WHY PENSION PLANS SHOULD REASSESS USING THE AGGREGATE INDEX

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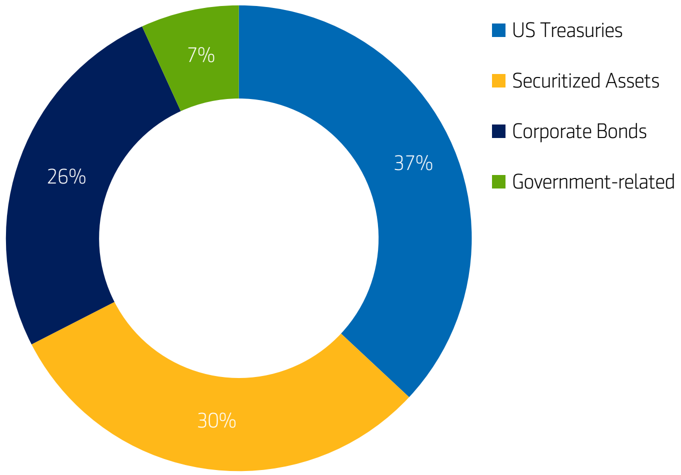
Summary

- Using the Bloomberg Barclays US Aggregate Index as a benchmark for the fixed income portion of a pension fund portfolio may lead to sub-optimal asset/liability matching for intermediate-term plan liabilities.
- The Aggregate Index reflects a significant weighting to US Treasury securities and mortgage-backed securities. These asset classes may not provide the optimal long-term fit for matching intermediate-term pension liabilities.
- We propose considering a multi-sector intermediate credit investment strategy with the goal of better meeting the cash flow needs of intermediate-term plan liabilities and providing enhanced total return opportunities.

Composition of the Bloomberg Barclays US Aggregate Index

The Bloomberg Barclays US Aggregate Bond Index was created to be a broad-based benchmark covering the US investment-grade fixed-rate taxable bond market. The index contains a range of asset classes, as shown in Exhibit 1.

Exhibit 1: 2017 year-end asset class composition of the Bloomberg Barclays US Aggregate Index



Source: Bloomberg Barclays Indices

Potential drawbacks of the Aggregate Index for pension plans

Let's take a closer look at the two largest asset classes comprising the Aggregate Index through the lens of a corporate pension plan sponsor discounting fairly stable plan cash flows using the AA-rated corporate bond yield.

US Treasury securities

As outlined in our Case for Corporates paper, we believe US Treasuries are a sub-optimal asset choice for pension plan investing compared to investment-grade corporate bonds. Based on historical five-year rolling period observations, we show corporate bonds have provided more than enough spread to compensate investors for default losses within each investment-grade rating bucket compared to duration-matched US Treasuries. And, US Treasuries have exhibited a higher level of tracking error to a AA-rated discounted liability than investment-grade rated corporate bonds, leading to increased funded status volatility for a pension plan. These drawbacks highlight the reason we believe US Treasuries are less than ideal investment options to back intermediate-term pension plan liabilities.

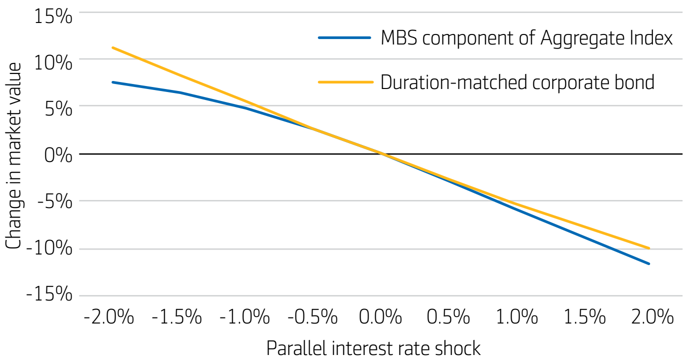
Securitized assets

The securitized portion of the Aggregate Index is made up of asset-backed securities (ABS), commercial mortgage-backed securities (CMBS) and mortgage-backed securities (MBS). However, MBS have accounted for the vast majority of the securitized component, representing approximately 90% at 2017 year-end. We believe there are drawbacks of using MBS to back pension liabilities. MBS cash flows are interest rate sensitive as they are subject to prepayment and extension risk. Essentially, MBS contain embedded interest rate options, which we believe makes them an inferior investment choice for non-interest rate sensitive liability cash flows, like pensions. For a basic primer about embedded options and what causes interest rate sensitivity within MBS, please refer to page 3.

We analyzed the MBS portion of the Aggregate Index to estimate the price impact of parallel interest rate shocks, ranging from -200 bps to +200 bps in 50 bp increments. For comparison purposes, we estimated the price sensitivity of an actual corporate bond with a duration of 5.31 years to match the duration of the MBS portion of the Index. We assumed the interest rate shocks occurred instantaneously with no change in asset spreads.

Exhibit 2 charts the price impact across the range of interest rate shocks for the MBS component of the Aggregate Index and the duration-matched corporate bond. The impact of the embedded interest rate options within MBS is evident when looking at price impacts for large negative and positive interest rate changes. Given many pension intermediate cash flows are non-interest rate sensitive, we would expect their price behavior to be more in line with the price behavior shown for the intermediate-term corporate bond.

Exhibit 2: Price behavior of MBS component of the Bloomberg Barclays US Aggregate Index and a duration-matched corporate bond



Source: Aegon AM US via BlackRock Solutions© AnSer as of 9/25/2018.

Why do MBS demonstrate this price behavior? When interest rates fall, a number of mortgage holders will likely exercise their option to refinance their mortgage at a lower rate, effectively prepaying their original loan. When prepayments occur, the principal is returned to the investor at par. In other words, there is no price appreciation on the mortgages that are refinanced. When interest rates rise, prepayments most likely will slow down causing the duration to extend and leading to a more dramatic price fall than securities without extension risk. The MBS price impacts shown in Exhibit 2 illustrate what is referred to as negative convexity, where the price curve bends down below the price curve of a corporate bond with comparable duration.

Return implications of the Bloomberg Barclays US Aggregate Index for pension plans

Now let's examine the historical returns of the Aggregate Index. How have components of the Aggregate Index performed versus the Bloomberg Barclays US Intermediate AA-rated Corporate Bond Index, a proxy for the typical discount rate used by corporate pension plans? Exhibit 3 shows historical returns and risk statistics for the Aggregate Index components from September 1988 through September 2018, the time period for which Aggregate Index returns are available through the Barclays POINT system. Recall that the Securitized component of the Aggregate Index is largely comprised of MBS.

Exhibit 3: Historical annualized returns and risk statistics for the Bloomberg Barclays US Aggregate Index and its components

		Aggregate Index Components			
	Aggregate Index	US Treasuries	Securitized Assets	Corporate Bonds	Gov't-related
Total Return	6.13%	5.81%	6.06%	6.85%	6.11%
Excess Return[1]	-0.56%	-0.88%	-0.62%	0.17%	-0.58%
Funded Status Volatility[2]	2.09%	2.90%	3.03%	1.66%	2.25%

[1]Excess Return to the Bloomberg Barclays US Intermediate AA-rated Corporate Bond Index. [2]Funded Status Volatility estimated using tracking error to the Bloomberg Barclays US Intermediate AA-rated Corporate Index, a proxy for the typical discount rate used by corporate pension plans.
Source: Bloomberg Barclays Indices, Aegon AM US, using returns from September 1988 to September 2018. Production date: 10/24/2018.

What conclusions can be drawn from this table? First, one can see the lowest excess returns to the Bloomberg Barclays US Intermediate AA-rated Corporate Index came from US Treasuries and securitized assets, the two largest components of the Aggregate Index. Second, the tracking error is largest for securitized assets and US Treasuries, demonstrating the increased volatility of these asset classes compared to the typical discount rate used by corporate pension plans. These results demonstrate the theoretical shortcomings of using US Treasuries and MBS to back pension plan liabilities.

The table also points out the potential benefit of using a credit-based index in place of the Aggregate Index within a pension plan's fixed income investment strategy. The corporate component of the Aggregate Index is the only sector that outperformed AA-rated corporates over the time period. Additionally, the tracking error for corporates is the lowest one among the represented asset classes.

Considerations for public & multi-employer pension plans

Although parts of this paper focus on corporate plans using a AA-rated intermediate corporate bond yield to discount liabilities, there also are takeaways for public and multi-employer plans focused on total returns. Exhibit 3 shows the historical returns of the Aggregate Index and its main components. For the reported time period, corporate bonds have outperformed all other components of the Index on an annualized total return basis. The potential additional return a plan can earn by directing fixed income investments to corporate bonds instead of managing to the Aggregate Index can be important for plans focused on expected returns when discounting plan liabilities. Also, reducing exposure to MBS within a public plan's fixed income portfolio can be beneficial in limiting price volatility from the optionality present in these securities.

Conclusion

Pension plans using the Bloomberg Barclays US Aggregate Index to benchmark the fixed income portion of their investment portfolio may not be achieving the desired asset/liability matching. The two largest components of the Aggregate Index, US Treasury securities and mortgage-backed securities, have exhibited a higher level of tracking error to AA-rated discounted liabilities than investment-grade rated corporate bonds. Coupled with a long-duration fixed income component, such as long credit and US Treasury STRIPS, pension plans incorporating a multi-sector intermediate credit strategy may be able to better align with the liability risk profile, thereby reducing funded status volatility.

Mortgage-Backed Securities (MBS) & Embedded Options Primer

Residential MBS are a collection of residential mortgage loans that are pooled together and sold to investors. The mortgage on your house was probably sold to an MBS originator, who then packaged your loan with other mortgages to create a securitized pool of loans.

Most homeowners have the option to pay more than the minimum required mortgage payment each month without incurring a penalty, with the additional payment going towards the principal amount of the loan. Also, most borrowers have the option of paying off the entire mortgage at any time without penalty. The ability to prepay a loan without penalty is a powerful embedded interest rate option benefitting the borrower. If interest rates drop, the homeowner can refinance the mortgage into a new loan with a lower interest rate. This means the investor who bought the mortgage will receive the remaining principal amount in a lump sum payment and will need to reinvest the proceeds at now lower interest rates. This is referred to as prepayment risk.

Another type of risk emerges within MBS when interest rates rise. As rates rise, homeowners tend to refinance less frequently and make fewer voluntary prepayments. The delay in receiving additional principal payments means the investor cannot reinvest those cash flows at now higher rates, and it also causes the duration of the MBS to increase. This risk is called extension risk.

Let's evaluate how the embedded interest rate option in MBS can impact a pension plan's investment portfolio. We will start with a simple illustration in which a pension plan needs to select an investment to back $1,000,000 of pension liability cash flows in the intermediate part of the curve with a duration of 5 years. The plan considers two investment options, a corporate bond and a MBS, as noted in Exhibit 4.

Now, let's assume US Treasury rates drop from 4% to 3% instantaneously right after the initial investment is made. We will also assume corporate bond spreads remain unchanged over this period. What happens to the market value of the liabilities and the two assets in this illustration?

Exhibit 4: Impact of a change in interest rates from 4% to 3%

Name	Description	Duration	Yield	Initial value	Value after rate decline
Liability	Intermediate pension liability cash flows	5 years	N/A	$1,000,000	$1,050,000
Asset A	A-rated corporate bond	5 years	5%	$1,000,000	$1,050,000
Asset B	Mortgage-backed security	5 years	5%	$1,000,000	$1,000,000

Source: Aegon AM US.

The value of the liabilities and the corporate bond move in tandem, increasing in value by approximately 5% due to the interest rate drop. However, the homeowners whose loans are part of the MBS pool would be incented to prepay their mortgages with the fall in interest rates. If all the homeowners refinance, the investor would receive only $1,000,000 through the return of principal at par due to the prepayments. In all likelihood, not all homeowners comprising the pool of mortgages backing the MBS will refinance, but even if only a few borrowers do, MBS prepayment risk will have a negative impact on the value of a pension plan's asset portfolio.

What would be the impact of a rise in interest rates on these investment options? Extending the illustration shown above, the value impact on the A-rated corporate bond and the liabilities would move in sync, both experiencing the same drop in value. However, given the extension risk inherent in MBS, the rise in rates will cause the duration of the MBS to increase, leading to a greater decline in value for the MBS compared to the liabilities.

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