



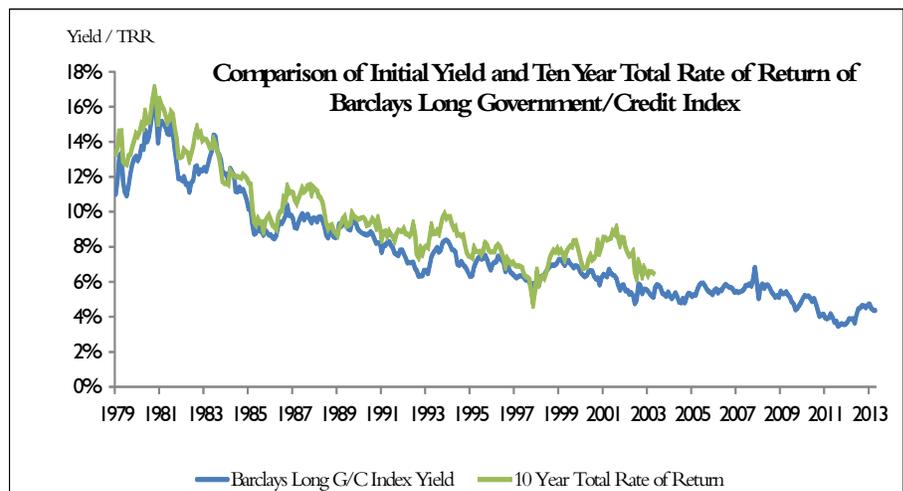
Another Way to Look at LDI

Driven by higher interest rates and explosive stock market gains in 2013, the funding status of pension plans is much better than at this time last year. This has led to many plans reconsidering liability-driven investment (LDI) options. The purpose of LDI is to hedge the pension liability such that rising (or falling) interest rates, and uncertain stock and other asset market returns, will not impair a firm's ability to meet its pension obligation. Conceptually, the process is pretty straightforward with fixed income assets being purchased consistent with the plan liabilities. Indeed, our firm has seen increased activity in this product and, for plans whose primary focus is on reducing (or eliminating) their pension liability, traditional applications are appropriate.

During our conversations with clients and consultants, however, another strain of thought regarding implementing LDI arises that has implications for how a fixed income portfolio is constructed. This report will address some thoughts on that subject.

The genesis of this "other" school of thought is that due to low interest rates, low asset returns are being locked in by investing a portfolio primarily in long duration bonds. While the path of interest rates, particularly over very long periods of time, will be extremely uncertain, this school of thought believes that other long duration assets will outperform bonds. Here, the definition of long duration deserves discussion. Bonds derive duration by a mathematical calculation based on a set of cashflows – the interest payments and final maturity – that are known. Thus, bonds are a perfect solution for hedging actuarially determined pension plan liabilities. The match will not be exact to the penny, but will be close enough to reduce concerns about meeting the pension liability. But what about equities? Or private equity funds that invest in operating companies? What is their duration? Because there is some uncertainty about the dividend payment, and a high degree of uncertainty about the final payment (not to mention no maturity date), determining a duration number is at best an exercise in a multitude of assumptions. Traditional LDI may eschew these asset classes for this reason. But, the "other" school of thought assumes asset classes like equities and private equity do indeed have long durations. And, if you believe this, then the long-term returns on these securities are appropriate to compare to the returns for long term bonds.

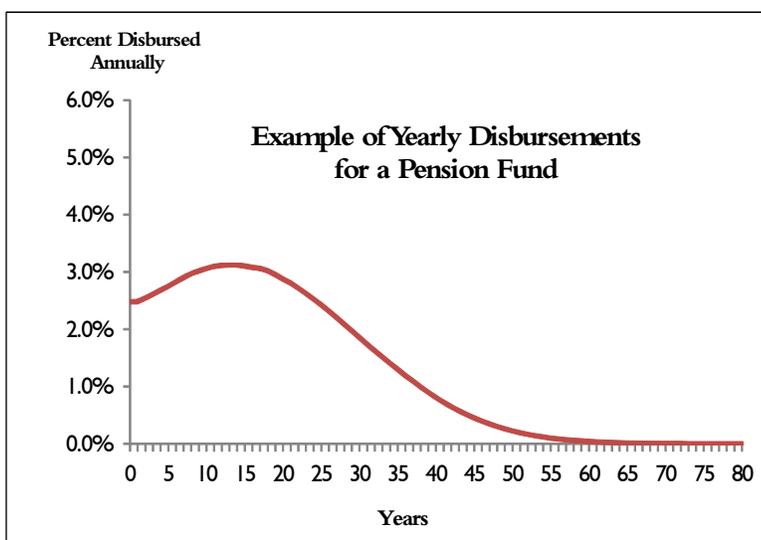
What will long-term bonds return over long periods of time? Again, with the future path of interest rates uncertain, the return numbers will be uncertain. However, building on an article by Martin Leibowitz, Anthony Bova, and Stanley Kogetman, "Long-Term Bond Returns under Duration Targeting," the mathematical properties of bonds can help quantify long run return numbers. There is a high degree of correlation between the long run return of a bond index and its initial yield. This is particularly true for a period of time approximately equal to the duration of the bond index. To illustrate this, the following chart details the ten year returns of the Barclays Long Government/Credit Index and the beginning yield of the Index. (Note this Index is a popular Index for traditional LDI investment). While the two series of data do not match perfectly, there is indeed a high correlation.



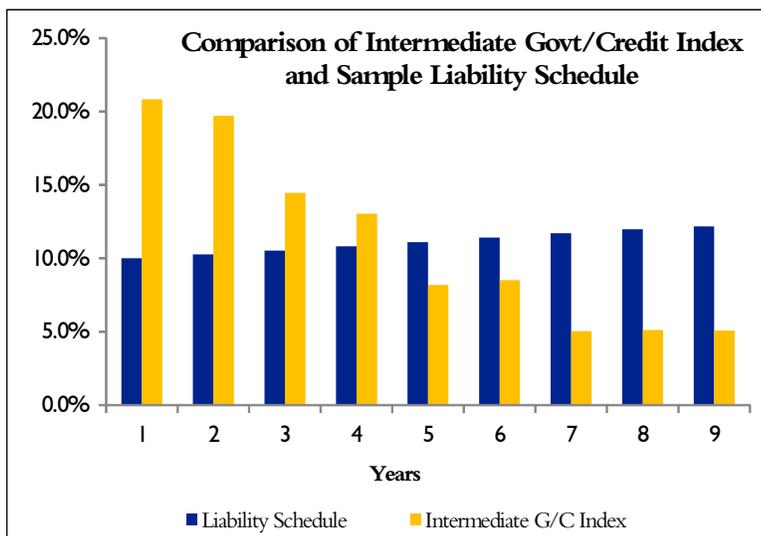
At March 31, 2014, the yield on the Barclays Long Government/Credit Index was 4.36%. Using the past as a guide, that means long duration fixed income will likely return between 2.36% and 6.36% during the next ten years. The question then before plan committees is: Will other long duration assets (like equities) do better? If in the view of a pension plan's investment committee the answer is yes, then those asset classes could be ripe for investment. The question then is: What is the role of fixed income under such a strategy?

One important caveat to this line of thinking is that the non-fixed income long duration assets must have the opportunity to be held for a long term. Think back to the financial crisis of 2008-2009. Risky long term asset prices declined significantly (during the worst twelve month period the S&P 500 return was negative 43% from February, 2008 to February, 2009). Being forced to sell or reallocate away from these assets at that time would have been disastrous. Thus, the role of fixed income in this strategy is to ensure the other long-term risky asset classes can indeed be held long-term. Here fixed income assets should be held to sufficiently hedge all short to medium term liabilities - for a period of say ten years. If a plan has fixed income assets such that all pension liabilities are covered for ten years, then the other assets can withstand the ups and downs of the investment cycle and can indeed be considered long-term in nature.

From a fixed income perspective, the choice to cover ten years of liability payments requires investors to match bond investments directly to the liability schedule for ten years of pension payments. Popular fixed income benchmark indices such as the Barclays Intermediate Government/Credit Index – which includes only bonds of one to ten year maturities - do a very poor job of providing a correct investment framework to accomplish the goal. Why? Benchmark fixed income indices are constructed based on all outstanding debt. This means that they are heavily tilted to 1) Government issuance, and 2) maturities that are concentrated in the one to three year maturity range. Pension plan liability schedules, on the other hand, are based on the actuarial assumptions of when employees retire and collect benefits. Thus, the maturity plots of the benchmark index and the liability schedule are vastly different.



For example, the first chart is a sample pension plan liability schedule. This liability schedule is spread out over many years consistent with a mature pension plan (each plan schedule will be unique). In this schedule, approximately 25% of the actual cash flows occur in the first ten years with 42% of the present value of cashflows at a five percent discount factor occurring during this period. Let us assume a plan wants to create a portfolio of fixed income securities to hedge this ten year liability. Turning to the Barclays Intermediate Government/Credit Index benchmark is a poor choice, even though it invests in one to ten year bonds. The reason is that the timing of the cashflows are overly front-loaded resulting in the plan needlessly giving up yield – and hence total return – versus an investment consistent with the liability schedule. The second chart details the ten year investment period cashflows of the two methods.



The mismatch of these two cashflow series comes at a cost to the pension plan given the steep yield curve. The table below compares statistics between the alternatives:

	Barclays Intermediate Government/Credit	Liability Schedule
Portfolio Yield	1.59%	2.69%
Portfolio Duration	3.87 Years	4.98 Years

Moving to an investment schedule directly tied to the liability stream picks up yield by eliminating unneeded short maturity investments and investing in investment grade corporate bonds rather than government securities. Plus, the entire ten year liability schedule is effectively hedged allowing longer duration assets time to provide returns.

The obvious downside of the “other” approach is a much higher degree of uncertainty. Should higher risk asset returns outperform long-term bonds over the long-term the plan benefits and funding status will be enhanced or future contributions reduced. On the other hand, should bonds outperform, plan committees will look back with angst at the opportunity to lock-in the pension plan funding status and costs.

Which strategy is best? Each plan will be different and there is no right answer. We believe strongly that significant thought and planning should go into the investment decision before embarking on either path. We do not claim to have a crystal ball in projecting asset returns over the long-term. But experience dictates that plans will reach different conclusions and how fixed income is used in each is very important. What is clear is that, consistent with pension trends over the past years, customized solutions that pay close attention to liabilities are a far superior way to invest fixed income than the traditional index based strategies.

Fixed Income Data Bank

Index Returns			
	<u>Qtr.</u>	<u>1 Yr.</u>	<u>3 Yr.</u>
Barclays Aggregate	1.84%	-0.10%	3.75%
Barclays Int. Aggregate	1.20%	0.01%	3.04%
Barclays Govt/Credit	1.98%	-0.26%	4.22%
Barclays Int. Govt/Credit	1.00%	-0.13%	3.13%
Barclays 1-3 Year G/C	0.23%	0.68%	1.18%
Barclays 1-10 Year TIPS	1.03%	-4.93%	2.17%

Source: Barclays

As of March 31, 2014

Treasury Market Yields		
	<u>3/31/14</u>	<u>12/31/13</u>
3 Month	0.03%	0.07%
2 Year	0.42%	0.38%
5 Year	1.72%	1.74%
10 Year	2.72%	3.03%
30 Year	3.56%	3.97%