A New Metric for Managing Pension Plans

It isn’t enough for an underfunded public pension plan just to achieve its expected return on assets target, it needs to beat that projected return handily. We present here a measure that reveals just how much asset return a plan needs to be able to discharge its pension obligations. This measure is the plan’s internal rate of return (IRR). We also describe how this measure can be used to determine cash contribution schemes that can reduce necessary asset returns to attainable levels. Finally, we highlight the relevance of the IRR measure for both public and corporate plans.

When a public plan’s asset returns match its expected return on assets, the plan’s funded ratio will hold steady, but it will not rise. The reason for this is simple. Under current protocols, public pension plans use their expected return on assets (EROA) to discount their projected future benefit payments to a current valuation. When they use their EROA to discount plan obligations, they guarantee that their liability valuation will grow at this rate over time. This is so because as each future year’s obligations move closer in time, they are discounted over a shorter period of time. So, the present value of each obligation grows at the discount rate, and so does the sum of these present values, which is merely the liability valuation. The expected return on assets becomes the inevitable return on liabilities.

So, if plan assets grow at the EROA, assets and liabilities grow at the same rate. For a fully-funded plan, this might be fine, since equal growth rates in assets and liabilities leave it fully-funded. However, if the plan is under-funded, equal growth in assets and liabilities leaves it under-funded indefinitely. Its funded deficit actually grows over time, since a steady funded ratio and rising liability valuations mean a rising funded deficit in dollar terms.

When a public plan is under-funded, the targeted rate of return on assets needs to be greater than the EROA in order to discharge the plan’s obligations. This is where the IRR comes in. In financial analysis, the IRR is simply that discount rate that reduces a projected stream of future payments to a given present value target. This is exactly what we seek when we ask what return on assets will allow full discharge of future obligations. If we know the value of plan assets and we know the stream of projected future benefit payments, we can determine a unique IRR that will equalize the present value of the payments to that of the assets. Achieving that rate of return on assets could then allow the plan to fulfill its obligations.

Presently, many plans spend a lot of time agonizing over what their EROA should be. This may be fine for reporting the funded status of the plan, but it is generally not enough for plan management, since the EROA will not fully discharge liabilities when the plan is under-funded. In contrast, the IRR is not subject to

1 Liabilities will grow by less than this rate due to current benefit payments. However, those current benefit payments subtract from plan assets as well as liabilities, so the inferences drawn in the text will still hold. Similarly, liability valuations will also change over time due to changes in actuarial assumptions and to accretion of further service credits by plan participants. These complicate the plan management decision, but they don’t alter the major fact detailed in the text: that a plan’s asset returns must exceed the expected return on assets in order to discharge plan obligations whenever the plan is under-funded based on using that expected return on assets as a discount rate for liabilities.
debate or deliberation. It is determined uniquely and objectively from the plan’s assets and from actuaries’
determination of future benefit obligations. Once the IRR is determined, it provides a relevant, useful target
for plan asset returns.

Combining Cash Contributions and Asset Returns. Now, suppose this IRR determination process delivers
an IRR that plan managers deem to be unattainably high. In that case, this same process can be used to
determine a path of contributions that can combine with initial assets to discharge plan obligations. Plan
managers need only experiment with different contribution paths until they find one where the value of
existing assets plus the present value of those future contributions equals the present value of plan obliga-
tions (when both are discounted at an attainable rate of return on assets).

Exhibit 1 provides the elements of such an analysis. The plan is assumed to have $100 million in assets
presently. The light blue bars in the chart represent actuarial estimates of the future benefit payments the
plan will have to make. At a discount rate of 7.5%, the future payments have a present value of $133 million,
so the plan would have a funded ratio of 75% at an EROA of 7.5%. With a little experimentation, the plan’s
actuaries could easily determine that its IRR currently is 10.6%. To discharge its obligations with no further
cash contributions, the plan would need to achieve 10.6% compound returns on assets.

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Exhibit 1
Determining IRR & Contributions for a Public Plan

For projected benefit payments as per light blue bars and:
Expected Return on Assets = 7.5%
Liability Valuation = $133 M
Present Assets = $100 M
Internal Rate of Return = 10.6%
Contributions as per dark blue bars reduce IRR to 7.5%

Source: Western Asset

Should 10.6% annualized returns be deemed unattainably high, with a little more experimentation, the plan
actuaries could determine that the stream of cash contributions shown by the dark blue bars in the chart
would reduce the IRR of the plan to 7.5%. Along with a commitment to such a contribution stream, the plan
could target 7.5% returns on assets with some confidence that it could discharge its liabilities.
A higher stream of contributions would allow a still-lower IRR and a still-lower asset return target. In this regard, we have observed many real-world plans requiring increased contributions from existing employees in order to improve plan funding.

**Future Service Credits Also Require Funding.** One thing plan administrators should ensure is that such a contribution stream is dedicated to funding only plan obligations that have already been earned. As plan participants earn more service credits, increasing their projected benefits above the levels underlying previous payment estimates, further contributions will be required to fund those yet-to-be earned benefits. The IRR calculations described here are accurate only when the benefit payment estimates encompass all the obligations that an existing asset stock and projected contribution scheme is slated to fund. If a plan determines a contribution stream via the analysis described here, it should understand that actual required contributions will need to be larger by amounts sufficient to fund benefits that participants will earn in the future.

**Risk Will Remain.** The plan should also understand that even when it achieves an average asset return equal to its IRR, it will still be at risk for year-to-year fluctuations, because of the effects of ongoing benefit payments. Should asset returns fall below the IRR in the near term, benefit payments will deplete asset returns further. Even if asset returns exceed the IRR in the future, those will compound off depleted asset levels, and the plan will remain under-funded even when asset returns have moved back to the IRR on average. By the same reasoning, if asset returns run above the IRR in the near term, the plan will remain over-funded even when asset returns have fallen back to the IRR on average.

In effect, the IRR will change over time when actual asset returns differ from it. Below-IRR realized returns will raise the IRR in the future, and above-IRR realized returns will lower the IRR in the future.

We will detail this point more fully in a future white paper. For now, we merely state that the “luck of the draw” remains important for any DB plan. The more volatile the asset returns and/or the higher near-term benefit payments, the more important the near-term time pattern of asset returns will be. While the IRR provides an accurate estimate of the level of asset returns necessary to discharge plan obligations, timing and risk will still be relevant.

**IRR Analysis Also Relevant For Corporate Plans.** Usage of a plan’s IRR is focused on plan management rather than on plan reporting. So, it is just as relevant for corporate plans as for public plans, since for both types of plans, asset returns must be sufficient to discharge obligations. While corporate and public plans are subject to different reporting milieus, their strategic requirements are the same.

When a corporate plan determines its IRR via the process described above, it should compare that IRR to its EROA. If the IRR exceeds the EROA, this means that projected asset returns will likely prove insufficient to discharge plan obligations. The plan might consider increased contributions and/or resort to a more aggressive (and more risky) asset allocation. If the EROA exceeds the IRR, the plan likely has more than enough prospective asset returns to discharge its obligations, although the risk and timing issues of the preceding section will still be relevant for it.

Though public and corporate plans use the EROA for different purposes in their pension reporting, both utilize it in exactly the same way relative to their IRR when it comes to determining an asset allocation strategy that can successfully discharge plan obligations. Our experience on this front has been that corporate plans are tending to reduce EROAs and increase obligations, in effect working to bring their EROA and IRR into conformity.
Conclusion. We believe public and corporate plans should consider integrating an IRR analysis into their pension management practices. The analysis is simple, straightforward, and flexible enough to handle any combination of asset values, contribution schedules, and benefit payments. It can provide plans a metric that is unique, objective, and useful in their efforts to successfully discharge their obligations.