

The myth of the liability benchmark

The era of investing pension assets against “asset-only” benchmarks is over. Virtually all practitioners, analysts, and academic researchers agree that pension plans’ financial commitments must play a direct role in the policy portfolio selection process. As an embodiment of this apparent consensus, a new innovating line of thinking about pension investing has reportedly emerged. The new approach, called liability driven investing (LDI), is presented as “the perfect solution” to many problems pension plans face. In this article, I explore the adequacy of solutions produced by the new approach to those problems.

Numerous articles have been written for the purpose of exposing the deficiencies of “asset-only” investing and demonstrating the advantages of LDI. Presentations at numerous conferences have been made for the purpose of illustrating and clarifying the rewards of LDI. Numerous advertisements have been placed in pension industry publications for the purpose of promoting knowledge and expertise of providers of LDI products. Expecting LDI products to be “the next big thing”, numerous players in the institutional asset management arena have either created or significantly expanded their LDI departments. Numerous marketers of LDI products have been travelling the world trumpeting the “low hanging fruits” of LDI.

Yet, numerous pension plan managers remain unenthusiastic about LDI. One of the reasons for this lack of enthusiasm is the foundation of the LDI concept appears to be rather shaky, to put it charitably. No one can satisfactorily explain what the term “liability” means, how it is related to the economic reality of pension plans, and why pension investing should be “driven” by that mystifying “liability”. LDI proponents’ marketing materials and conference presentations are remarkably vague in that respect.

At best, readers and attendees are treated to a discussion about various accounting “obligations” and their relationships to the word “liable”; at worst, the meaning of the term “liability” is assumed to be common knowledge and therefore ignored.

To be fair, marketing materials and conference presentations are not the right source for theoretical foundations of an economic theory. But a practitioner who wishes to get the consensus viewpoint on the subject of pension liability and LDI from academic or industry publications will almost certainly be disappointed.

Those publications contain raging debates and little consensus. Most likely, the practitioner’s conclusion will be that no one understands what the term “liability” means, but everyone knows that investing of pension assets must be “driven” by this “liability”. It does look like the time has come to ask certain hard questions. After all, what is LDI?

Defining LDI

Two distinct meanings of the term “LDI” have emerged from the flow of information on the subject: LDI is a line of investment products and, at the same time, a decision-making framework. Let’s deal with the two meanings separately.

LDI as a line of investment products does represent innovative investment solutions to the



Dimitry Mindlin argues the conventional Liability Driven Investing (LDI) approach is inadequate for open pension plans, and that the concept should rather be called Termination Driven Investing (TDI)

problem of controlling interest rate risks. Those who believe that the liability benchmark behaves like a portfolio of nominal bonds, assets must behave like the liability benchmark, should definitely take a close look at LDI products. I address the validity of that belief in particular and the foundations of LDI in general in subsequent sections.

As a decision-making framework, LDI is hardly new. Pension plan managers have been able to analyse certain liability-related measurements (funded ratio, unfunded liability, minimum required contributions, etc.) at various points in time, and integrate liabilities into the process of policy portfolio selection since at least the mid-seventies. Even though pension forecasting is just an illustration of the properties of pre-selected policy portfolios, it’s still popular among pension plan managers as a tool for policy portfolio selection.

Asset allocation methodologies that directly incorporate liabilities into the optimisation proce-

sure have been around since the late-eighties. The foundations of these methodologies were established by W. Sharpe, M. Leibowitz, and their colleagues.

Is there LDI life outside of these methodologies? I wouldn’t rule it out, but, as of today, it’s hard to find a proponent of LDI who claims that LDI as a decision-making framework possesses significant improvements over policy portfolio optimisation tools that have existed for quite sometime. LDI as a decision-making framework appears to be a new name assigned to old methodologies.

Realities of the DB system

To put the foundations of LDI in proper context, let’s look at the realities of the defined benefit (DB) pension system. In this section, I discuss several important concepts that are often misrepresented and need clarification.

What is a pension plan? Most publications assume that a pension plan is a financial instrument without realising the limitations of this assumption. Pension plans are not tradable assets, and any “mispricing” of a pension plan doesn’t create an arbitrage opportunity. Pensions and financial instruments have similarities, but they also have significant differences. A pension plan is also a human resource management tool, and should be analysed as such.

● Pricing vs. Funding. There is a fundamental difference between pricing a cash flow and funding a cash flow. The objectives of pricing and funding

are different, and therefore may require different methodologies and measurements of the cash flow. The goal of most plan sponsors is to fund the pension commitment, not to price it.

● Accounting Value vs Economic Value. Measurements presented in accounting reports are one of the most important sources of information about financial entities. Combined with current market prices, this information is the basis for further financial analysis that produces economic measurements of those entities. Outside of accounting gimmicks, the main difference between accounting and economic values is the presence of forward-looking assumptions in the latter. While the utilisation of expectations of future economic events is severely limited in accounting statements, the presence of those expectations in financial analysis is not only allowed, but in many cases required. As far as accounting for DB plans is concerned, the backward-looking nature of traditional accounting completely conceals the nature of pension assets and future benefit accruals. To an accountant, US\$100 of bonds is the same as \$100 of stocks. Outside of accounting, however, asset allocation is very important. There is a multitude of measurements of a pension plan associated with the existing policy portfolio and its relationship with the plan’s financial commitment that are vital to the determination of prudent asset allocation and contribution policies. Thus, there is a multitude of economic values associated with a pension plan. In some cases, accounting reports



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provide the most important measurements; in some other cases, accounting measurements are irrelevant.

● **The Matching Asset.** The matching asset for a pension commitment is defined as a portfolio of tradable securities that has the same payouts – in terms of timing, magnitude, and probability – as the pension commitment. Unfortunately, the existence of the matching asset is a highly questionable assumption – in reality, matching assets for on-going plans rarely exist.

If the matching asset for an on-going plan existed, it would contain bonds indexed to wage inflation in a particular state and/or industry; these bonds would have maturities of 50 years or more.

However, for a terminated plan a group annuity contract with a highly rated insurance company is the matching asset. This matching asset largely behaves like a portfolio of nominal bonds, assuming that the benefits are not adjusted for inflation.

● **Risk Management vs Risk Hedging.** Many publications suggest that pension risks must be hedged away at any cost. This “one-size-fits-all” solution is an unnecessary simplification of the problem. Risk management is more comprehensive than risk hedging. For some sponsors, effective risk management can create value for shareholders/taxpayers and plan participants. For some others, pension risks may be too much to bear and should be minimised. The methods of broadly defined asset-liability management should be applied to pension plans individually.

Recognition and thorough examination of these issues would be a good step in the right direction.

What is the liability benchmark?

Now, let's look at the foundations of LDI in light of the realities we just discussed.

As was previously mentioned, the term “LDI” has two distinct meanings. The tendency of assigning several meanings to the same term is not helpful to the clarity of any subject. This tendency is not unique to LDI – it's not uncommon to assign different meanings to the term “liability” as well. In some publications, the term “liability” means a payment in a series of future payments (“future liabilities”, “liability schedule”, “liability index”). In some other publications, as well as conventional actuarial reports, the term “liability” means a certain present value that can be compared to the value of assets. The “dual meaning” tendency is as regrettable as it is easily avoidable.

To clarify the language, let's go back to basics. A pension plan is a set of rules utilised to determine a stream of payments to plan participants and assets to fund these payments. This stream is called “the pension commitment”. The pension commitment is a series of future payments that may be contingent upon several factors.

The pension commitment should be funded, which means that assets should be available every time a promised payment is due. To achieve that, the plan managers must make contribution and asset allocation decisions. This is arguably the managers' most important mission. Since the contribution and asset allocation decisions must be made now, we need a measurement of the pension commitment at the present. With rare exceptions, a “liability” is defined as a present value of the pension commitment.

A “liability benchmark” is a liability that is superior to any other measurement of the pension commitment. This “benchmark” serves as a standard for determining the plan's financial health. It would be highly desirable if the liability benchmark behaved like a conventional asset held short, so it could be hedged. “LDI” literally means that investing of pension assets should be driven by a certain liability benchmark. In order to identify a liability benchmark, we have to a) define a discounting procedure for the pension commitment, and b) demonstrate the necessity of this particular measurement of the pension commitment.

Let's deal with the issue of discounting procedures first. Current publications contain essentially four approaches to the problem of discounting.

Approach 1 is based on the assumption that the pension commitment is a financial instrument held short. The “liability benchmark” is the price of the same financial instrument held long. In other words, the liability benchmark is the price of the matching asset. For discounting purposes, one could use today's term structure of interest rates, or the plan sponsor's cost of capital, or the expected return on a certain mix of stocks and bonds – these are examples of discounting procedures presented in various publications under the assumption of the existence of the matching asset. It must be emphasised that the assumption of the existence of the matching asset holds essentially for terminated plans only.

Approach 2 is an attempt to disguise the shortcomings of Approach 1. It is based on the fact that the plan's actuary produces a stream of deterministic expected benefit payments for the purposes of compliance with relevant regulations. The liability benchmark is defined as that stream discounted by today's yield curve, or some other set of fixed rates, or a single rate. Effectively, the approach is based on the following assumptions.

● The pension commitment is known at the present.

● Yield curves can be extended indefinitely.

Due to its simplicity, Approach 2 is much more popular than Approach 1. Once again, it must be emphasised that assumptions A and B hold essentially for terminated plans only.

Approach 3 utilises a certain accounting liability as the liability benchmark. Numerous economists and actuaries have stated that the termination liability is the only measurement that deserves to be called a “liability” in accounting statements. Under assumption of plan termination, the pension commitment is discounted by today's yield curve (“marked-to-market” accounting) or a “smoothed” yield curve (“opaque” accounting).

Approach 4 has been developed by this author. The approach requires no liability benchmark, even though the investment solutions generated by this approach are driven by the pension commitment. Pension commitments are discounted by actual returns, and assumptions A and B are unnecessary. Details of this approach are beyond the scope of this paper.

Now, let's deal with the issue of necessity of particular measurements.

For Approaches 1 and 2, the necessity of their discounting procedures is supposedly based on the law of one price. This law states that two tradable financial instruments with identical cash flows must have the same price. But pensions are not tradable assets; therefore, the law of one price is inapplicable. A hypothetical matching asset would be just one of many available investment options. Investing in the matching asset may or may not be in the best interests of the plan participants and shareholders/taxpayers. Of course, pension plan managers may choose to measure the plan's financial health as the difference between the assets and the price of termination, but that's a choice, not a necessity. As an alternative measurement of funding progress that doesn't utilise the price of termination, consider the difference between this year's budgeted contribution as a percentage of payroll and, for example, the 60th percentile of the present value of future contributions expressed as a fixed percentage of payroll.

For Approach 3, the claim of the necessity of its discounting procedure used in these approaches is based on the belief that accounting measurements represent vital economic values that must be taken into account. This logic is debatable at best. Historically, the measurements presented in pension accounting statements have been mostly inadequate. Some believe that “this time we've got it right”, but count me as a sceptic.

To manage their plans prudently, pension man-



agers do need a comprehensive measurement of pension commitments that, among other things, takes into account the volatility of pension commitments. As was just discussed, for on-going plans, the existence of such a measurement that can be considered as an asset held short is largely a myth. LDI products are more appropriate for terminated plans or the plans for which termination is likely. This mindset should be called “Termination Driven Investing” (TDI) rather than LDI. Those concerned about the accuracy and transparency of financial information should support this clarification. Or so I hope.

Termination Driven Investing

There is a consensus that the asset allocation decision is the main factor determining financial performance of a DB plan. Yet, there's no consensus about what constitutes an optimal policy portfolio for a DB plan. In order to design a proper policy portfolio for a DB plan, the plan managers have to deal with numerous risks the plan faces. These risks include, but are not limited to, contribution risk, insufficient assets risk, low returns risk, financial statements risk, and insolvency risk. Consequently, plan managers face a difficult task of prioritising their goals and developing a sensible compromise between them.

But proponents of LDI don't acknowledge the complexity of this task. They essentially claim that the problem of risk classification for DB plans has been solved. According to them, the solution is pension investments should be driven by termination liabilities.

This solution is as controversial as it is unsubstantiated. So, several questions to proponents of LDI are in order.

- Do you believe that incorporating the termination liability in the policy portfolio optimisation makes the best possible risk management framework?
- Do you support valuing every segment of a particular business on a termination basis, or just the pension plan?
- Do you believe the markets value every segment of a particular business on a termination basis?
- Do you believe that the termination accounting liability is a good estimate of the cost of termination?
- Do you believe that a healthy company, by virtue of terminating its pension plan, can take away a valuable part of its compensation package without replacement and face no adverse consequences?
- Do you believe that the role of the policy portfolio is to manage the volatility of accounting statements?

- Do you believe that an on-going pension plan that has perfectly matched its assets and termination liabilities faces no risks?
- Do you believe that a healthy DB system can withstand the requirement of permanent solvency for all plans?
- Do you know the price tag for the requirement of permanent solvency for on-going plans?
- Is our goal to create a perfect accounting system or a healthy DB system?

Simple truths about DB plans

This paper is an invitation to open a debate that is more balanced and comprehensive than the one that's taken place so far. As a starting point, here are several statements that deserve consideration and should be helpful for the debate.

- There is a fundamental difference between risk hedging and risk management.
- There is a fundamental difference between investing and asset-liability matching.
- There is a fundamental difference between pricing a cash flow and funding a cash flow.
- There is a fundamental difference between accounting values and economic values.
- Interest rates don't directly affect pension commitments.
- Interest rate risk is an important risk to manage, but there are other important risks to manage as well.
- The cost of a pension plan largely depends on the following three factors: the plan's demographics benefit package, and asset allocation.
- Ever-changing accounting rules don't make pension plans more or less expensive.
- Utilisation of asset allocation to produce better looking accounting statements can be very costly.
- The role of ever-changing accounting and funding rules is not to determine winners and losers in the pension game, but to keep players in the game.

In conclusion, there are great products to control the interest rate risk, but managers of on-going plans should be exceedingly cautious before utilising them. The conventional LDI “liability-is-a-bond” approach is inadequate for most on-going plans not because it produces bad solutions, but because it solves the wrong problems.

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