environments. For example, in 2008 the BofA Merrill Lynch Long Dated CMO Index returned 10.1%, while the Barclays Long Corporate index lost -5.2%. However, mortgages do introduce a level of basis risk relative to a long corporate index, particularly in periods when spreads on corporates are volatile. In addition, the stated yield and average life of CMOs may not reflect the actual experience given that yields and average life expectations rely on prepayment assumptions that may not materialize. Although CMOs do generally allow managers to control the convexity of a portfolio more easily than a portfolio of mortgage pass-throughs, a mortgage portfolio may have a less appealing convexity profile than a portfolio of long corporate bonds. Active management can help to manage negative convexity risk. A negatively convex portfolio, assuming spreads stay constant, will experience less price appreciation in a falling rate scenario than the stated duration would indicate. Finally, if prepayment speeds are too high, it can be challenging for a manager to manage to a duration target.

The number of managers that include mortgages as an important piece of their long duration opportunity set is limited. It is our view that it would be optimal to identify a manager that primarily invests in mortgages, but which has the latitude to build some corporate exposure when corporates are offering attractive relative value. There may be periods where mortgages are unattractive on a relative basis, so allowing a skilled manager the latitude to identify attractive entry points should be beneficial.

### Commercial Mortgages

A commercial mortgage is a loan between a borrower and lender in which the borrower uses a commercial real estate property as collateral. Typically, lenders look for high quality assets that are in top-tier locations that are nearly fully occupied with long term leases. First mortgage lenders are senior in the capital structure, historically providing fixed rate loans at an LTV (loan-to-value) of 50% to 70% of the asset's total value. Commercial mortgages have generally offered 100 – 200 basis points over similar maturity treasuries. Given the nature of the collateral securing the loan, the asset class has experienced low realized loss rates. Further, a portfolio of commercial mortgages generally has a better convexity profile than residential mortgages given the call protection that is typically built into these loan agreements.

Potential investors should be mindful that commercial mortgages are less liquid than corporate bonds, provide direct exposure to commercial real estate market fundamentals, have shorter durations than a typical long corporate portfolio, and require a specialist investment manager. Given the duration of commercial mortgages, one might not consider them a viable option within an LDI program; however, we would suggest that plan sponsors consider the broadest universe of high quality bonds (investment-grade rated) to include in portfolios as a way to diversify exposure in the long corporate sector.

Insurance companies are large players in the commercial mortgage market and several are willing to manage third party assets. There are other real estate managers, other than insurance companies, that also have the ability to manage this type of mandate. In most cases, investors would have to gain exposure via a separate account; however, there are a small number of managers that offer commingled funds.

### Infrastructure Lending/Corporate Private Placements

Infrastructure debt investing has long been dominated by banks, but given regulatory pressures, there is an opportunity for other institutional investors, insurance companies and pension plans particularly, to enter the market. Infrastructure debt investors have traditionally financed existing assets and new projects within the power and energy sectors (coal, renewables, pipelines, and oil & gas) and transportation (roads, ports, airports, etc.) sectors. Infrastructure debt lending is attractive from a pension plan's perspective given the hard nature of the assets, the stability and duration of projected cash flows, the high barriers to entry and the low historical loss rates. Historically, the asset class has offered a fairly attractive liquidity premium to similar quality corporate bonds (historically 50-75 bps)[3].

An investment into infrastructure debt would require an investor to be comfortable with a number of considerations, including:

1. Depending on the mandate size, it may take longer than 12 months to build out a portfolio.
2. Given the illiquid nature of the asset class, a portfolio should be built with a buy-and-hold mindset.
3. Portfolios will tend to be fairly concentrated.
4. Given the global nature of the opportunity set, an investor may take on some level of currency risk, which might need to be hedged.

There are a small number of insurance companies that are willing to manage an infrastructure debt focused separate account for third party investors. These mandates would have a debt-only focus. Partnering with an insurance company helps to align interests given that the insurance company will hold these assets on its balance sheet.

3 Source: MetLife

Corporate private placements could also be considered as part of the opportunity set. Corporate private placements are exempt from SEC registration because they are not offered publicly. Corporate private placements, excluding quasi-public 144a securities, are typically issued by private companies or small to mid-sized public companies and are typically not rated by the rating agencies. Relative to public corporate bonds, private placements tend to offer favorable spreads, stronger covenants, and lower loss rates. Investors should be mindful that corporate private placements are less liquid and have a shorter duration than a typical long corporate bond portfolio. Particularly for clients further down the glide path, who have a custom benchmark that includes intermediate credit, corporate private placements could play a role.

## Conclusion

Investment grade corporate bonds represent a large portion of a DB plan's long credit program, and, given their strong liability hedging properties, should continue to do so. However, recognizing that hedging is an imperfect science, an investment program that is concentrated in long corporate credit exposes a plan to the risk of not keeping pace with liabilities due to potential credit migration and defaults. Therefore, we would submit that, for some investors, the less traditional long duration assets that we described above could play a role within a client's program in an effort to reduce corporate credit risk. While plan sponsors need to be cognizant of their plan's funded status volatility given its impact on contributions, PBGC premiums, and financial statements, including alternative long duration assets may make the long-term asset/liability match more robust given that their inclusion may improve returns and result in fewer losses and less credit migration.

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