INVESTMENT INSIGHTS

Benefits of being "insurance-like"

Pension funds can build better portfolios by adopting strategies used by insurers

May 2017

IN BRIEF

Pension plan hedge portfolios can benefit from long-standing investment practices in many life insurers' portfolios:

- Diversifying the portfolio outside of investment grade corporates can lift overall yield and tap new sources of return.
- Hedge portfolio diversification can sidestep excessive issuer concentration, as the same large cap-weight names often dominate both U.S. equity and investment grade corporate benchmarks.
- Active management can mitigate funded status deterioration. It enables pension funds to hold downgraded issues until they recover rather than selling them on the downgrade and incurring a loss.

THE INVESTMENT CHALLENGE FOR INSURANCE ANNUITY WRITERS AND CORPORATE DEFINED BENEFIT PENSIONS IS SIMILAR, but in practice the investment strategies diverge considerably. In this paper, we compare insurance and corporate pension investment strategies in the U.S. In particular, we examine aspects of insurance investing that can be pragmatically implemented by corporate pension funds to help them construct more resilient fixed income portfolios that better achieve their investment objectives.[1]

The particular aspects of insurance investing that we think pensions should adopt are:

- deciding to hold or sell downgraded bonds with the goal of maximizing value instead of adhering to index rules or strict investment guidelines
- allocating funds out of corporate bonds and into structured credit asset classes in order to diversify systematic risk exposures, reduce single name concentration and potentially reduce interest rate exposure in anticipation of a rising rate environment

DIFFERENT … BUT ALIKE

The products offered by pension funds and annuity-writing life insurers are analogous in principle, providing a stream of lifetime income to protect against the risk of outliving plan participant or policyholder resources. However, the management of pension and insurance assets has evolved with some fundamental differences, due mainly to diverging regulatory

[1] The implication of lessons learned can go both ways. In fact, outside of fixed income, corporate pensions generally have much more diversified portfolios than insurers, resulting in higher overall Sharpe ratios. However, insurers have to deal with onerous explicit or implicit constraints due to regulatory and rating agency requirements, and these severely limit how closely an insurer could mimic a pension investment strategy.

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U.S. pension plans and life insurers' investing behaviors are different ... but alike

EXHIBIT 1: COMPARISON OF PENSION FUND AND LIFE INSURANCE INVESTMENT PORTFOLIOS

	U.S. corporate pension funds	Life insurance companies
Typical asset allocation	• Mix of long-duration government/credit and diversified risk assets across public equities and alternatives	• Primarily investment grade fixed income, with larger allocations to structured credit and illiquids than a typical corporate pension
Goals	• Mitigate interest rate risk with long-duration fixed income • Maintain growth allocation to close deficit and cover liability growth and other demographic risks	• Invest in fixed income strategies that maximize yield and are efficient from a regulatory and rating agency capital perspective
Accounting	• Mark-to-market of assets and liabilities leads to balance sheet and income statement volatility	• Book value accounting mitigates balance sheet volatility and facilitates buy-and-maintain portfolios
Risk tolerance	• Compared with insurers, pensions and their corporate sponsors are typically able to withstand much larger shocks and drawdowns	• A typical life insurer is around 10x levered and has very little tolerance for risk
Regulatory backdrop	• PBGC premiums place increased burden on plan sponsors	• Global regulatory standards for capital requirements and financial stability can be complex and costly

Source: J.P. Morgan Asset Management. For illustrative purposes only.

backdrops but also to cultural and behavioral differences. **EXHIBIT 1** outlines some of the similarities and differences between these two types of institutional investors.

While U.S. pension funds are allowed (and even encouraged under the current pension relief regulatory regime) to carry a deficit, U.S. insurers must always maintain a surplus on a statutory basis.[2] Furthermore, insurance investing constraints are largely driven by competing capital requirement rules, while pension investing constraints tend to be driven more by sponsor risk tolerance, plan governance and the capital markets outlook.

With this as background, we take a closer look at how plan sponsors may apply life insurance investment approaches to active bond management and hedge portfolio diversification to help improve funded status outcomes.

IMPACT OF CREDIT MIGRATION

One of the more intractable issues facing a typical pension hedge portfolio is the potential for credit migration and its adverse impact on funded status. A duration-matched investment grade fixed income portfolio has historically underperformed the pension liability, largely due to downgrades and defaults. These bonds fall out of the liability discount curve universe used to value liabilities, while the asset portfolio fully experiences credit losses and the forced sale of a downgraded bond prior to any potential recovery.[3]

In contrast to the systematic index rules embedded in most pension hedge portfolio benchmarks, insurers' use of buy-and-maintain credit strategies allows them the flexibility to hold on to downgraded issues. Our analysis of insurance statutory filing data indicates that the majority of bonds downgraded from investment grade to high yield (fallen angels) are held by insurers for at least one year (or to maturity), as opposed to automatically selling on downgrades. To better illustrate this concept, **EXHIBIT 2** tracks the funded status performance of duration-matched (100% interest rate hedge ratio) corporate bond portfolios of various credit qualities against a hypothetical frozen pension liability.[4]

Across all strategies highlighted, funded status fell materially over the 20-year period. If we had incorporated mortality table updates and other demographic changes, the funded status deterioration would likely be even greater.

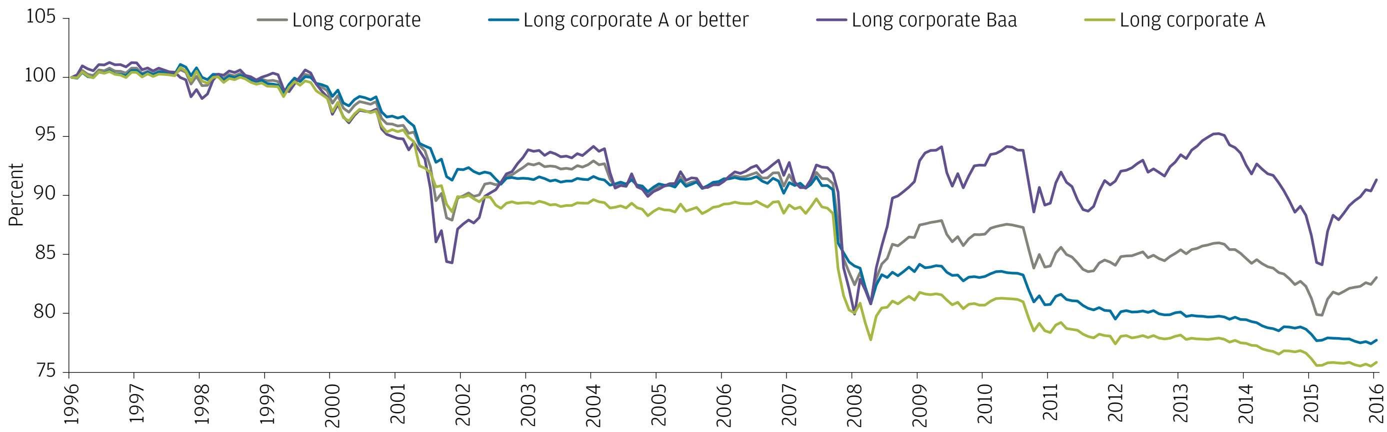
[2] On a U.S. statutory basis, mark-to-market changes have very little impact on surplus in the short and medium term, so this basis is different from how pension funded status is measured. However, most life insurers would still show a surplus if their assets and liabilities were valued as corporate pensions are under US GAAP or Pension Protection Act rules.

[3] Bonds may also be upgraded, of course, with a positive and opposite impact on funded status. However, investment grade bonds have historically had higher rates of downgrade than upgrade migration. In addition, the spread-widening impact of a downgrade tends to be larger than the tightening of an upgrade.

[4] The pension liability is represented by a set of hypothetical expected benefit payments discounted on the Citigroup Pension Discount Curve (AA Corporate).

The sponsor's dilemma: Over the long run, lower rated IG bonds generate better returns ... and higher rated bonds exhibit less funded status volatility

EXHIBIT 2: COMPARATIVE FUNDED STATUS DURATION FOR DURATION-MATCHED CREDIT TRANCHES, DECEMBER 1996–DECEMBER 2016*



	Long corporate	Long corporate A or better	Long corporate Baa	Long corporate A
Annual return (%)	7.15	6.85	7.54	6.73
Annual excess return (%)	0.31	0.00	0.73	-0.13
Annual asset volatility (%)	9.23	9.43	9.28	9.47
Annual funded status volatility (%)	2.59	1.98	4.00	2.27
Ending funded status (%)	83.00	77.70	91.30	75.90
Annual funded status deterioration (%)	-0.85	-1.11	-0.43	-1.21

Funded status tracking based on A-AAA equal-weighted liability proxy and Bloomberg Barclays index returns for each corresponding benchmark; data as of December 31, 2016.

*Assumes no change in demographic assumptions during the period and assets fully hedged at inception.

Also notable is the trade-off in funded status volatility across various portfolios. Long corporate Baa bonds have the highest returns and terminal funded status over the period, but also exhibit the highest tracking error (as measured by funded status volatility) to the pension liability. In contrast, by reducing basis risk and moving to an A rated-or-higher portfolio, funded status volatility is significantly reduced but the deterioration in funded status over the period is magnified due to lower returns.

One central inference from this exercise is that a portfolio of high quality long-duration bonds alone is unlikely to keep pace with even a frozen pension plan over long periods of time. To keep pace necessitates either the inclusion of higher returning assets (and a higher tracking error) or sponsor contributions. However, the dispersion in performance across credit qualities suggests that *active bond management* can alleviate some of this historically persistent funded status deterioration by allowing portfolio managers to apply credit research insights and hold downgraded issues where guidelines permit.

In a downgrade situation, most of the price depreciation comes prior to the actual announcement, as the market is quicker than rating agencies to act. Clearly, passive strategies that are forced sellers of out-of-benchmark exposures will suffer. Barclays estimates that a buy-and-maintain investment grade corporate portfolio has historically earned an extra 20 basis points (bps) of excess return annually over a similar portfolio forced to sell bonds downgraded to high yield.[5] Similarly, Moody's finds that price recovery on a senior secured bond 30 days post-default has historically exceeded 50% on both an issuer-weighted and a volume-weighted basis.[6]

[5] Albert Desclée, Anando Maitra, Simon Polbennikov. June 10, 2015. *The Effect of Stop-Loss Rules on Credit Portfolio Performance.* Barclays Research.

[6] Moody's Annual Default Study: Corporate Default and Recovery Rates, 1920–2015.

DIVERSIFYING THE HEDGE

In addition to active management, another approach to reducing the impact of downgrades and defaults on funded status is hedge portfolio diversification among both risk factor exposures and issuers. There are multiple levers fixed income investors can use to generate diversified sources of risk and return, but in practice many corporate pensions allocate to traditional government and credit mandates, which are dominated by duration and credit spread risk. Expanding the solution set to include a more diversified set of risk exposures presents an opportunity to add incremental yield to the portfolio and enhance risk-adjusted returns by investing in illiquid fixed income, diversifying corporate counterparty exposure and using structured credit to access real estate and other markets (**EXHIBIT 3**). The approach can take advantage of embedded leverage as well. Once again, insurance portfolios offer useful insights into these methods.

Many corporate plans overlook critical sources of risk premium

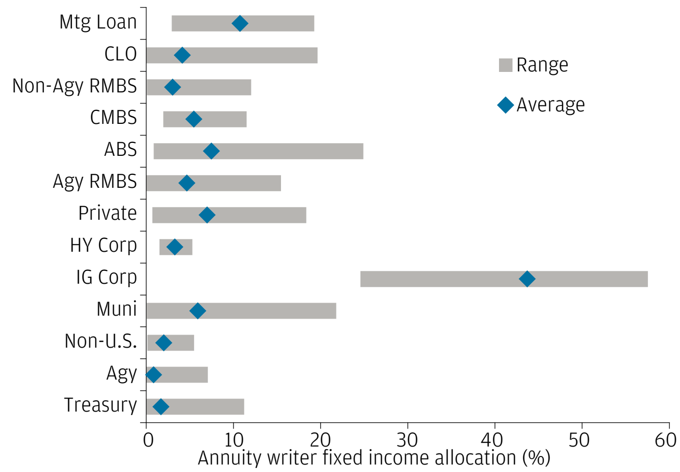
EXHIBIT 3: FIXED INCOME LEVERS FOR DIVERSIFICATION AND YIELD ENHANCEMENT

Interest rate risk	Credit risk	Liquidity risk	Structure/ construction risk	Leverage risk
Traditionally utilized by corporate pensions (e.g., government/credit)		Often overlooked by corporate pension plans (e.g., private mortgages and collateralized loan obligations)		

Source: J.P. Morgan Asset Management. For illustrative purposes only.

Life insurance portfolios are typically much more diversified than pension funds

EXHIBIT 4: LARGE ANNUITY WRITER FIXED INCOME ALLOCATIONS*



Source: SNL Financial, J.P. Morgan Asset Management; data as of December 31, 2016.

*Asset allocation ranges of the 19 largest U.S. life insurers, whose statutory reserves are at least 80% annuity lines; 2012-16.

Risk exposure diversification

Insurers, especially those whose statutory reserves are largely backing annuity-based liabilities (much like pension funds), tend to invest less than half of their fixed income portfolios in investment grade credit (**EXHIBIT 4**). The remainder is diversified across multi-sector fixed income classes, such as commercial mortgage-backed securities (CMBS), asset-backed securities (ABS), mortgages (agency and non-agency, collateralized and pass-through, and public and private), bank loans and private credit assets. (We include a list of fixed income asset classes, the range of their current yields and some of the distinctive risk factors in the Glossary.)

Structured credit vehicles have a tranched cash flow structure that provides explicit protections from downgrades and defaults, whereas asset classes like agency residential mortgage-backed securities (RMBS) and collateralized mortgage obligations (CMOs) have guarantees that remove credit risk entirely, although they may introduce other risks, like convexity. Private market fixed income asset classes, like private credit and commercial mortgage loans, offer a yield pickup vs. public market equivalents, while their more favorable covenants typically result in better default recoveries and lower credit losses. This multi-sector approach also addresses the effect of issuer concentration in pension portfolios.

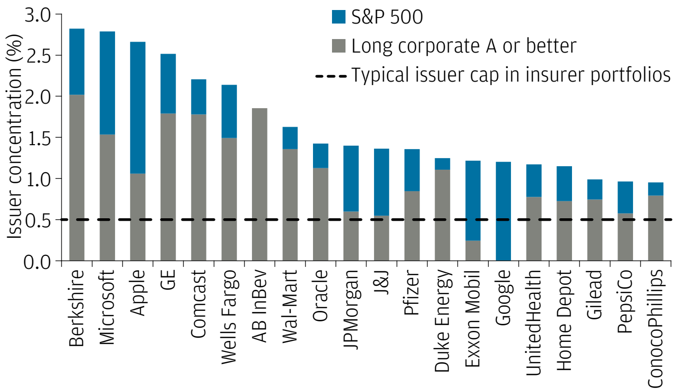
Issuer diversification

As corporate pension plans carve out pieces of their strategic asset allocation across multiple managers, elevated issuer concentration at an aggregate level can often go unnoticed. Risks can be magnified by owning different parts of the corporate capital structure in the same names across both the hedge and growth portfolios. For example, in a hypothetical strategic allocation equally weighted between U.S. large cap equity and U.S. long corporate A-or-better, the largest 20 issuers would account for over 30% of the portfolio at just the benchmark level (**EXHIBIT 5**, next page).

Concentration at the portfolio level can boost issuer exposures even further. This contrasts with our examples of insurance portfolio construction, where large life insurers typically cap their investment grade corporate issuer exposures at between 0.3% and 0.5% of their overall fixed income allocation. The policy contrasts with the index-driven portfolios favored by pensions that

Equal-weighted U.S. equity and fixed income portfolios of quality names have disproportionate exposure to the largest issuers

EXHIBIT 5: BENCHMARK-LEVEL ISSUER CONCENTRATION FOR 50% U.S. LARGE CAP/50% U.S. LONG CORPORATE A OR BETTER STRATEGIC ALLOCATION



Source: S&P 500 Index and Bloomberg Barclays US Long Corporate Index; data as of December 31, 2016.

have much higher concentration risk. Insurers' higher allocation to private market fixed income reduces concentration levels by extending loans to borrowers that may not issue in public markets. Similarly, diversified sources of risk and return in a multi-sector fixed income portfolio offer protection from credit events that can produce unexpected funded status drawdowns.

IMPLEMENTATION CONSIDERATIONS

The portfolio with the lowest tracking error to a corporate pension liability in most cases will be high quality long-duration corporate bonds. However, the trade-off is that this portfolio likely won't earn enough to keep up with the liability, while downgrades and defaults paired with high levels of issuer concentration can contribute to funded status deterioration over time. Given these considerations, we've outlined some ways to implement a more diverse hedge portfolio and take advantage of an expanded multi-sector fixed income solution:

- **Expanded guidelines:** A traditional long credit or a long government and credit mandate could, for example, be made more flexible by allowing portfolio managers to invest larger amounts in out-of-benchmark exposures. This is analogous to a "plus" strategy, more often implemented relative to a U.S. Aggregate benchmark. Since the benchmark is unchanged, the liability-hedging properties of the strategy remain intact. A portfolio manager buying shorter-duration structured credit could make up the interest rate duration elsewhere in the portfolio or, alternatively, use Treasury futures or other derivatives to achieve the desired duration profile.

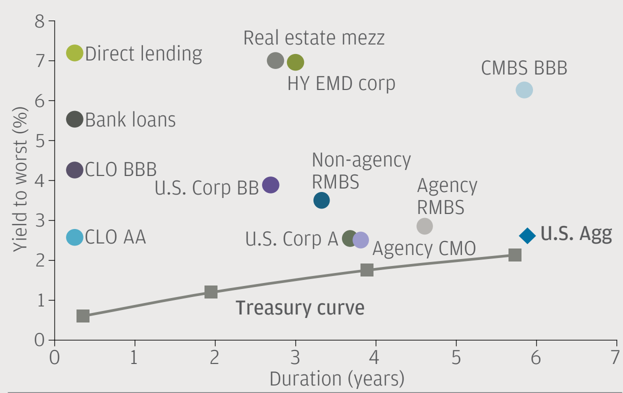
RISING RATE ENVIRONMENT?

As of the end of the first quarter, the 10-year Treasury yield had sold off more than 50bps since the November election. As pensions' rising rates dreams finally come true, the question remains about how and when to de-risk. Opportunistically adding long duration to portfolios as rates rise will help limit losses, but revisiting the insurance world we find strategies, such as bank loans and structured credit, that can be more attractive than the "sell equities, buy long bonds" trade that some glide paths may dictate. Furthermore, plans expressing a short-duration view through core bond allocations, for instance, can look to extended fixed income sectors for more attractive risk/return trade-offs in a rising rate environment.

Plan sponsors can pick up higher yields without extending duration by moving down the quality spectrum and into floating rate assets like bank loans with limited interest rate duration but spread exposures that correlate positively with the pension liability movements. Similarly, a budget for illiquid strategies like direct lending can be a particularly attractive source of yield without extending duration of the asset portfolio.

Extended sectors can provide a return boost

FIXED INCOME CURRENT MARKET YIELDS ADJUSTED FOR EXPECTED CREDIT LOSSES



Source: Bloomberg Barclays, J.P. Morgan Markets, J.P. Morgan Asset Management; data as of December 31, 2016.

- **Stand-alone mandates:** A single sleeve, either encompassing a single asset class (e.g., long CMOs) or a multi-sector fixed income sleeve, can be managed as a stand-alone allocation. These strategies should be considered in a holistic manner, taking into account how they interact with the rest of the portfolio. A multi-sector fixed income strategy could serve as a public equity replacement. It would likely reduce expected returns, but it would similarly reduce surplus risk as a result of the combined effect of lower asset volatility and higher correlations, with the pension liability arising from interest rate and credit spread duration exposures.

- **Buy and maintain roll-down portfolios:** This type of strategy may be more attractive to plans that can tolerate a moderate level of tracking error and balance sheet volatility in order to capture more yield. A traditional pension hedging strategy is run against a benchmark that resets each month as new-issue bonds enter and older bonds drop out (as they fall below the benchmark's maturity minimum or as a result of tender offers, downgrades or defaults). Holding on to the bonds in a roll-down strategy can significantly reduce turnover and transaction costs in an increasingly illiquid marketplace. Moreover, the strategy allows a manager to focus on selecting solid credits, buying cheap diversified cash flows and managing liquidity requirements for benefit payments and other needs (e.g., Pension Benefit Guaranty Corporation premiums and administrative expenses).

CONCLUSION

The sole reliance on benchmark-driven corporate credit strategies in pension hedge portfolios may still suit many plans, but we believe other solutions could lead to better outcomes. Our analysis shows that diversifying away from corporate credit into a more "insurance-like" portfolio enhances diversification and ultimately can result in improvements to total return, funded status volatility or both.

An additional benefit of an insurance investment approach is related to the pension buyout market, which we have not addressed in detail in this paper. More pension plan sponsors are seeking to transfer their liabilities to insurance companies, either as a strategic reduction in their pension footprint or as part of a full plan termination. In many cases, pension plans can construct an "annuity ready" portfolio—with assets passed through in-kind as payment for a buyout—for which it is beneficial to take into account insurer preferences and capital requirements. In fact, corporate pensions may find over time that they can replicate most of what insurers do in a pension buyout, albeit without the shackles of burdensome capital requirements.

Glossary of Fixed Income Strategies

Asset class	Average duration/ weighted average life (yrs)	Ratings	Description	Market yields (%)	Return drivers
Agency RMBS	3-7	AAA	Pass-through mortgage pools issued by GNMA, FNMA and Freddie Mac	2.90	Rates
Agency CMO	> 10	AAA	Tranched cash flow securities backed by agency RMBS collateral	3.20	Rates, structure
Non-agency RMBS	2-4	IG & HY	Mortgage securities issued by private institutions, backed by non-conforming collateral	3.00-3.50	Credit, rates, illiquidity
CMBS (10-yr A-Aaa)	7-10	AAA-A	Tranched securities backed by pools of commercial mortgage loans	3.20-4.00	Rates, credit, structure
Private commercial mortgage loans	5-10	Not rated	Privately negotiated investment grade commercial loans	4.00-4.50	Rates, credit, illiquidity
Asset-backed securities	1-3	AAA-BBB	Tranched securities backed by pools of credit card receivables, auto loans, student loans and other collateral	1.80-2.90	Rates, credit, structure
Taxable munis	> 10	AAA-BBB	Taxable securities issued by local governments, generally to finance projects	4.00-4.25	Rates, credit
Emerging market debt	7-10	AAA-BBB	Dollar-denominated corporate or sovereign debt issued by emerging market countries	3.75-4.25	Credit, rates
Bank loans	Floating rate	BB/B	Senior floating rate loans issued by sub-investment grade companies	4.00-5.00	Credit
Collateralized loan obligations	Floating rate	AAA-BBB	Tranched securities backed by public bank loans	2.40-5.00	Credit
High yield	3-7	BB/B	U.S. corporate bonds rated below investment grade	4.00-6.00	Credit, rates
IG private corporate credit	5-10	A/BBB equivalent	Privately placed corporate bonds	Small premium to public markets	Credit, illiquidity
High yield private credit	3	BB/B equivalent	U.S. middle market direct lending	6.00-11.00	Credit, illiquidity
Real estate mezz debt	3-7	Not rated	Private mezzanine financing of U.S. commercial real estate	7.00-9.00	Rates, credit, illiquidity

Source: J.P. Morgan Asset Management; as of December 31, 2016.

J.P. MORGAN ASSET MANAGEMENT

IG: Investment grade | **CLO:** Collateralized loan obligation | **CMO:** Collateralized mortgage obligation
CMBS: Commercial mortgage-backed security | **RMBS:** Residential mortgage-backed security

II_ Benefits of being insurance-like | 0903c02a81de0174