

# Dear Actuary:



In light of the current market turmoil, we are reviewing our public plan's funding policy. I am curious to learn more about the options for amortizing our unfunded liability. Can you help me?

- Curious in Columbia

## Dear Curious:

You are not alone. Many plan sponsors are looking to make sure their funding policies are appropriate and sustainable. For some sponsors, the recent market volatility may result in significant contribution increases and perhaps an unmanageable level of contribution volatility. There are various ways to amortize a plan's unfunded liability, and these different approaches have different implications in terms of contribution volatility.

The plan's funding policy should always contain two important elements: first, covering the cost of benefits that active members are earning this year (the "normal cost" or "service cost"), and second, amortizing (or "paying down") the unfunded liability. There's really only one approach to funding the normal cost, but there are a whole host of ways to approach amortizing the unfunded liability, so I'll focus on that. Take a look at Figure 1 for some amortization terminology—paying off the unfunded liability is a lot like paying off a mortgage on your house!

FIGURE 1: YOUR OPTIONS: PENSION SPEAK VS. MORTGAGE SPEAK

PENSION ACTUARY LANGUAGE	THE MORTGAGE EQUIVALENT
What is the amortization period?	Do you want a 15-year mortgage or a 20-year mortgage?
Is the amortization period "open," "closed," or "layered"?	Do you refinance each year but keep using the original number of years, do you set the mortgage period at the beginning and pay it off steadily each year, or do you take out new home equity loans each year as the size of the unfunded liability ebbs and flows?

I've written about other aspects of amortizing the unfunded liability before; today let's focus on the three main amortization methods you can choose from: *open*, *closed*, and *layered*. For simplicity, let's assume that you've already decided on an amortization period of 20 years.

**Open amortization:** Under this approach, the unfunded liability is amortized over 20 years. Each year, the unfunded liability is recalculated and amortized over a new 20-year period.

Sometimes this method is referred to as "rolling" amortization. If there are never any gains or losses in the future, the amortization payment will slowly decline and the unfunded liability will gradually get smaller and smaller. However, because the amortization period is being reset each year to 20 years, the unfunded liability will never actually be paid off. Translating into mortgage speak, this approach is just like refinancing your home with a fresh 20-year mortgage every year—you will always be making mortgage payments, but you will never pay off the home!

So why do plan sponsors use this approach? It does have the attractive feature that contribution volatility is minimized, because future gains and losses are also amortized over 20 years as part of the newly redetermined unfunded liability at each future valuation date.

**Closed amortization:** Under this approach, the unfunded liability is amortized over 20 years. The following year the unfunded liability is redetermined, reflecting any gains and losses that have occurred, and amortized over 19 years. The following year, the amortization period is 18 years. Every year the amortization period gets shorter, until it reaches one year, at which point the unfunded liability has been paid off and the plan is fully funded. In mortgage speak, this is just like taking out a 20-year mortgage and paying it off—you're done in 20 years.

If there are never any future gains or losses, the amortization payment will remain the same throughout the entire 20-year period. However, there is the potential for significant volatility in the contribution as the 20-year amortization period winds down. For example, by the time you get to year 15 you will only have five years left in the amortization period, and if a large loss comes around (think financial crisis), your amortization payments might go through the roof for the last five years of the amortization schedule.

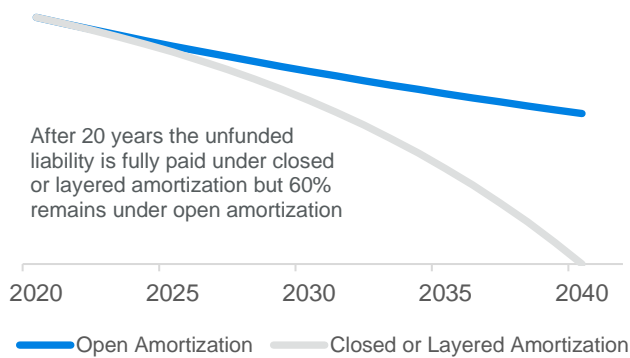
**Layered amortization:** This approach can be thought of as a hybrid of the closed and open amortization approaches. Similar to closed amortization, the initial unfunded liability is amortized over a closed 20-year period. However, any gains or losses that arise in future years will be amortized over new 20-year periods, which is similar to the open amortization approach. With each valuation, a new closed 20-year “layer” gets added to the amortization schedule. In mortgage terms, this is like taking out a 20-year mortgage, but then every year you finish the attic, or tear down the old shed out back, or repaint the porch, and you take out a 20-year home equity loan that just covers whatever you added or subtracted to the property that year.

Importantly, the amortization of the original unfunded liability and gains and losses from prior years remain unchanged, providing the expectation that the plan will become fully funded over the next 20 years, if there are no significant gains or losses. Some plan sponsors like this approach because a loss that occurs near the end of the original 20-year amortization period does not trigger the same degree of contribution volatility that could occur under the closed amortization approach.

**COMPARISON OF AMORTIZATION APPROACHES**

If there were no gains or losses, the closed and layered amortization approaches would both lead to a fully funded plan after 20 years. However, only the closed amortization approach will fully fund the plan even with gains or losses. And of course there *will* be gains and losses over the years! Figures 2-4 below have a few illustrations of what this looks like.

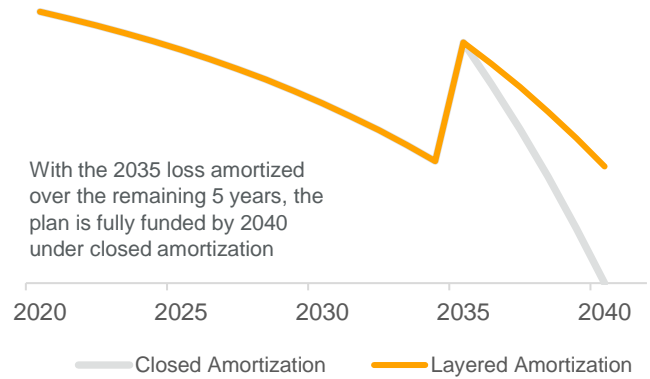
**FIGURE 2: UNFUNDED LIABILITY, NO GAINS OR LOSSES**



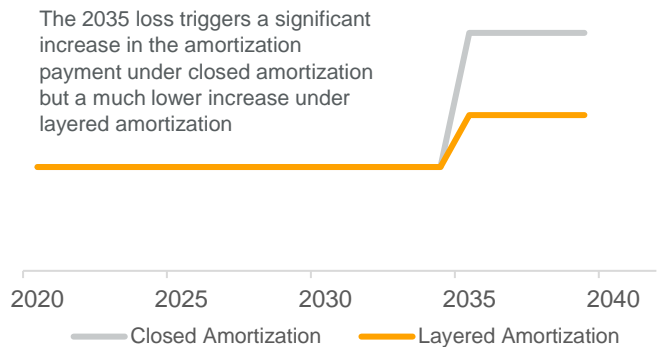
Suppose there is a significant loss to the plan in 2035. With closed amortization, the plan would still be fully funded by 2040, but that would not be the case under layered amortization. Some plan sponsors like the closed amortization approach because it provides a fixed point in time when the plan will be fully funded.

However, the contribution volatility may result in this approach being unsustainable.

**FIGURE 3: UNFUNDED LIABILITY WITH LOSS IN 2035**



**FIGURE 4: AMORTIZATION PAYMENT WITH LOSS IN 2035**



In summary, you need to select the amortization method that is right for you. While open amortization provides for the lowest contributions, the plan is not actually expected to ever become fully funded. On the other hand, the closed amortization approach will fully fund the plan within the 20-year period but may produce an unacceptable level of contribution volatility. Plan sponsors may find that the layered amortization method is a happy middle ground where the plan is expected to become fully funded within 20 years but contribution volatility is minimized by spreading new gains or losses over new 20-year periods.

While we have discussed one component of your funding policy here, it is important to assess your funding policy as a whole and not just each aspect individually. You should work with your actuary to examine what your future pension costs and funding levels could look like to make sure you understand how any decisions you make today could impact the future status of your plan.

**Your Milliman Actuary**

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