



**Annual Review of Funding Levels
and Risks as of June 30, 2011**

Introduction

As part of the Board Governance project, the Board approved a new committee structure that included powers reserved for the Board and its committees. One of the powers reserved for the Finance & Administration Committee is an annual review of unfunded liability, overall pension soundness and sustainability. In response to this, the actuarial office has prepared this report to assist the board in assessing the funding levels of and risks to the PERF.

There are two efforts currently underway that will enlighten the discussion of overall pension soundness and sustainability in the future. These are the setting of a risk appetite/risk tolerances for the funding risk and the work on developing an asset liability decision making framework. Staff expects that these two efforts will result in significant improvements in the second report on funding levels and risks next year.

This is the first annual report to the Board on funding levels and risk measures. The five key measures that are monitored in this report are funded status, net cash flow, asset to payroll ratio, smoothing “corridor” and the annual pay off of the unfunded liabilities based on the market value of assets.

The breakdown of these measures is grouped by public agency non-pooled, the nine public agency risk pools and the state and schools plans.

Analysis

Funded Status

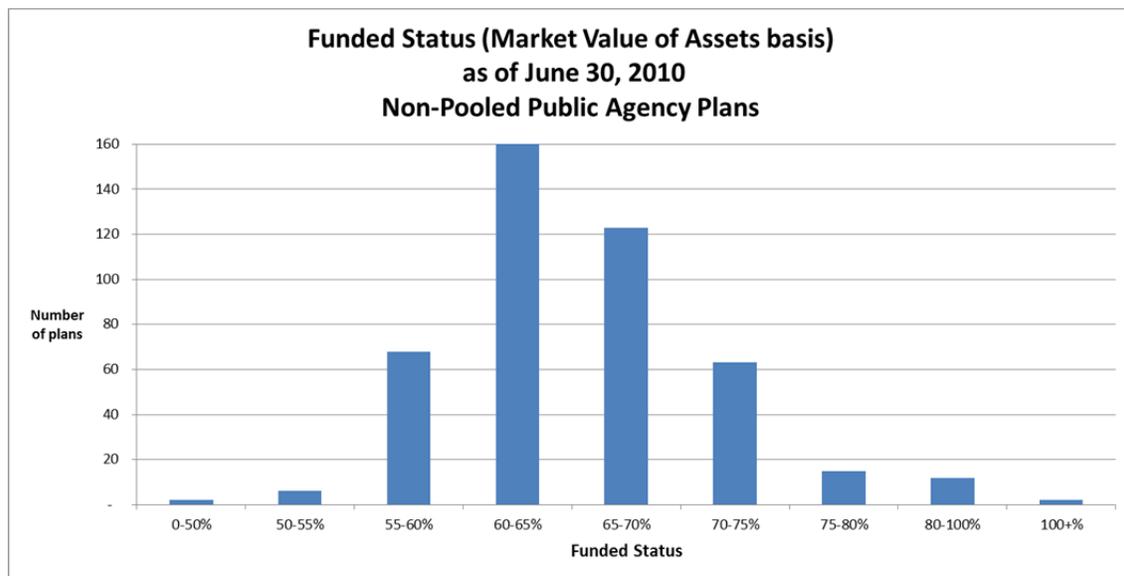
It is not required, nor necessarily desirable, to have accumulated assets sufficient to cover the total present value of benefits until every member has left employment. Instead, the actuarial funding process calculates a regular contribution schedule of employee contributions and employer contributions (called normal costs) which are designed to accumulate with interest to equal the total present value of benefits by the time every member has left employment. As of each June 30, the actuary calculates the “desirable” level of plan assets as of that point in time by subtracting the present value of scheduled future employee contributions and future employer normal costs from the total present value of benefits. The resulting “desirable” level of assets is called the accrued liability.

A plan with assets exactly equal to the plan’s accrued liability is simply “on schedule” in funding that plan, and only future employee contributions and future employer normal costs are needed. A plan with assets below the accrued liability is “behind schedule”, or is said to have an unfunded liability, and must temporarily increase contributions to get back on schedule. A plan with assets in excess of the plan’s accrued liability is “ahead

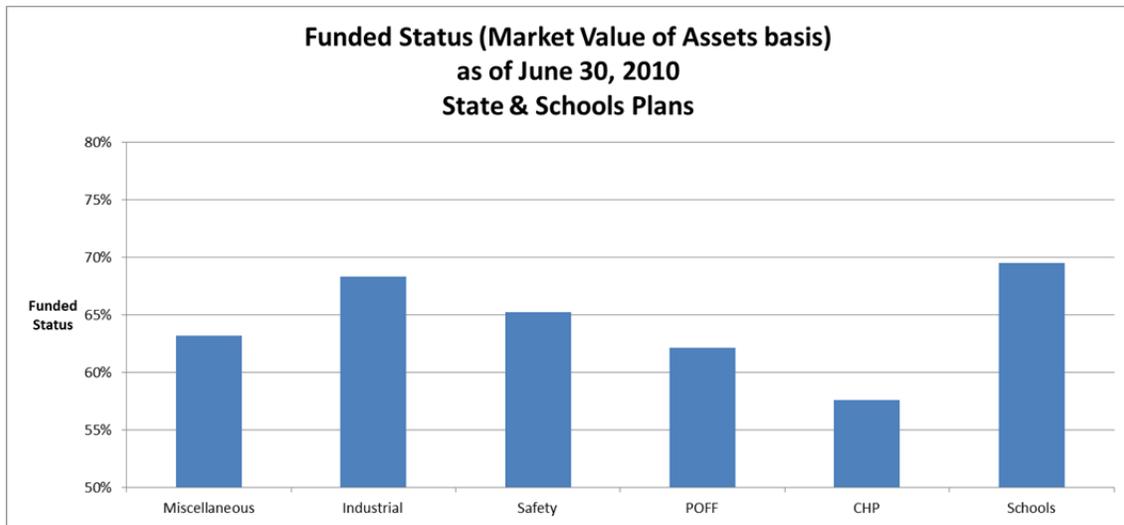
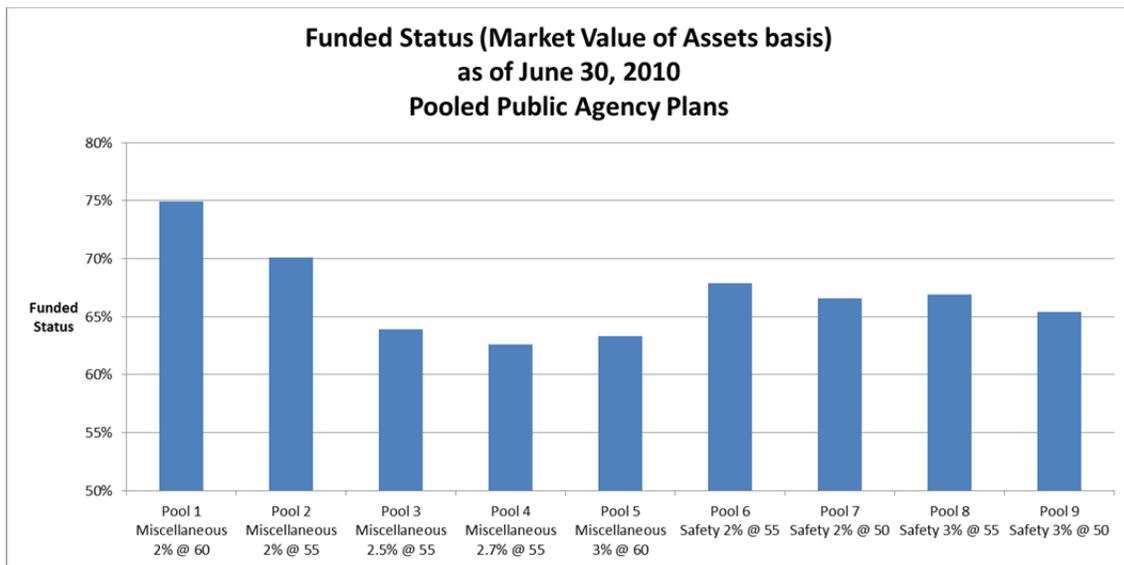
of schedule”, or is said to have excess assets, and can temporarily reduce future contributions. Of course, events such as plan amendments and investment or demographic gains or losses can change a plan’s condition from year to year.

The funded status of a pension plan is defined as the ratio of assets to a plan’s accrued liabilities. This measure when below a certain level along with other risk measures like net cash flow and period of amortization of unfunded liabilities indicates whether a plan is at risk of not meeting future benefit obligations.

The funded status shown in the following summary and charts is based on the market value of assets. As of June 30, 2010, the PERF was 65.4% funded on a market value basis. This number is an average of all plans that participate with CalPERS. June 30, 2010 is the most recent figure available since the June 30, 2011 actuarial valuations for all plans will not be completed until fall 2012. As a result of the 21.7% return in 2010-2011, we estimate the funded status on a market value basis for the PERF to be about 74% as of June 30, 2011¹. When looking at the funding risk, one needs to look at all plans individually and not only the PERF as a whole. Below are charts of the funded status of the PERF system as of June 30, 2010 broken down by various groups.



¹ The estimated funded status as of June 30, 2011 is prior to any changes to actuarial assumptions or gains and losses other than the known investment gain in 2010-2011.



The vast majority of plans (including all of the risk pools and the State and Schools plans) were between 55 and 75% funded as of June 30, 2010. Only a tiny fraction of the plans were more than 100% funded on this date. Being less than 100% funded means that employer contributions need to be higher than the employer normal cost – the expected long-term average contribution level.

There are 2 non-pooled plans that have funded statuses below 50%. In both cases, the plans have just recently contracted with CalPERS with 100% past service so these statuses are to be expected. There are 6 non-pooled plans that have a funding level between 50 and 55%. All of these plans have experienced heavy retirement and asset losses in conjunction with recent benefit improvements.

There are two non-pooled plans that have funded statuses over 100%, these plans also have recently joined CalPERS and have contributed more than their liabilities (0% past service) since inception. There are twelve non-pooled plans that are between 80% and

100% funded, these plans have had either good experience or have been making contributions above those that are required but none indicated that Pension Obligation Bonds were the source of the extra contributions.

The funded status risk measure does not appear to indicate an immediate risk, but will continue to be monitored closely. As stated earlier, being less than 100% funded means that employer contributions need to be higher than the employer normal cost – the expected long-term average contribution level.

Another aspect to keep in mind is the actuarial assumptions used in determining the funded status. The funded status information reported in this report is based on the actuarial assumptions that were in place for the June 30, 2010 actuarial valuations. In March 2012 the CalPERS Board will be considering revisions to both price inflation and the discount rate assumption. Changes to these assumptions would result in an immediate change to the funded status of the plans.

Net Cash Flow

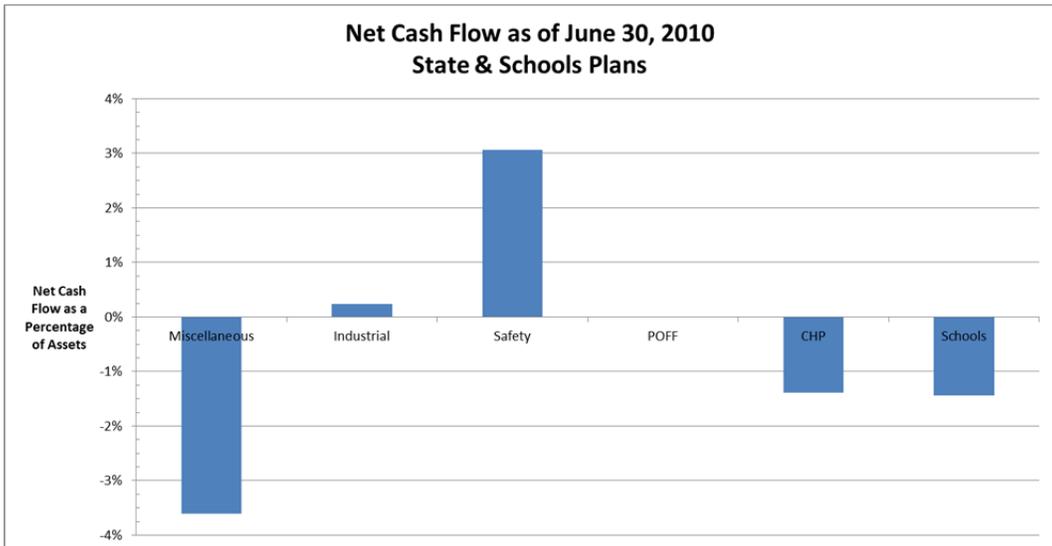
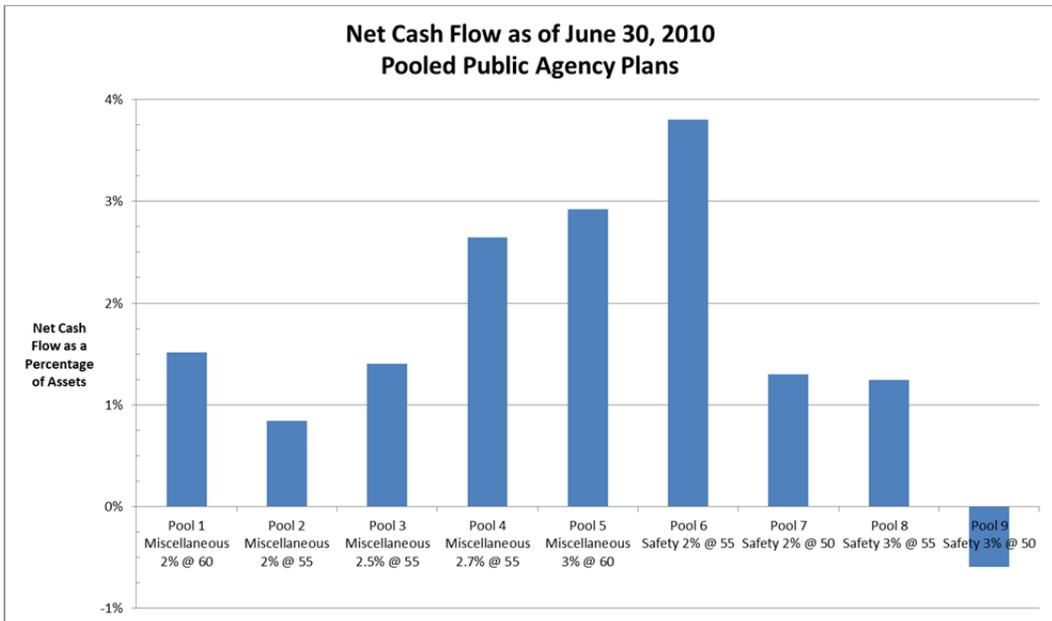
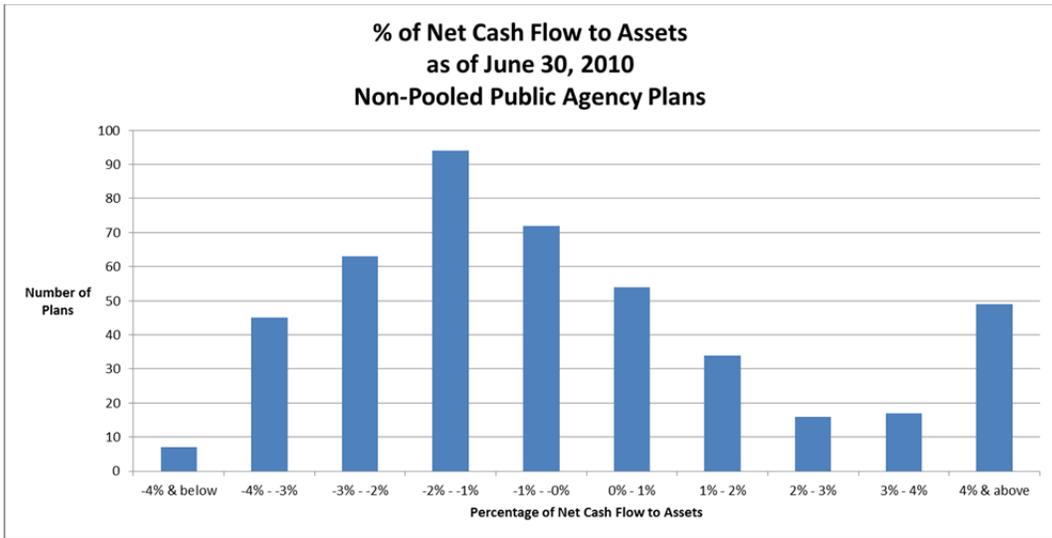
Retirement plans generally have contributions coming in and benefits being paid out. The net (non-investment) cash flow is the contributions less benefits and expenses. These cash flows will be different for each plan since all plans have different maturities. Younger plans tend to have positive cash flows, whereas older plans may have negative cash flows. The issue here lies in the fact that for some plans, the net cash flows i.e. benefits being paid out of the fund versus employer and member contributions coming in are negative and represent in some cases 4% to 5% of the assets on hand.

There is nothing wrong for a plan to have negative cash flows. It is expected that all plans will over time have negative cash flows. It is the normal cycle of a pension plan.

What negative net cash flow exacerbates is the fact that if the assets of a plan have dropped to a level that is significantly below a 100% funding level on a market value basis due to poor investment performance then these negative cash flows now represent a much larger percentage of the assets. This can be an indicator that such a plan may need to have a more aggressive funding schedule.

Benefits paid reduce both assets and liabilities. However, when the plan is well below 100% funded, the funded status of such plans could be very slow to progress toward 100% unless contributions are increased. This situation would suggest an increase in contributions.

For fiscal year 2010-2011, CalPERS paid more in benefit payments than it received in contributions from members and employers. The negative cash flow for 2010-2011 was \$2.7 billion which represented 1.3% of the market value of assets. Below are histograms of the net cash flows of the PERF system broken down by various group:



As shown in the charts above, the plans with significant negative cash flows are the State Miscellaneous plan and a modest number of public agency plans. In February 2010, the CalPERS Board adopted a policy that requires more aggressive funding for plans where the negative cash flows were preventing adequate progress towards being 100% funded. The policy in place requires that if in 30 years, 1) a plan's funded status is not projected to improve by 15% or 2) a funded status of 75% is not projected, the amortization period for gains and losses will be shortened to ensure the satisfaction of both criteria.

Plans are tested against this policy each year and an adjustment is made whenever a plan fails either of the criteria. So far, this policy has resulted in additional contributions for the State Miscellaneous plan, the CHP plan as well as a few public agency plans. We do not expect the requirement for additional contribution to be required based on the June 30, 2011 as a result of the improvement in funded status that is expected from the 21.7% investment return in fiscal year 2010-2011.

Asset to Payroll Ratio (Volatility Index)

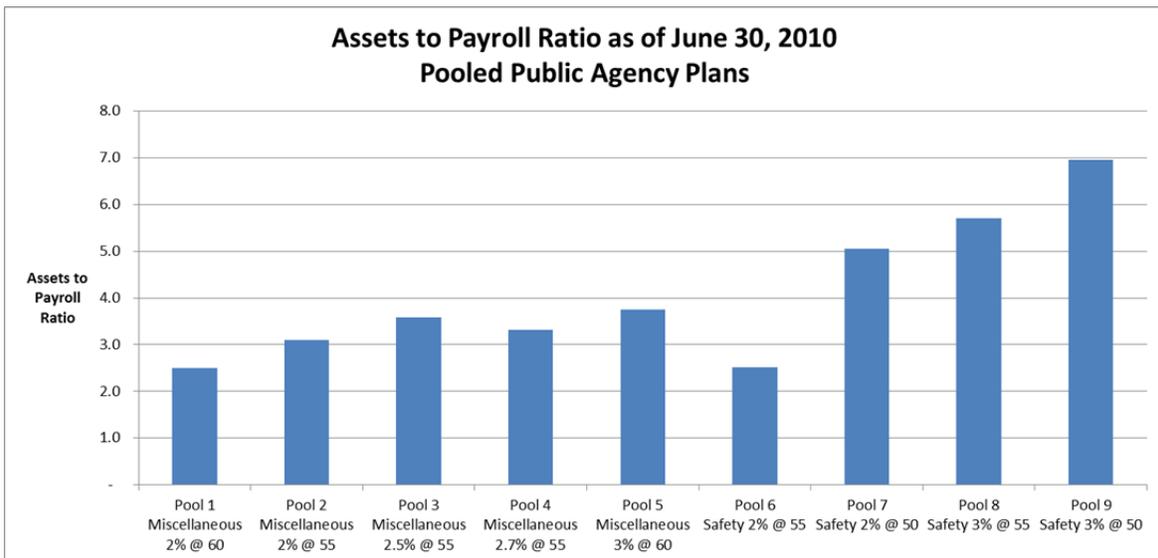
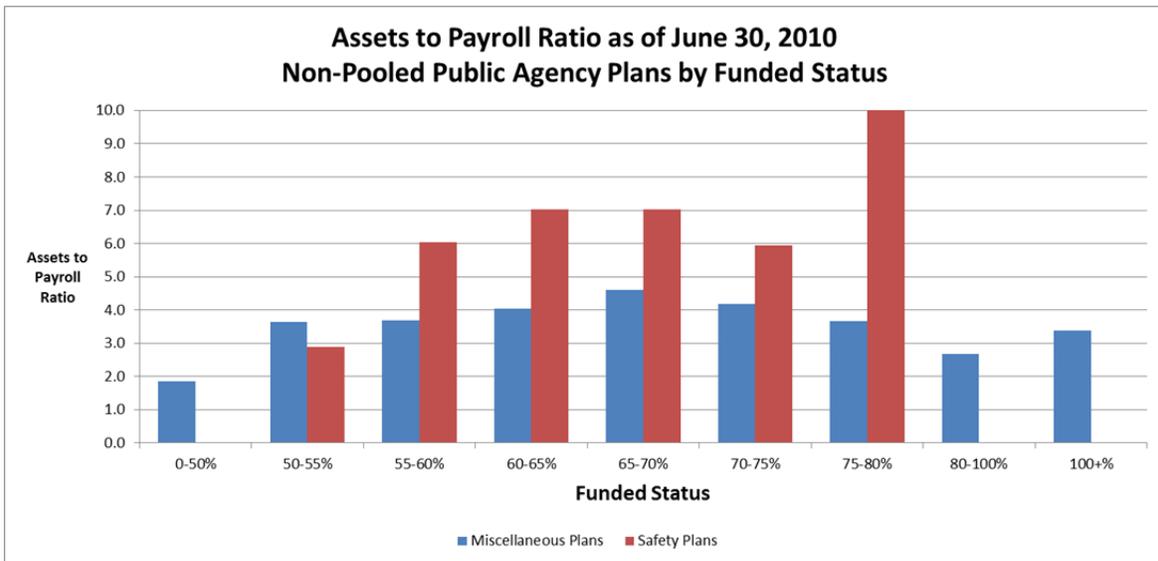
The volatility in annual employer rates may be affected by the accumulation of assets. Higher benefits and earlier retirement ages require the accumulation of more assets per member earlier in their career. Rate volatility is heavily influenced by the ratio of plan assets to active member payroll. Higher asset to payroll ratios produce more volatile employer rates. To see this, consider two plans, one with assets that are 4 times active member payroll, and the other with assets that are 8 times active member payroll. In a given year, let's see what happens when assets rise or fall 10% above or below the actuarial assumption. For the plan with a ratio of 4, this 10 percent gain or loss in assets is the same in dollars as 40% of payroll. For the plan with a ratio of 8, this is equivalent to 80% of payroll. If this gain or loss is spread over 20 years (and we oversimplify by ignoring interest on the gain or loss), then the first plan's rate changes by 2% of payroll while the second plan's rate changes by 4% of payroll.

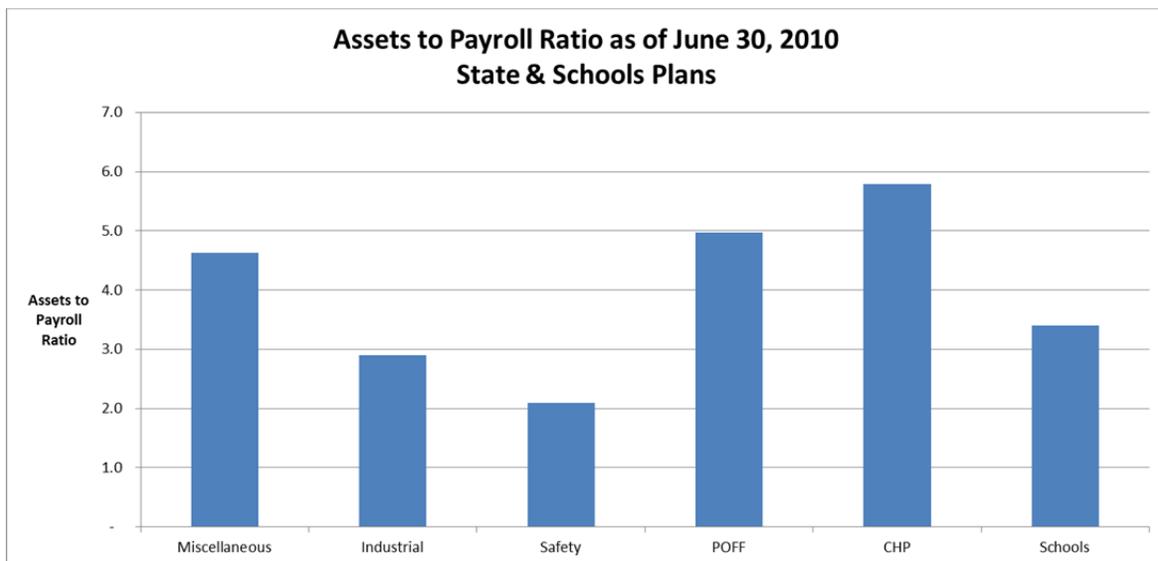
Plans with relatively larger benefits and earlier retirement ages need to accumulate assets at a faster rate than their counterparts. Such plans tend to have a higher ratio and are more susceptible to larger asset gains or losses. These asset gains or losses are, by current Board policy, amortized over a rolling 30 years (with the exception of the 3 year phase-in of the 2009 losses) as a level percentage of payroll. Thus larger ratios combined with large asset gains or losses translate into larger contribution changes relative to payroll.

It should also be noted that these ratios tend to stabilize as the plan matures. That is, all plans with no past service start their lives with zero assets and zero accrued liability – and so asset to payroll ratio and liability to payroll ratio equal zero. However, as time goes by these ratios begin to rise and then tend to stabilize at some constant amount as the plan matures. Higher benefit levels and earlier expected retirements produce higher constant future ratios. For example, our miscellaneous plan pools have ratios that

range from 2.75 for the “2% at 60” pool to a ratio of 4.71 for the “3% at 60” pool. For safety pools, the ratios range from 3.02 for the “2% at 55” pool to a ratio of 9.36 for the “3% at 50” pool. These ratios are also known as the Volatility Index.

Below are charts of the asset to payroll ratios of the PERF system broken down by various groups:





This risk measure is descriptive in nature. That is, there is nothing to “fix” if the Volatility Index is high. A high Volatility Index simply indicates that there is a lot of money invested for the plan--a good thing in the overall scheme of a pension plan. It should, however, serve as a reminder that the more money invested, the more impact investment gains and losses have. It should also be noted that this Volatility Index only considers volatility related to investment returns and, to a lesser extent, payroll. Other gains and losses affect the liability and are therefore not taken into account in the determination of the index.

As shown in the charts above, the average asset to payroll ratio is between 4 and 5 but there are a significant number of plans with ratios above this level. Given the expected level of investment volatility, plans with higher asset to payroll ratios are expected to experience a gain or loss in excess of 50% of the sponsoring employer’s payroll in about one third of future years.

Smoothing “Corridor”

In 2005, the CalPERS Board adopted rate smoothing policies that included a new set of parameters for the establishment of the actuarial value of assets. In order to minimize contribution rate changes from year to year, actuaries often use an actuarial value of assets instead of the market value of assets to set required contribution rates in a pension plan.

In 2005, CalPERS adopted a revision to its asset smoothing method that included the following:

- Investment gains and losses are spread over a 15 year period
- Actuarial value of assets is subject to a 80%-120% “corridor”

The corridor adopted by the Board means that in any given year the actuarial value of assets cannot be less than 80% of the market value of assets or greater than 120% of the market value of assets. This corridor was deemed necessary at the time because investment gains and losses are spread over a 15 year period. A wider or even no corridor would be acceptable only if the period over which investment gains and losses are spread is shortened.

The use of a corridor can lead to the inability to smooth the impact of investment experience when the actuarial value of assets is near the corridor. For example, if the actuarial value of assets is equal to the market value of assets i.e. 100% then the smoothing method can absorb and smooth out a gain or a loss of about 20% above or below the expected return. Our current discount rate assumption is 7.75%. In this example, the smoothing methods in place today would be able to smooth out over 15 years the impact of returns ranging between -12% and +28% if the actuarial value of assets is 100% of the market value of assets.

Below is a chart comparing the actuarial value of assets to the market value of assets for the PERF since the implementation of the new smoothing methods in 2005. The methods applied for the first time in the June 30, 2004 actuarial valuations.

| Valuation Date | Ratio of Actuarial Value of Assets to Market Value |
|----------------|--|
| June 30, 2004 | 102% |
| June 30, 2005 | 97% |
| June 30, 2006 | 94% |
| June 30, 2007 | 86% |
| June 30, 2008 | 98% |
| June 30, 2009 | 137% |
| June 30, 2010 | 127% |

In 2009, in order to further dampen the impact of the -24% investment return in 2008-2009, the CalPERS Board adopted a three year phase-in of this investment loss. The phase-in was achieved by widening the corridor over a 3 year period. For the 2009 valuation, the corridor was widened to 60%-140%. For the 2010 valuations it was reduced to 70%-130%. For the 2011 valuations and later, the corridor is back to its original 80%-120%. This widening of the corridor can be seen in the above table.

For the 2011 valuation, the actuarial value of assets is anticipated to be about 115%. This means that there will be little space left for smoothing a potential investment loss in 2011-2012 fiscal year.

As a result, plans at CalPERS are currently more at risk if investment markets do not perform well. A return 10% below the funding assumption will see contributions rise significantly. In contrast, a return 10% above the funding assumption would result in rates remaining stable. The Actuarial Office began in the June 30, 2010 actuarial valuation reports to disclose this potential risk in the form of an investment return sensitivity analysis. This sensitivity analysis includes the impact on rates over the next

5 years under various investment return scenarios. These projections show that rates are more likely to increase in the event of a poor investment performance. Copies of all valuation reports can be found on the CalPERS website.

Amortization Payment Towards the Unfunded Liability

As mentioned earlier, plans do not necessarily have to be fully funded at all times. When a plan is “behind schedule”, the unfunded accrued liability (UAL) is amortized over time. The CalPERS Board has adopted Board policy ACT-96-05E regarding amortization of unfunded liabilities.

Actuarial Policy ACT-96-05E specifies that all changes in liability due to plan amendments, changes in actuarial assumptions, or changes in actuarial methodology are amortized separately over a 20-year period. In addition, all gains or losses are tracked and the net unamortized gain or loss is amortized as a rolling 30-year amortization with the exception of gains and losses in fiscal years 2008-2009, 2009-2010 and 2010-2011 in which each year's gains or losses will be isolated and amortized over fixed and declining 30 year periods (as opposed to the current rolling 30 year amortization). Also, if a plan's accrued liability exceeds the actuarial value of assets, the annual contribution with respect to the total unfunded liability may not be less than the amount produced by a 30-year amortization of the unfunded liability.

There are two primary sources of potential risk when it comes to the amortization payment schedule. The first is the 30 year rolling amortization of gains and losses. This rolling 30 year amortization is done as a level percentage of expected payroll and results in a payment that represents 6% of accumulated net gains and losses (which equals the outstanding UAL, excluding the portions due to changes in benefits, assumptions or methods). The UAL in the meantime increases at 7.75% each year. This means that any gain or loss that occurs in a particular year may never actually be paid off unless these gains and losses offset each other over time.

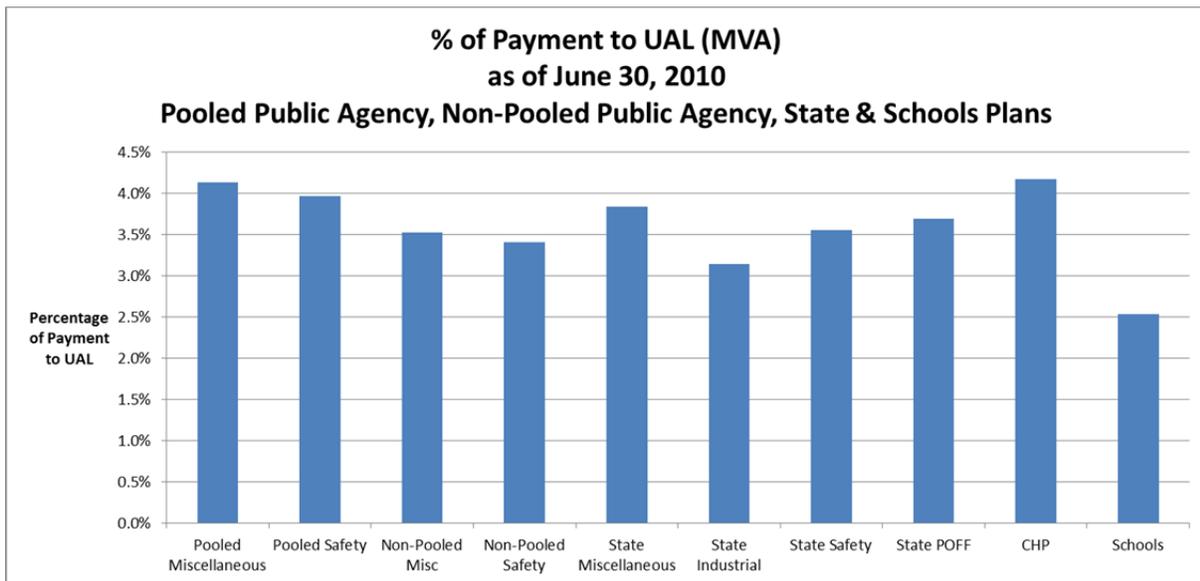
Note that for plans that are growing, the proportion of the UAL to the overall plan's accrued liability will decrease (or funded status will increase) over time and the potential risks due to the rolling amortization are probably not significant. However for those plans that have no growth and a declining membership this is not the case and the UAL could become a larger proportion of the plans' accrued liability in the absence of offsetting experience.

The second source of risk is the asset smoothing we use to determine the actuarial value of assets. The actuarial value of assets is the asset value we use to set contribution rates. The required payment toward the UAL is based on the plan's actuarial value of assets rather than the plan's market value of assets in order to keep contribution rates stable. In times when plans have a UAL and the actuarial value of assets exceeds the market value of assets (as is currently the case), employers are making payments based on a UAL that is smaller than the one calculated using the market value of assets.

As pointed out in previous sections, if our long-term estimate of investment returns is accurate, then it is expected that there will be other times when the payments will be higher using the actuarial value of assets than under a market value (as was the case in the first few years of the policy).

Accordingly, plans that are currently paying off their UAL on a market value of asset basis sooner will be better able to handle future market downturns and be better able to meet their future obligations.

Below are listings of the amortization payment percentages of the total unfunded liabilities on a market value of asset basis for the PERF system:



As you can see from the above tables, only a very small portion of the UAL on a market value of assets basis is being paid in the current year. Most plans are paying between 3% and 4% toward their unfunded liability each year. Given that the discount rate assumption is currently 7.75%, this measure shows that employers are generally paying less than the interest on the unfunded liability and that contributions are likely to increase in the future. This is a result of the smoothing policies that we have in place currently combined with the experience of the last few years. It is an indication that contributions amounts will generally have to increase in the future.

Summary

The five risk measures that were analyzed all interact with each other. Under short and long term investment return outlooks, these risk measures can give an indication of how the system will most likely behave in terms of contributions and funded status. In the short term there is more emphasis on contribution rate levels and their stability or volatility, while over the long term funded status gathers more weighting. With these goals in mind and with these current risk measures how will the system respond under

the assumed long term assumptions? Will contributions drop, level off or rise? What about funded status? What will the risk measures tell us after a poor investment year?

As of June 30, 2010, the system was about 65% funded with negative cash flows. As a result of the 21.7% investment return in 2010-2011, we estimate the funded status to be about 74% on June 30, 2011². Most plans in the system are between 55% and 75% funded as of June 30, 2010. This indicates that contributions will need to be greater than the normal cost for some time to come unless there are extraordinary gains in the next few years. Note that this does not imply increasing contributions because contributions are currently greater than the normal cost.

Currently the PERF system has a negative non-investment cash flow. Since benefit payments are not reduced for funded status, each benefit payment has to be paid at 100% funded and hence a high level of benefit payments acts as a drag on funded status. This implies that there may need to be a more aggressive funding schedule for some plans.

The plans with significant negative cash flows are the State Miscellaneous plan and a small number of public agency plans. In February 2010, the CalPERS Board adopted a policy that requires more aggressive funding for plans where the negative cash flows were preventing adequate progress towards being 100% funded.

The average asset to payroll ratio is between 4 and 5 but there are a significant number of plans with ratios above this level. Given the expected level of investment volatility, plans with higher asset to payroll ratios are expected to experience a gain or loss in excess of 50% of the sponsoring employer's payroll in about one third of the time. While CalPERS has relatively aggressive smoothing policies in place, there is a limit to the amount that can be done to smooth out such significant volatility.

A good indicator of the amount of smoothing that can be done in any given year is the value of the actuarial value of assets in relation to its corridor. The actuarial value of assets for the June 30, 2011 valuations is expected to be about 115% of market value of assets, near the corridor adopted by the Board. What this means is that plans at CalPERS are currently at risk for significant contribution increases if investment markets do not perform well.

Finally, this report shows that the payments towards the unfunded liability (UAL) are generally less than the interest on the unfunded liability. This is a result of the smoothing policies that we have in place currently combined with the experience of the last few years. It is an indication that contributions will generally have to increase in the future.

Currently, CalPERS actuaries are reviewing and monitoring these measures on a plan by plan basis and taking appropriate action, where needed, by adjusting the funding schedule.

² The estimated funded status as of June 30, 2011 is prior to any changes to actuarial assumptions or gains and losses other than the known investment gain in 2010-2011.