Dear Actuary:

Milliman

I read about how a nearby community just issued "pension obligation bonds" for its defined benefit pension plan. What are they, and should my community be considering them?

–Wondering in Westchester

Dear Wondering:

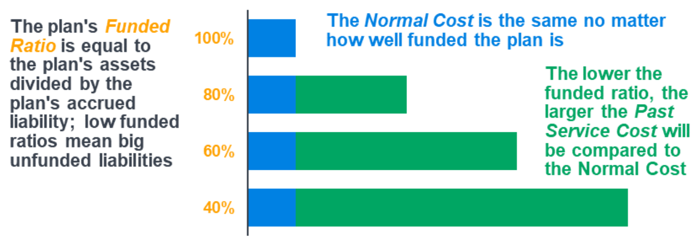
You may see a lot more communities kicking the tires on whether it makes sense to issue pension obligation bonds in order to take advantage of the current low interest rate environment. These financial instruments can sometimes involve very large sums of money, so communities like yours should make sure they are doing plenty of due diligence before following suit!

But let's start at the beginning. One of the most important things your pension plan's actuary does is figure out how much your community should contribute to the pension plan each year in order for there to be enough money in the pension trust to pay all of the promised benefits. The appropriately named *Actuarially Determined Contribution* typically consists of two pieces: a *Normal Cost* to cover the value of the benefits being earned this year by the employees who are covered by the plan, plus a *Past Service Cost* to systematically pay off any unfunded accrued liability. (The Past Service Cost is kind of like paying off your mortgage over time.)

When we talk about how well or poorly funded a pension plan is, we are comparing the plan's assets to the plan's accrued liabilities. Sometimes we subtract the assets from the accrued liabilities to get the *unfunded accrued liability*, and sometimes we divide the assets by the accrued liability to get the *funded ratio*. A big unfunded accrued liability means a low funded ratio, and vice versa. If a pension plan has a big unfunded accrued liability (you got it, a very low funded ratio), then the Past Service Cost will also be very large, perhaps several times larger than the Normal Cost. Figure 1 shows what this might look like.

Which brings us to Pension Obligation Bonds, commonly known as POBs. When you or I need money for big ticket items like home improvements or college costs, we go to a bank and take out a loans or a mortgage. When communities need to raise money for large capital improvements, like school renovations or bridge repairs, they typically issue municipal bonds. Just like with loans or mortgages, municipal bonds are a way to get money now, and then pay it back over time with interest. A POB is a special kind of taxable municipal bond that can be used to shore up the funding of a defined benefit pension plan.

FIGURE 1: ACTUARIALLY DETERMINED CONTRIBUTION



Suppose City A's pension plan has an unfunded accrued liability of $10 million. City A could issue $10 million of POBs, put the $10 million into its pension plan, and voila! It has a fully funded pension plan and no more Past Service Cost. Of course, now it has to start paying off the bonds. So it's traded Past Service Cost for bond repayments. But, and here's where we come to all the interest in POBs right now, interest rates on taxable municipal bonds are at historic lows—under 3%! City A reckons that the pension plan's investments can earn about 6% per year over the long term, so it would be borrowing money at 3% and investing that money and earning 6%.

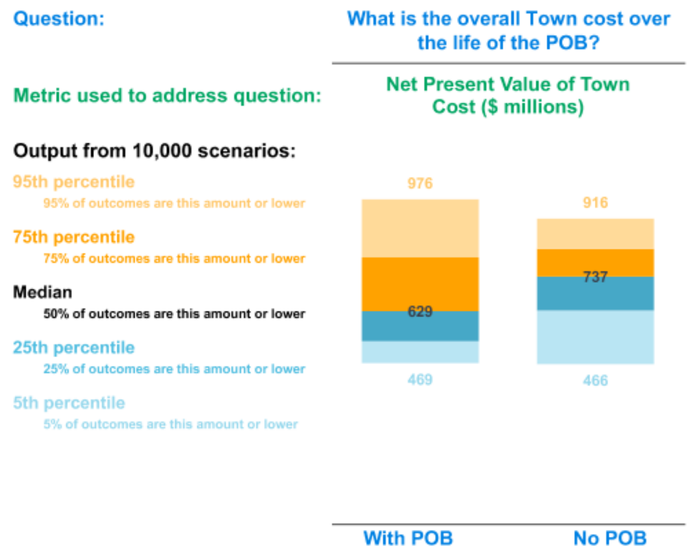
FIGURE 2: ANNUAL OVERALL COST FOR CITY A

In theory, City A could save a lot of money over the next 20 to 30 years. But wait, there's gotta be a catch, right? Absolutely! The catch is that City A *knows* it has to pay 3% interest on the bonds, but City A *doesn't know* how well or poorly the pension plan's investments will *actually* perform over the next 20 to 30 years. Maybe the investments will do better than 6% returns, but what happens if the returns fall short? Suppose we have another Great Depression, or Great Recession, or Dot-Com Bubble, or all three rolled into one, or worse? If the pension plan's investments don't manage to earn about 6% on average, City A might be right back where it started, with a big unfunded accrued liability *plus* it would still have to pay off the bonds. Ouch!

Fortunately, actuaries can help communities get their arms around both the risks and the rewards of a POB. We can look at a whole bunch of different scenarios to get an idea of what might happen to the pension plan investments going forward, and see how the investment performance would impact the Actuarially Determined Contribution.

Here's an example for another community. Town B's actuary kicked the tires on 10,000 different random scenarios for what the pension plan investments might earn over the next 30 years. For each of the 10,000 scenarios and each of the 30 years, the actuary calculated Town B's overall cost (the Actuarially Determined Contributions plus the bond repayments) and then determined the net present value of the Town's cost for each scenario. The net present value can help the finance folks compare all 30 years of costs in today's dollars. With a little bit of sorting and analysis, the conclusion is that a POB could save Town B a lot of money. The median net present value with the POB is $629 million compared to the median net present value without the POB of $737 million, a difference of more than $100 million (see the black numbers in Figure 3). But, just as importantly, there is a second conclusion: there is a chance that a POB *might* cost Town B *more* over the life of the bonds, because for more than 5% of the scenarios the net present value with the POB is *higher* than the net present value without the POB (see the orange numbers in Figure 3). Town B will need to weigh the potential reward of likely savings against the potential risk of increased costs.

FIGURE 3: TOWN B SCENARIO



Obviously, there's a lot at stake when it comes to pension obligation bonds. With today's very low interest rates, there may be no better time to issue bonds and fully fund your pension plan. But you have to think long and hard about the financial risks. Your actuary, of course, is the starting place for helping you understand the impact of a POB on the long-term financial picture. Your actuary may also have some good ideas for helping you manage those risks. You'll also want to loop in your community's financial advisor, municipal bond counsel, and the pension plan's investment consultant. In addition, depending on what state you live in, there may be state laws that govern whether or not you can issue POBs or that put strings on their use.

Good luck, and keep me posted!

Your Milliman Actuary

P.S. A big thanks to Becky Sielman, FSA for lending her expertise and her fast computer to help with those 10,000 scenarios!

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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.