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March 1, 2013

TO: Appointing Powers of the California Actuarial Advisory Panel

RE: Actuarial Funding Policies and Practices for Public Pension and OPEB Pans and Level Cost Allocation Model

The California Actuarial Advisory Panel (CAAP) has adopted the *Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model* as final. Please see the attached document. Our hope is this document will serve as a tool to advance the practice.

Sincerely,

Alan Milligan, FSA, FCA, MAAA
Chair, California Actuarial Advisory Panel

cc: Panel members:
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CALIFORNIA ACTUARIAL ADVISORY PANEL

ACTUARIAL FUNDING POLICIES AND PRACTICES FOR PUBLIC PENSION AND OPEB PLANS

AND

LEVEL COST ALLOCATION MODEL

FEBRUARY 2013

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INTRODUCTION

This document develops the principal elements and parameters of an actuarial funding policy for representative California public pension and OPEB plans, as well as other similar U.S. public sector plans. It includes the development of a Level Cost Allocation Model (LCAM) as a basis for setting funding policies. This document does not address policy issues related to benefit plans where a member's benefits are not funded during the members' working career, e.g., plans receiving "pay-as-you-go" funding or "terminal" funding.

As developed here the LCAM is a level cost actuarial methodology[1], which is consistent with well-established actuarial practice. The LCAM is a principles-based mathematical model of pension and OPEB cost. The model policy elements are developed in a logical sequence based on stated general policy objectives, and in a manner consistent with primary factors that affect the cost of the pension or OPEB obligation. Note that while this document focuses on funding cost (i.e., contributions) this model framework can also be applied to other level cost applications.

The particular model that we develop is based on a combination of policy elements that has been tested over many years and, we believe, is well understood and broadly applicable. However, there are other models that practitioners may use that are internally consistent and may be as appropriate in some circumstances as the model that is developed herein, and it is not our intention to discourage consideration of such other policies. Furthermore, there are situations where the policy parameters developed herein may require additional analysis to establish the appropriate parameters for that situation[2]. It is up to the actuary to apply professional judgment to the particulars of the situation and recommend the most appropriate policies for that situation, including considerations of materiality.

Our approach begins with identifying the policy objectives of such a funding policy, and then evaluating the structure and parameters for each of the particular policy elements in a manner consistent with those objectives, as well as with current and emerging actuarial science and governing actuarial standards of practice.

This document is intended as advice to actuaries and retirement boards[3] in the setting of funding policy. It is not intended to be proscriptive, nor is it intended to supplant or replace the applicable

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[1] Here a "level cost actuarial methodology" is characterized by economic assumptions based on the long term expected experience of the plan and a cost allocation designed to produce a level cost over an employee's active service. This is in contrast to a "market based actuarial methodology" where economic assumptions are based on current market observations, and costs are allocated based on the (non-level) present value of an employee's accrued benefit.

[2] For example, plans that are closed to new entrants may require additional analyses and forecasts to determine whether the policy parameters herein provide for adequate funding.

[3] Here "retirement boards" is meant to refer generally to whatever governing bodies have authority to set funding policy for public sector plans.

Actuarial Standards of Practice (ASOPs). Furthermore, it may not be used as a basis for litigation, and should not be referenced in a litigation context. This is consistent with the legislation that created the CAAP and established both its responsibilities and authority. In particular, California Government Code Section 7507.2 (e) states:

> The opinions of the California Actuarial Advisory Panel are nonbinding and advisory only. The opinions of the panel shall not, in any case, be used as the basis for litigation.

Given the wide range of such policies currently in practice in the U.S., this development also acknowledges that the boards will require some level of policy flexibility to reflect both their specific policy objectives and their individual circumstances. To accommodate that need for reasonable flexibility and yet also provide substantive guidance, this development evaluates various policy element structures and parameters or ranges according to the following categories:

1. Model (i.e., LCAM-consistent) practices
2. Acceptable practices
3. Acceptable practices, with conditions
4. Non-recommended practices
5. Unacceptable practices

These categories are best understood in the context of the different elements that comprise an actuarial funding policy and the various policy alternatives for each of those policy elements. They are intended to assist in the evaluation of specific policy elements and parameters relative to the policies developed herein. They are not intended as a grading or scoring mechanism for a system's actuarial funding policy.

Generally, throughout this discussion, "model practices" means those practices most consistent with the LCAM as developed here.[4] Acceptable practices (category 2) are generally those which, while not consistent with the LCAM, are well established in practice and typically do not require additional analysis. Practices which are acceptable with conditions (category 3) may be acceptable in some circumstances either to reflect different policy objectives or on the basis of additional analysis. Systems that adopt practices which under this model analysis are not recommended (category 4) should do so only with acknowledgment of the policy concerns identified herein.

This evaluation of practice elements and parameters was developed in relation to the LCAM, based on experience with the many independent public plans sponsored by counties, cities and other local public employers in California, and is intended to have general applicability to such plans. However, for some plans, special circumstances or situations may apply. The specific applicability of the

[4] Some commentators have interpreted "model practices" as synonymous with "best practices." That is not our intent.

results developed here should be evaluated by their governing boards based on the advice of their actuaries.

Note that while the selection of actuarial assumptions is an essential part of actuarial policy for a public sector plan, the selection of actuarial assumptions is outside the scope of this discussion.

Finally note that some retirement systems have features that may require funding policy provisions and analyses that are not addressed herein. One example is systems with "gain sharing" provisions whereby favorable investment experience is used as the basis for increasing member benefits and/or directly offsetting employer and/or member contributions. Another example is Deferred Retirement Option Programs (DROPs) whereby members who continue in service can accumulate a lump sum benefit based on their retirement benefits as accrued as of some DROP entry date. The policies developed here should not be interpreted as being adequate to address these plan features without additional analysis specific to those features.

TRANSITION POLICIES

In order to avoid undue disruption to a sponsor's budget, it may not be feasible to adopt policies consistent with this document without some sort of transition from current policies. For example, a plan using longer than model amortization periods could adopt model periods for future unfunded liabilities while continuing then current (declining) periods for the current liabilities. Such transition policies should be developed with the advice of the actuary in a manner consistent with the principles developed herein.

GENERAL POLICY OBJECTIVES

The following are policy objectives that apply generally to all elements of the funding policy. Objectives specific to each principal policy element are identified in the discussion of that policy element.

1. The principal goal of a funding policy is that future contributions and current plan assets should be sufficient to provide for all benefits expected to be paid to members and their beneficiaries.

2. The funding policy should seek a reasonable allocation of the cost of benefits and the required funding to the years of service. This includes the goal that annual contributions should, to the extent reasonably possible, maintain a close relationship to the expected and actual cost of each year of service.

3. The funding policy should seek to manage and control future contribution volatility to the extent reasonably possible, consistent with other policy goals.

4. The funding policy should support the general public policy goals of accountability and transparency. While these terms can be difficult to define in general, here the meaning includes that each element of the funding policy should be clear both as to intent and effect, and that

each should allow an assessment of whether, how and when the plan sponsor is expected to meet the funding requirements of the plan.

5. The funding policy should take into consideration the nature of public sector pension plans and their governance. These governance issues include (1) agency risk issues associated with the desire of interested parties (agents) to influence the cost calculations in directions viewed as consistent with their particular interests, and (2) the need for a sustained budgeting commitment from plan sponsors.

Policy objective 1 means that contributions should include the cost of current service plus a series of amortization payments or credits to fully fund or recognize any unfunded or overfunded past service costs (note that the latter is often described as "Surplus").

Policy objectives 2 and 3 reflect two aspects of the general policy objective of interperiod equity (IPE). The "demographic matching" goals of policy objective 2 promotes ***intergenerational*** IPE, which seeks to have each generation of taxpayers incur the cost of benefits for the employees who provide services to those taxpayers, rather than deferring those costs to future taxpayers. The "volatility management" goal of policy objective 3 promotes ***period-to-period*** IPE, which seeks to have the cost incurred by taxpayers in any period compare equitably to the cost for just before and after.

These two aspects of IPE will tend to move funding policy in opposite directions. Thus the combined effect of policy objectives 2 and 3 is to seek an appropriate balance between intergenerational and period-to-period IPE, that is, between demographic matching and volatility management.

Policy objective 3 (and the resulting objective of balancing policy objectives 2 and 3) depends on the presumed ongoing status of the public sector plan and its sponsors. The level of volatility management appropriate to a funding policy may be less for plans where this presumption does not apply, e.g., plans that are closed to new entrants.

Policy objective 4 will generally favor policies that allow a clear identification and understanding of the distinct role of each policy component in managing both the expected cost of current service and any unexpected variations in those costs, as measured by any unfunded or overfunded past service costs. Such policies can enhance the credibility and objectivity of the cost calculations, which is also supportive of policy objective 5.

Policy objective 5 seeks to enhance a retirement board's ability to resist and defend against efforts to influence the determination of plan costs in a manner or direction inconsistent with the other policy objectives. This favors policies based on a cost model where the parameters are set in reference to factors that affect costs rather than the particular cost result. This separation between the selection of model parameters and the resulting costs enhances the objectivity of the cost results. As a result, any attempt to influence those results must address the objective parameters rather than the cost result itself.

A common example of agency risk is that, because plan sponsors may be more aware of and responsive to the interests of current versus future taxpayers, there may be incentives to defer necessary contributions to future periods. This may be countered by avoiding policy changes that selectively reduce contributions.

For plans with an ongoing service cost for active members, policy objective 5 also reflects a policy objective to avoid encumbering for other uses the budgetary resources necessary to support that ongoing service cost. This introduces an asymmetry between funding policies for unfunded liabilities versus surpluses, which is discussed in the policy development for surplus amortization.

Note that the model funding policies developed here are substantially driven by these policy objectives. In some situations other plan features or policies (e.g., investment policy, reserving requirements, plan maturity) may also be a consideration in setting funding policy. Such considerations are not addressed in this analysis.

PRINCIPAL ELEMENTS OF ACTUARIAL FUNDING POLICY

The type of comprehensive actuarial funding policy developed here is made up of three components:

1. An **actuarial cost method,** which allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL).

2. An **asset smoothing method,** which reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets.

3. An **amortization policy,** which determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL.

An actuarial funding policy can also include some form of "direct rate smoothing". Two types of direct rate smoothing policies were evaluated for this development:

1. Phase-in of certain extraordinary changes in contribution rates, e.g., phasing-in the effect of assumption changes element over a three year period.

2. Contribution "collar" where contribution rate changes are limited to a specified amount or percentage from year to year.

ACTUARIAL COST METHOD

The Actuarial Cost Method allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL).

SPECIFIC POLICY OBJECTIVES AND CONSIDERATIONS

1. Each participant's benefit should be funded under a reasonable allocation method by the expected retirement date(s), assuming all assumptions are met.
2. Pay-related benefit costs should reflect anticipated pay at anticipated decrement.
3. The expected cost of each year of service (generally known as the Normal Cost or service cost) for each active member should be reasonably related to the expected cost of that member's benefit.
4. The Normal Cost should emerge as a level percentage of member compensation[5].
5. No gains or losses should occur if all assumptions are met, except for
    a. Investment gains and losses deferred under an asset smoothing method consistent with these model practices, or
    b. Contribution losses (or gains) due to the phase-in of a contribution increase (or decrease).
6. The cost method should allow for a comparison between plan assets and the accumulated value of past Normal Costs for current participants, generally known as the Actuarial Accrued Liability.

DISCUSSION

1. Any actuarial cost model for retirement benefits begins with construction of a series or array of Normal Costs that, if funded each year, under certain stability conditions will be sufficient to fund all projected benefits for current active members. The following considerations serve to specify the cost model developed here.
    a. The usual stability conditions are that the current benefit structures and actuarial assumptions have always been in effect, the benefit structures will remain in effect, and future experience will match the actuarial assumptions. Special considerations apply if in the past the benefit structure has been changed for current active members changing the benefits for members with service after some fixed date.

[5] This objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related it may be appropriate to modify this objective and the resulting policies accordingly.

b. Consistent with Cost Method policy objective #3 and with the general policy objective of transparency, the Normal Cost for each member is based on the benefit structure for that member. This means that a separate Normal Cost array is developed for each tier of benefits within a plan. This argues against Ultimate Entry Age, where Normal Cost is based on an open tier of benefits even for members not in that open tier.

c. Consistent with Cost Method policy objective #4, the Normal Cost is developed as a level percentage of pay for each member, so that the Normal Cost rate (as a percentage of pay) is designed to be the same for all years of service. This provides for a more stable Normal Cost rate for the benefit tier in case of changing active member demographics. This argues against Projected Unit Credit.

d. Also consistent with Cost Method policy objective #4, the Normal Cost for all types of benefits incurred at all ages is developed as a level percentage of the member's career compensation. This argues against funding to decrement.

e. Consistent with Cost Method policy objective #6, the Normal Cost is developed independent of plan assets, and the Actuarial Accrued Liability (and so also the UAAL) is based on the Normal Costs developed for past years. This argues against Aggregate and FIL as model practices. These methods should be considered as a fundamentally different approach to the determination and funding of variations from Normal Cost. Plans using these methods should also measure and disclose costs and liabilities under the Entry Age method, similar to the requirements of current accounting standards.

2. Consistent with all the above, under the cost model developed here the Normal Cost rate should change only when the projected benefits for the tier change either in amounts or in present value.

   a. The Normal Cost rate (both in total and by member) will vary from valuation to valuation due to demographic experience and assumption changes.

   b. The Normal Cost rate will not change when an individual member reaches an age or service where, under the consistent benefit structure for the member's tier, the member's benefit eligibility or accrual rate changes. This is because that event was anticipated in the projected benefits for the tier, so that the projected benefits are substantially unaffected by such predictable changes in eligibility or benefit accrual.

   c. Similarly the Normal Cost rate for a member should be unaffected by the closing of the member's tier and the creation of a new tier for future hires.

   d. However, if the benefit structure of a continuing, open tier is changed for members with service after some fixed date, then the Normal Cost rate should change to reflect the

unanticipated change in projected benefits for members in the tier[6]. This calls for an extension or variation of the Entry Age method in order to value this type of benefit change.

i. There are two methods in practice to adjust the Normal Cost rate for this type of plan change. While a detailed analysis of these two variations is beyond the scope of this discussion, our summary conclusions are:

   A. The "replacement life" Entry Age method would base the Normal Cost on the new benefit structure as though it had always been in place, thereby producing a consistent Normal Cost rate for all members in the tier. This has the advantages of a change in Normal Cost (both individual and total) more consistent with what would be expected for a change in future benefit accruals, a stable future Normal Cost rate for the tier and a relatively smaller (compared to the alternative) change in Actuarial Accrued Liability. Its disadvantages are that it is more complicated to explain and to implement.

   B. The "averaged" Entry Age method would base each member's Normal Cost on the new projected benefit for that member, thereby producing a different Normal Cost rate for different members in the tier, based generally on their service at the time of the change in benefit structure. The advantages and disadvantages are essentially the reverse of those for the replacement life version of Entry Age. The change in Normal Cost is less than what would be expected for a change in future benefit accruals, the future Normal Cost rate for the tier will be unstable (as it eventually reaches the same rate as under the replacement life variation) and there is a relatively larger (compared to the alternative) change in Actuarial Accrued Liability. Its advantages are that it is less complicated to explain and to implement.

PRACTICES

Based on the above discussion, and consistent with the policy objectives, actuarial cost methods and parameters are categorized as follows:

MODEL PRACTICES

- Entry Age cost method with level percentage of pay Normal Cost
  - Level Normal Costs even if benefit accrual or eligibility changes with age or service.
  - All types and incidences of benefits funded over a single measure of expected future service.

[6] Note that, as of this writing, for public sector pension plans this is relatively uncommon because of legal protections that are understood to apply both to accrued benefits and to future benefit accruals for current members.

  - The Normal Cost for a tier of benefits is the sum of the individually determined Normal Costs for all members in that tier.
  - Exception: for plans with benefits unrelated to compensation the Entry Age method with level dollar Normal Cost may be more appropriate
- For multiple tiers: Normal Cost based on each member's benefit
- For benefit formula or structure changes within a tier (generally after a fixed date):
  - Normal Cost based on current benefit structure (replacement life Entry Age.)

ACCEPTABLE PRACTICES

- Projected Unit Credit cost method.
- Aggregate cost method: Plans using the Aggregate method should disclose costs and liabilities determined under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Determine single amortization period for the Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to Aggregate method Normal Cost.
- Frozen Initial Liability cost method: This method should disclose costs and liabilities under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Deduct the FIL amortization bases from the Entry Age UAAL.
  - Determine single amortization period for the remaining Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to FIL method Normal Cost.
- Funding to Decrement Entry Age method, where each type and incidence of benefit is funded to each age at decrement.
  - May be appropriate for some plan designs or for plans closed to new entrants[7].
- For benefit formula or structure changes within a tier (generally after a fixed date):
  - Normal Cost based on each member's composite projected benefit (averaged Entry Age.)

[7] For example, a Plan that provides very valuable early career-benefits (such as heavily subsidized early retirement or disability benefits) may prefer to have the higher early-career Normal Costs associated with the Funding to Decrement Entry Age method.

ACCEPTABLE PRACTICES, WITH CONDITIONS

- Entry Age method variation where the Normal Cost for a tier of benefits is determined as the Normal Cost rate for the tier applied to the compensation for the tier, and where the Normal Cost rate for the tier of benefits is determined as the present value of future Normal Costs for all active members in the tier, divided by the compensation for all members in the tier.

NON-RECOMMENDED PRACTICES

- Normal Cost based on open tier of benefits even for members not in that open tier (Ultimate Entry Age.)

UNACCEPTABLE PRACTICES

- Traditional (non-Projected) Unit Credit cost method for plans with pay-related benefits.
- Note that while this document does not address policy issues related to pay-as-you-go funding or terminal funding, such practices would be unacceptable if the policy intent is to fund the members' benefits during the members' working careers.

ASSET SMOOTHING METHODS

An asset smoothing method reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets.

SPECIFIC POLICY OBJECTIVES AND CONSIDERATIONS

1. The funding policy should specify all components of asset smoothing method.
    a. Amount of return subject to deferred recognition (smoothing).
    b. The smoothing period or periods.
    c. The range constraints on smoothed value (market value corridor), if any.
    d. The method of recognizing deferred amounts: fixed or rolling smoothing periods.
2. The asset smoothing method should be unbiased relative to market.
    a. The same smoothing period should be used for gains and for losses.
    b. Any market value corridor should be symmetrical around market value.
3. The asset smoothing method should not be selectively reset at market value only when market value is greater than actuarial value.

4. The asset smoothing method should be unbiased relative to realized vs. unrealized gain loss.
    a. Deferrals based on total return gain/loss relative to assumed earnings rate.
5. The asset smoothing method should incorporate the ASOP 44 concepts of:
    a. Likely to return to market in a reasonable period AND likely to stay within a reasonable range of market, or
    b. Sufficiently short period to return to market OR sufficiently narrow range around market.
6. The policy parameters should reflect empirical experience from historical market volatility.
7. The asset smoothing method should support the policy goal of demographic matching (the intergenerational aspect of interperiod equity) described in general policy objective 2. This leads to a preference for smoothing methods that provide for full recognition of deferred gains and losses in the UAAL by some date certain.
    a. Note that this objective is also consistent with the accountability and transparency goals described in general policy objective 4.

DISCUSSION

1. Longer smoothing periods generally reduce contribution volatility. A discussion of smoothing periods could include the following considerations:
    a. To the extent that smoothing periods are considered as being tied to economic or market cycles, those cycles may be believed to be longer or shorter than in past years.
    b. If markets are more volatile, then longer smoothing would be needed even if only to maintain former levels of contribution stability.
    c. Better funded plans, more mature plans and higher benefit plans (i.e., plans with a higher "volatility index") have inherently more volatile contribution rates, so may justify longer smoothing.
    d. Sponsors may be more sensitive to contribution volatility.
2. However, ASOP 44 implies that longer smoothing periods call for narrower market value corridors.
    a. In effect, the corridor imposes a demographic matching style constraint on the use of longer smoothing periods to obtain greater volatility management.
3. Our panel consensus is that five year smoothing is "sufficiently short" under ASOP 44.
    a. Long and consistent industry practice, as well as GASB Statements 67 and 68.
    b. This implies that five year smoothing with no market value corridor is ASOP compliant.

c. It still may be useful to have a market value corridor as part of the asset smoothing policy.

   i. This avoids having to introduce the corridor structure in reaction to some future discussion of longer smoothing periods.

4. Consider the extensive recent data available on the impact of smoothing periods and market value corridors after large market downturn (such as occurred in 2008.)

   a. The smoothing method manages the transition from periods of lower cost to periods of higher cost.

      i. The level of those higher costs is determined primarily by size of the market loss and UAAL amortization period, not the asset smoothing policy.

   b. The smoothing period determines length of the transition period.

   c. The market value corridor determines cost pattern during the transition.

      i. A wide corridor or no corridor produces a straight line transition.

      ii. "Hitting the corridor" accelerated the cost increases in early years of transition.

         A. In effect the corridor inhibits the smoothing method after years of large losses (or gains.)

      iii. There are various possible policy justifications for such an accelerated transition.

         A. Market timing: get more contributions in while the market is down.

         B. Cash flow management: low market values may impair plan liquidity.

         C. Employer solvency: if the employer eventually is going to default on making contributions, get as much contribution income as possible before that happens.

         D. Employer preference to have the higher costs in their rates as soon as possible.

      iv. Following the 2008 market decline, these justifications were generally not found to be compelling.

         A. The normal lag in implementing new contributions rates defeats A and B.

         B. Employers are presumed solvent and if not accelerating contributions would make things worse.

         C. Many employers clearly preferred more time to absorb the contribution increases.

      v. Absent these considerations, 2008 experience argues for permitting a wide corridor with five year smoothing period, as five year smoothing actuarial value to market value ratios exceeded 140%.

A. Projections in early 2009 actually showed these ratios could have been as high as 150% if markets had not recovered some before the June 30, 2009 valuations.

5. Other industry indicators for market corridor selection with long smoothing periods.

   a. CalPERS 2005 policy: 15 year rolling smoothing with 20% corridor.

6. Structural issue: Fixed, separate smoothing periods vs. a single, rolling smoothing period.

   a. Fixed, separate smoothing periods for each year of market gain or loss insure that all deferred gains and losses are included in the UAAL (and so in the contribution rates) by a known date. Consistent with accountability and with demographic matching.

   b. A single rolling smoothing period avoids "tail volatility" where contributions are volatile not only when gains and losses occur but also when each year's gain or loss is fully recognized. Consistent with volatility management.

   c. With fixed, separate smoothing periods, tail volatility due to alternating periods of market gains and losses can be controlled by limited active management of the separate deferral amounts.

      i. One such adjustment involves combining the separate deferral amounts when the net deferral amount is relatively small (i.e., the actuarial and market values are very close together) but the recognition pattern of that net deferral is markedly non-level.

         A. The net deferral amount is unchanged as of the date of the adjustment.

         B. The period over which the net deferral amount is fully recognized is unchanged as of the date of the adjustment.

      ii. Other uses of active management of the deferral amounts may add complexity to the application of the policy and may reduce transparency.

      iii. Restarts of fixed, separate smoothing periods should not be used:

         A. Too frequently, as this would produce a de facto rolling smoothing period, or

         B. To selectively restart smoothing at market value only when market value is greater than actuarial value. This would violate General Policy Objective 5, since it would selectively change the policy only when the effect is to reduce contributions.

PRACTICES

Based on the above discussion, and consistent with the policy objectives, asset smoothing methods and parameters are categorized as follows:

MODEL PRACTICES

- Fixed smoothing periods.
- Maximum market value corridors for various smoothing periods.
  - 5 years, 50%/150% corridor.
  - 7 years, 60%/140% corridor.
  - 10 years, 70%/130% corridor.
- Combine smoothing periods or restart smoothing only to avoid tail volatility.
  - Avoid using frequent restart of smoothing to achieve de facto rolling smoothing.
  - Avoid restarting smoothing only accelerate recognition of deferred gains, i.e., only when market value is greater than actuarial value.
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans.

ACCEPTABLE PRACTICES

- Five year (or shorter) smoothing with no corridor.
- Rolling smoothing periods subject to the above corridors, with additional analysis and possible constraints.
  - Projections of when the actuarial value is expected to return within some narrow range of market value.

ACCEPTABLE PRACTICES, WITH CONDITIONS

- 15 years, 80%/120% corridor.

NON-RECOMMENDED PRACTICES

- Longer than 5 year smoothing with no corridor.

UNACCEPTABLE PRACTICES

- Smoothing periods longer than 15 years.

AMORTIZATION POLICY

An amortization policy determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL.

SPECIFIC POLICY OBJECTIVES AND CONSIDERATIONS

1. Variations in contribution requirements from simply funding the Normal Cost will generally arise from gains or losses, method or assumption changes or benefit changes and will emerge as a UAAL or Surplus. As discussed in the general policy objectives, such variations should be funded over periods consistent with an appropriate balance between the policy objectives of demographic matching and volatility management.

2. As with the Normal Cost, the cost for changes in UAAL should emerge as a level percentage of member compensation.[8]

3. The amortization policy should reflect explicit consideration of these different sources of change in UAAL, even if the resulting policy treats different changes in the same way:

    a. Experience gains and losses.

    b. Changes in assumptions and methods.

    c. Benefit or plan changes.

4. The amortization policy should reflect explicit consideration of the level and duration of negative amortization, if any.

    a. This consideration should not necessarily preclude some negative amortization that may occur under an amortization policy that is otherwise consistent with the policy objectives.

    b. Amortization periods developed in consideration of negative amortization (along with other policy goals) may be relevant for level dollar amortization (where negative amortization does not occur).

5. The amortization policy should support the general policy objectives of accountability and transparency. This leads to a preference for:

    a. Amortization policies that reflect a history of the sources and treatment of UAAL.

[8] As with the Normal Cost, this amortization policy objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related, or when costs are budgeted on a basis other than compensation it may be appropriate to modify this objective and the resulting policies accordingly.

b. Amortization policies that provide for a full amortization date for UAAL.

   i. Note that this objective is also consistent with the demographic matching aspect of general policy objective 2.

6. The amortization of Surplus requires special consideration, consistent with general policy objective 5 (nature of public plan governance).

DISCUSSION

1. General preference for level percentage of pay amortization.

   a. Consistent with policy objectives and with the Normal Cost under the model Actuarial Cost Method.

   b. This discussion of amortization periods presumes level percentage amortization; level dollar amortization will be discussed separately as an alternative to level percentage amortization.

2. General preference for multiple, fixed amortization layers.

   a. Fixed period amortization is clearly better for accountability, since UAAL is funded as of a date certain.

   b. Single layer, fixed period amortization is not a stable policy, since period must be restarted when remaining period gets too short.

   c. Multiple layer amortization is also more transparent, since it tracks the UAAL by source.

   d. Discussion of periods will assume multiple, fixed amortization and then revisit the use of rolling periods to manage volatility.

3. For gains and losses, balancing demographic matching and volatility control leads to an ideal amortization period range of 15 to 20 years.

   a. Lesson learned from the 1990s is that less than 15 years gives too little "volatility control", especially for gains.

      i. Short amortization of gains led to partial contribution holidays (contributions less than Normal Cost) and even full contribution holidays (no contribution required).

      ii. This is inconsistent with general policy objective 5, in that it led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.

   b. Longer than 20 years becomes difficult to reconcile with demographic matching, the intergenerational aspect of interperiod equity described in general policy objective 2.

i. Substantially longer than either average future service for actives or average life expectancy for retirees.

c. Longer than 20 years also entails negative amortization (which starts at around 16 to 18 years for most combinations of assumptions).

i. Here negative amortization is an indicator for not enough demographic matching but based on economic rather than demographic assumptions.

ii. Observed consistency between the period of onset of negative amortization and the periods related to member demographics.

d. Two case studies: CalPERS and GASB.

i. CalPERS 2005 analysis focused on volatility management. Resulting funding policy uses exceptionally long periods for gain and loss amortization (as well as for asset smoothing).

ii. GASB Statements 67 and 68 focus on demographic matching. Resulting expensing policy uses very short recognition periods.

iii. Our general policy objectives indicate a balance between these two extremes.

4. For assumption changes, a case can be made for longer amortization than for gain/loss, since liabilities are remeasured to anticipate multiple years of future gains or losses.

a. A similar or even stronger case could be made for changing cost method (such as from Projected Unit Credit to Entry Age), or for the initial liability for a newly funded OPEB plan.

b. However longer than 25 years entails substantial (arguably too much) negative amortization.

5. For plan amendments, volatility management is not an issue, only demographic matching.

a. Use actual remaining active future service or retiree life expectancy.

b. Could use up to 15 years as an approximation.

i. Any period that would entail negative amortization is inconsistent with general policy goals 2 (demographic matching) and 5 (nature of public plan governance).

c. For Early Retirement Incentive Programs use a period corresponding to the period of economic savings to the employer.

i. Shorter than other plan amendments, typically around five years.[9]

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[9] For example, a Government Finance Officers Association (GFOA) 2004 recommended practice states that "the incremental costs of an early retirement incentive program should be amortized over a short-term

6. For Surplus, similar to short amortization of gains, the lesson from the 1990s is that short amortization of surplus leads to partial or full contribution holidays (contributions less than Normal Cost, or even zero.)
    a. Inconsistent with general policy objective 5, led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.
    b. General consensus that this is not good public policy.
        i. See for example Recommendation 7 by 2007 Governor's Commission, and also CalPERS 2005 funding policy.
    c. Because of both the ongoing nature of the Normal Cost and the nature of public plan governance, amortization of UAAL and Surplus should <u>not</u> be symmetrical.
        i. Amortize Surplus over a period longer than would be acceptable for UAAL.
        ii. Such an asymmetric policy would reduce the magnitude and/or likelihood of partial or full contribution holidays.
    d. Note that long amortization of Surplus does not preclude other approaches to Surplus management that are beyond the scope of this discussion.
        i. Treating some level of Surplus as a non-valuation asset.
        ii. Changing asset allocation to reflect Surplus condition.
    e. Recent changes to California law require that contributions to most California public pension plans be no less than the Normal Cost.
7. Separate Surplus related issue: When plan first goes into Surplus, should existing UAAL amortization layers be maintain or eliminated?
    a. Could maintain amortization layers and have minimum contribution of Normal Cost less 30 year amortization of Surplus.
    b. However, maintaining layers can result in net amortization charge even though overall plan is in Surplus.
    c. Alternative is to restart amortization.
        i. In effect, 30 year rolling amortization of current and future Surpluses.
        ii. Restart amortization layers when plan next has a UAAL.

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payback period, such as three to five years. This payback period should match the period in which the savings are realized."

8. Level dollar amortization: fundamentally different from level percent of pay amortization.
    a. No level dollar amortization period is exactly equivalent to a level percent period.
    b. Plan and/or sponsor circumstances could determine appropriateness of level dollar method.
        i. Level dollar could be appropriate for plans where benefits are not pay related.
        ii. Could be appropriate for sponsors and plans that are particularly averse to future cost increases, e.g., utilities setting rates for current rate payers.
        iii. Could be appropriate for sponsors and plans that want an extra measure of conservatism or protection against low or no future payroll growth.
        iv. Could be useful as a step in developing amortization payments in proportion to some basis other than payroll.
9. Multiple, fixed period layers vs. single, rolling period layer for gains and losses.
    a. Multiple, fixed amortization periods for each year's gain or loss ensures that all gains and losses are funded by a known date. Consistent with accountability and with demographic matching.
    b. A single rolling smoothing period avoids tail volatility where contributions are volatile not only when gains and losses occur but also when each year's gain or loss is fully amortized. Consistent with volatility management.
    c. With fixed, separate smoothing periods, tail volatility can be controlled by limited active management of the amortization layers, including combining consecutive gain and loss layers as necessary to reduce tail volatility.
        i. As with asset smoothing, active management should be used to manage the pattern of future UAAL funding and not to accomplish a short-term manipulation of contributions.
        ii. In particular the net remaining amortization period should be relatively unaffected by any combination of offsetting UAAL amortization layers.
        iii. The use of active management of the amortization layers may add complexity to the application of the policy and may reduce transparency.
10. Plans with an unfunded liability should consider actions to achieve a minimum net amortization charge that is not less than the payment required under a single 25 year amortization layer. This may be accomplished through active management of the amortization layers or through other means.
11. Rolling amortization periods for a single layer for gains and losses or for the entire UAAL.

a. Similar to level dollar, acknowledge that rolling amortization is fundamentally different from fixed period amortization.

b. An argument can be made for rolling amortization of gains and losses if assumptions are believed to be unbiased so that gains or losses will offset each other.

c. Weaker argument for rolling amortization for assumption changes (especially if consistently in a single direction, such as mortality assumption adjustments or recent investment earnings assumption changes), and for gains and losses in the presence of biased assumptions.

d. Substantially weaker argument for benefit changes, since harder to achieve accountability and transparency objectives.

e. Especially for (c) and (d), must affirmatively show that funding objectives will be achieved, without substantial violation of intergenerational equity.

f. Specific exception for rolling, lengthy amortization of Surplus, since as described earlier helps meet general policy objective 5.

12. Choice of appropriate amortization period for non-model practices (level dollar and/or rolling amortization) requires additional analysis to evaluate whether general policy objectives are met, including projections of contributions and funded status.

    a. Level dollar is generally faster than level percent of pay, so longer periods may be reasonable.

    b. Rolling amortization is generally slower that fixed period amortization, so shorter periods may be required.

    c. To evaluate appropriateness of amortization period under alternative practices, compare projections of contributions and funded status under model practice (i.e. level percentage of pay, layered amortization) using acceptable periods with alternative practices and periods.

        i. Policies could be considered substantially equivalent under alternative practices and periods if projections in future years show expected contributions and funded status remain within reasonable range of results using acceptable policies under model practice.

        ii. For rolling amortization, policy objective 2 (demographic matching) may require shorter amortization periods, resulting is substantial reductions in volatility management (contrary to policy objective 3).

        iii. Rolling amortization of entire UAAL implicitly amortizes plan amendments over a rolling period, which is arguably inconsistent with policy objectives 2 (demographic matching), 4 (accountability) and 5 (governance issues).

PRACTICES

Based on the above discussion, and consistent with the policy objectives, amortization methods and parameters are categorized as follows:

MODEL PRACTICE

- Layered fixed period amortization by source of UAAL.
- Level percent of pay amortization.
- Amortization periods:

Source	Period
Active Plan Amendments	Demographic, or up to 15
Inactive Plan Amendments	Demographic, or up to 15
Experience Gain/Loss	15 to 20
Assumption or Method Changes[10]	15 to 25
Early Retirement Incentives	5 or less

- 30 year amortization of surplus (for plans with ongoing Normal Cost and/or plan expenses.)
  - Eliminate all prior UAAL layers upon going into Surplus.
- Combine gain/loss (and other) layers or restart amortization only to avoid tail volatility.
  - Combining layers should result in substantially the same current amortization payment.
  - Avoid using restart of amortization to achieve de facto rolling amortization.
  - Restart amortization layers when moving from Surplus to UAAL condition.
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans.

ACCEPTABLE PRACTICES

- Level dollar fixed period layered amortization by source of UAAL, using the same model amortization periods as above.

[10] Method change includes the initial liability for a newly funded plan.

  - Ideally, with some rationale given if used with pay related benefits.
- Rolling amortization of a single combined gain/loss layer with an amortization period that does not entail any negative amortization
  - With model periods for other sources of UAAL.
  - Use separate, fixed period layers for extraordinary gain or loss events.

ACCEPTABLE PRACTICES, WITH CONDITIONS

- Up to 25 year layered fixed period amortization by source, for all sources of UAAL.
  - Ideally with some rationale given for using periods outside the model ranges.
- Up to 20 year rolling amortization of a single combined gain/loss layer.
- Rolling/open amortization of entire UAAL as a single combined layer exclusive of plan amendments, where the amortization period:
  - Does not entail any negative amortization and
  - Can be shown to meet the general policy objectives, particularly policy objective 4.
- 30 year fixed amortization of change in funding method (e.g. from PUC to Entry Age) or initial liability for a newly funded plan.
  - Ideally with some rationale given for using periods outside the model ranges.

NON-RECOMMENDED PRACTICES

- Fixed period amortization of the entire UAAL as a single combined layer, with periodic reamortization over a new starting amortization period.
- Layered fixed period amortization by source of UAAL over longer than 25 years.
- Rolling/open amortization over longer than 20 years of a single combined gain/loss layer.
- Rolling/open amortization of entire UAAL as a single combined layer (exclusive of plan amendments) where the amortization period entails negative amortization.
- Rolling/open amortization of entire UAAL as a single combined layer (including plan amendments.)

UNACCEPTABLE PRACTICES

- Layered fixed period amortization by source of UAAL over longer than 30 years.

- Rolling/open amortization over longer than 25 years of a single combined gain/loss layer.
- Rolling/open amortization over longer than 20 years of the entire UAAL as a single combined layer.

DIRECT RATE SMOOTHING

An actuarial funding policy can include some form of direct rate smoothing, where the contribution rates that result from applying the three principal elements of funding policy are then directly modified. Two types of direct rate smoothing policies that are known to be in current practice were evaluated for this development:

1. Phase-in of certain extraordinary changes in contribution rates, e.g., phasing-in the effect of assumption changes element over a three year period.
2. Contribution collar where contribution rate changes are limited to a specified amount or percentage from year to year.

DISCUSSION

1. Contribution rate phase-in can be an effective and reasonable way to address the contribution rate impact of assumption changes.
    a. The phase-in period should be no longer than the time period until the next review of assumptions (experience analysis).
    b. The plan and its sponsors should be clearly aware of the additional time value of money cost of the phase-in, due to the plan receiving less than the actuarially determined contributions during the phase-in.
    c. Note that the phase-in of the contribution rate impact of an assumption change is clearly preferable to phasing in the assumption change itself. While a detailed discussion is outside the scope of this discussion, phasing in an assumption change may be difficult to reconcile with the governing actuarial standards of practice.
2. Contribution collars have the policy drawback that the collar parameters arbitrarily override the contribution results produced by the other funding policy parameters (including asset smoothing), each of which has a well-developed rationale.
    a. If contribution collars are used they should be supported by analysis and projections to show the effect on future funded status and future policy based contribution requirements (prior to the application of the contribution collar).
    b. There may also need to be a mechanism to ensure adequate funding following extraordinary actuarial losses.

3. Using either form of direct rate smoothing for other than assumption changes (i.e., for actuarial experience or plan amendments) appears inconsistent with the development of parameter ranges for the other elements of the funding policy.

4. This discussion does not address the use of direct rate smoothing techniques as an alternative to asset smoothing.

PRACTICES

Based on the above discussion, and consistent with the policy objectives, direct rate smoothing methods and parameters are categorized as follows:

MODEL PRACTICE

- None.

ACCEPTABLE PRACTICES

- Phase-in of the cost impact of assumption changes over a period no longer than the time period until the next review of assumptions (experience analysis), accompanied by disclosure of impact on contribution rates.

ACCEPTABLE PRACTICES, WITH CONDITIONS

- None.

NON-RECOMMENDED PRACTICES

- Phase-in of the cost impact of actuarial experience or plan amendments, in conjunction with model practices for asset smoothing and UAAL amortization.
- Contribution collars in conjunction with model practices for asset smoothing and UAAL amortization.
- Phase-in or contribution collars for the cost impact of plan amendments, even if not used in conjunction with model practices for asset smoothing and UAAL amortization.