



Annual Review of Funding Levels and Risks

November 18, 2014

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Executive Summary

This report is intended to assist the CalPERS Board of Administration in assessing the funded status of the Public Employees Retirement System and its overall soundness and sustainability. It focusses on the funding levels and risks associated with the funding of the system.

Overall, the report highlights that employers are exposed to a considerable amount of contribution rate volatility and a risk of further changes in funded status. Contribution rates are expected to remain high for an extended period unless there is a period of exceptional returns in the markets.

Current contribution levels are high relative to historical levels and, for almost all employers, scheduled to increase further as our amortization policies phase in previous asset losses. For many plans, the contribution rates have never been as high as they are now. Current contribution levels already exceed 30% of payroll for over 100 miscellaneous plans. Safety plans generally have higher contribution levels with over 150 plans having contribution levels of more than 40% of payroll. Employers are reporting that these contribution levels are putting significant strain on their budgets and limiting their ability to provide services to the people in their jurisdictions.

Current funding levels are generally between 65 and 85 percent funded as of June 30, 2014, significantly below the ideal level of 100%. Our current amortization policies are expected to fully fund the plans over the next 30 years but to do so require the high contribution levels shown in this report. On a hypothetical termination basis, funded levels are even lower. This means that members will be exposed to significant or even devastating benefit reductions should employers elect to terminate their plans unless employers are able to make up the shortfall.

Recent actions by the Board, combined with good investment markets in the last two years, have resulted in a significant improvement in one of the most important risk measures shown in this report. The probability of reaching any of the three low funded status thresholds shown has been reduced. However, the probability of this occurring is still higher than staff is comfortable with. Currently the probability of falling below 50% funded at some point in the next 30 years ranges from 23% (for the Schools pool) to 35% (for the California Highway Patrol Plan). It is likely that this probability is even higher for some select public agency plans.

The report shows that there is a significant amount of risk being taken in the funding of the system. The probability that the system will face a period of severe stress is still at a level that may be unacceptable. Staff urges the Board to review these results carefully and determine whether they feel that changes are necessary to ensure the soundness and sustainability of the system.

Introduction

This report is intended to assist the CalPERS Board of Administration in assessing the funded status of the Public Employees Retirement System and its overall soundness and sustainability.

This is the third report on funding levels and risk measures. The last report was as of June 30, 2012 and was presented to the Board in early 2013. To make the report timelier, we are presenting it right after the completion of the annual valuation reports for the public agencies. This has allowed staff to update the results by two years (to June 30, 2014) rather than by a single year (to June 30, 2013).

In addition, much of the key information on the results of the public agency annual valuation has been incorporated into this report rather than being reported separately.

In this report, we focus on:

- Current and near-term contribution levels,
- Current funding levels on a going concern basis
- Current funding levels on a hypothetical termination basis,
- The volatility index (a measure of plan maturity)
- Three key funding risk considerations that are used in the Asset Liability Management process.

Any attempt to present an overview of funding levels and risks for a system such as CalPERS has an inherent difficulty; the system is composed of many plans, and several risk sharing pools that are funded separately. As a result, it is not sufficient to look at the funded status or various risk measures for the system as a whole. Instead, we need to look at the breakdown of the various measures for each of the non-pooled public agency plans, the two public agency risk pools and the state and schools plans. Given the number of non-pooled public agency plans, we will focus on presenting the distribution of results with additional analysis of the outliers.

Shared Risk

As fiduciaries of the system, we are concerned about the risks to the members and their benefits, and also the risks to the employers and their financial needs.

We are looking at the risk that a member's benefits will not be paid – in full and when due – as a result of the way the plan has been funded. It is also important, though, to consider the risks to the employer that is required to make contributions to fund the pensions. Investment and actuarial policies adopted by the CalPERS Board are always adopted with the purpose of maintaining benefit security for members while also considering the employers' ability to pay the contributions needed to fund the benefits.

For example, the CalPERS Board recently decided to phase in over several years the impact of changes to the actuarial policies and assumptions to help employers better prepare and budget for the contribution increases. Helping employers plan for their contribution requirement reduces risks to both the employer and the members' benefits.

So long as the employer makes all of the contributions needed to fund the plan, along with the contributions from the members and the investment returns provided by CalPERS, the members' benefits will be paid. While there is a legal requirement for the employer to make the full contribution needed to fund the system, in extreme circumstances the employer may be unable to do so. In these situations, the employer's financial hardship can become a direct risk to the members and their benefits. By focusing on the risks to the Soundness and Sustainability to the overall system, CalPERS can better reduce the risks to both members and employers.

In the end, some of the greatest risks to the sound and sustainable funding of members' benefits are those things that put stress on the financial strength of their employer.

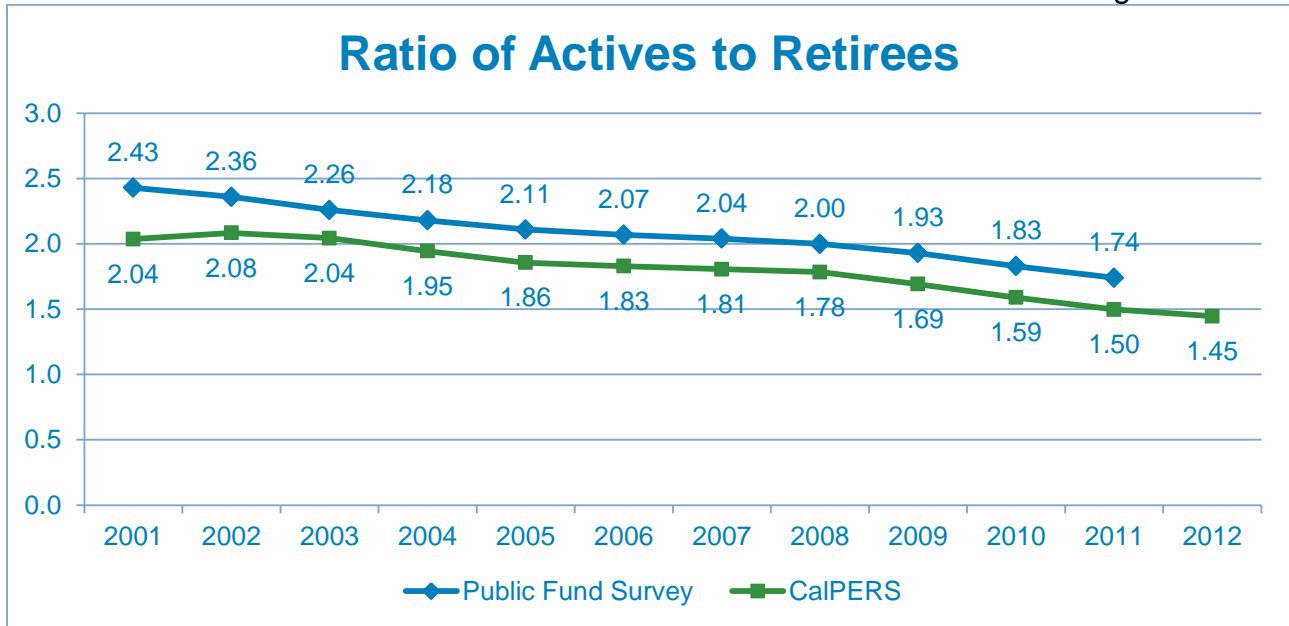
Ultimately, members and employers are in this together.

Changing Pension Environment

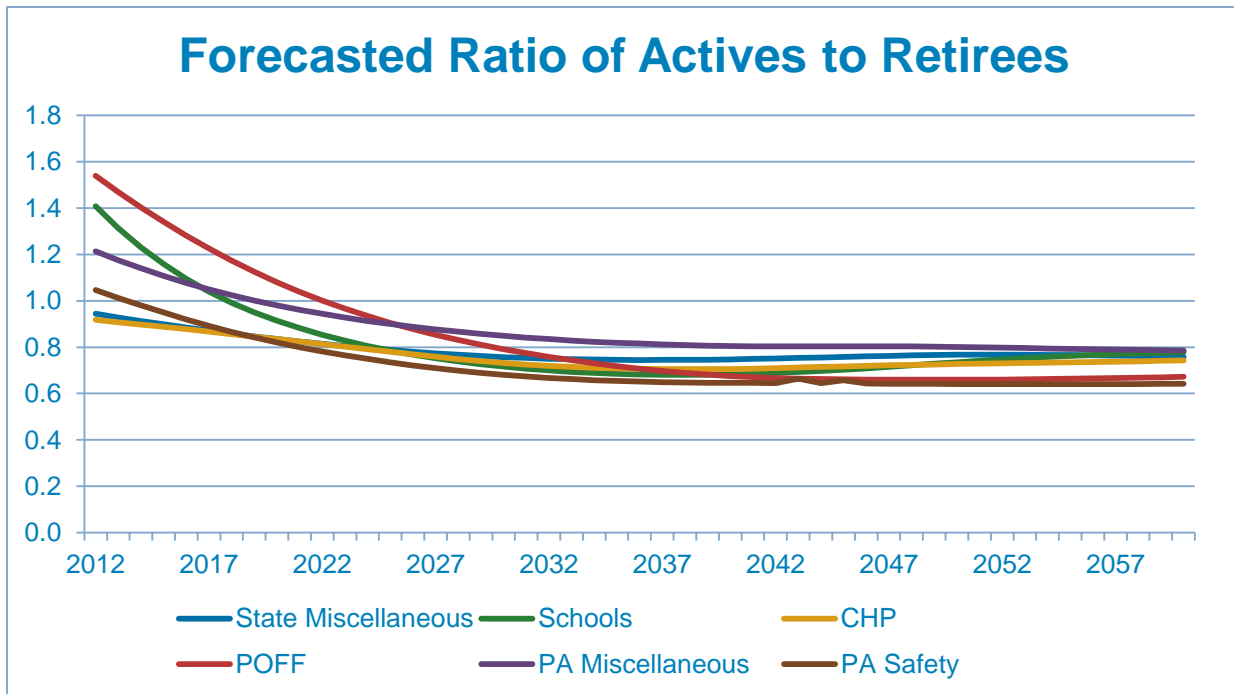
The aging of the population and the retirement of the baby boomer generation is well known to everyone. Demographic shifts have long been predicted and taken into account in the funding of the system. The higher number of retirements we have seen the last few years was projected all along and this trend is expected to continue as the baby boomer generation leaves the workforce to enter into its retirement years. Even though anticipated, this demographic shift is impacting risk measures identified in this report and has to be part of any discussion on funding levels and risks.

One way to look at the maturity level of CalPERS and its plans is to look at the ratio of actives to retirees. A pension plan in its infancy will have a very high ratio of active to retired members. As the plan matures, the ratio starts declining. A mature plan will often have a ratio near or below one. For both CalPERS and other retirement systems in the US, these ratios have been steadily declining in recent years. Below is a chart comparing the ratio of active to retired members for CalPERS to other public retirement systems in the US.

The trend for CalPERS plans is that they are becoming more mature. The ratio of retired members to active members is increasing for the most part. There may be some cities or agencies that are in a growth cycle however it appears that most are in a static growth period. This in conjunction with the benefit levels has resulted in an increase in the asset to payroll ratio. This will mean that volatility from this source will have a greater impact on employers than it had in the past.



As can be seen, the ratio for CalPERS has dropped from just above 2 to just below 1.5 over a 10-year period. So now we only have about one and a half active members' payrolls to spread the risk associated with each retiree's benefits instead of the two to one ratio of a decade ago. An additional concern is that these ratios are also expected to continue dropping over the next decades until they reach a floor somewhere between 0.6 and 0.8 depending on the plan. Below is a chart showing a projection of the ratio over the next 50 years for a sample of plans at CalPERS.



As plan matures, risk measures such as probabilities of high contribution rates or large changes in contribution rates on a year to year will increase and remain high unless actions are taken to significantly reduce the risk imbedded in the current asset

allocation. This means that when financial markets fail to deliver a strong return or even collapse like they did in 2008-2009, it can lead to very high contribution levels that could lead to employer insolvency or even bankruptcy that ultimately could impact the security of benefits for members.

Over the last few years, four CalPERS participating employers have declared bankruptcy. They are the cities of Stockton, San Bernardino and Vallejo and the town of Mammoth Lakes. These bankruptcies pose a substantial risk to the system. Unsecured creditors of the cities of Stockton and San Bernardino have argued that the cities' state law obligations to CalPERS and to the members are pre-empted by federal bankruptcy law. CalPERS is taking appropriate steps to protect the integrity of the system and the retirement security of its members; however, significant legal risk remains. Should the bankruptcy court rule that a city's pension plan need not be funded consistent with state law, other struggling CalPERS public agencies could be tempted to alter their actuarially required contributions through bankruptcy proceedings.

It is important to realize that other than the City of San Bernardino, none of these cities failed to pay CalPERS the amount that was determined was necessary to properly fund the benefits. The City of San Bernardino did not remit its full contributions for the Fiscal Year 2012-13. The principal amount of payments required to be made to CalPERS by the City during Fiscal Year 2012-13 and which were not made by the City during that time was approximately \$13.5 million for all of the City's plans (Miscellaneous and Safety) combined, excluding interest, penalties, late fees, costs of collection and the like. During Fiscal Year 2013-14, as part of a confidential court-ordered mediation process, the City and CalPERS reached an agreement regarding various items. While the terms of this agreement remain confidential, since reaching the agreement, the City has made certain partial payments with respect to the deferred amounts owing.

Even though municipal bankruptcy has been at the forefront of both local and national news lately, employers continue to fulfill their pension promises to their members.

Contribution Levels

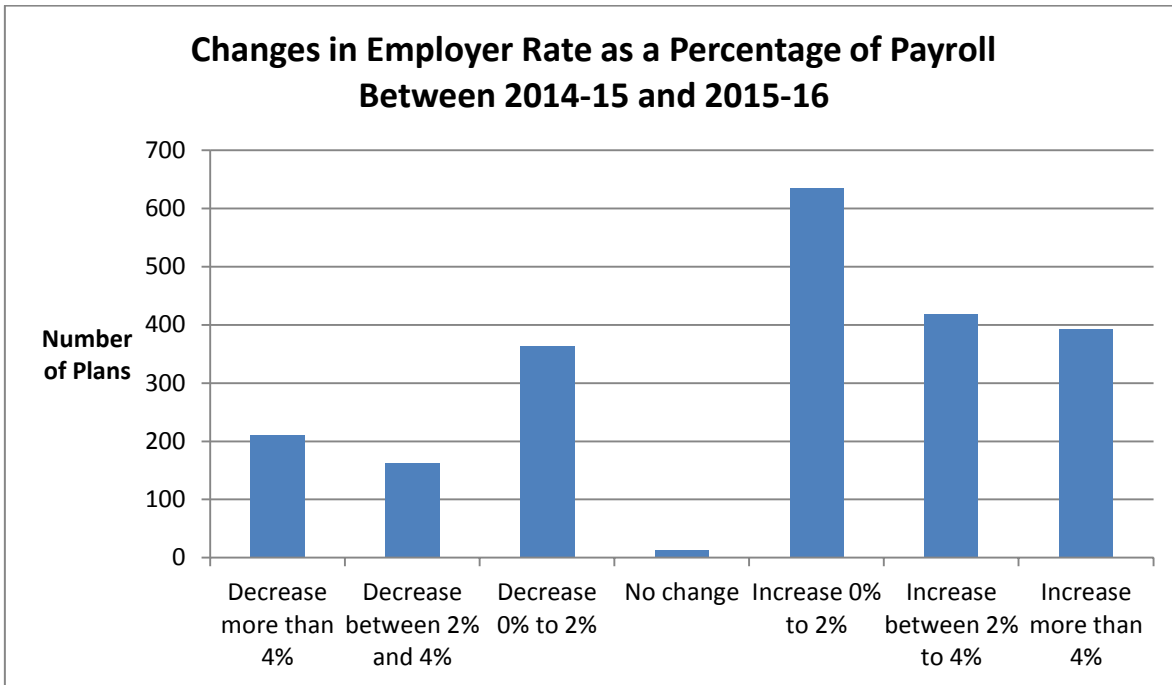
Contribution levels have continued to increase over the prior year. While most employers saw relatively modest increases in their required contributions, some employers in risk pools with high retiree to active member ratios are seeing significant increases in their required contributions. This is a result of the combining of risk pools in response to the Public Employee Pension Reform Act (PEPRA) and the new accounting standards.

In addition, many employers have been reducing their payrolls. Since the required contribution to pay off the unfunded liability is not related to their payroll, this is having the effect of increasing the UAL contribution rate as a percent of the (reduced) payroll.

Most employers who saw significant increases in their contribution rates were affected by one of these two factors.

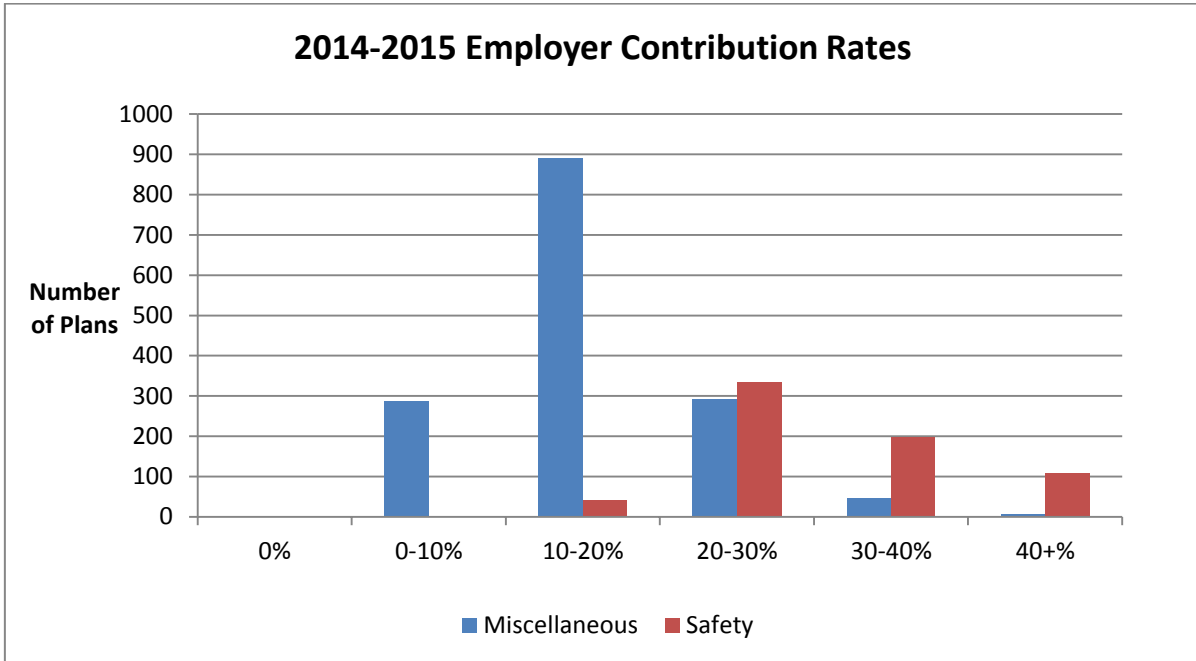
The distribution of the changes in employer rates is shown in the following table.

Distribution of Changes in Employer Rates between 2014-15 & 2015-16

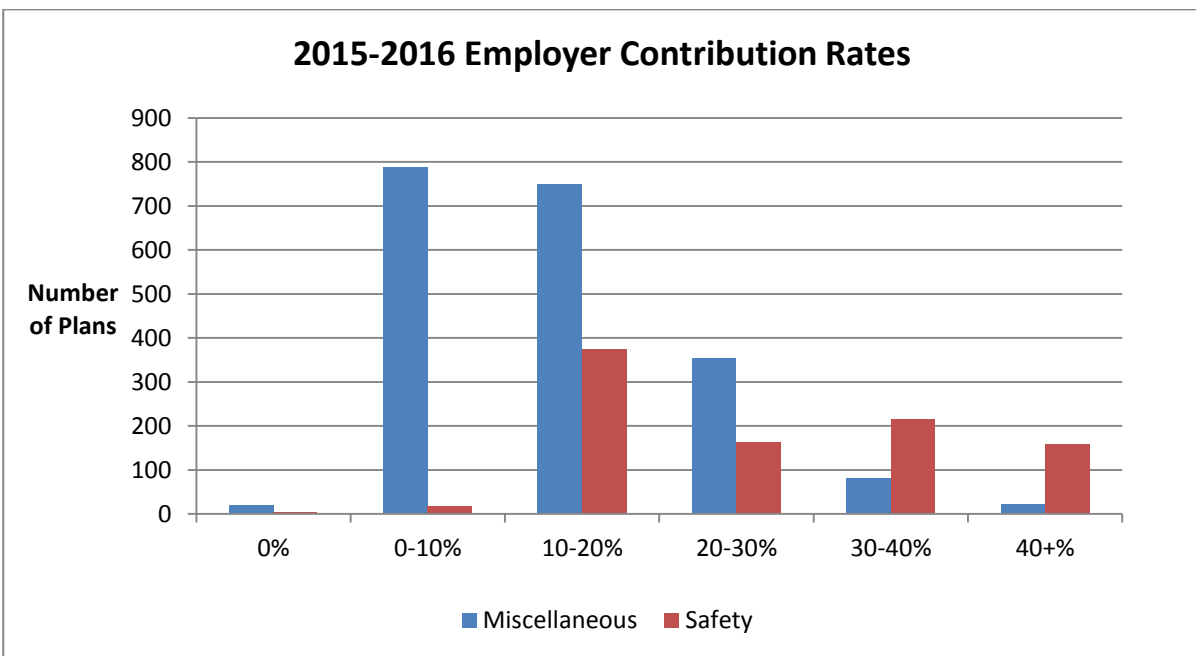


With the implementation of the Public Employees’ Pension Reform Act, there has been an explosion of new benefit tiers and, for pooled plans this has meant new rate plans. Most of these new rate plans have no unfunded liabilities and hence have modest required contribution rates. This is resulting in many more plans with contribution rates between 0% to 10% of pay for Miscellaneous plans and 10% to 20% of pay for Safety plans. However, it should not be seen as an overall reduction in the contribution levels for employers. This is shown by comparing the graphs of contribution levels that follow.

2014-15 Public Agency Employer Rates



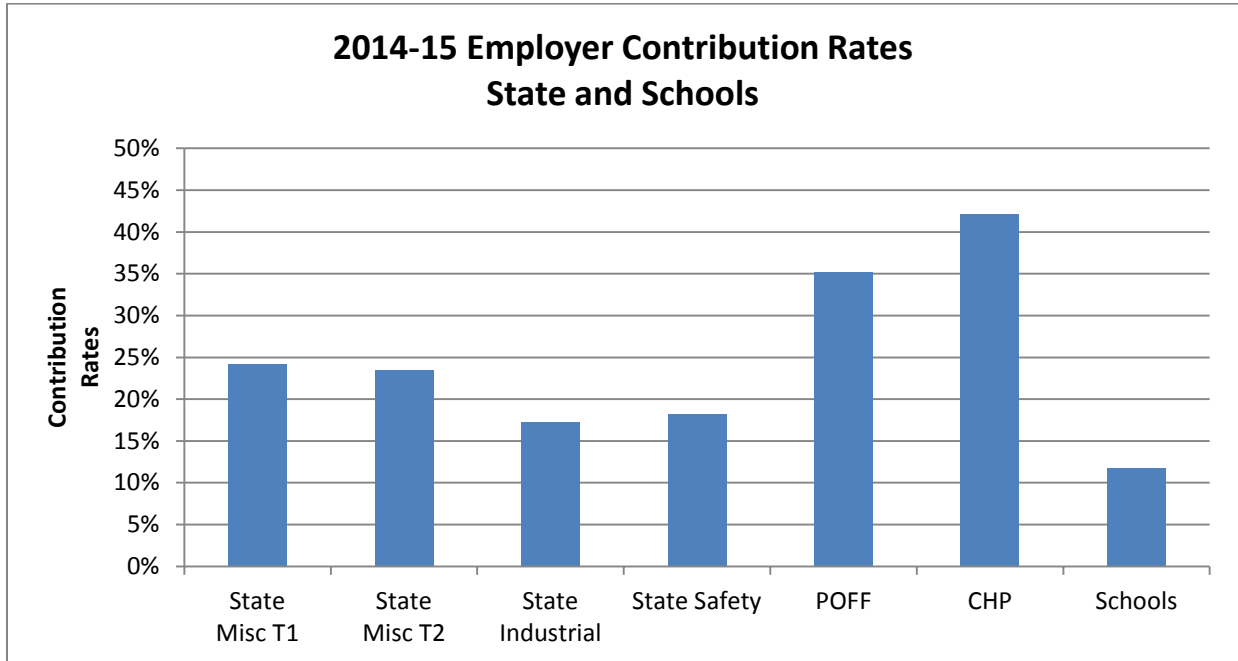
2015-16 Public Agency Employer Rates¹



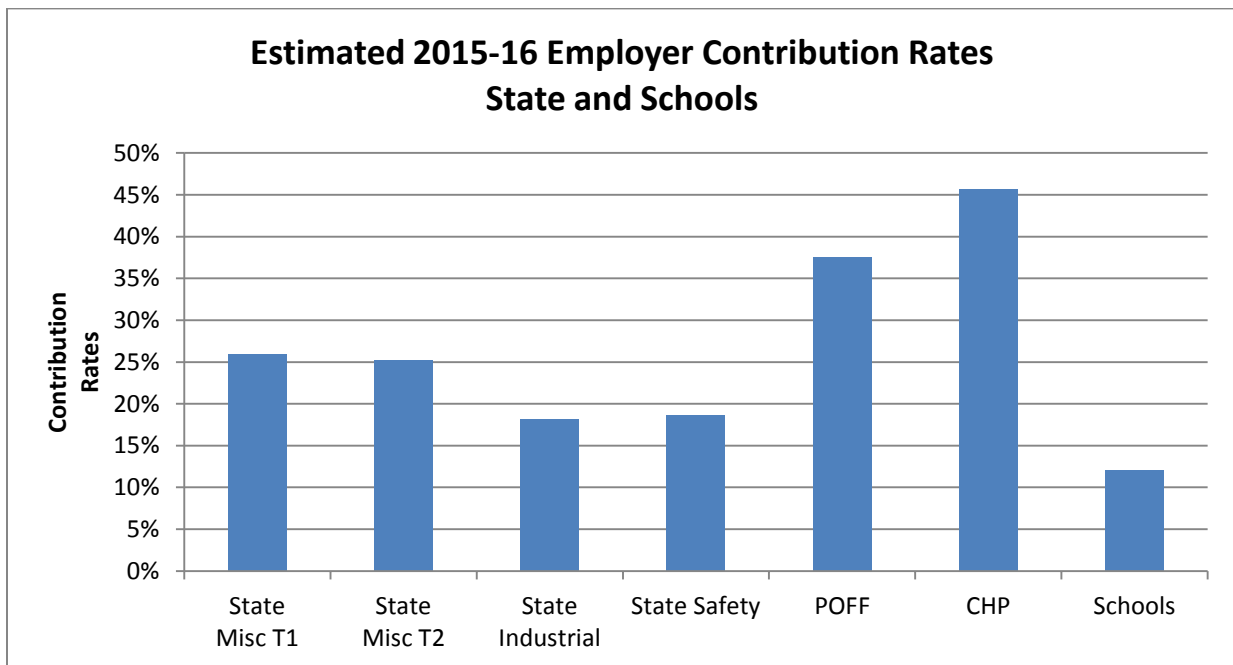
¹ Includes PEPRA plans, which have a small membership base and have been recently created. Including this data skews the chart toward lower contribution rates.

We are expecting to see continuing increases in the contribution requirement for the State and School plans. The following charts show the distribution of the 2014-15 and the estimated 2015-16 contribution rates for State and Schools plans.

2014-15 State and Schools Employer Rates



Estimated 2015-16 State and Schools Employer Rates



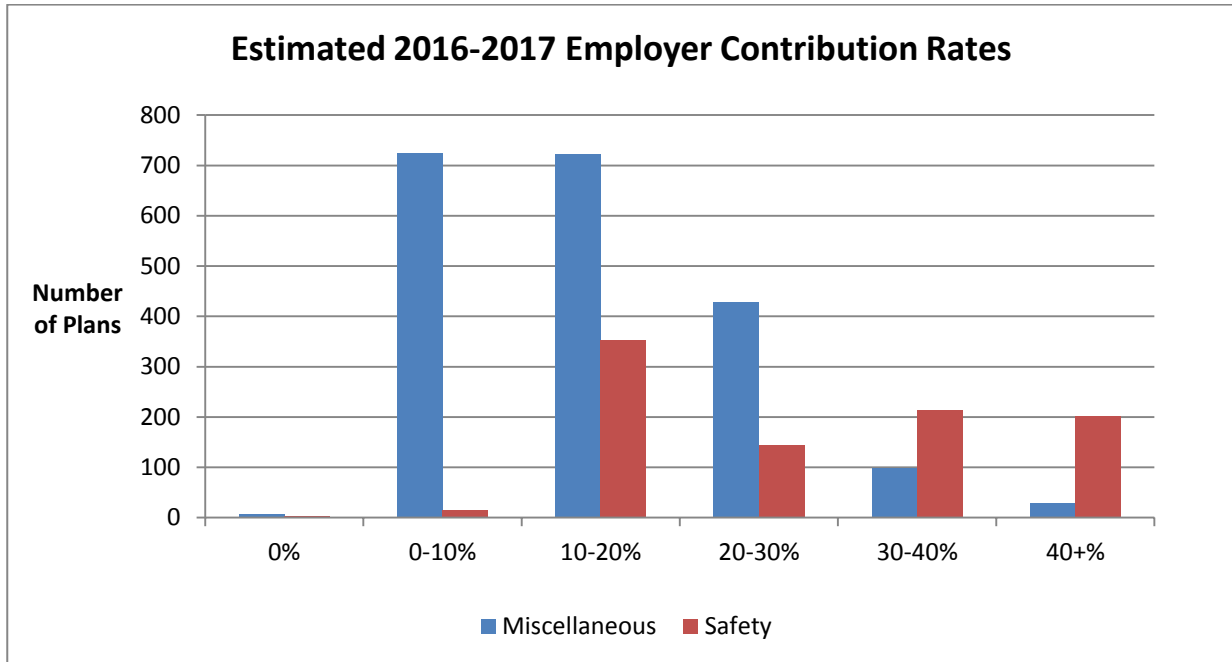
Estimate of 2016-17 Employer Contribution Rates

As in prior years, the actuarial valuation reports include an estimate of the employer contribution rates for the next fiscal year, in this case 2016-17. The rates were

calculated based on an estimated 18 percent investment return for Fiscal Year 2013-14¹ and the new actuarial assumptions that will be implemented as of June 30, 2014.

The following chart shows the distribution of the estimated 2016-17 contribution rates for Miscellaneous and Safety plans based on the new amortization and smoothing policy.

Estimated 2016-17 Public Agency Employer Rates¹



¹ Includes PEPRA plans, which have a small membership base and have been recently created. Including this data skews the chart toward lower contribution rates.

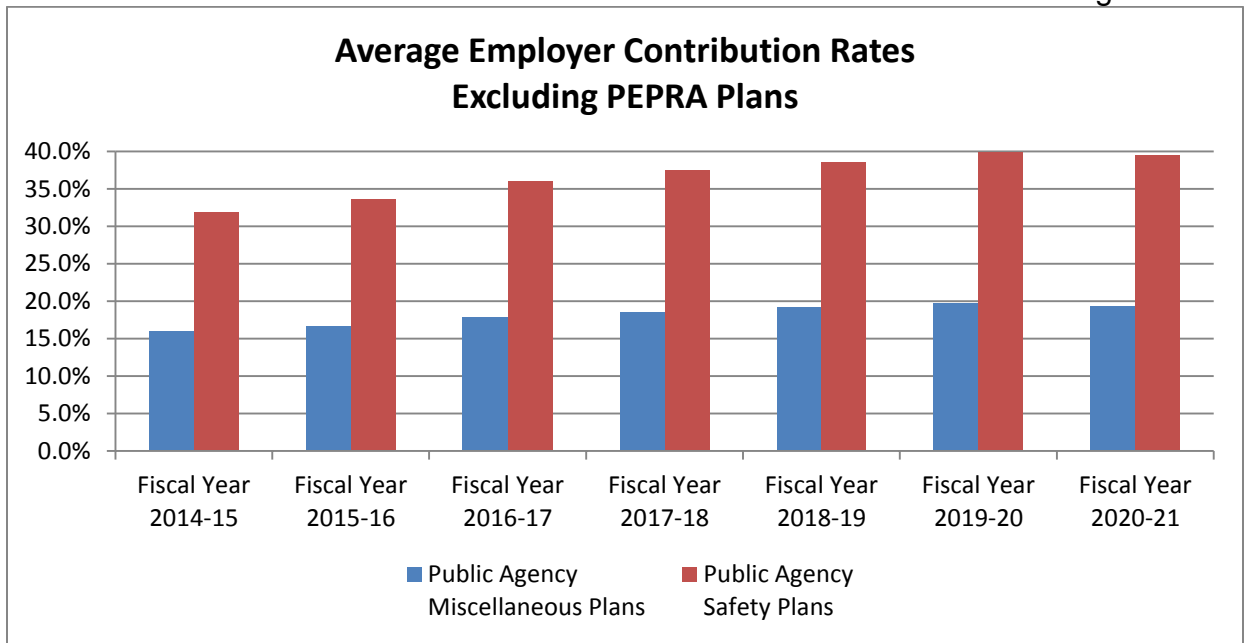
This graph shows that the number of employers with contributions above 30 or 40% of pay continues to increase. Currently, there are 70 plans that have rates above 50%, 8 Miscellaneous and 62 Safety plans. It seems likely that these employers are seeing significant budget strain as a result.

As always, member contributions (whether paid by the employer or the employee) are in addition to the above rates.

Another way to look at the gradual increase in employer contribution rates is by looking at the expected average contribution rate. Below is a table showing the average employer contribution rates for Miscellaneous plans and Safety plans for Fiscal Years 2014-15 to 2020-21.

Average Employer Contribution Rates

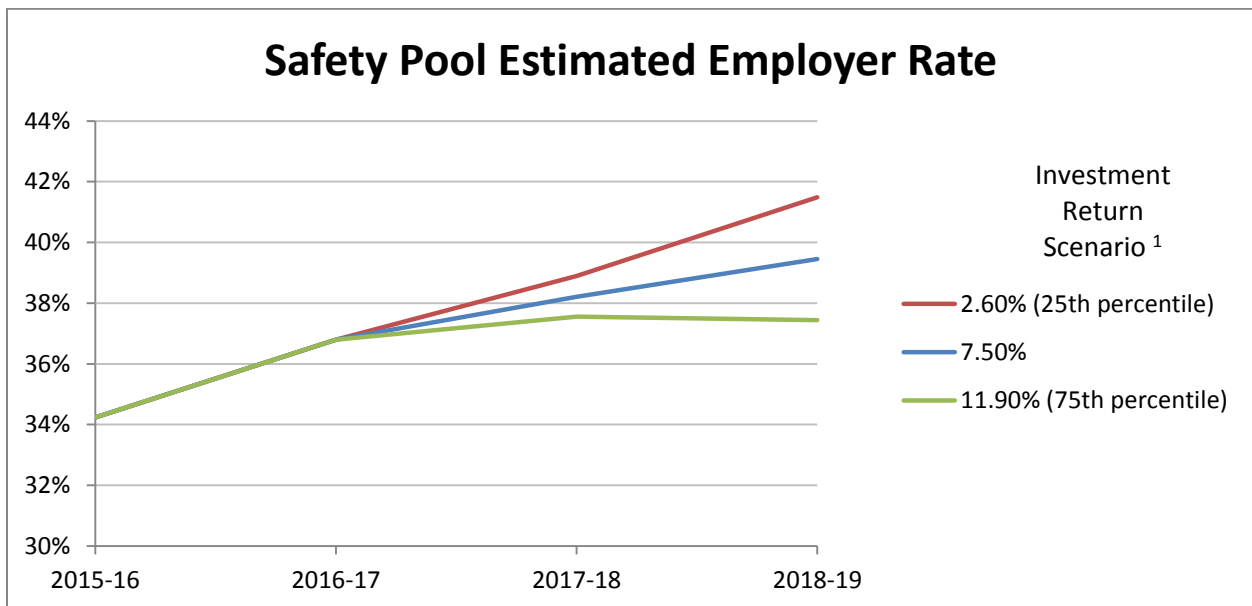
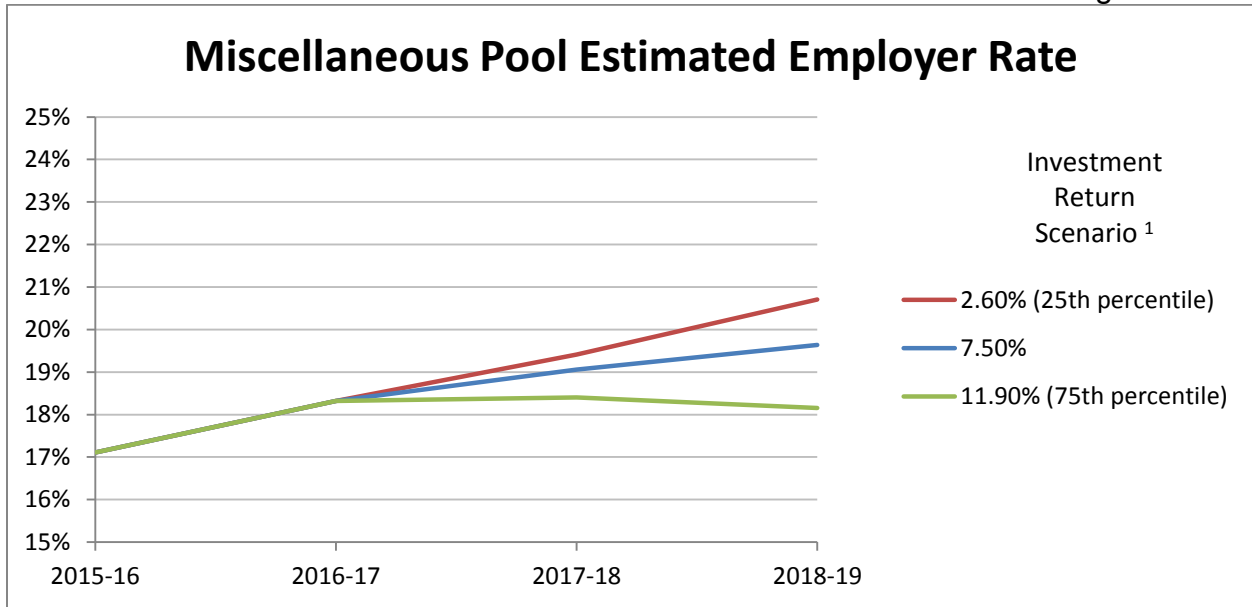
¹ The money weighted rate of return net of investment expenses was 18.3%. However, this was reduced to include an allowance for administrative expenses.



While employers are expected to see a small reduction in their required contributions in 2020-21, the rates in that year are still expected to be above current levels.

The impact of smoothing and providing projected contribution rates should be of assistance to employers in their budgeting process. Nonetheless, the overall level of contributions is still of concern, especially for safety plans.

Plans at CalPERS are still at risk of higher expected contributions if investment markets do not perform well. A return 10 percent below the funding assumption will see contributions continue to rise. In contrast, a return 10 percent above the funding assumption would result in rates remaining essentially stable to slightly lower. 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. Below we show how contribution rates would be affected under different investment return scenarios. Copies of all valuation reports can be found on the CalPERS website.



¹ The investment return scenario reflects an 18% return in 2013-14 and assumes the stated return in each of the next two fiscal years.

Funding Levels

In February 2014, the CalPERS Board made important decisions regarding the funding of pension benefits at CalPERS, these decisions also had an impact on funding levels. Specifically, the Board adopted relatively modest changes to the current asset allocation that will reduce the expected volatility of investment returns while holding the fund's long-term assumed rate of return at 7.5 percent. The Board also adopted more significant changes to the actuarial assumptions, most importantly, the inclusion of future mortality improvements in the actuarial assumptions. Finally, the Board approved a financing method which determines when and how quickly these changes will impact

employer contributions. The actuarial assumptions adopted by the CalPERS Board of Administration are designed to ensure greater sustainability and soundness of the pension fund, and will be better at predicting future experience resulting in more secure retirement benefits in the decades to come. The current experience study was based on demographic CalPERS data for years 1997 to 2011. The study focused on recent patterns of termination, death, disability, retirement and salary increases. These new assumptions will apply for funding purposes beginning with the June 30, 2015 valuation for the Schools Pool, setting employer contribution rates for the 2016-17 Fiscal Year. For Public Agencies, the new assumptions will apply for funding purposes in the June 30, 2014 valuations, setting rates for the 2016-17 Fiscal Year. The charts below, and for our discussion here we have computed the funded statuses with the new assumptions applied as of June 30th, 2013.

The discussion below looks at funding levels in two different contexts. First, we examine the funding levels on an on-going plan basis. That is, we look at the funded status using our regular funding assumptions assuming that the plan is on-going with service being accrued by members, salary increases occurring normally and so on. The second context is that of a hypothetical termination basis where we look at what the funded status would have been had the employer sponsoring the plan elected to terminate their contract with CalPERS.

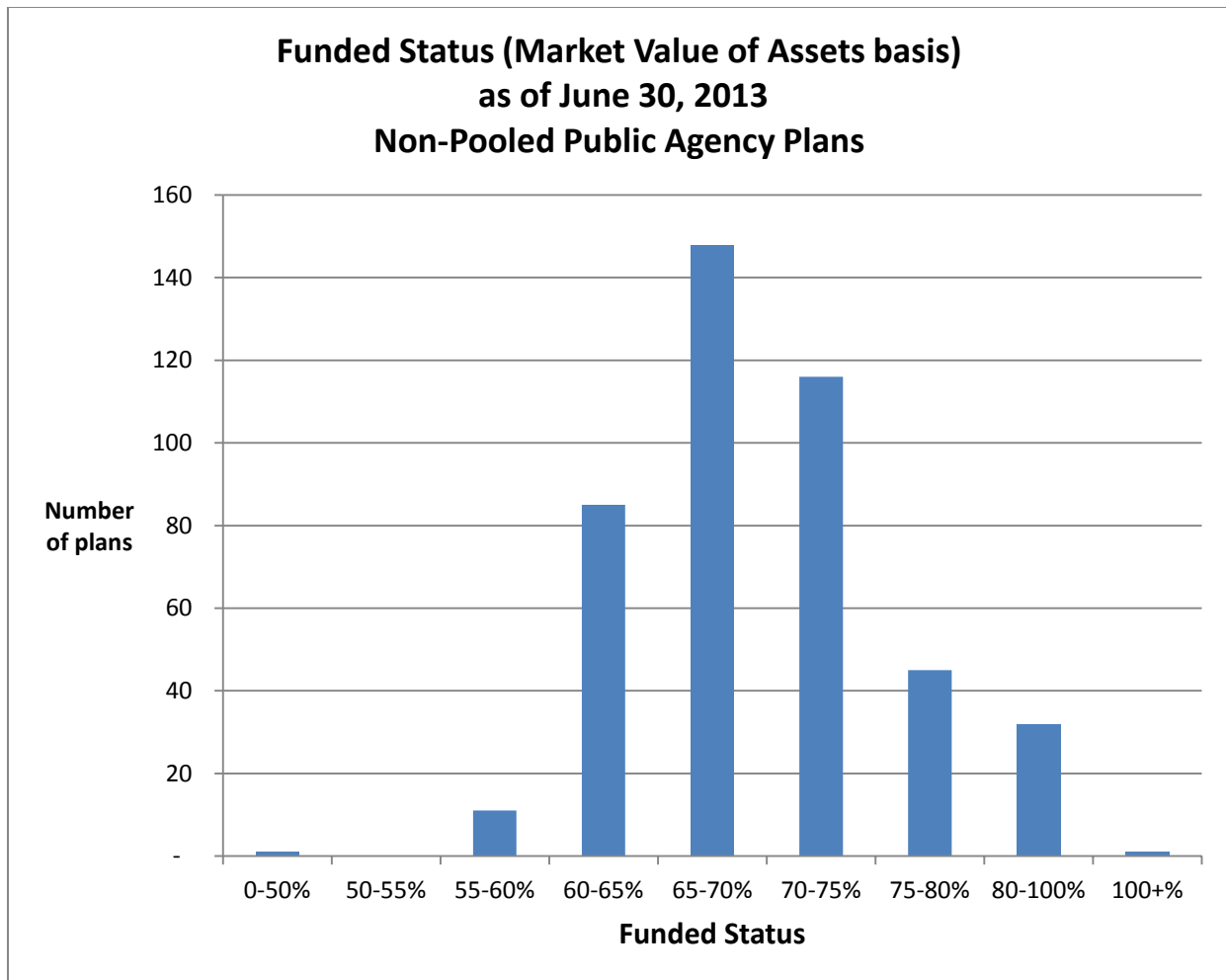
Going Concern Basis

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) that 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.

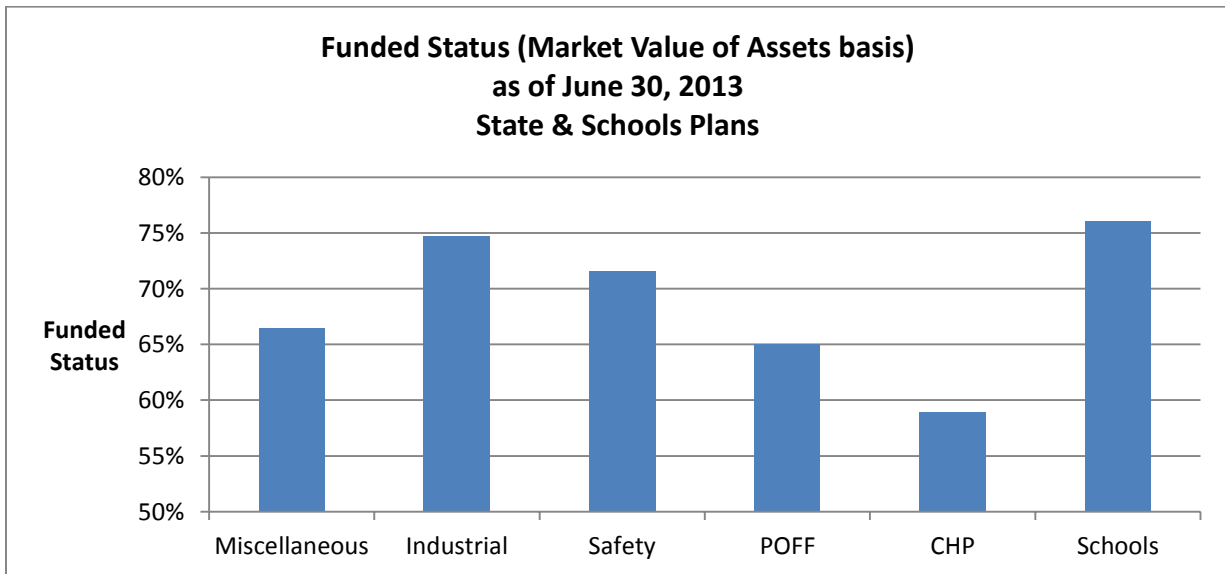
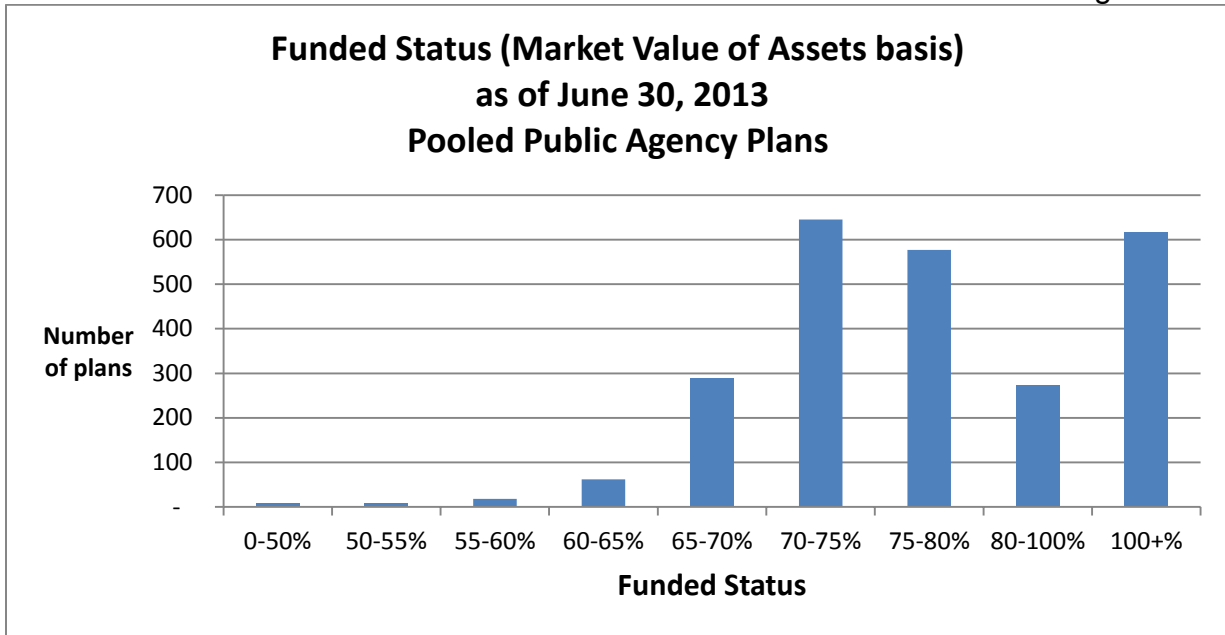
A plan with assets exactly equal to the plan’s accrued liability is simply “on schedule” in funding that plan, and only future employee contributions and future employer normal costs are needed. A plan with assets below the accrued liability is “behind schedule”, or is said to have an unfunded liability,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

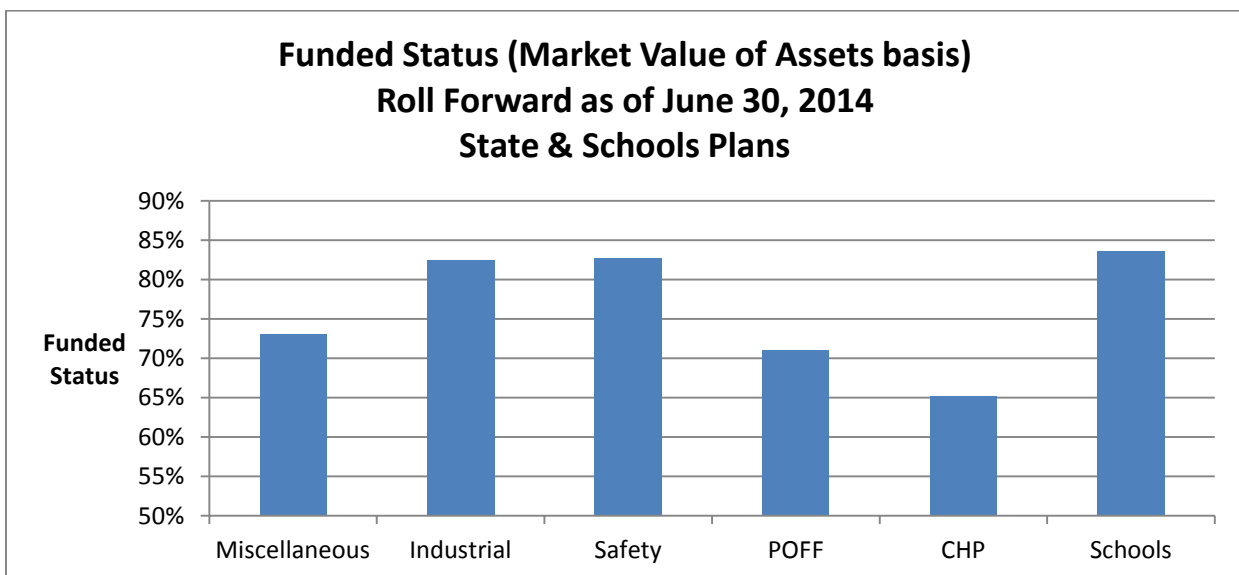
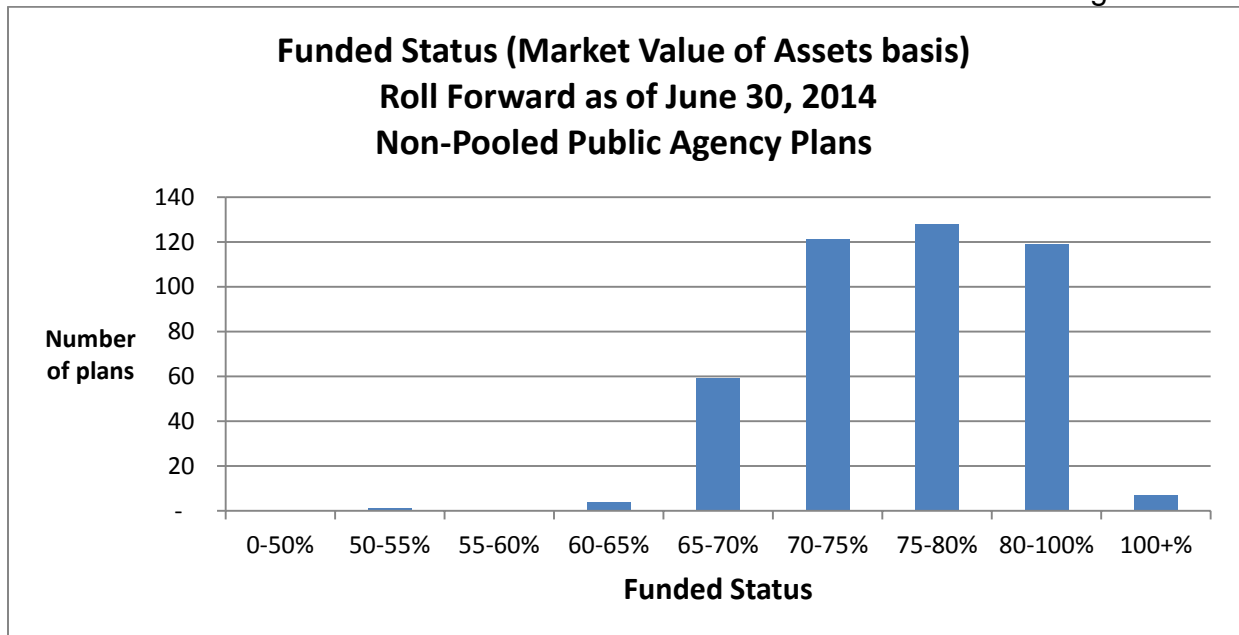
The funded status of a pension plan is defined as the ratio of assets to a plan’s accrued liabilities. The funded status shown in the following summary and charts is based on the market value of assets. As of June 30, 2013, after reflecting the new assumptions adopted by the CalPERS Board the PERF was 70 percent funded on a market value basis. This number is an average of all plans that participate with CalPERS. June 30,

2013 is the most recent figure available since the June 30, 2014 actuarial valuations for all plans will not be completed until the summer of 2015. As a result of the 18% percent investment return in 2013-14, we estimate the funded status on a market value basis for the PERF to be about 77 percent as of June 30, 2014². 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 broken down by various groups as of June 30, 2013 based on the new assumptions adopted by the Board in February 2014 as well as charts showing the estimated funded status as of June 30, 2014.



² The estimated funded status as of June 30, 2014 is estimated after changes to actuarial assumptions and the known investment gain in 2013-2014 of approximately 18%.





As shown in the charts above, most plans in the system are between 60 percent and 80 percent funded as of June 30, 2013. The vast majority of plans (other than new PEPRAs) were between 65 percent and 85 percent funded as of June 30, 2014. Many of the new PEPRAs, but only a tiny fraction of other plans were more than 100 percent funded on this date. Being less than 100 percent funded means that employer contributions need to be higher than the employer normal cost.

There is one non-pooled plan that has a funded status below 50 percent. The plan has just recently contracted with CalPERS with 100 percent past service so a low funded status is to be expected.

There is one non-pooled plan that has a funded status over 100 percent, this plan has recently joined CalPERS and has contributed more than their liabilities (0 percent past service) since inception. There are 32 non-pooled plans that are between 80 percent and 100 percent 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 percent funded means that employer contributions need to be higher than the employer normal cost. While this does not necessarily mean that contributions need to be higher than the current contribution level, results presented earlier show that contributions are expected to increase over the next five years.

Hypothetical Termination Basis

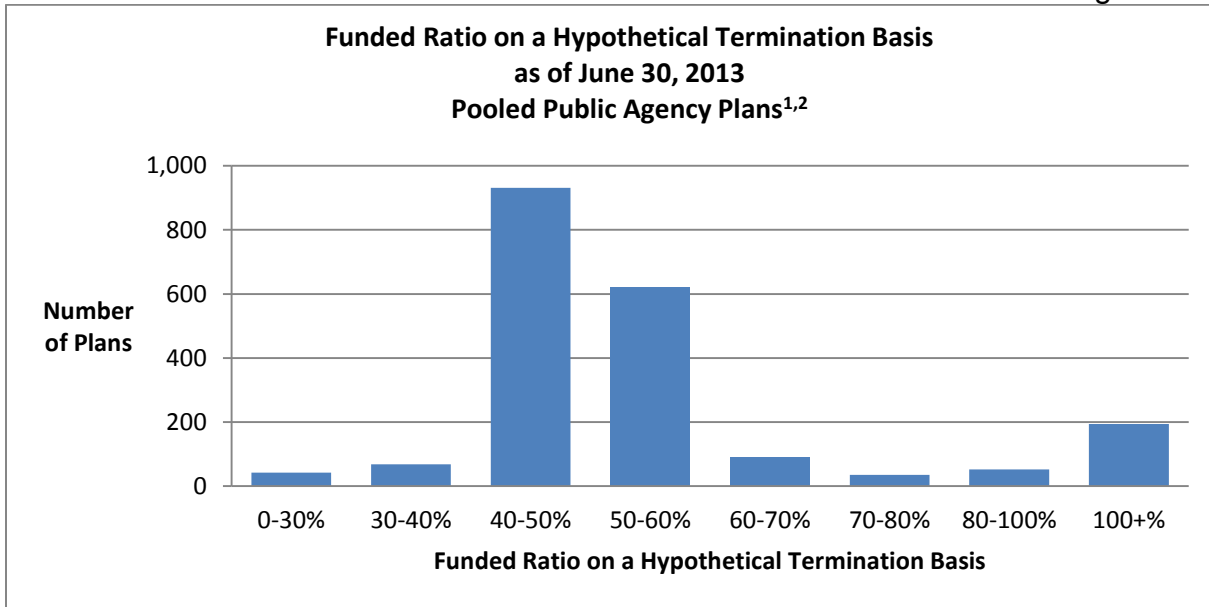
In August 2011, the CalPERS Board adopted an investment policy and asset allocation strategy for the Terminated Agency Pool that more closely reflects expected benefit payments from that pool. With this change, CalPERS increased benefit security for members while limiting its funding risk.

It is important to keep in mind that tracking the funded status on a hypothetical termination basis is key because if a plan were to terminate and the employer is unable to make up the shortfall, benefits could be reduced by the amount that the plan is underfunded.

The assumptions used, including the discount rate, take into account the yields available in the US Treasury market on the valuation date and the mortality load for contingencies. The discount rate is duration weighted and is not necessarily the rate that would be used for a given plan if it were to terminate. The discount rate for each plan's termination liability would depend on the duration of the liabilities of the plan. For purposes of this estimate, the discount rate used, 3.72 percent, is the June 30, 2013 30-year US Treasury Stripped Coupon Rate. Please note, as of June 30, 2014 the 30-year US Treasury Stripped Coupon Rate was 3.55 percent. On this basis the hypothetical termination funded statuses for most plans is in the 40 percent to 60 percent range and are based on the old actuarial assumption set, the only available at the writing of this report.

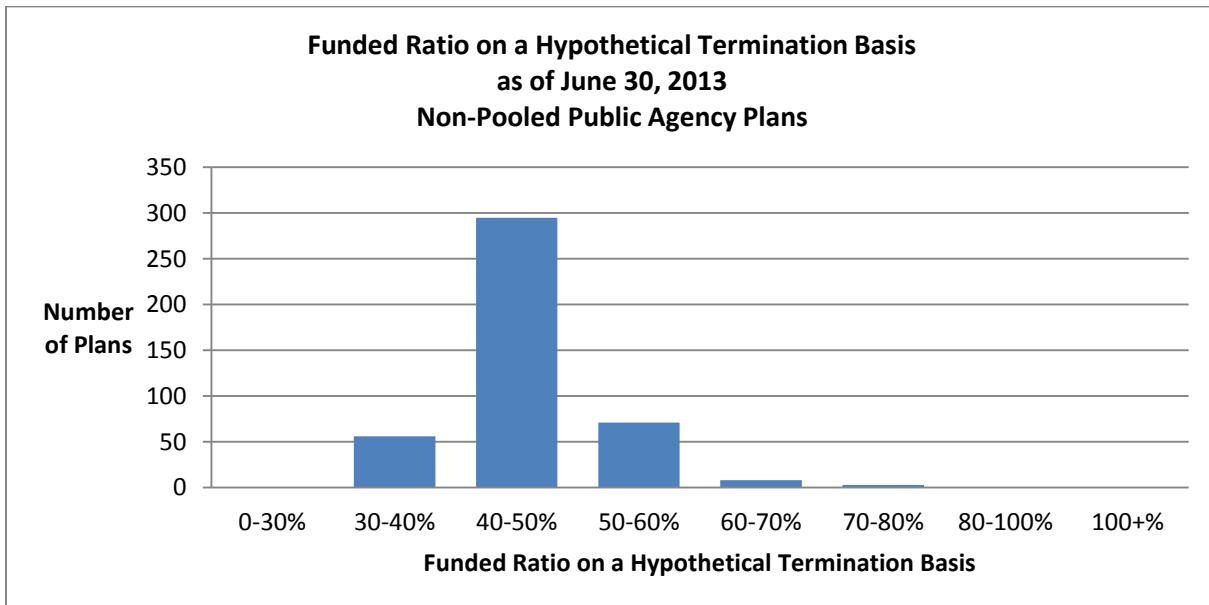
Below are charts of the hypothetical termination funded status of the public agency plans³. For the non-pooled plans the bulk of plans are currently in the 40% to 60% funded range and for those below 40%, nearly all are near 40% funded. For the pooled plans the same pattern exists with the exception of several new rate plans that are just beginning to develop and show much higher liabilities relative to assets.

³ Legislation does not permit State & Schools Plans to be terminated.



¹ Excludes PEPRA plans, as they have a low membership base and have been recently created. Due to this, they have a hypothetical funded status greater than 100% which would skew the chart.

² Most plans with a funded status greater than 100% are recently created 2nd Tier plans that have low assets and liabilities. These plans correspond to 1st Tier plans that are between 40-60% funded.



Even though actuarial valuations now show hypothetical information on the amount that would be owed at termination, a plan termination is a rare occurrence at CalPERS and usually occurs as a result of an employer ceasing to exist. The current terminated agency pool at CalPERS has 90 employers that have terminated for which we have liabilities. In the last fiscal year, four very small employers terminated their contract with CalPERS. Three of the terminations were initiated by CalPERS once staff discovered the agencies were no longer in existence. The other employer initiated the process due

to its inability to continue to fund the pension plan. In all cases, these employers were very small in size.

Risk Measures

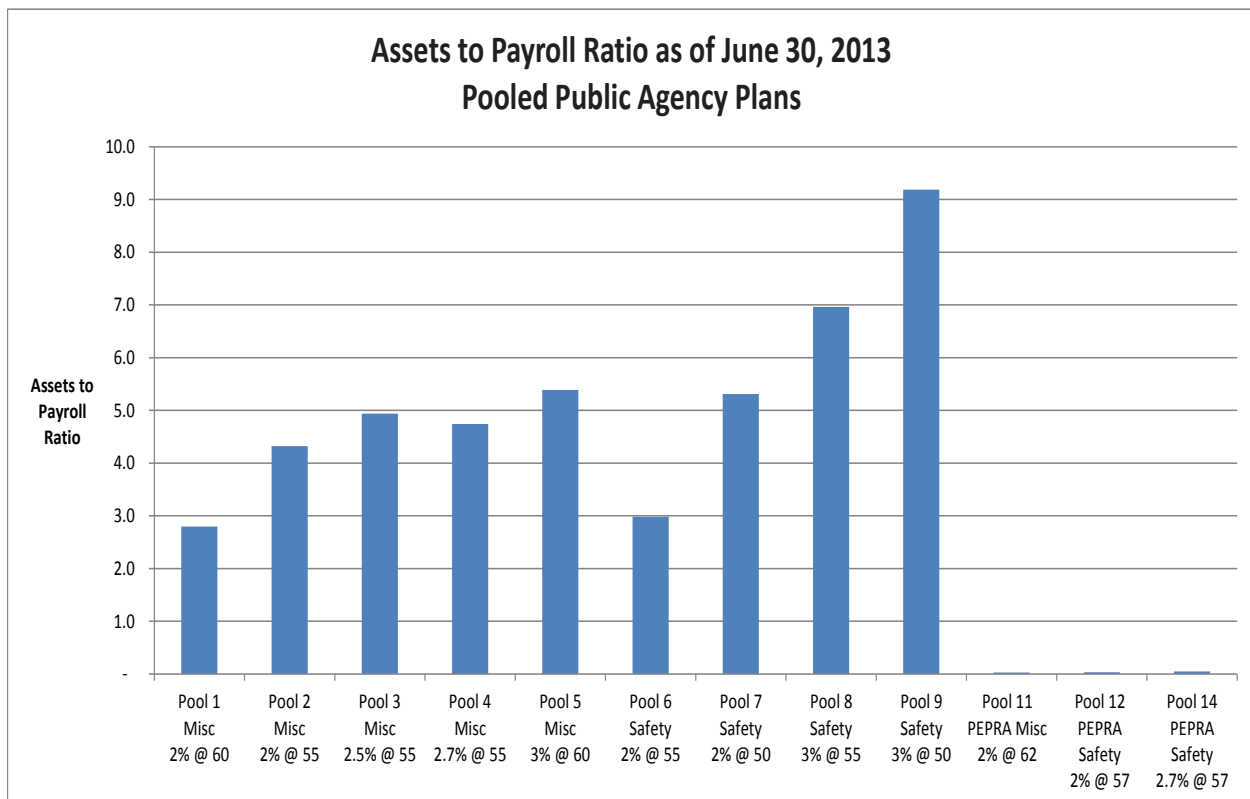
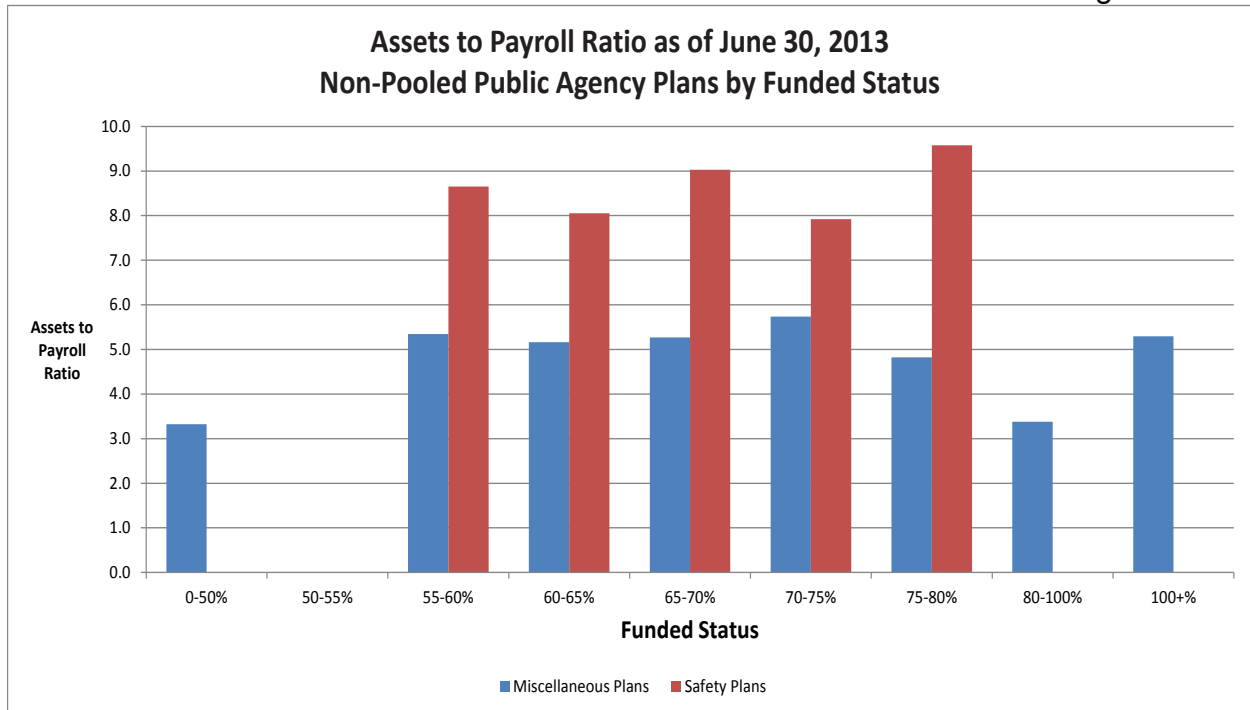
Volatility

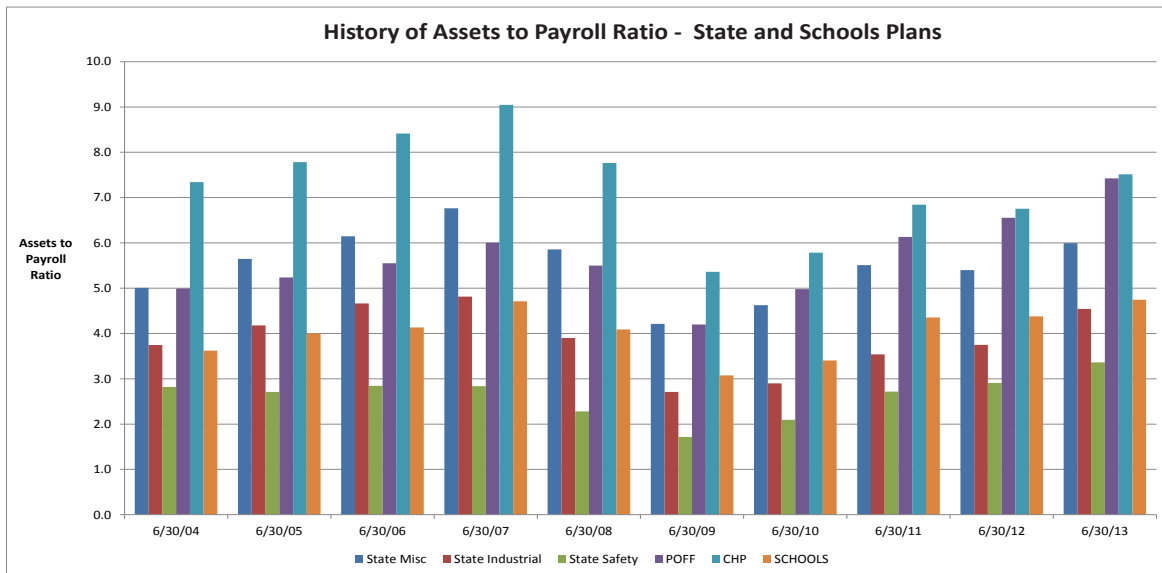
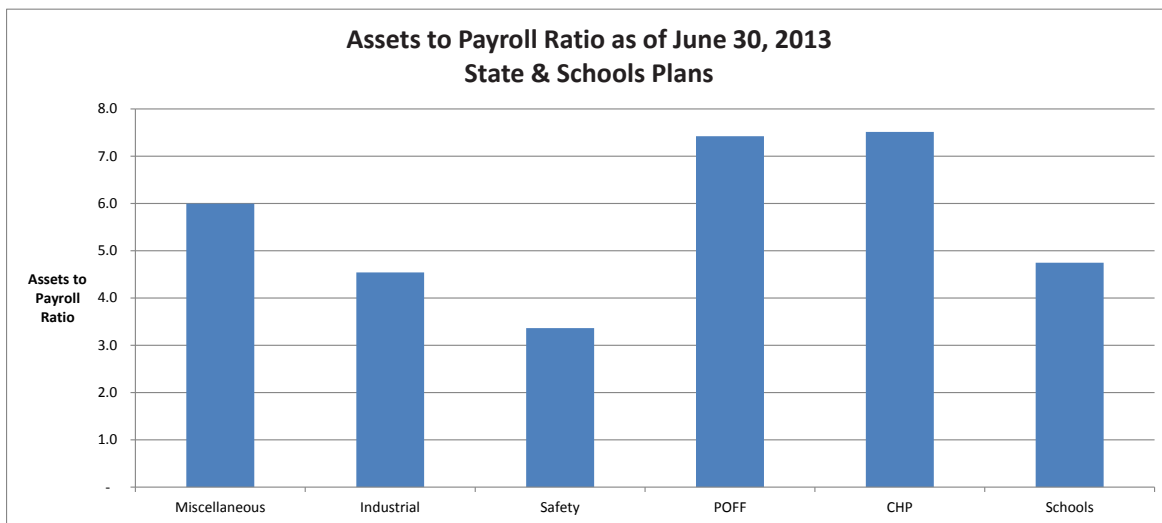
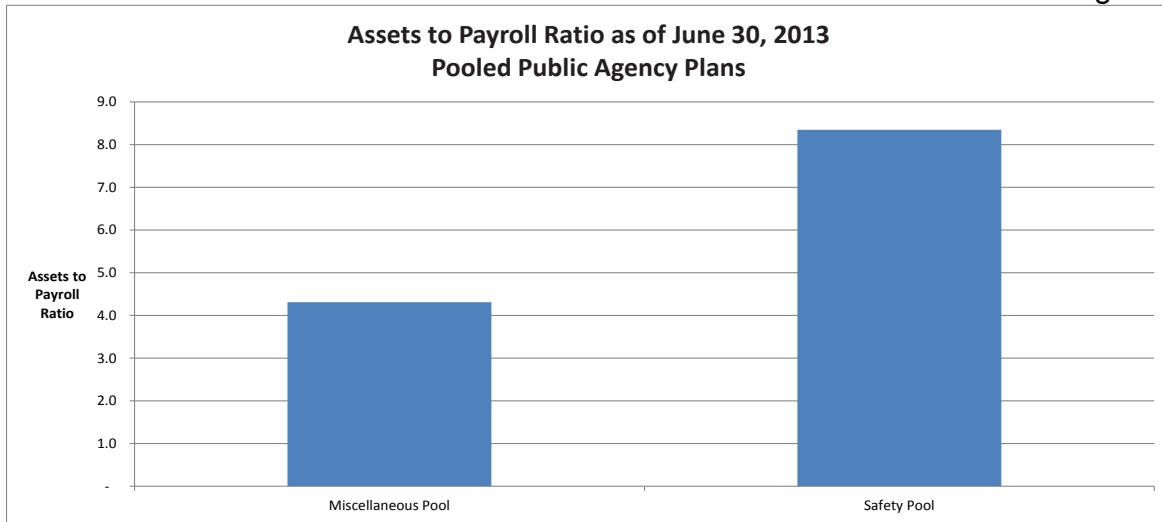
Rate volatility is heavily influenced by the ratio of plan assets to active member payroll. Higher asset to payroll ratios produce more volatile employer rates. To understand this, consider two plans, one with assets that are 4 times active member payroll, and the other with assets that are 8 times active member payroll. In a given year, let's see what happens when assets rise or fall 10 percent 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 percent of payroll. For the plan with a ratio of 8, this is equivalent to 80 percent 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 percent of payroll while the second plan's rate changes by 4 percent 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. Thus larger ratios combined with large asset gains or losses translate into larger contribution changes relative to payroll.

This ratio is significantly affected by plan maturity. Plans start their lives with no assets and so the asset to payroll ratio is zero. As time goes by, the ratio rises and then tends to stabilize at some level as the plan matures. As discussed in the section on "Changing Pension Environment" plans at CalPERS have been and continue to mature. This means that the asset to payroll ratio is expected to continue to increase for some time. Ultimately, the ratio is expected to decline from the peak as a result of the lower benefit levels included in PEPRRA but that will take many years.

The following 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 an asset to payroll ratio of 4 are expected to experience a gain or loss in excess of 50 percent of the sponsoring employer’s payroll in about one third of future years. Plans with higher asset to payroll ratios are expected to experience even greater levels of investment volatility.

Asset Liability Management

Over the last year few years, CalPERS Actuarial Office, Investment Office, and Financial Office have worked together to develop the Asset Liability Management (ALM) model to help understand the issue of funding risk. It uses an integrated view of assets and liabilities to assist in the evaluation of actuarial and investment decisions. This tool has proved very useful in bringing risk issues into the foreground.

The ALM model focusses on three measures of risk over an extended period of time. The measures are:

1. The probability of low funded status which is an indication of risk to the members in the event that the employer does not continue funding.
2. The probability of high levels of employer contribution rates which is an indication of financial strain on the employers and could lead to employers being unable to continue funding the benefits.
3. The probability of a large increase in employer rates in a single year, which is another indication of financial strain on the employers.

At the present time, the ALM model is only able to provide information on a limited set of plans. Currently these plans are:

- State Miscellaneous Plan
- State Peace Officer/Firefighter Plan (State POFF)
- California Highway Patrol Plan
- The Schools Pool
- A sample (very large) public agency Miscellaneous plan
- A sample (very large) public agency Safety plan

The probabilities of the funded status of these plans falling below various levels at any point in the next 30 years are shown below.

Plan Name	Probability of Falling Below Given Funding Level (at any point in next 30 years)		
	40%	50%	60%
State Misc.	14%	32%	55%
Schools	10%	23%	43%
PA Misc.	11%	26%	47%
CHP	13%	35%	100%
State POFF	11%	30%	55%
PA Safety	12%	29%	51%

The table above still shows an uncomfortably high probability that plans will fall below 50%, even though it has improved in comparison with the prior year as is shown by the table below.

Plan Name	Probability of Falling Below Given Funding Level (at any point in next 30 years)		
	30%	40%	50%
State Misc.	14%	34%	59%
Schools	11%	27%	51%
PA Misc.	10%	26%	50%
CHP	7%	27%	59%
State POFF	9%	26%	54%
PA Safety	9%	27%	54%

Because of the demands of safety jobs, safety plans are designed to accommodate earlier retirement. As such, they generally have higher required contribution levels. For this reason, we show the high contribution levels and large single year increases for safety and miscellaneous plans at different levels. The table below shows the probability of plans exceeding a specified contribution level at some point in the next 30 years.

Plan Name	Probability of Employer Contribution Rates Exceeding Given Level
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	(at any point in next 30 years)		
	30% of Payroll	35% of Payroll	40% of Payroll
State Misc.	67%	49%	33%
Schools	27%	13%	5%
PA Misc.	39%	22%	10%
	50% of Payroll	55% of Payroll	60% of Payroll
CHP	76%	62%	50%
State POFF	52%	40%	29%
PA Safety	54%	44%	34%

These probabilities have increased in comparison with the prior report for some of the same reasons that the probability of low funded status has fallen, i.e. new asset and amortization policy. Below is the same chart from the last risk report based on the old asset smoothing and amortization methods and the previous actuarial assumptions.

Plan Name	Probability of Employer Contribution Rates Exceeding Given Level (at any point in next 30 years)		
	30% of Payroll	35% of Payroll	40% of Payroll
State Misc.	57%	33%	13%
Schools	11%	1%	0%
PA Misc.	24%	6%	1%
	50% of Payroll	55% of Payroll	60% of Payroll
CHP	47%	31%	17%
State POFF	18%	8%	2%
PA Safety	30%	16%	7%

Finally, the table below shows the probability of an increase in the employer contribution level above a specified level at some point in the next 30 years.

Plan Name	Probability of Employer Contribution Rates Increasing by More Than a Given Level (at any point in next 30 years)		
	3% of Payroll	5% of Payroll	7% of Payroll
State Misc.	59%	15%	2%
Schools	43%	6%	0%
PA Misc.	48%	10%	1%
	5% of Payroll	7% of Payroll	9% of Payroll
CHP	61%	28%	11%
State POFF	49%	20%	7%
PA Safety	55%	27%	10%

In comparison, below is the same chart from the last risk report based on the old asset smoothing and amortization methods and the previous actuarial assumptions.

Plan Name	Probability of Employer Contribution Rates Increasing by More Than a Given Level (at any point in next 30 years)		
	3% of Payroll	5% of Payroll	7% of Payroll
State Misc.	82%	59%	29%
Schools	78%	43%	15%
PA Misc.	78%	47%	19%
	5% of Payroll	7% of Payroll	9% of Payroll
CHP	80%	62%	41%
State POFF	73%	52%	31%
PA Safety	79%	62%	41%

The tables above show that there is considerable risk in the funding of the system. Unless changes are made, it is likely that there will be a point over the next 30 years where the funded status of many plans will fall below 60% at some point. There is about a 30% chance that we will see funded statuses below 40%.

These probabilities are lower than they were the last time this report was prepared. This is due to two main factors – good investment returns in the last two years and changes to our smoothing and amortization methods. Unfortunately, the changes to the smoothing and amortization methods have also increased the probability of high contribution rates.

Finally, the new methods have made it less likely that employers will see sharp increases in their rates in a single year. Hopefully this will give employers time to plan for and, as best as they can, mitigate the impact of higher contributions if we experience a difficult financial period.

The combined message of the ALM measures shown above is that risk to funded status and large single year increases in contributions have been reduced since the prior report but that they remain high. The risk of high contributions has increased, mostly as a result of actions that the Board has taken to reduce risk in other areas.

Conclusion

The various measures that were analyzed give different perspectives on the risk associated with the funding of the system. When looked at together, these risk measures show that there is still considerable risk in the funding of the system. The risk of low funded status has been reduced considerably over the last few years by the adoption of a new asset allocation and new assumptions and by changes to the smoothing policies. However, this improvement has come at the expense of increasing employer contributions and this has put additional strain on contributing employers.

In the short term, contribution rate levels are expected to increase unless the System experiences a period of exceptional investment returns. The rates will probably remain high for an extended period to eliminate the unfunded liabilities.

Pension plans at CalPERS are becoming more mature. That is, the ratio of retired members to active members is increasing. Along with the benefit levels, this has resulted in an increase in the asset to payroll levels. This means that volatility is having a greater impact on employers than it had in the past.

Changes to accounting standards (GASB Statement 68) may affect employers' willingness to accept the current level of risks associated with the sponsoring of a defined benefit pension plan as the magnitude of unfunded liabilities and pension expenses are now reported on the basic financial statements. This may result in pressure to change their risk profile by making changes to actuarial or investment policies and/or benefit levels.

Pension reforms implemented effective January 1, 2013 will afford employers some relief in the longer term both as to level and volatility of contributions but this will be minimal in the short term.

The work on Asset Liability Management has shown that there remains considerable risk in the funding of the system. There is a substantial risk that, at some point over the

foreseeable future, there will be periods of low funded status and high employer contribution rates. Should this coincide with a period of financial weakness for employers or if such a period occurs before we recover from the current funding shortfall, the consequences could be very difficult to bear.

Combined, the measures discussed above indicate that employers will be under continuing financial stress for many years unless there is a period of exceptional returns in the markets.

Should this stress result in employers electing to terminate their contracts with CalPERS, there could be significant or even devastating consequences to our members. Most plans are between 40 and 60 percent funded on a hypothetical termination basis. While staff will make every effort to collect any shortfall if a plan were to terminate their contract, any uncollectable shortfall will raise the specter of benefit reductions to the level that the benefits are funded.

The report shows that there is a significant amount of risk being taken in the funding of the system. The probability that the system will face a period of severe stress is still at a level that may be unacceptable. Staff urges the Board to review these results carefully and determine whether or not they feel that changes are necessary to improve the soundness and sustainability of the system.