

Dear Actuary:



I recently ran across an article on ASOP 51 risk disclosures and would like to learn a little more about some of these risks. What exactly is interest rate risk and how does it impact my small municipal pension plan?

- Quizzical in Quincy

Dear Quizzical,

Good question, and kudos for keeping up with the latest and greatest developments in Actuarial Standards of Practice (ASOPs)! The best place to start here is by defining the risk, then we can get into the implications for a public pension plan.

Interest rate risk is described by ASOP 51 as the risk that future interest rates will be different from what we expect when we peer into the future today. The interest rates we're talking about here are market rates for fixed income investments (e.g., corporate bond rates, Treasury rates, etc.). The specific characteristics of a pension plan will determine whether unexpected changes in these interest rates pose a risk to the plan. These characteristics include the type of plan (e.g., single employer, multiemployer, public), the plan's asset allocation, and any benefit provisions that may refer to one of these interest rates.

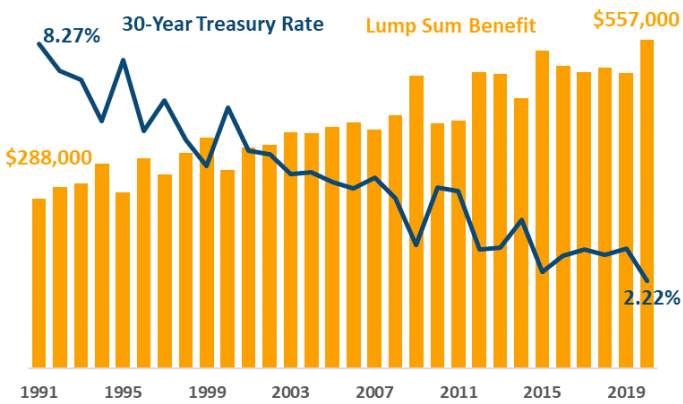
The type of plan has a significant impact on interest rate risk. Single employer (corporate) pension plans have much higher interest rate risk than the other types of plans, because they are required to measure their liabilities using a discount rate that is based on corporate bond rates. These bond rates change on a monthly basis and are fairly unpredictable from month to month and year to year. A scary recent example is July 2020, when a key corporate discount rate plummeted by 40 basis points! Public pension plans, on the other hand, are much less susceptible to this type of interest rate risk. They are not required to use bond rates for calculating liabilities. Instead, they typically choose a discount rate for calculating liabilities that is based on reasonable expectations for the plan's investment returns over the long term.

Although the measurement of liabilities for public plans is not tied directly to market interest rates, these plans are not immune to interest rate risk. The allocation of assets for these plans can generate interest rate risk. To the extent a plan's portfolio contains fixed income investments, they have interest rate risk because the market value of these investments will move up and down as interest rates move up and down. If the market value of the investments moves around a lot that can mean unwelcome

swings in the contributions that are needed to keep the plan well-funded.

Finally, one last source of potential interest rate risk is the plan's benefit provisions. The benefit provisions are described in a plan document or statute, and they spell out how pension benefits are accrued, when they can be distributed to members, and in what payment forms. Occasionally an Easter egg will be tucked into the plan provisions that creates interest rate risk for a plan. As an example, most pension plans allow retiring members to choose between different forms of payment such as a single life annuity, a joint life annuity, or even a lump sum. The plan language will specify a particular mortality table and a particular interest rate that are used to convert one form of payment to another, such that the financial present value of the different forms are all equal. This is referred to as "actuarial equivalence." If the plan document specifies that the particular interest rate is tied to some market rate, for example a Treasury rate or a bond index, then the financial present value of one form of payment compared to another will shift over time as the market-based interest rate changes.

You may be saying to yourself that this "actuarial equivalence" stuff is pretty esoteric, but I have worked with public pension plans that allow members to receive their benefits as a single lump sum, and the actuarial equivalent interest rate that the plan specifies is the 30-year Treasury rate. Back in 1991 these plans were calculating lump sums at 8.27%; in 2020, these plans are calculating lump sums at a mere 2.22%. Check out the graph below to see what a huge difference this has made on the size of the lump sums!



As you can see, even though we're looking at exactly the same \$2,000 monthly benefit starting at age 60, the lump sum amount nearly doubled as the 30-year Treasury interest rate declined. The plan would have paid a \$288,000 lump sum based on the interest rate in 1991 compared to a \$557,000 lump sum based on the interest rate in 2020.

This is just one example of how interest rate risk can be embedded in the plan provisions of a pension plan. Public pension plans have fewer regulatory restrictions than single and multiemployer plans and can have unique benefit provisions. These provisions may create interest rate risk in surprising ways.

If you want to dive deeper and determine the interest rate risks specific to your pension plan, you should try to obtain a copy of a recent actuarial valuation report. The report will include a section that describes the plan's benefit provisions as well as an ASOP 51 section that details the risks the plan faces.

If you're still quizzical or want to learn more, call me! Also, stay tuned for my next column.

Your Milliman Actuary

P.S. Thanks to Eamon Dick, ASA for technical assistance and an informative illustration



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For more information about defined benefit pension plans, see prior letters [here](#).

Do you have a question about your defined benefit pension plan? Write to us at dear.actuary@milliman.com.