ADDRESSING EMPLOYER RATE FLUCTUATION

ISSUE PAPER

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INTRODUCTION

Over the past several years, CalPERS contracting public agencies faced considerable fluctuation in their employer contribution rate to fund their pension plan. CalPERS Board and staff are working hard to find ways to stabilize these rates as we go forward. To that end, we have prepared this issue paper and attached a survey which we hope that you will read, analyze, and utilize to help us find solutions.

It is worth noting that almost 10 years ago; this same issue faced public agency employers. Back then, CalPERS presented an issue paper and survey just like this one to public agencies. The Chief Actuary and staff traveled the State and spoke to employers to discuss the issues of the day and work with them to find solutions. In 1994, there were two main factors driving employer pension rate fluctuation.

- The first was statutory requirement, in place long before the passage of Proposition 162 (which gave all actuarial authority to the CalPERS Board), which established a "full funding date" of June 30, 2000 for all public agency plans. What this meant was that all plans were to completely eliminate all unfunded liability or surplus by June 30, 2000. This date could be extended only by improving benefits through plan amendment. In 1994 about 70% of all plans still had this "drop dead" full funding date of June 30, 2000. So, all actuarial gains and losses whether on the liability or asset side had to be paid for by June 30, 2000. This meant that the gain or loss occurring in 1993-94 had to be paid off with 6 payments, the gain/loss for 1994-95 with 5 payments and so. Squeezing the amortization payments into ever decreasing time periods was causing wild swings in employer rates.
- The second major issue was the changing of actuarial assumptions too frequently. Prior to 1995, the CalPERS practice was to change assumptions in two out of every three years. The first year of the three year cycle, a study would be done and based on that study; the demographic assumptions (retirement, disability, death, termination, salary merit increases) would be changed. The second year of the cycle, the economic assumptions (inflation, investment return, and non-merit salary increases) would be reviewed and most often changed. The third year would be a year of rest and then the cycle would begin anew. These assumption changes brought considerable changes to employer rates, especially when the impact had to be completely paid for by June 30, 2000 (see the bullet point above).

In response to public agency input, the CalPERS Board adopted a number of policies to decrease the volatility in employer rates. These policies, in use for almost 10 years now,

include 20 year amortization (from the year of occurrence) of plan amendment costs as well as changes in actuarial methods or assumptions. Also included is the policy to smooth asset gains and losses, adding only 10% of the smoothed gain or loss to the employer's rate each year.

In addition, the Board changed major assumptions only twice in the last ten years. In 1996 the Board lowered the inflation assumption from 5% to 4.5% (thus lowering the anticipated cost of post retirement cost of livings (colas) and future salary growth. At the same time the Board lowered the investment return assumption from 8.5% to 8.25%. The second assumption change was a complete revision of demographic and economic assumptions as of June 30, 2003 (which will impact rates for 2005-06). These latest changes have again lowered the inflation assumption, now down to 3.0% (and so lowered assumed salary growth and cola costs) and lowered our assumed investment return to 7.75%.

These changes served CalPERS and employers well for several years. However, over the past 5 years the investment returns, at first extremely favorable and more recently extremely unfavorable, have caused a large fluctuation in employer rates.

Unfortunately, the swings in the stock market over the past several years drove employer rates down dramatically and then up dramatically. It is hoped that the following discussion, in question and answer format, will assist in you in understanding the issues and enable you to share your opinion with CalPERS Board and staff through the attached survey.

QUESTIONS & ANSWERS

Q1. How are employer contribution rates determined?

A. An employer's defined benefit plan contributions are determined annually by actuarial valuation and can be very unpredictable. An employer's pension liability is based on the fact that the employer has promised to pay the employee a benefit if some future event occurs. However, the timing of the event and the amount of the benefit is unknown. Actuarial assumptions must be made to estimate the timing and amount of future payments.

These assumptions are used to determine funding targets for each member in the plan. The goal is to accumulate the total targeted dollars by the time the event occurs so that costs are allocated to those receiving service from the individual. For the sake of intergenerational equity and rate stability, CalPERS chooses to use a method designed to collect contributions as a level percent of payroll (the Entry Age Normal Funding Method).

The Entry Age Normal method establishes a normal cost (or annual premium) as the level percent of payroll which will accumulate to the targeted dollars if all assumptions are met. The accrued liability is the scheduled level of assets to date.

That is, what the current level of assets would be if all actuarial assumptions had been met and the level percentage of payroll (normal costs) had been received for each member from the time they entered the plan.

At any point in time, the accrued liability (scheduled desired level of assets) can be compared to the actual level of assets. When actual assets fall below the scheduled level, there is an unfunded accrued liability. Similarly, when actual assets exceed the scheduled level, there is an actuarial surplus.

The employer's "cost" is ultimately equal to the total benefits paid less the employees' contributions and the investment earnings. The actuarial funding methods employed simply attempt to spread this ultimate cost over time in a manageable fashion. The annual contribution rate by the employer is the sum of the normal cost plus or minus amounts needed to bring actual assets back in line with the accrued liability (i.e. the desired level of assets).

Q2. Is "smoothing" what is needed or is it something else?

A. Smoothing of employer rates is always at the expense of the funded status of the plan. The opposite of smoothing would be to have employer's contribute whatever was needed each year to keep the plan exactly 100% funded, i.e. on target. For example, without smoothing, an asset loss or the cost of greater than anticipated disabilities would have to be made up entirely in the following year's employer contribution.

However such volatility in employer contribution rates presents a significant budget planning problem for employers. Worse yet, the required employer contributions run counter cyclically with the employer's ability to pay. In the employer's good budget times the employer's pension contributions are usually low. In the employer's bad budget times the employer's pension contributions are usually high. Even the ultimate smoothing, i.e. a constant employer contribution rate may not be satisfactory because the employer may not be able to pay the constant rate when their budget is in really hard times.

This raises the question "Is smoothing what we're after or is it matching the required contribution to the employer's economic cycle?"

Some basic principles should be applied. For example, a member's benefit should be completely funded by the time the member leaves service. This preserves intergenerational equity with taxpayers paying wages and benefits while the public employee performs the service. It must be noted that without some smoothing, this principle is practically impossible to enforce since there may be a substantial gain or loss in the year before the member leaves service.

Q3. What causes fluctuations in employer contribution rates?

A. Contribution rates fluctuate due to planned and unplanned events.

Planned events include changes in the "target" dictated by changes in benefit provisions (contract amendments or legislative mandates) and changes in the "target" caused by changes in actuarial assumptions or methods. Unplanned events arise from the need to amortize (pay off) actuarial gains or losses, i.e. changes in liability or assets due to actual experience different from that assumed.

The employer rate is impacted by both liability fluctuations and asset fluctuations.

Liability fluctuations occur whenever actual demographic experience differs from the actuarial demographic assumptions. For example, when retirements, disabilities, deaths, or terminations occur in numbers or at ages other than those assumed or when salary increases occur at levels other than those assumed. Also, when new entrants are hired at ages different than the ages at which existing members were hired changes in the normal cost occur.

Asset fluctuations occur whenever the "smoothed" actuarial value of assets differs from the value predicted by the investment return assumption. The actuarially assumed investment return is a very long term estimate of future asset returns. The time horizon extends from the age of the youngest member until the last benefit is paid for all current members. While that assumed return may actually prove to be a very good long term predictor, it is highly unlikely that each year's annual return will be "close" to this long term compound average.

Q4. What is currently done to smooth liability fluctuations?

A. Current attempts to "smooth" employer rate fluctuations due to liability fluctuations include:

- Use of the Entry Age Normal Method, which determines normal cost as a level percent of the employee's pay from hire through age of retirement.
- CalPERS' amortization policy, which adds 10% of the remaining unamortized liability gains or losses to the employer's rate for the coming year.
- The pooling of "small" plans (i.e. plans with less than 100 active employees). These plans liability gains and losses many times those of large plans.

Q5. What more could be done to smooth liability fluctuations?

A. Possible alternative attempts to "smooth" employer rate fluctuations due to liability gains and losses include:

- An "open group" valuation where we anticipate future hires might provide a small improvement in this area.
- The amortization of liability gains and losses could add less than the current 10% of the remaining unamortized liability gains or losses to the employer's rate for the coming year. However, the liability gain or loss is a discounted present value number and so will grow with interest without offsetting gains or losses or amortization amounts greater than the interest of 7.75% of the unpaid balance.

Q6. What is currently done to smooth asset fluctuations?

A. Current attempts to "smooth" employer rate fluctuations due to asset gains and losses include:

- The diversified CalPERS asset allocation.
- CalPERS' asset smoothing method. Each year one-third of the previously unrecognized differences between actual return and the actuarially assumed return are acknowledged. This smoothing is currently subject to a 10% corridor around market value. That is, 90% of market value minimum and a 110% of market value maximum is superimposed on the smoothed asset value as calculated. The asset gain or loss for the year is the difference between the actuarially assumed investment return and the return on the smoothed assets.
- CalPERS' amortization of asset gains and losses, which adds 10% of the remaining unamortized asset gains or losses to the employer's rate for the coming year.

Q7. In general, what causes more rate fluctuation, unexpected liability swings or unexpected asset swings?

A. Liability swings cause large rate fluctuation for small plans. However, with pooling, this should be greatly reduced. For large plans (including risk pools), asset swings are expected to cause more rate fluctuation. The asset allocation issue is the key driver in employer rate fluctuation.

Q8. How is the asset allocation at CalPERS determined and how does it impact the employer rates?

A. At least every two years, the CalPERS staff conducts an asset/liability workshop for the Board. In this workshop, ten or more asset mixes are compared to each other and to the projected liabilities of the system. Each asset mix has a different combination of the varying asset classes. For example, one mix may have 50% stock, 30% bonds, 10% real estate, and 10% private equity while another mix has 60% stocks, 35% bonds, and 5% real estate. Because of the different combinations of asset classes, every mix has a different expected statistical distribution, i.e. a different mean (average expected long term return) and a different standard deviation (a measure of the variation in annual returns from year to year – or said another way a different expected volatility). Each asset mix under consideration lies on something called the efficient frontier, meaning that for every possible mix with that specific amount of "risk" (or expected volatility) the mix under consideration has the highest possible expected return. So, there are ten or more asset mixes, each with different levels of expected volatility and each producing the highest possible expected long term return for its particular level of expected volatility. Unfortunately, an inescapable fact is that mixes with higher expected returns automatically come with higher expected volatility. The task for the CalPERS Board is to choose, based on several criteria, between mixes with lower expected long term returns and corresponding lower expected volatility and mixes with higher expected long term returns and corresponding greater volatility. In terms of employer rates, this translates to mixes with lower average rates with higher rate fluctuation and mixes with higher average rates with less rate fluctuation.

Historically, the asset allocation workshop has been conducted based on a model that combines all plans at CalPERS as though they were combined into one large plan. That is, we use a one-size-fits-all approach to our asset allocation. However, the volatility of the asset allocation impacts different plans at CalPERS quite differently.

The liabilities and assets of the CalPERS plans have been viewed in a traditional manner. However, if one divides both assets and liabilities by the payroll of active members for an ongoing plan, a different picture immerges. If the payroll of active employees serves as a proxy for the employer's budget, this non-traditional view of assets and liabilities as a percent of payroll clearly demonstrates how a particular asset mix impacts different plans at CalPERS in dramatically different ways.

In theory, as a plan "matures" the demographics of members become what are called a "stationary population". Year after year, there are the same number of retirees and actives with the same age distribution. Each year new employees are hired at a salary that is one year of inflation higher than last year's new employees. Since benefits are directly affected by final compensation, each new

year of retirees receives benefits that are greater than the previous year's retirees' initial benefit by one year of inflation. Note that last year's retiree has now received a COLA, but they started at an original benefit that was one year of inflation less than the original benefit of this year's retiree. When we divide these benefits (or liabilities) by the payroll of active members, which is growing by the same rate of inflation, we eventually reach a constant state. The level of this constant state is directly tied to the benefit formula used in the plan. The higher the benefit formula and the earlier the average retirement age, the higher the final liability to payroll ratio.

In the early stages of a plan, the benefit payout is small. So, there is lower liquidity needed in the asset allocation. However, as a plan matures and approaches something similar to a stationary population, the call on the assets to pay monthly benefits increases and liquidity needs to increase. Said another way, assets must eventually provide annual benefit payouts and simultaneously grow as active member payroll grows for an ongoing plan. Further, for some plans at CalPERS the ratio of liabilities and assets to payroll can be 6 times as high as for other plans at CalPERS. This means that a 10% swing in assets might be equivalent to 20% of payroll for one plan, but equivalent to a 120% of payroll swing for another. If the actuary changes the employer rates by 10% of the gain or loss to account for this 10% asset swing, the first plan receives a 2% of pay contribution rate adjustment while the second plan receives a 12% of pay contribution rate adjustment.

Consider two public agency plans at opposite ends of this asset to payroll ratio. On June 30, 2001 both of these plans were about 100% funded. In fact, both had a zero employer rate. However, the safety plan had a ratio of assets and liabilities to payroll of about 17 while the miscellaneous plan had a ratio of about 4. Even though both experienced the same asset returns over the next several years, the safety plan's rate went from 0% to over 30% of pay while the miscellaneous plan's rate went from 0% to 12% of pay.

The current asset mix in place at CalPERS has a long term expected return of about 8% and a standard deviation of about 12%. Using a statistical distribution with these parameters, we can randomly project possible future asset returns and future employer rates for these two plans. Such a projection process is called a stochastic projection and each separate multiple year projection is called a scenario. We projected 10,000 possible future scenarios for each of these two plans. Each scenario is composed of 20 years of future asset returns and resulting future employer contributions. While each scenario is as likely as the next, the scenarios tend to bunch together and one can make statements like "50% of the scenarios are above this point and 50% are below this point", or "95% of the scenarios fall below these for the next 20 years". This later rate is described as a 95% confidence rate. The table below shows the 95% confidence rate at the end of 20 years minus the plan's current rate. That is 95% of the time we can be sure

that the current rate will not increase by more than the amount shown in the table below.

Entity	Liability to Payroll Ratio on June 30, 2003	95% Confidence Rate minus Current Rate after 20 years
Sample Miscellaneous Plan	3.8	20%
Sample Safety Plan	15.7	57%

Q9. What more could be done to smooth asset fluctuations?

Possible alternative attempts to "smooth" employer rate fluctuations due to asset gains and losses include:

- A more conservative asset mix for all plans at CalPERS. However, this would raise all employer rates because CalPERS would then lower its investment return assumption.
- A "smoother" actuarial asset valuation method. For example, rather than recognizing asset gains and losses over a 3-year rolling period as is currently done, they could be recognized over 5 or 10 years. In addition, the 90% to 110% corridor around market value could be widened or eliminated..
- The amount of the asset gain or loss added to the employer rate could be lower than the current 10%. However, the asset gain or loss represents assets that were assumed to grow with interest. So, without offsetting gains or losses or amortization amounts greater than the interest of 7.75% of the unpaid balance, the asset gain or loss will grow.
- Different asset smoothing techniques could be used for different plans at CalPERS. This is of limited value - asset smoothing cannot fix this problem.
- Different investment returns could be credited to different plans at CalPERS. This could be done by:
  - Actually creating several asset pools, each with a different asset allocation, or
  - Allocating the annual investment return to plans on a method other than the current method. The current method produces the same investment return for all plans. We could, for example, credit some plans with a conservative market index, others with a moderate index return, and distribute the balance of investment earnings to the remaining plans.
  - Assigning plans to one of the asset mixes based on their asset/liability to payroll ratio (or some other measure of their tolerance for rate levels and volatility).

  There are a number of issues connected with the notion of different asset returns for different plans at CalPERS:

- This would require different investment return assumptions for the different asset pools. This would increase employer rates (but more stable) for those in the pools with more conservative asset mixes?
- There could be considerable political fallout from crediting different plans at CalPERS with different investment return.
- Who would decide which plans belong to each asset pool? Does the employer and members of each plan have a voice?

Q10. All of the above ideas are more traditional approaches to the problem of rate fluctuation. Are there non-traditional approaches that could be considered?

A. Yes, three non-traditional ideas have been discussed:
- Direct Rate Smoothing (similar to a concept discussed in the issue paper on rate smoothing 10 years ago),
- Superimpose a minimum and/or a maximum employer contribution rate, and,
- Implement a so-called "Pension Contribution Stabilization Accounts".

Q11. What is direct rate smoothing?

A. The concept of direct rate soothing, or "ramping" was first introduced at CalPERS in 1995. At that time the potential impact on funded status was not part of the discussion. Under direct rate smoothing traditional methods would be used to develop an employer rate. However, if the change in rate (up or down) was "too" large, a final rate somewhere between the current rate and the new rate would be established.

For example, if the current traditional method rate was 10% of pay and the new traditional method rate jumped to 20%, then a direct smoothing would be applied and a rate of say 12% would become the minimum acceptable rate for the coming year. Assuming the third year out the traditional rate was still about 20%, the minimum rate would "ramp up" to 14% in the third year. This ramping would continue to phase into the traditional method rate over say 5 years. In should be noted that the rate at the end of the phase-in period would actually end up slightly higher (or lower when ramping down) than the traditional 20% rate because of missed investment opportunities during the "ramping" period.

One downside to this approach is that quite often, perhaps more often than not, the "ramped" rate would not satisfy the Governmental Accounting Standards Board (GASB) rules under GASB Statement No. 27. So, the employer would have to track and "book" the difference between the traditional rate and the actual rate paid to CalPERS.

Q12. What's involved in utilizing a minimum and/or maximum employer contribution?

A. Just as the name implies, traditional methods would be used to develop the employer rate. However, the final rate due to CalPERS would be subject to some minimum employer rate, e.g. 50% of normal cost, and/or some maximum employer rate, e.g. 200% of normal cost.

This minimum/maximum employer approach might prove more "psychologically" useful than practically useful. For example, for a plan with assets and liabilities that are 10 times payroll, a 10% swing in assets requires the employer's rate to increase sufficiently to cover 100% of pay. With a normal cost of about 15% of pay, one would have to collect a minimum contribution of 7.5% of pay for a very long time to collect the 100% of pay loss plus interest.

This approach might also cause GASB accounting issues. The employer would have to track and "book" the difference between the traditional rate and the actual rate paid to CalPERS whenever the minimum or maximum rate was invoked and it was different from a traditional rate produced under the GASB 27 guidelines.

Q13. What is a "Pension Contribution Stabilization Account" and how would it work?

A. The concept would be to have employers (whether on a voluntarily or mandatory basis) make additional contributions to, and sometime receive offsets from, a separate stabilization account which could be used only for rate stabilization purposes. In "good" years for an employer, a contribution would be made into their stabilization account over and above their required contribution to the PERF. In "bad" years for the employer, money would flow from the employer's stabilization account into the PERF as an offset to the otherwise required employer contribution. This could be done in such a fashion that the total contribution from the employer in "good" years would always equal 150% of the employer's normal cost. In "ok" years the total contribution from the employer would be 100% of normal cost. In "bad" years, the total employer contribution would be 50% of normal cost.

There has been no modeling to provide evidence that this would "work". That is, we have no analysis to indicate whether there would be enough "good" years to build assets in the stabilization account that would prove sufficient to provide the offset necessary in the "bad" years.

The accounting treatment of these additional contributions and offsets has not been researched by CalPERS as yet.

The table on the next page illustrates how the money flows into and out of the Pension Contribution Stabilization Account could work.

Pension Contribution Stabilization Fund (PCSF) Proposed Money Flow				
	Employer's Economic Condition for the Fiscal Year			
		Good	**OK**	**Poor**
Employer's Contribution Rate	**High** Total Er Rate > 150% of Er Normal Cost	PCSF Offset = Lesser of Total Er Rate – 150% of Er Normal Cost Or 50% of Er Normal Cost	PCSF Offset = Lesser of Total Er Rate – Er Normal Cost Or Er Normal Cost	PCSF Offset = Lesser of Total Er Rate – 50% of Er Normal Cost Or 150% of Er Normal Cost
	Medium High Total Er Rate < 150% of Er Normal Cost and Total Er Rate > Er Normal Cost	PCSF Contribution = 150% of Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total ER Rate)	PCSF Offset = Total Er Rate – Er Normal Cost	PCSF Offset = Total Er Rate – 50% of Er Normal Cost
	Medium Low Total Er Rate < Er Normal Cost and Tot Er Rate > 50% of Er Normal Cost	PCSF Contribution = 150% of Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total ER Rate)	PCSF Contribution = Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total ER Rate)	PCSF Offset = Total Er Rate – 50% of Er Normal Cost
	Low Total Er Rate < 50% of Er Normal Cost	PCSF Contribution = 150% of Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total Er Rate)	PCSF Contribution = Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total ER Rate)	PCSF Contribution = 50% of Er Normal Cost – Total Er Rate (with min of Ee Contribution – Total ER Rate)