

TEACHERS' RETIREMENT BOARD

BENEFITS AND SERVICES COMMITTEE

Item Number: **3**

SUBJECT: Additional Earnings and Annuity Credits Policy – *Second Reading*

CONSENT:

ATTACHMENT(S): 1

ACTION:

DATE OF MEETING: February 5, 2015 / 45 mins.

INFORMATION: X

PRESENTER: Ed Derman

PURPOSE

The purpose of this item is to continue the review of board's policy for reviewing and modifying, if necessary, the Additional Earnings and Annuity Credits of the Defined Benefit Supplement (DBS) and Cash Balance Benefit (CB) programs.

SUMMARY

At the November 2014 meeting, the committee initiated a review of its policy for adopting Additional Earnings and Annuity Credits in the DBS and CB Benefit programs. To review, in both programs, the board annually adopts a guaranteed minimum interest rate based on the yield in 30-year Treasury bonds. If the funded status of the program exceeds specified levels, current board policy provides for the board to award Additional Earnings and Annuity credits to existing accounts and annuities.

Because of the steep decline in the minimum interest rate and 30-year U.S. Treasury rates, it became much more likely that additional credits would be adopted. As stated in the November agenda item, the issue before the committee is whether the current crediting policy is more likely to reduce the programs' funded status to below 100 percent than the committee deems prudent. The board's consulting actuary, Milliman, presented scenarios analyzing the current crediting policy and three alternatives. The three alternatives were

1. A higher threshold based on the standard deviation of the portfolio (14 percent was assumed for this example) instead of the current policy of twice the Minimum Interest Rate;
2. Not granting retirees additional credits (Non-Retired Only alternative), and
3. Using a lower expected investment return assumption such as 6.5 percent.

For each scenario, the analysis showed the probability of the funded levels being less than 50 percent, greater than 100 percent and greater than 150 percent after 30 years for each alternative and combination of the alternatives.

The results of the stochastic modeling showed that under the given assumptions, the alternatives had a higher probability of being greater than 150 percent funded and a lower probability of being less than 50 percent funded after 30 years, when compared to current policy.

At the November 2014 meeting, the committee requested information on additional alternatives, including a threshold of a 120 percent funded ratio before a credit was awarded, and whether other changes could improve the long-term stability of program funding.

Milliman has updated its analysis to reflect the requested information, which is attached. The committee indicated in November its desire to continue the discussion on the policy, with an expectation that the existing policy would either be ratified or a new policy adopted at the April 2015 meeting.

Nick Collier and Mark Olleman from Milliman will be present at the meeting to discuss their updated analysis.



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January 21, 2015

Teachers' Retirement Board

Re: DBS/CBB Interest Crediting Policy

Dear Members of the Board:

At the November, 2014 Board meeting, we discussed potential modifications to the additional crediting policy for the Defined Benefit Supplement (DBS) and Cash Balance Benefit (CBB) Programs. At that time, the Board expressed interest in looking at some additional alternatives. This letter includes our prior analysis and adds the alternative scenarios requested. We have labeled the additional scenarios as "New Alternatives" in this letter. We have also proposed one technical change in the calculation of the additional credits (see Proposed Technical Change).

The basic premise of both the DBS and CBB Programs is that all of the actual earnings of the funds net of expenses will be distributed to the member accounts over time, subject to the accumulation of a reasonable Gain and Loss (G&L) Reserve. Unlike defined contribution plans for which all earnings (positive and negative) are credited to accounts each year (or more commonly, each day), the CalSTRS cash balance plans have a Minimum Interest Rate (MIR) determined in advance of the plan year. If returns were constant from year to year, the Board could safely distribute all earnings net of expenses at the end of each year. However, the asset allocations in both programs are designed to earn more than the MIR over the long haul, but with a certain degree of volatility. The volatility and the uncertainty regarding future economic outcomes require the Board to prudently set aside some of the earnings in the G&L Reserve, after good investment periods, to distribute as the MIR in years when the investment returns are below the MIR.

Summary

In setting the interest crediting policy, a balance should be struck between maintaining an adequate level of funding and allocating the earnings of the programs back to the members. A further goal that may be considered is crediting interest as equitably as possible to different generations of members.

Our analysis starts with the current interest crediting policy and then modifies various parameters to see how the change would be expected to impact the projected funded level of the program and the interest credited to the members. Increasing the thresholds at which additional credits are granted (or otherwise reducing the credits) would generally result in a small reduction in the probability that the programs are significantly underfunded in the future.

Although not an imminent concern, our analysis shows there is a material probability that investment returns could stress the funding of these programs at some point in the future. The focus of this letter is the interest credited when the programs are more than 100% funded (as is

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currently the case for both programs); however, we have included two alternatives where adjustments would be made when the programs are less than 100% funded.

Current Policy

The strategy behind the current policy, in general terms, is as follows:

- Do not allocate any of the G&L Reserve to Additional Credits until the Funded Ratio exceeds a certain threshold.
- Once the threshold is exceeded, credit a modest amount of additional earnings so that the total credit for the year is equivalent to the average long-term expected return.
- If the Funded Ratio exceeds a second, higher threshold, credit some, but not all of the excess.

The current policy is expressed in terms of the G&L Reserve as a percentage of the Actuarial Obligations for the DBS and CBB Programs. This is the same as the Funded Ratio of these programs at the valuation date, less 100%. For example, the Funded Ratio of the DBS Program was 109.61% at June 30, 2013 (prior to any Additional Credits), so the G&L Reserve was at a 9.61% level.

Current Policy	2013 Valuation Example
<p>1. First Threshold: No amount of the G&L Reserve will be allocated to Additional Credits unless the G&L Reserve as of the valuation date exceeds two times the subsequent year's MIR.</p>	<p>For the 2013 valuation, twice the MIR for the next year of 3.0% is 6.0%. Since the 9.61% G&L Reserve exceeded the first threshold of 6.0%, Additional Credits were possible.</p>
<p>2. First Step Allocation: Members could be granted a total crediting rate up to the expected long-term rate of return in effect for the plan year if there are sufficient funds in excess of the First Threshold.</p>	<p>The G&L Reserve exceeded the first threshold by 3.61%, and the expected long-term return of 7.50% was 3.75% greater than the MIR for the previous year (which was 3.75%). Since the 3.61% was less than 3.75%, the full 3.61% was granted.</p>
<p>3. Second Threshold: If the G&L Reserve as of the valuation date (after reduction to reflect the First Step Allocation) exceeds three times the subsequent year's Minimum Interest Rate, a second allocation will be made.</p>	<p>Since the G&L Reserve after granting the first allocation was 6.0%, it was less than three times the subsequent MIR, and therefore no further Additional Credits were granted.</p>

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Current Policy	2013 Valuation Example
<p>4. Second Step Allocation: A Second Step Allocation will be equal to 50% of the remaining excess of the G&L Reserve over the Second Threshold, after the reduction due to the First Step.</p>	<p>The Second Step Allocation did not apply to the 2013 valuation.</p>

Proposed Technical Change

When applying the additional credit, the impact on the G&L Reserve is not equal to simple subtraction. For example, if twice the MIR was 10% and the G&L Reserve was 12%, the additional credit under the currently policy would be 2%. However, after applying the 2% additional credit, the new G&L Reserve is 9.8%, not 10.0% (12% - 2%). This is because the impact is multiplicative, not additive. We propose revising the method of calculating the additional credit so that the G&L Reserve does not decrease below the first threshold. This will result in a slightly smaller additional credit, but maintain a reserve consistent with the first threshold, at a minimum.

What are the Key Factors that will Affect Future Funding Levels?

The following are the factors that we believe will most significantly affect the future funding levels of the DBS and CBB Programs:

- **Interest Crediting:** Future interest crediting will impact the assets and liabilities and will depend both on the basis for determining the MIR and when Additional Credits are granted.
- **Investment Returns:** As with the DB Program, investment returns will generally be the most significant factor affecting future funding levels. If the value of assets drops below the accrued liabilities, there are no contributions dedicated to make up the funding deficit. The only current source of funding the shortfall is investment returns that exceed the interest credited. Therefore, investment returns are key to maintaining an adequate level of funding.

Stochastic Projection

To assess the impact of alternative interest crediting policies, we used a stochastic model to vary key components of the interest crediting policy and compared the results under varying economic scenarios. The stochastic model generates a range of results and can estimate probabilities of a specific outcome. See the Basis of Projections section later in this letter for details on the stochastic model.

We have used the DBS Program, since it is the larger of the two, although the same logic could be applied to the CBB Program and the results would be similar with some small differences due to the different investment return assumptions. The only exception to this is that any adjustments to Additional Annuity Credits in the CBB Program would have a much smaller

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impact on the program funding, because there are very few annuities paid out of the CBB Program as a large percentage of members elect to take a lump sum of their account value.

We have broken out our results by probabilities of various funded levels at the end of a 30-year period. It is not clear what the ideal target for a funding level is, but we can identify funding levels that we believe are clearly either too high or too low. We believe an interest crediting policy that results in a significant probability of an ending funded ratio below 50% does not provide adequate downside protection. Conversely, if it is likely the funded ratio will exceed 150%, we believe the policy is not adequately sharing the investment earnings with the member.

We have provided detailed comments on each of the following alternatives. A summary of the results for all alternatives is shown in Exhibit 1 at the end of this letter.

Stochastic Results – Higher Threshold for Additional Credits (Percent of Standard Deviation)

In 2014, the first threshold was 6.0% (twice the MIR). This provides only a small margin against future adverse experience. We looked at how future funding levels might be affected by applying a higher threshold before granting additional credits under varying economic scenarios (see Exhibit 1 for additional details). Since future investment returns will likely have a significant impact on future funding levels, we believe it would be appropriate to consider the volatility of the investment portfolio. For example, the first and second thresholds could be set based on one and two standard deviations of the investment portfolio respectively. For purposes of this analysis we have assumed a 14% standard deviation on the investment portfolio, which is close to the current portfolio. We have also assumed a 5% MIR in the future, which is close to our expectation of the yield on the 30-year treasury in the long term.

The results show that the alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50% at the end of 30 years) from 24% to 20% and increase the probability the funded ratio is greater than 100% from 35% to 45%. Applying the alternative approach would also increase the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150% at the end of 30 years) from 2% to 5%.

Stochastic Results – Additional Credit for Non-Retirees Only

When DBS members retire, they can convert their account balances to an annuity based on a 7.5% interest assumption. This is effectively equivalent to guaranteeing a minimum 7.5% return each year in the future. If cumulative returns above the MIR are shared with the retirees they are expected to receive an annuity which, if discounted at 7.5%, is more valuable than the lump sum amount elected by other members. This raises the question of whether retirees should be eligible for additional credits, particularly for the first threshold. We looked at how future funding levels might be affected if retirees were not eligible for additional credits. Please see the section titled Alternative Approaches for Retiree Benefits for additional comments on retiree benefit adjustments.

The results show that the alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 19%, and increase the probability the funded ratio is greater than 100% from 35% to 39%. Applying the alternative approach would also increase the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%) from 2% to 3%.

Stochastic Results – More Conservative Investment Return Assumption

Using a more conservative investment return assumption would increase the expected long-term funding level. The tradeoff would be lower additional credits under the first threshold and a more conservative conversion factor when members retire (resulting in slightly lower retiree benefits). We have modeled how a lower investment return assumption might affect future funding levels under varying economic scenarios. Note that for purposes of this analysis, we have assumed an investment return assumption that is 1.0% lower under the alternative.

The results show that the alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 20%, and increase the probability the funded ratio is greater than 100% from 35% to 38%. Applying the alternative approach would not materially affect the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%).

New Alternatives

Stochastic Results – Higher Threshold for Additional Credits (Minimum 120% Funded Ratio)

Another option for the higher thresholds would be the first and second thresholds set based at 20% and 30% respectively, as requested by the Board.

The results show that this alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 19% and increase the probability the funded ratio is greater than 100% from 35% to 48%. Applying this alternative approach would also increase the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%) from 2% to 6%.

Stochastic Results – Alternative Approach for Retiree Benefits

Another option would be to convert the accounts of future retirees to an annuity using an investment return assumption that approximates the long-term expected MIR, instead of the valuation assumption. For this example, we have assumed the long-term MIR will average 5%. This would result in initial annuity benefits based on a return lower than the 7.5% (or 7.0%) assumption, but future annuity credits should ultimately result in the value of the annuity payments being equal to the account balance, assuming the 7.5% assumption. The actuarial valuation would include an assumption for those future annuity credits. See the section titled “Alternative Approaches for Retiree Benefits” for further discussion of this approach.

The results show that this alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 17% and increase the probability the funded ratio is greater than 100% from 35% to 41%. Applying the alternative approach would not materially change the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%), remaining about 2% in both policies.

Stochastic Results – Adjustment to MIR when Program is Underfunded

As previously shown, there is a material probability that the funded ratio of the DBS Program will drop below 50% under the current and alternative interest crediting policies. The main reason for this is that these policies only address interest crediting when the plan is well funded. One way to reduce the probability that the program becomes severely underfunded would be to reduce or eliminate the MIR when the plan becomes underfunded. However, it appears the Board's ability to do this for the DBS Program may be limited by Education Code §25005(a) which states that "The minimum interest rate declared annually by the board...shall not be less than the rate at which interest is credited under the Defined Benefit Program." Further restrictions may apply to the CBB Program, since it is the sole retirement program for these members who are not covered by Social Security. Still, we think it is worthwhile to see the potential impact of lower interest crediting when the plan is underfunded. For this example, we have assumed no interest credit would be given if the DBS Program Funded Ratio falls under 90%.

The results show that this alternative approach would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 3% and increase the probability the funded ratio is greater than 100% from 35% to 53%. Applying the alternative approach would not materially change the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%), remaining about 2% in both policies.

The alternative policy would result in years where members received no interest on their account balances. In over 90% of our economic scenarios, there was at least one year out of the next 30 where the Funded Ratio was projected to decline below 90% and therefore no interest would be credited under this alternative policy. In looking at all the economic scenarios, there was about a 20% chance that in any given year, the interest credit would be 0%.

Stochastic Results – Combination of Alternatives

Combining the alternatives would increase the impact on the program funding, although there would be some offsetting effect. This example combines two alternatives: a) higher thresholds (15% and 30% in this example); and, b) a 5% annuity conversion rate.

The results show that this combination would reduce the probability the fund would be significantly underfunded (i.e., funded ratio less than 50%) from 24% to 14% and increase the probability the funded ratio is greater than 100% from 35% to 53%. Applying this combined alternative approach would also increase the probability the fund would be significantly overfunded (i.e., funded ratio greater than 150%) from 2% to 7%.

Summary of Alternatives

The impact of potential changes to the interest crediting policy shown in Exhibit 1 is summarized below.

Summary of Alternative Funding Policies			
Policy	Probability of Funded Level After 30 Years		
	≤ 50%	≥ 100%	≥ 150%
Current	23.5%	34.5%	1.7%
Higher Thresholds (Standard Deviation)	19.7%	44.8%	5.1%
Non-Retirees Only	17.2%	38.9%	2.8%
Inv Ret = 6.5%	20.1%	37.6%	2.3%
Higher Thresholds (120% Funded)	18.7%	48.4%	5.8%
NEW 5% Conversion	17.2%	40.9%	2.2%
No Credit < 90% Funded	3.2%	53.0%	2.3%
Combination (5% Conv & Std Dev)	13.9%	53.3%	6.9%

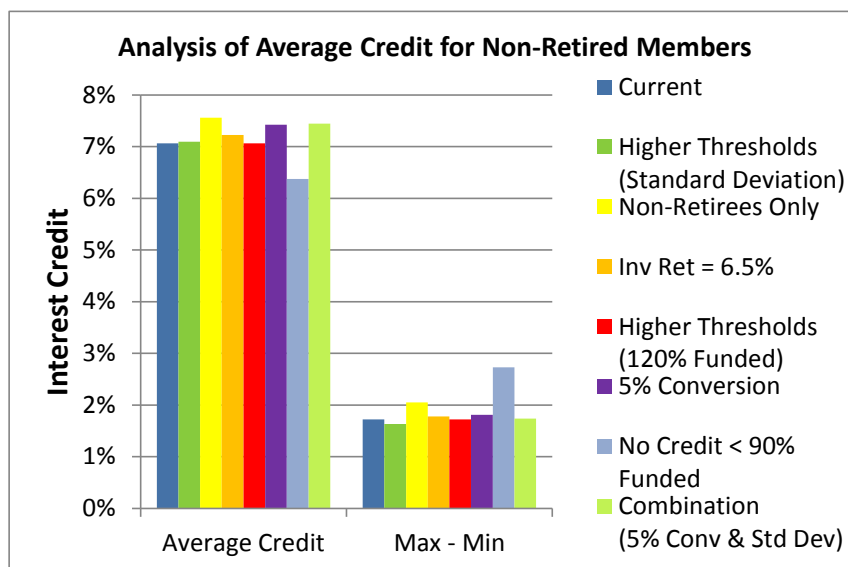
Interest Crediting Equity among Generations of Members

To give some idea of how the different alternatives affect the equity of additional credits among members who work during different periods, we have analyzed three sample members. Each member has a 30-year career, but the first member is hired immediately and the other two sample members are hired 10 and 20 years in the future. We then compared the difference between the total interest credit percentage each of the three sample members would receive under the stochastic scenarios. We did this by calculating the difference between the sample member with the highest interest credit and the sample member with the lowest total credit. This provides a measure of the variation of the average credit that members of different generations are expected to receive due to fluctuations in investment returns over time. This is referred to as “Max – Min” in the following graph. Note that if the MIR was fixed and there were no additional credits, this measure would be 0.0%, since everyone would receive the same level of interest crediting. A measure of 1.0% would indicate that under that alternative, the sample member who fared the best would on average have an interest credit of 1.0% higher than the sample member who fared the worst.

The following graph shows the average annual credit rate expected to be received by each member and the average difference between the highest and lowest credit received by the three sample members. The current and five alternative policies are generally very comparable. The only exceptions are the “Non-Retired Only” alternative which has a higher average credit and a proportionately higher variation, since the non-retired members do not share the additional credits with retirees under this scenario, and the “No Credit < 90% Funded” alternative which has a lower average credit and a higher variation.

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The similar levels of the average credit indicate that each of the alternatives, with the exception of the “No Credit < 90% Funded” alternative, is projected to give roughly the same amount of interest credits back to the members. The “Max – Min” bars show that, although the average annual credit the member is expected to receive may be about 7.1% (assuming a 5% long-term average MIR), when a member is hired will impact the credit an individual will receive, since investment returns will vary over time. Since the bars are about the same height, with the exception of the “No Credit < 90% Funded” alternative, it indicates that the alternatives generally provide about the same level of generational interest credit equity.



Alternative Approaches for Retiree Benefits

Currently the DBS and CBB Programs are much younger than most other public plans. This has helped their funding stability because retiree liabilities make up a much smaller percentage of their total liabilities than the average public plan. Although lump sum distributions will reduce the size of future retiree liabilities, it is still unknown how large the retiree liabilities will grow compared to the whole. This affects the stability of the Plans’ funding for two reasons:

- Retirees do not share in poor experience.
- Retirees’ annuity benefits are expected to be more valuable than the corresponding lump-sum distributions.

Retirees do not share in bad experience because their monthly benefits are calculated at retirement using annuity factors based on a 7.5% assumption (whereas actives would be expected to receive interest credits less than 7.5% in periods of bad experience). Therefore, even if they never receive an additional credit after retiring, retirees’ benefits are expected to have a value based on 7.5% returns. There is no room to make up for experience below 7.5%. Over time there are expected to be both gains and losses resulting from returns above and below the long-term 7.5% assumption. Retirees can currently participate in gains (through additional credits), but will not participate in losses.

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Retirees' annuity benefits are expected to be more valuable than the benefits of members who take lump sum distributions. First, benefits based on 7.5% annuity rates are much more favorable than any annuities available on the open market to members who take a lump sum. However, to the extent retiree benefits are discounted at 7.5% in the actuarial valuation, the initial value of the annuities is cost neutral. It is the combination of 7.5% annuity rates and additional annuity credits based on the MIR that is expected to make the retiree benefits more valuable. If the plan actually earns 7.5% long term and the MIR is 5.0%, then retirees are expected to average annuity credits of 2.5%. This is roughly equivalent to receiving a benefit based on 10% returns: an initial annuity assuming 7.5% returns in all future years plus 2.5% annuity credits in the future.

If member accounts were converted to an annuity assuming a lower interest rate and the valuation included the value of long-term expected annuity credits, then retirees would share in poor experience and their benefits might not be more valuable than members electing a lump sum. For example assume:

- 1) It was decided 5% was a reasonable estimate of the long-term MIR.
- 2) Retiree benefits were calculated using a 5% annuity conversion assumption (resulting in an approximately 20% lower monthly benefit than the 7.5% conversion, all else being equal).
- 3) Annuity credits were determined based on 5%, i.e., the first allocation for retirees, if earnings met the assumption, would be $7.5\% - 5.0\% = 2.5\%$ (for DBS).
- 4) The valuation included an assumption that retirees would receive 2.5% annuity credits each year.

This would have the following results: Retirees would share in poor experience because when returns were low they would only receive benefits based on 5% returns plus past credits granted to them. Retirees would only receive the value of benefits based on returns in excess of 5% to the extent those returns actually unfolded. In any year the retirees did not receive an annuity credit, the valuation liability held for them would be reduced by 2.5% for the annuity credit that was assumed, but not received. The Program's funding would be neutral to the initial calculation of the retirement benefit because the benefit calculated at 5% interest with no annuity factors would have the same present value as the same benefit discounted at 7.5% with 2.5% assumed future annuity credits.

Basis of Projections

The calculations performed in this model are based on the results of the June 30, 2013 actuarial valuation of the DBS Program. The model also relies on the following assumptions regarding future events:

- The current actuarial assumptions/methods remain unchanged in the future. The model allows for projecting the assets forward using alternative investment returns; however, the assumption used for the interest crediting threshold remains at 7.5%.
- The size of the active population remains level and the liabilities of the retired population are 20% of the DBS Program liabilities.

- The funded ratio shown is equal to assets (market value) divided by the actuarial accrued liability.
- There are no changes in the benefit structure.

Additional assumptions apply to the stochastic assumptions:

- Future investment returns follow the Pension Consulting Alliance's 2014 capital market assumptions. For real estate and inflation-sensitive asset classes, we used the assumptions from CalSTRS investment policy. We found these assumptions to be reasonably consistent with those of other investment consultants. Based on these assumptions and CalSTRS current target asset allocation, we estimate the long-term geometric average return is approximately 7.1% with an annual standard deviation of about 14.1%. Note that the capital market assumptions are only for the next 10 years, but we have used them for the 30-year period, since this is the longest period for which they are available.
- The starting point for the projection is the June 30, 2013 actuarial valuation. For all future years, we used stochastically generated returns.
- The investment returns used in the stochastic analysis are based on 1,000 independent random generated trials. The projection of liabilities is done on a deterministic basis.
- Administrative expenses are assumed to reduce the gross return by 0.10% . .

The actual assets and liabilities in future years will vary from the projected amount to the extent actual experience differs from that projected by the assumptions and methods outlined above.

Limitations and Certification

In developing the stochastic model, we have relied upon the data, methods, assumptions and plan provisions provided to us by CalSTRS for the June 30, 2013 actuarial valuation of the DBS Program, except where noted. Please refer to that report for further details. The cost estimates presented in this letter reflect possible changes to the rules affecting interest crediting, as described in this letter. These cost estimates are subject to the uncertainties of a regular actuarial valuation; the costs are inexact because they are based on assumptions that are themselves necessarily inexact, even though we consider them reasonable.

In preparing the valuation upon which this letter was based, we relied without audit, on information (some oral and some in writing) supplied by CalSTRS staff. This information includes, but is not limited to, statutory provisions, employee data and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. It should be noted that if any data or other information is materially inaccurate or incomplete, our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into

account the experience of CalSTRS and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting CalSTRS.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Retirement Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix B of the June 30, 2013 valuation report.

Actuarial computations presented in this letter are for purposes of estimating the cost impact of changes to the interest crediting of the DBS and CBB Programs. The calculations in this letter have been made on a basis consistent with our understanding of CalSTRS current funding requirements. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this letter. Accordingly, additional determinations may be needed for other purposes.

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No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. These possible changes should be reviewed by counsel. Note that we have not explored these or any other legal issues with respect to the potential policy changes. We are not attorneys and cannot give legal advice on such issues.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this cost study letter is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the



applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

We are consulting actuaries for Milliman, Inc. We are also members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

If you have any questions, please contact us.

Sincerely,

A handwritten signature in black ink that reads "Nick Collier".

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

NJC/MCO/nlo

cc: Mr. Ed Derman
Mr. Rick Reed
Ms. Jennifer Senta

A handwritten signature in black ink that reads "Mark C. Olleman".

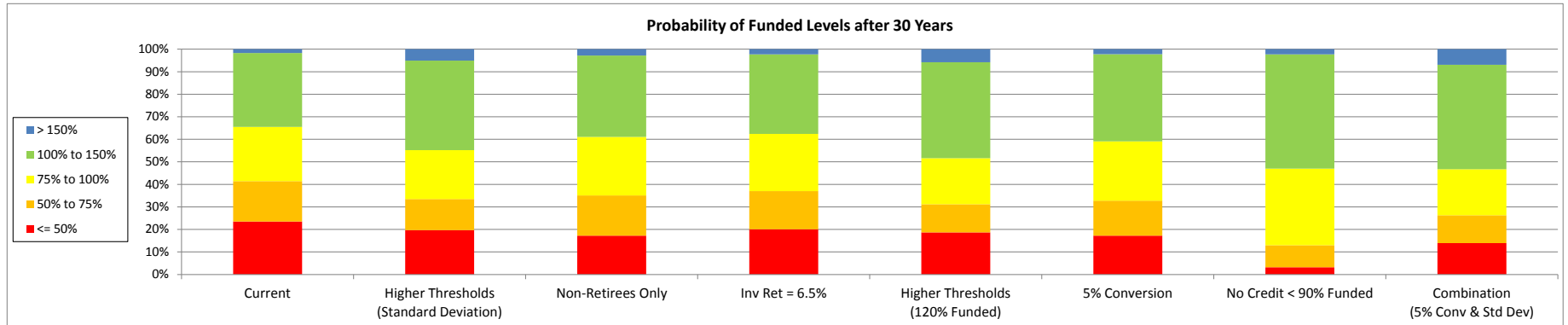
Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary

Exhibit 1

Summary Results
DBS Program Interest Credit Analysis

	Current Policy	Alternative Policies			New Alternatives			
		Higher Threshold (Standard Deviation)	Non-Retired Only	Lower Assumption	Higher Threshold (120% Funded)	5% Conversion at Retirement	0% Credit When < 90% Funded	Combination 5% @ Ret & Std Dev
Minimum Interest Rate	30-Year Treasury	30-Year Treasury	30-Year Treasury	30-Year Treasury	30-Year Treasury	30-Year Treasury	Same as Current, except 0% if Funded Ratio < 90%	30-Year Treasury
First Threshold	2 x MIR	1 x Std Dev	2 x MIR	2 x MIR	20%	2 x MIR	2 x MIR	1 x Std Dev (15%)
First Threshold Credit	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR	Excess up to Assumed Return minus MIR
Excess to Non-Retired	100%	100%	100%	100%	100%	100%	100%	100%
Excess to Retired	100%	100%	0%	100%	100%	100%	100%	100%
Second Threshold	3 x MIR	2 x Std Dev	3 x MIR	3 x MIR	30%	30%	3 x MIR	2 x Std Dev (30%)
Second Threshold Credit	All Excess	All Excess	All Excess	All Excess	All Excess	All Excess	All Excess	All Excess
Excess to Non-Retired	50%	50%	50%	50%	50%	50%	50%	50%
Excess to Retired	50%	50%	0%	50%	50%	50%	50%	50%
Return Assumption	7.5%	7.5%	7.5%	6.5%	7.5%	7.5% for valuation 5.0% for Annuity Conv.	7.5%	7.5% for valuation 5.0% for Annuity Conv.

NOTE: Hi-lited items indicate a change from the Current Policy



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