

Mature Pension Plans Are Sensitive: Manage With Care

A Survey of Public Plan Maturity Measures

INTRODUCTION

A good deal has been written about public plans taking on too much risk. Less has been written about the factors that make pension plans sensitive to risk.

That is about to change.

A new actuarial standard of practice on the assessment and disclosure of risk (ASOP 51) requires actuaries to identify and assess significant risks to pension plans and to disclose plan maturity measures that are important to understanding those risks.¹

As pension plans mature, they become far more sensitive to risks than plans that are not mature. But, there is significant variation in the level of maturity among public pension plans. Understanding plan maturity and how it affects the ability of pension plans to tolerate risk is essential to understanding how they are affected differently by investment return volatility, other economic conditions, improvements in longevity and other demographic changes.

Mature pension plans are very sensitive to changes. The ups and downs of investment returns can throw mature pension plans into crisis while less mature plans are able to adjust relatively easily. Changes in the economic environment or demographics of members can necessitate assumption changes that may make mature pension plans unaffordable. All of the risks pension plans face are increasingly magnified as plans mature.

We have identified key plan maturity measures and the range of those measures based on data from the Public Plans Database.²

¹Please see our discussion of ASOP 51 in our [Client Alert \(https://cheiron.us/cheironHome/viewArtAction.do?artID=246\)](https://cheiron.us/cheironHome/viewArtAction.do?artID=246) published July 10, 2018.

²<http://publicplansdata.org/>. Data is as of July 18, 2018.

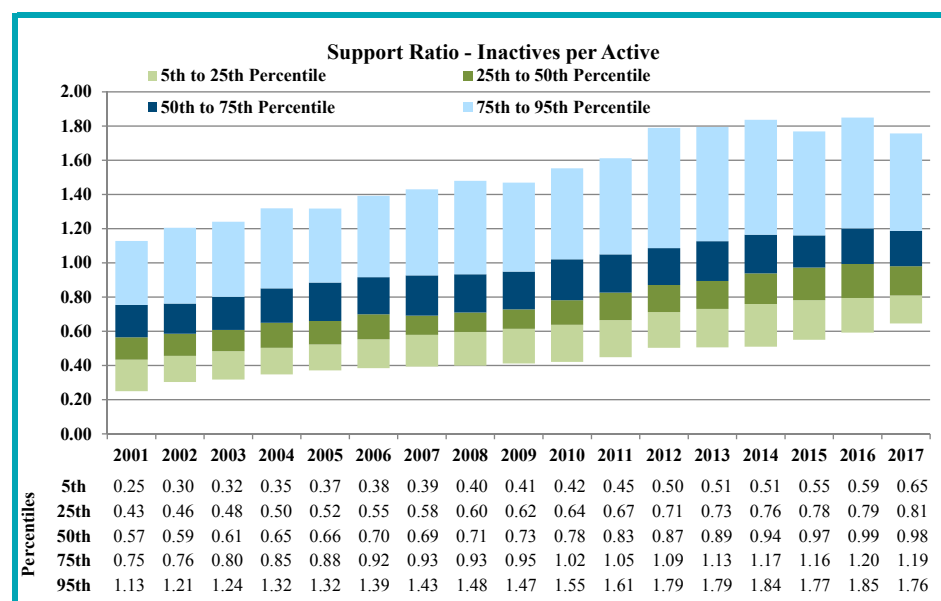
PENSION PLAN MATURITY MEASURES

Support Ratio

The most intuitive measure of pension plan maturity is the Support Ratio — the ratio of inactive³ members to active members. New plans have no inactive members. Over time, active members quit their jobs, retire, and become eligible to collect benefits and new active members replace them. Contributions to the plan are often based on a percentage of active members' payroll, and the contributions have to support each active member plus any shortfall that may have accumulated on active and inactive members. As the number of inactive members grows, the contributions needed to support the potential shortfalls related to inactive members as well as active members becomes a larger percentage of active member payroll.

Chart 1 shows the distribution of Support Ratios for the plans in the Public Plan Database from 2001 through 2017. Support Ratios have increased steadily, with a notable increase during the Great Recession. The number of inactive members grew faster than the number of active members for all plans, but for some plans, particularly those with declining active populations, the growth in Support Ratio was much faster than for others.

CHART 1



Asset Leverage Ratio

While the Support Ratio is a relatively intuitive indicator of plan maturity, it doesn't tell us how changes actually impact a plan's finances. The Asset Leverage Ratio⁴, in contrast, can be used to estimate the impact of investment risks on a plan's finances. The ratio is calculated by dividing the market value of the plan's assets by its payroll.

³ Inactive members are members no longer employed by the sponsor who are entitled to a future benefit from the plan. They include service and disability retirees, deferred vested members and surviving beneficiaries.

⁴ This measure is also sometimes referred to as the Asset Volatility Ratio.

Plans with large Asset Leverage Ratios are likely to have more difficulty recovering from an investment loss and receive a greater benefit from an investment gain. They are more sensitive to investment volatility than plans with small Asset Leverage Ratios.

For example, Table 1 below summarizes the impact of a 10% investment loss compared to an assumed investment return of 7.0% (in other words a -3.0% investment return) for hypothetical plans A and B.

TABLE 1

IMPACT OF A 10% INVESTMENT LOSS		
	Hypothetical Plan A	Hypothetical Plan B
Asset Leverage Ratio	3.0	10.0
Loss as a Percent of Payroll	30.0%	100.0%
Interest on Loss as a Percent of Payroll	2.1%	7.0%

Plan A has an Asset Leverage Ratio of 3.0, so the 10% investment loss equates to 30% of payroll. Given the discount rate of 7.0%, Plan A would have to pay 2.1% of payroll to cover the interest on the investment loss, which may be an affordable increase in contribution. Plan B has an Asset Leverage Ratio of 10.0, so the 10% investment loss equates to 100% of payroll, and a 7.0% of payroll payment to cover the interest on the investment loss or more than three times as much as Plan A for the same 10% investment loss. Plan B is more sensitive to investment gains and losses than Plan A and may need to consider a more conservative investment policy than Plan A in order to reduce the likelihood of investment losses that it may not be able to afford.

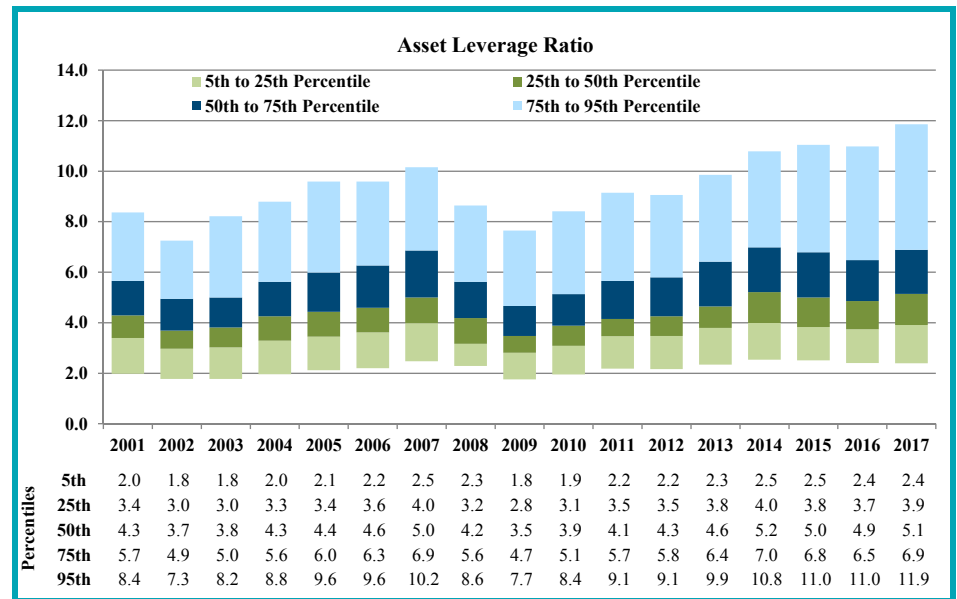
Chart 2 (next page) shows the distribution of Asset Leverage Ratios for the plans in the Public Plan Database from 2001 through 2017. The Asset Leverage Ratio fluctuates with asset and payroll levels. In 2009, asset levels had plummeted due to the significant investment losses causing Asset Leverage Ratios to decline as well. Since then, asset levels have grown while payroll levels have remained relatively flat, resulting in increases in Asset Leverage Ratios for most plans.

These changes in Asset Leverage Ratios illustrate some key dynamics. Plans are more sensitive to investment risks immediately before an investment loss than immediately after, and a plan that is fully funded is more sensitive to investment risks than if it were poorly funded. As a result, plans that are well-funded may want to consider reductions in investment risk while plans that are poorly funded may not.

There is a wide range of Asset Leverage Ratios among public plans, indicating significant differences in sensitivity to investment risk. A 10% investment loss for the least mature plans would equate to 24% of payroll or less while the same investment loss for the most mature plans would equate to 119% of payroll or more.

Even within plans, there can be significant differences in Asset Leverage Ratios for different employers. Plans may want to consider this metric as they consider how much investment risk each employer can afford. All other things being equal, plans with a low Asset Leverage Ratio are more likely to be comfortable with more aggressive asset allocations while plans with a relatively high Asset Leverage Ratio may need to take a more defensive approach to investment risk.

CHART 2



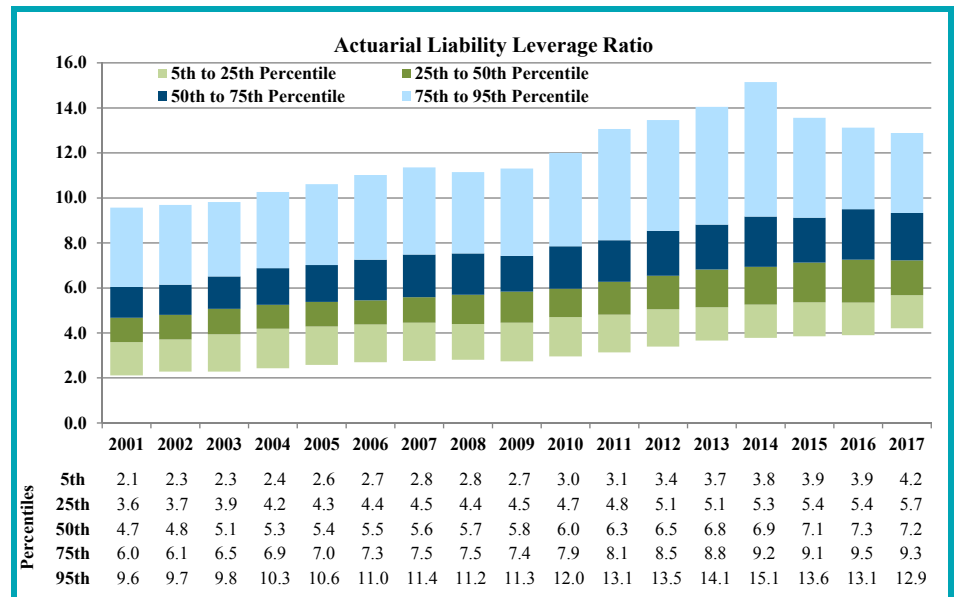
Actuarial Liability Leverage Ratio

The Actuarial Liability Leverage Ratio equals the actuarial liability of the plan divided by payroll. As with the Asset Leverage Ratio, plans with a large Actuarial Liability Leverage Ratio are more sensitive to assumption changes and demographic gains and losses. In many cases, particularly among larger plans, demographic gains and losses are relatively minor, but changes in assumptions such as reducing discount rates and improving mortality assumptions have had a significant impact on public plans recently. For plans with high Actuarial Liability Leverage Ratios, these changes are more significant than for plans with low Actuarial Liability Leverage Ratios.

Chart 3 (next page) shows the distribution of Actuarial Liability Leverage Ratios for the plans in the Public Plan database from 2001 through 2017. Unlike the median Asset Leverage Ratio, the median Actuarial Liability Leverage Ratio increases at a relatively steady rate throughout the period.

As with the Asset Leverage Ratio, there is a wide range of Actuarial Liability Leverage Ratios among public plans that may make different policies appropriate for managing changes. Plans with high Actuarial Liability Leverage Ratios may have a greater need to phase in the impact of assumption changes and to target a level of conservatism in their assumptions even as it is more difficult to do so.

CHART 3



Net Cash Flow

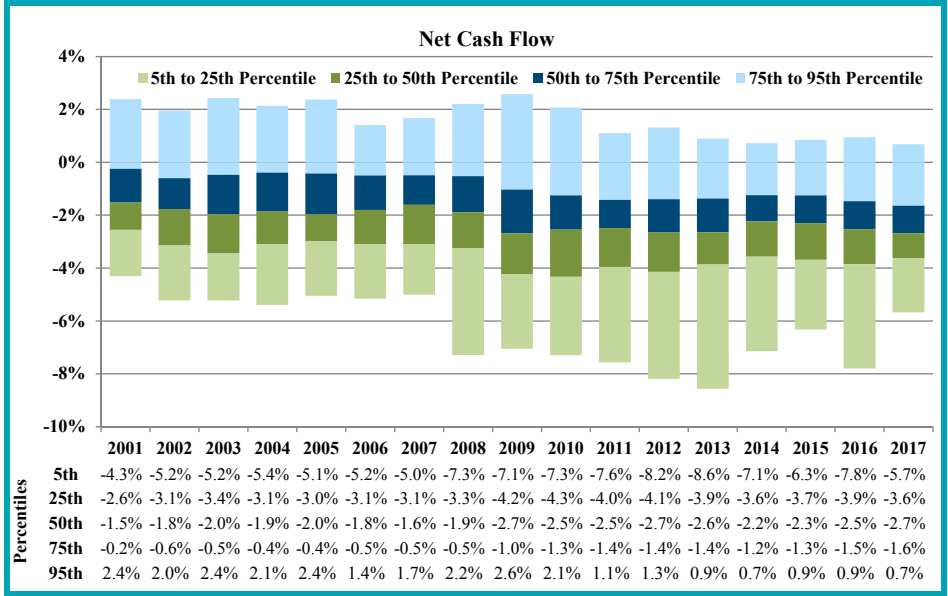
Net cash flow is defined as total contributions less benefit payments and administrative expenses as a percentage of assets. A negative cash flow indicates that benefit payments and expenses are larger than contributions, and significantly negative cash flow makes a plan more sensitive to near term investment returns, particularly negative returns. When investments lose money and the net cash flow is negative, the asset base from which plans need to recover is smaller. As a result, plans need an even higher investment return to recover. For example, if net cash flow is zero, to recover from a 20% loss a plan would need an investment return of 25% ($1 \div 0.8$). But if the plan had a negative cash flow of 15% of assets, it would need more than a 30% return to recover ($0.85 \div 0.65$).

Negative cash flow does not indicate a plan has been managed poorly. In fact, the entire objective of pre-funding a pension plan is to accumulate assets to pay benefits instead of just paying benefits with contributions. The objective of pre-funding is to create negative cash flow. Moreover, plans that are very well-funded will have low contribution rates even as they pay out significant benefits — a situation with highly negative cash flow.

For public plans that always contribute an Actuarially Determined Contribution, cash flow is most negative when the plans are well-funded. When funding levels decline; contribution levels increase easing the negative cash flow. However, for plans where the contribution rates are fixed or cannot be increased, negative cash flow combined with declining funding levels can indicate that the plan may be at risk of insolvency.

Chart 4 below shows the distribution of Net Cash Flow for the plans in the Public Plan Database from 2001 through 2017. Most plans have negative cash flow, but at relatively moderate levels. For the plans with more significant negative cash flow, some additional analysis may be needed to determine whether the plan is drawing on its assets because it is well funded or because it cannot increase contributions.

CHART 4



CONCLUSION

With the implementation of ASOP 51 and its requirement to disclose plan maturity measures that help explain the risks faced by the plan, we expect an increased focus on plan maturity measures. To put these measures in context, it is helpful to understand how one public plan compares to a universe of public plans. In addition, it may be helpful to project how plan maturity metrics are expected to change in the future under various scenarios. With this perspective, plans can gain insight into how sensitive they are to various risks and develop policies to manage those risks. Plans that are more mature may want to consider ways to reduce their exposure to risks compared to other plans even at the expense of increased costs, and plans that are less mature may be willing to have a greater exposure to risks compared to other plans in order to reduce expected costs.

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