Why Pension MVL is a Misapplication of Financial Economics
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Unfortunately, an incorrect application of a financial economics concept has guided accounting standards for pensions, causing defined benefit plans to appear much more costly than they really are. A manifestation of this error is the proposal to define 'market value of liabilities' or MVL, as the present value of accrued liabilities discounted at a risk-free rate.

The Fundamental Error

Financial economics has failed to recognize that many FAS 157 Level 3 instruments – including pension liabilities - are not subject to arbitrage, and are thus not subject to the law of one price. (The law of one price states that two traded instruments with the same cash flows should be priced the same.) The reason pensions are not subject to arbitrage: a prerequisite for the possibility of arbitrage is a market with easy buying and selling at set prices.

FAS 157 is the Financial Accounting Standards Board (FASB) statement defining fair value. Level 3 instruments are those that lack 'observable inputs'; they do not have easily observable market prices. In contrast, Level 1 instruments (e.g., stocks and bonds) do have easily observable market prices.

Consider two traded financial instruments with identical cash flows, one priced at $100 and another priced at $110. An arbitrageur can make a quick profit by following these steps, which are the blueprint for nearly pure arbitrage:

1. Recognize the mispricing available in the marketplace.

2. Transact for the mispriced instrument such that the arbitrageur underpays or gets overpaid.

3. Conduct the opposite transaction for the other instrument(s) involved at the market price. (At this point, the arbitrageur has bought the $100 asset and sold short the $110 asset, regardless of the correct pricing of the assets.)

4. Exit the positions when the prices of the two instruments have converged (or immediately for pure arbitrage). (Arbitrage theory suggests that almost all the time, the prices of two instruments with identical cash flows will quickly converge.)

Now, say there are two identical frozen pension plans seeking to settle their liabilities by transferring them to another company. Your firm is interested in a pension buyout transaction. Plan Sponsor A is offering $100 million for the settlement of their liabilities and Plan Sponsor B is offering $110 million.

From the financial economics perspective, there's clearly some mispricing here – identical sets of cash flows with two different asking prices. Can anyone make a first-order (i.e., not considering second or higher order effects such as tax) nearly pure arbitrage profit in this situation? Upon reflection, you should agree that no, it is not possible to make a nearly pure arbitrage profit from this situation. What prevents this possibility is the absence of a market with easy buying and selling at set prices.

In particular, it is impossible for a third party arbitrageur to undertake both transactions in steps 2 and 3. He can accept the higher-priced $110 million settlement amount from Plan Sponsor B, but there is no analog of 'short selling' available to him to transact a 'reverse settlement' with Plan Sponsor A.

For both Plan Sponsors A and B, there's no assurance that they will be able to find a counterparty agreeable to their offer price to settle the liability. There is an inevitable risk that either step 2 or 3 will not happen, so it is impossible for Plan Sponsors A and B to act as arbitrageurs as well.

I used pension liabilities as an example, but the same argument can applied to any FAS 157 Level 3 instrument that is not a synthetic composite of Level 1 instruments. (In the 'Level 1 composite' case, arbitrage is possible and the law of one price does apply.)

Conclusion: The law of one price does not apply to pension liabilities and other non-arbitrageable FAS 157 Level 3 instruments. The law of one price is exclusively derived from no-arbitrage arguments. There is no other reason to believe that it applies to pension liabilities.

Other principles, however, do apply to pension liabilities; in particular, rational choice. Pension liabilities funded with risky assets are associated with a concept known as a Bader swap. A Bader swap is a theoretical derivative used by financial economists to illustrate the law of one price. Instead of thinking of the pension plan assets as a risky portfolio (RP) with value $V, imagine the pension assets consist of $V of risk-free bonds, plus a Bader swap. The Bader swap consists of a $V short position in risk-free bonds, and the portfolio RP with value $V.

The Bader swap per se has a fair value of zero. However, when used to fund a non-arbitrageable liability, the Bader swap affects the plan sponsor's exit price of that liability, and thus its fair value. The Bader swap represents a quantity I call PVEG - present value of (ex post) expected gains. PVEG is a legitimate expectation resulting from an expected return on risky assets higher than the risk-free rate. Because a pension plan sponsor is rational, he would require compensation for giving up PVEG. He is free to place a value on PVEG because pension liabilities are not subject to arbitrage. Therefore, the plan sponsor's exit price reflects an adjustment for PVEG.

So, by wrongly applying the law of one price to pension liabilities, current financial economics overstates the fair value of pension liabilities and violates the principle of rational choice.

A better approach to measuring the fair value of pension liabilities is a model where the plan sponsor's maximum exit price is based on keeping the present value of future contributions unchanged. I plan to present such a model soon.

This paper demands an immediate response from financial economists, actuaries and accountants. As they will be unable to do the impossible – that is, show how an unarbitrageable instrument can be arbitraged – they must acknowledge this error and correct it immediately. Only then can rational accounting standards be created for pensions and other non-arbitrageable instruments.