

Pension and OPEB underfunded status after Michigan PA 202

Potential impact of changes in assumptions and methods

Timothy J. Herman, FSA, EA, MAAA
Jack Chmielewski, FSA, EA, MAAA



A. Executive Summary

On December 20, 2017, the Michigan legislature passed Public Act (PA) 202, the Protecting Local Government Retirement and Benefits Act (the Act). The Act addresses underfunding issues associated with pension plans and retiree medical plans in Michigan that are sponsored by local governments. First, the Act requires local governments to use mandated metrics and methods to determine whether their pension and retiree medical plans are underfunded. And second, if plans are deemed to be underfunded using this mandated measurement basis, the local governments must develop and implement a process to resolve the underfunding.

It is important to note that the prescribed actuarial assumptions that will be used to make these calculations have not yet been set. The Act states, in Section 5(1):

For purposes of reporting under this section, the state treasurer shall annually establish uniform actuarial assumptions of retirement systems that include, but are not limited to, investment returns, salary increase rates, mortality tables, discount rates, and health care inflation.

These mandated actuarial assumptions can have a significant impact on the size of a plan's liability. This means that, until the state treasurer publishes the first set of annual assumptions, considerable uncertainty remains as to what the impact will be on each plan's liability. In fact, it is possible that a particular plan might be considered fully funded under the current actuarial assumptions that are being used for determining contributions to the plan or for satisfying financial reporting requirements, yet be considered underfunded based on new mandated assumptions.

This paper aims to help stakeholders of Michigan's many local government pension and other post-employment benefit (OPEB) programs develop informed expectations, based on the range of outcomes that could result from the state treasurer's decisions.

We have identified the three actuarial assumptions that have the largest potential impact on plans' funded status:

1. Discount rate
2. Mortality
3. Healthcare cost trend

In Section B, Overview of Michigan Public Act 202, we provide a brief history of the Act and the scope of the funding shortfall it is designed to correct: How does the Act define underfunding? And what must local government units do if they are found to be underfunded?

In Section C, Considerations for Mandated Assumptions, we review each of these assumptions in the context of the Act: What range exists of current assumptions, and what options might the state treasurer consider in setting the mandated assumptions?

In Section D, Impact of Mandated Assumptions on Sample Plans, we examine one hypothetical pension plan and one hypothetical OPEB plan and calculate the funded status based on a range of actuarial assumptions. This allows stakeholders to see the bottom-line consequences of different assumptions.

CONCLUSIONS

From the information presented below, the key ideas and takeaways for plan stakeholders are:

- The mandated assumptions could have a significant impact on the calculated plan liability. The discount rates reviewed in this white paper have the largest impact on the plan liabilities. For a plan that is currently using a discount rate of 7.50%, a mandated rate of 6% could increase a plan's liability by approximately 20%, and a mandated use of a municipal bond rate could increase a plan's liability by more than 50%.
- The impact of the mandated assumptions on a particular plan's funded ratio depends on the starting point. Because a plan's assets are not affected by the mandated assumptions, the change in funded ratio will be different for a fully funded plan (i.e., 100% funded ratio) compared to a plan that is not fully funded (e.g., 80%).
- For a plan that is currently 100% funded, a mandated discount rate of 6% could lower the funded ratio to under 85%, and a municipal bond rate could drop the funded ratio below 60%. The impact of the mandated discount rate is potentially even greater for a plan that is currently 80% funded. A 6% mandated discount rate could reduce the funded ratio to the around 65% and a municipal bond rate could reduce the funded ratio below 50%.

If Michigan Public Act 202 results in funding challenges for your plan, a future Milliman paper addressing actionable steps to mitigate plan underfunding is forthcoming.

The interaction of the assumption changes also has a significant impact on the funded ratio:

- A 6% mandated discount rate combined with other assumption changes could reduce the funded ratio for a fully funded plan from 100% to 77% for our sample pension plan and 67% for our sample OPEB plan. These relatively small changes in assumptions can make what appears to be a well-funded plan an underfunded plan.
- For a plan that starts at an 80% funded ratio, the combined impact of multiple mandated assumption changes might drop the funded ratio to 62% for our sample pension plan and 53% for our sample OPEB plan.
- A municipal bond discount rate such as 3.44% combined with other assumption changes dramatically reduces funded ratios. If the state treasurer mandates such conservative assumptions, then it would be likely that most, if not all, pension and OPEB plans would be considered underfunded plans under Michigan PA 202 standards.

B. Overview of Michigan Public Act 202

“Of the approximately 1,800 local general purpose governments in Michigan, roughly one third provide post-retirement benefits. Due to a multitude of factors, many communities are now facing challenges funding the benefits to retirees. The total unfunded pension liability is estimated to be around \$7.46 billion. The total unfunded liability for retiree health care is estimated at \$10.13 billion. It is estimated that, for many Michigan cities, roughly 20 cents on the dollar goes to pay pension and OPEB costs. In some communities, this number is growing faster and continues to be a bigger share of local budgets over time. Michigan is not alone in facing this growing crisis. State and local governments across the nation are also experiencing the same issues.”

—Responsible Retirement Reform for Local Government Task Force, p. 3

This estimate of \$17.6 billion in total unfunded pension and OPEB liabilities was the work of a task force convened by Michigan Governor Rick Snyder to study the underfunding problem and recommend solutions. The task force’s report, published in July 2017, identified two main causes for the shortfall: Lack of prefunding, and the use of economic, demographic, and investment assumptions that failed to produce adequate funding of liabilities.

In drafting the Act, Michigan legislators empowered the state treasurer to mandate the assumptions that plans must use for reporting purposes—and to update them annually. The Act defines the criteria to identify underfunded programs and requires underfunded programs to adopt a corrective action plan.

WHAT IS AN “UNDERFUNDED” PLAN?

The Act includes a specific definition of what constitutes an underfunded plan. Specifically:

A pension plan is underfunded under the Act if both of these conditions are present:

1. The funded ratio (that is, plan assets divided by plan liabilities) is less than 60%.
2. The actuarially determined contribution is more than 10% of total governmental fund revenue for cities, villages, townships, and counties.

An OPEB Plan is an underfunded plan under the Act if both of these conditions are present:

1. The funded ratio is less than 40%.
2. The actuarially determined contribution is more than 12% of total governmental fund revenue for cities, villages, townships, and counties.

For this purpose, the funded ratio must be determined using mandated actuarial assumptions and methods. The funded ratio must be included in a report filed no later than six months after the end of the local unit of government’s fiscal year. The state treasurer will list on its website the local governments with underfunded plans, and those entities are also required to publicly disclose their underfunded status on their websites or equivalents.

ADDRESSING UNDERFUNDING WITH A CORRECTIVE ACTION PLAN

Local governments with underfunded plans can, essentially, repair their credit by creating plans to address the underfunding. The Act lists examples of strategies that would be acceptable: Reducing or eliminating new accrued benefits—or even closing down a defined benefit pension plan. OPEB plans may reduce their outlays by requiring greater cost sharing from employees or capping employer costs for retirement health plans.

Next, the plan sponsors must get their corrective action plans approved by the local government's governing body. They can then apply to the state treasurer for waivers of their underfunded status.

If a waiver is not granted, then the state department of treasury will step in and require a comprehensive independent review of the local government's retirement system. The Act gives the state government a major role in forming the corrective action plan, based on this review.

If a waiver is granted, then this information is posted on both the state treasurer's website and that of the local government. Then the Act specifies a detailed timeline for implementing various stages of the corrective action plan.

C. Considerations for mandated assumptions and methods

Until the state treasurer publishes the mandated assumptions, stakeholders of local government plans will be somewhat in the dark regarding what the funded status of their plans will look like based on the mandated assumptions. To help plan stakeholders get previews of how funded status might be impacted, we'll take a closer look at the three assumptions that have the most impact on the measurement of funded status. After that, we'll drill down into the actual metrics that the state treasurer might specify for different calculations.

OVERVIEW OF THREE KEY MANDATED ASSUMPTIONS

1. Discount rate: Single or customized?

The discount rate used to calculate liability has a major impact on a plan's funded status. Historically, a broad range of discount rates have been employed by local government plans across the state of Michigan. Typically, the assumption is based on the expected long-term return on the plan's assets based on the plan's specific asset allocation. If this assumption is too optimistically high, the resulting actuarially determined contributions will be too low, and the plan will eventually become underfunded. This is why the discount rate assumption is one of the chief concerns addressed by the Act.

There are two different approaches the state treasurer might take in setting a mandated discount rate. The first is a "one-size-fits-all" approach, where the state treasurer would mandate a single fixed discount rate that all plans must use: for instance, 7.0%. In a variation on this theme, the state treasurer would mandate the use of a commercially available index or rate that would change over time: for instance, a municipal bond index or a Treasury rate. In either case, the mandated assumption would not reflect the specifics of each plan's own asset allocation.

The second approach would involve allowing each plan to tie its mandated discount rate to its specific asset allocation. Perhaps the state treasurer would mandate a range of acceptable

discount rates, depending on the allocation. Or the state treasurer could specify return expectations for each asset class and require the discount rate to be set at a level that has a 50/50 chance of being realized. This approach would mean that each plan would have a mandated discount rate that was appropriate to its own investment strategy.

2. Mortality assumptions will likely become standardized

Currently, mortality assumptions vary widely in Michigan's public sector. This variation is the result of different demographic makeups of employee populations in different jurisdictions and differences in actuarial judgment in recommending updates to mortality assumptions. By weighing the standardization of these assumptions, the Act potentially eliminates this variation to provide a more uniform basis for measuring funded status across all plans.

Actuaries anticipate future patterns of mortality using a two-part process. First, the actuary sets a base level of mortality that reflects information about current life expectancies. Second, the actuary builds an assumption about the extent to which longevity is expected to improve in the future. The longer plan members are expected to live and collect benefits, the higher the plan's liability. If a plan uses an out-of-date mortality table that does not reflect current life expectancies or that does not anticipate future improvements in longevity, the resulting actuarially determined contributions will be too low, and the plan will eventually become underfunded.

We expect that the state treasurer will establish a single standard mandated mortality assumption, which all plans will be required to use. The state treasurer might publish its own standard mortality table or rely on a table that has been determined by an independent organization such as the Society of Actuaries (SOA). The SOA is currently developing a mortality table based on public employee mortality experience, with a draft report expected in the spring of 2018.

Given the wide variation of mortality assumptions currently in use, it is likely that some plans will experience a significant increase in liability using the mandated mortality assumption, while others may see little change in their funded status.

3. Healthcare costs will continue to grow—by how much?

U.S. healthcare costs have been on an upward trend for the last half-century. In 1960, Americans spent 5.0% of gross domestic product (GDP) on medical treatments and insurance. In 2016, that number had reached 17.9% and, with an aging population, it will undoubtedly continue to grow. According to the Milliman Medical Index, in 2017 a typical family of four on employer-sponsored insurance spent almost \$27,000 on healthcare in one year.

Local governments in Michigan will need accurate estimates of their employees' and retirees' future healthcare costs in order to accurately measure the funded status of their OPEB plans and

ensure that they are soundly funded. Milliman uses research published by the SOA to formulate its own long-term trend assumptions. Obviously, large increases in healthcare costs cannot continue indefinitely. Our analysis indicates that resistance to further increases is likely to come into play at around 25% of GDP and costs will peak at 31.4%—around the year 2074. After that, increases will be limited to the rate of GDP growth.

Many local governments use a simplified assumption about future healthcare costs when measuring their OPEB liabilities. The simplified assumptions typically consist of a higher rate of increase in the short term, which then declines over a relatively short period to a long-term steady state.

More sophisticated approaches to setting this assumption take into account a wide variety of information with respect to the drivers of future growth in healthcare costs over a much longer time horizon. For instance, the SOA's Pension Section and Health Section research teams commissioned Professor Thomas E. Getzen of Temple University to construct a resource model for the projection of long-term healthcare cost trends, and continues to make annual updates to the model to ensure its usefulness and relevancy. The model projects per-person expenditures and growth rates through 2099 using a set of equations and assumptions developed by Getzen, with assistance from the SOA Project Oversight Group appointed to oversee the updates. (For more information about the Getzen model, see <https://www.soa.org/research-reports/2016/research-hlthcare-trends/>.) The state treasurer could mandate either a simplified assumption or an assumption based on the Getzen model.

DESCRIPTIONS OF THE RATES AND SCALES LIKELY TO BE USED

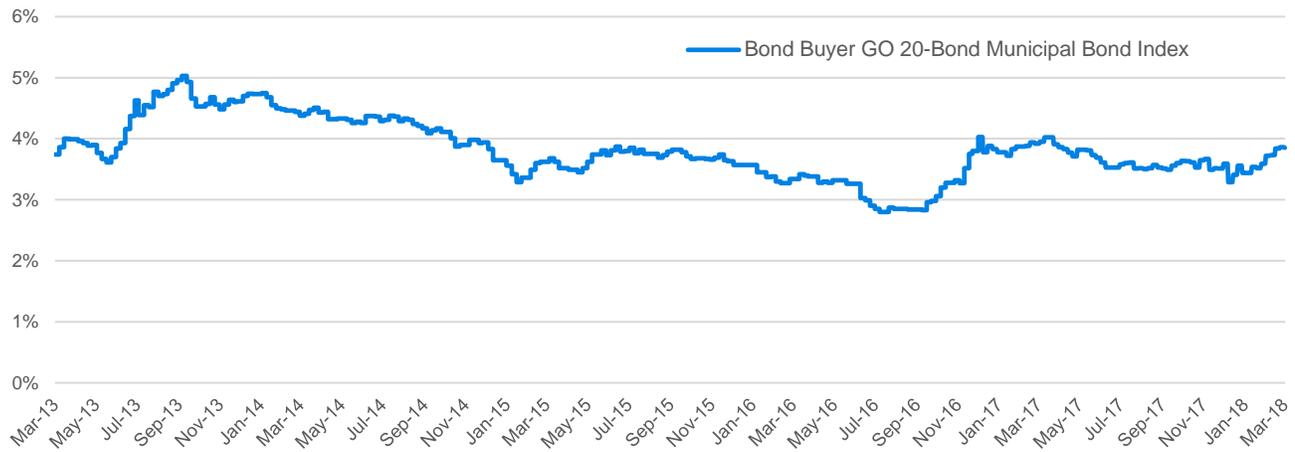
For each of the three assumptions we have been discussing, actuaries have a choice of metrics and methods that can be used to calculate a plan's liabilities. Discount rates, mortality tables, and healthcare costs are all complex issues, so it is natural that different approaches are in use across the state. Here we provide background on several of the most likely options in each category.

DISCOUNT RATE

Generally speaking, this assumption is based on the fund's asset allocation and the long-term expected returns of the plan's assets. There is a wide range of variation in asset allocations from one fund to the next. In addition, there is a range of expert thinking on expected long-term returns of different types of investments. Here we consider four possible discount rates that the state treasurer might mandate for 2018:

1. **7.50%:** The Milliman Public Pension Funding Study analyzes the funded status of the 100 largest U.S. public pension plans. In the most recent 2017 study, the median discount rate used by these plans was 7.50%.
2. **7.00%:** Based on Milliman's analysis of the specific asset allocations of the 100 largest U.S. public pension plans, the median long-term expected return in the 2017 Public Pension Funding Study was 6.71%; that is, the discount rate these plans were using was somewhat high (7.50%) relative to what current expert thinking would conclude (6.71%). This indicates that there is a realistic case for a somewhat lowered discount rate. A rate of 7.00% would represent a moderate assumption by the state treasurer.
3. **6.00%:** The state treasurer might set the mandated discount rate at a level below most plans' current expected long-term return on investments in order to build in a margin of conservatism for measuring funded status.
4. **3.44%:** Local governments whose pension or OPEB plans are projected to run out of assets are required for Governmental Accounting Standards Board (GASB) financial reporting purposes to use a municipal bond index to measure the liability for benefits that are expected to be paid after the point the assets are depleted. Note that if the state treasurer mandates a discount rate that is based on a commercially available index or rate, the discount rate will vary from year to year in response to changes in market conditions and therefore the funded status might display considerable volatility. The chart in Figure 1 shows the volatility of the Bond Buyer GO 20-Bond Municipal Bond Index over the last five years. The Bond Buyer Index stood at 3.44% on December 31, 2017.

FIGURE 1: MUNICIPAL BOND INDEX



MORTALITY

Mortality assumptions are used to determine how long pension and OPEB benefits are expected to be paid on average. Some OPEB plans provide benefits until the retiree and the retiree's spouse reach Medicare eligibility age, generally 65. Other OPEB plans provide lifetime benefits. The impact of the mortality assumptions on an OPEB plan's liability therefore varies significantly based on the plan design (i.e., pre-Medicare only vs. lifetime benefits). The assumption may be established based on an experience study (typically every three to five years), or based on characteristics of the covered population. In the public sector, we see a wide range of mortality assumptions in use.

Here, we consider three possible mortality assumptions that the state treasurer might mandate:

1. RP-2000 base table; future longevity improvements based on Scale AA projected to 2018.
2. RP-2000 base table; future longevity improvements based on Scale BB projected indefinitely ("generationally").
3. RP-2014 With White Collar Adjustment base table; future longevity improvements based on Scale MP-2017 projected indefinitely.

In the public sector, common practice has been to use the RP-2000 base mortality table with projection of future longevity improvements using Scale AA. However, there have been several developments over the past few years in the actuarial community with respect to mortality assumptions.

First, the SOA undertook an updated study of mortality trends. Before the study had been completed, the SOA concluded that longevity had been improving at a faster rate than was projected by Scale AA. As an interim measure, the SOA published Scale BB. Then in October 2014 the SOA published the results of its study: a new RP-2014 base table along with a new Scale MP-2014 for projecting future longevity improvements. These updated assumptions were intended to be successors to RP-2000 and Scale AA. However, the study was not based on any mortality data from public plans, so the SOA recommended that the RP-2014 base table should be used only for private employer plans, whereas the MP-2014 longevity improvement scale could be used for all plans.

Since 2014, the SOA has annually published updates to the mortality improvement scale. The most recent update, MP-2017, was published in October 2017. Generally speaking, the finding from these annual updates has been that longevity has not been improving as fast as had been expected based on MP-2014.

The SOA currently is working on a study of public plan mortality experience, with draft results expected later in 2018. It is likely that a new set of public plan mortality tables will be published at the conclusion of this study.

LONG-TERM HEALTH COST TREND RATE

The healthcare cost trend assumption is a significant driver of the liability for OPEB benefits. A 1% change in the healthcare cost trend assumption has about the same impact on the OPEB liability as a 1% change in the discount rate. A typical trend assumption is structured with higher rates in the short term that grade down over a period of years to lower rates in the long term. In the public sector, we see a large range of assumptions used.

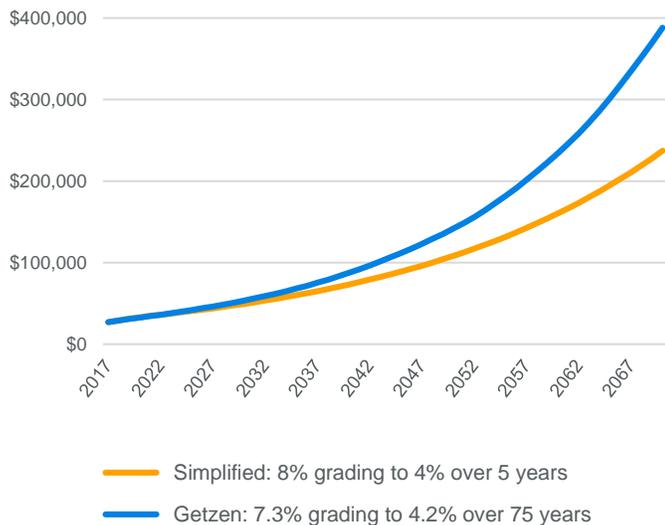
Here we consider two possible healthcare cost trend assumptions that the state treasurer might mandate:

1. Simplified graded rates, for instance reducing from 8% to 4% over five years. Simplified assumptions like this are commonly seen but are not based on an in-depth analysis of the full range of economic factors that impact healthcare costs over a long time horizon.
2. Sophisticated graded rates, for instance reducing from 7.3% to 4.2% over 75 years based on the Getzen model, which reflects a full analysis of the drivers of long-term trends in healthcare costs.

These two assumptions are illustrated in the chart in Figure 2.

Figure 2 illustrates the long-term impact of the healthcare cost trend assumption on projected healthcare costs. For both assumptions, the chart starts with 2017 healthcare costs of \$27,000 per year for a typical family of four. Using the assumption that healthcare costs are expected to initially increase at 8% per year and then taper down quickly to 4% per year, the \$27,000 is projected to increase to more than \$210,000 in 50 years. Using the Getzen model assumption, the \$27,000 is projected to increase to more than \$335,000 in 50 years. Figure 2 illustrates the powerful impact the healthcare cost trend rate assumption has on measuring OPEB liabilities.

FIGURE 2: PROJECTED HEALTHCARE COSTS FOR A FAMILY OF FOUR



D. Impact of mandated assumptions

We created a hypothetical pension plan and a hypothetical OPEB plan so that we could illustrate the financial impact of different possible mandated assumptions. The hypothetical plans are representative of situations that are encountered today across Michigan’s municipal governments. We calibrated the hypothetical plans to have an accrued liability of \$100 million based on a baseline set of assumptions:

- 7.50% discount rate
- RP-2000 base table; future longevity improvements based on Scale AA projected to 2018
- Medical trend rates using graded rates reducing from 8% to 4% over five years

We illustrate below first how our hypothetical plans’ liabilities are impacted by changing each of the three key assumptions in turn. Then we illustrate how our hypothetical plans’ liabilities and funded ratios are impacted by using a combination of assumptions.

FIGURE 3: IMPACT OF DISCOUNT RATE ON PLAN LIABILITY

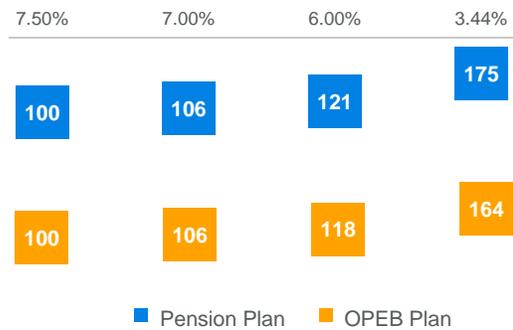
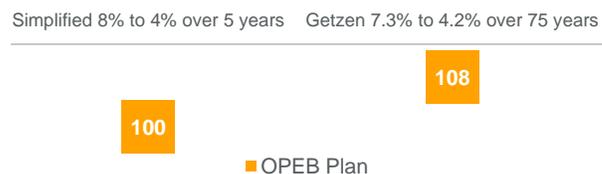


FIGURE 4: IMPACT OF THE MORTALITY TABLE ON PLAN LIABILITY



FIGURE 5: IMPACT OF THE MEDICAL COST TREND ON OPEB LIABILITY*



* Medical cost trend on its own does not affect a pension plan’s liability, therefore only OPEB plan liability is depicted in the chart above.

The chart in Figure 6 shows how our hypothetical plans are impacted not only by changing each of the three key assumptions, but how combinations of assumption changes may affect a plan's liability.

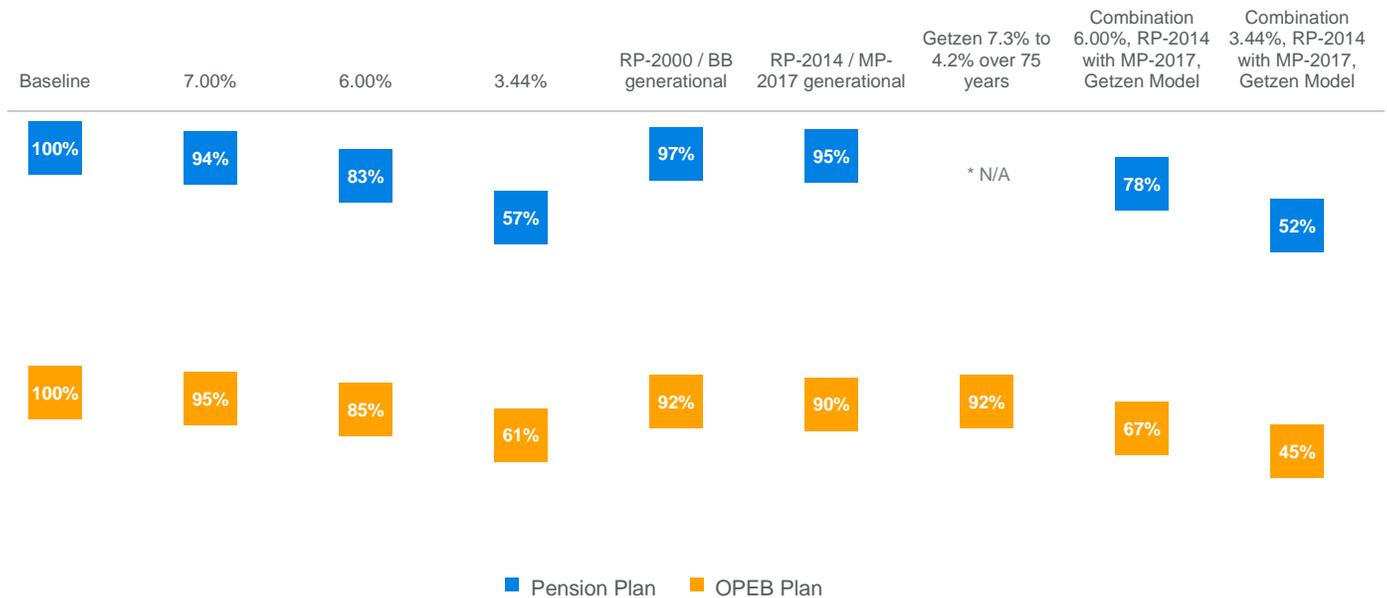
FIGURE 6: INDIVIDUAL AND COMBINED ASSUMPTIONS' IMPACTS ON PLAN LIABILITY



* Medical cost trend on its own does not affect a pension plan's liability, therefore only OPEB plan liability is depicted in the chart above.

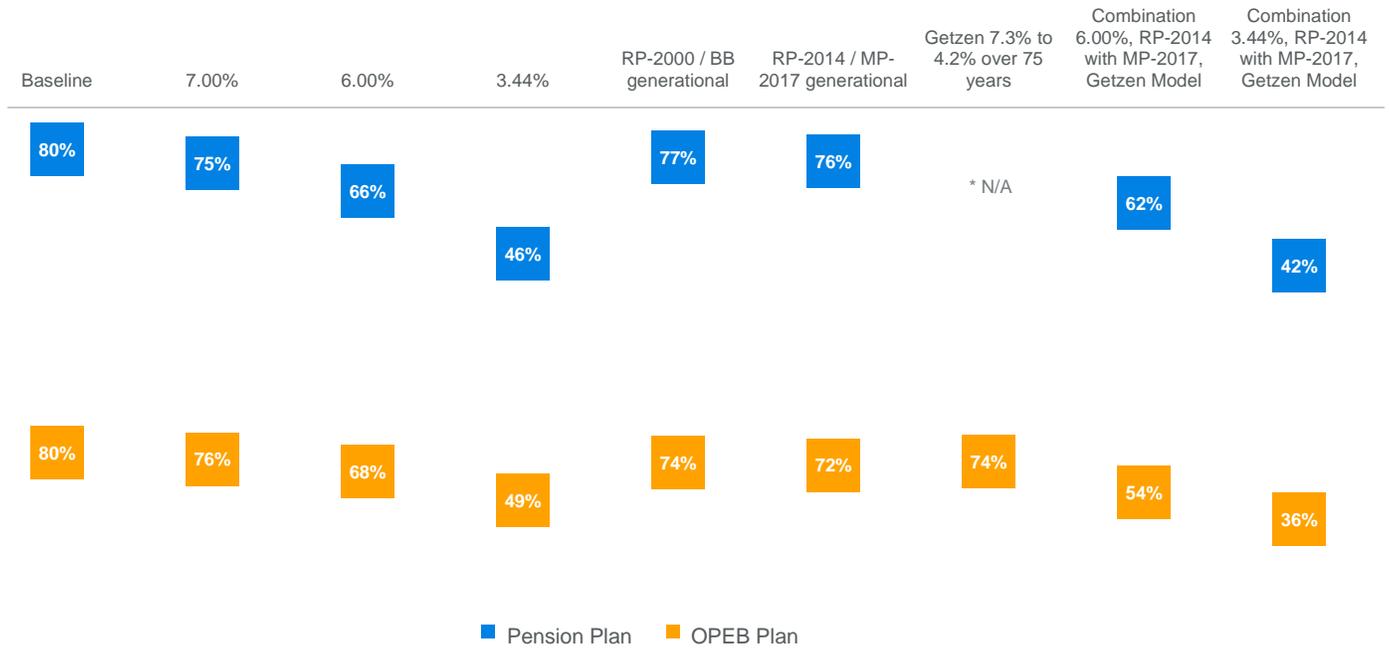
Finally, turning from the impact on liabilities to the impact on funded ratios, the magnitude of mandated assumption changes will depend in large part on what the plan's funded ratio was prior to the changes. We illustrate in Figures 7 and 8 this dependency by looking at two hypothetical pension plans and two hypothetical OPEB plans, which have funded ratios prior to any changes of 100% and 80%, respectively.

FIGURE 7: IMPACT OF POTENTIAL CHANGES ON FUNDED RATIO, PLANS WITH FUNDED RATIOS OF 100% PRIOR TO ANY CHANGES



* Medical cost trend on its own does not affect a pension plan's liability, therefore only OPEB plan liability is depicted in the chart above.

FIGURE 8: IMPACT OF POTENTIAL CHANGES ON FUNDED RATIO, PLANS WITH FUNDED RATIOS OF 80% PRIOR TO ANY CHANGES



* Medical cost trend on its own does not affect a pension plan's liability, therefore only OPEB plan liability is depicted in the chart above.



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

milliman.com

CONTACT

Tim Herman
tim.herman@milliman.com

Jack Chmielewski
jack.chmielewski@milliman.com