CalPERS

Finance and Administration Committee

Agenda Item 7a

December 19, 2017

Item Name: Review of Actuarial Assumptions and Discount Rate Selection

Program: Actuarial Office

Item Type: Action

Recommendation

1) Adopt new actuarial assumptions as presented in the Experience Study report to be effective with the June 30, 2017 actuarial valuations. Contribution rates due to changes in assumptions for the State and Schools will be impacted in FY 2018-19. Contribution rates for Public Agencies will be impacted in FY 2019-20.
2) Approve the discount rate recommendation corresponding to the candidate portfolio selected by the Board from the ALM process. (Refer to November 2017 Board ALM Workshop)
3) Use the recommended assumption changes in all affected member calculations effective as follows:
   a) For service credit purchase applications postmarked on or after December 20, 2017.
   b) For retirement applications dated on or after December 20, 2017.

Executive Summary

In accordance with the Board's Actuarial Assumptions Policy, The Actuarial Office (ACTO) has completed its statutorily mandated investigation (Experience Study) of the actuarial assumptions. The assumptions reviewed include both economic and demographic assumptions. This agenda item contains recommendations for new actuarial assumptions, as well as a copy of the Experience Study report.

The Experience Study report does not provide analysis or a recommendation regarding the discount rate. This assumption is analyzed separately as part of the Asset Liability Management (ALM) process. The discount rate is set equal to the expected long-term rate of return on investments, which is dependent on the asset allocation adopted by the Board. Depending on the asset allocation, costs for the pension plan could be materially different. Aside from the rate of return on investment, all other recommended assumption changes are not expected to have a material impact on contribution rates; contribution rates would vary positively or negatively by a minor amount. If adopted, these proposed assumptions would become effective with the June 30, 2017 actuarial valuations. Contribution rates for the State and Schools plans would be impacted in FY 2018-19. Public Agencies would be impacted in FY 2019-20.

See Attachment 1 for a copy of the Experience Study report.

Strategic Plan
This agenda item supports the Strategic Plan Goal A - Improve long-term pension and health benefit sustainability. This item further supports the Strategic Plan by providing employers and other stakeholders with thorough, risk-based information about the expected course and variability of future contribution rates.

Background
An experience study is a summarization of actual experience over a defined period and, along with future expectations, is used in setting actuarial assumptions. Experience studies which include reviews of both economic and demographic assumptions are required every four years under the Board's Actuarial Assumptions Policy and Government Code §20133. The previous experience study was completed in 2014. Note that actuarial standards of practice require the actuary to evaluate whether assumptions are reasonable for every valuation, so some change in assumptions could be recommended in the interim years between mandated experience studies.

Not all demographic assumptions have the same relative impact on the results of the actuarial valuations (and hence on employer contribution rates). In almost all cases, retirement benefits make up most of the liabilities of a retirement system such as CalPERS. Accordingly, assumptions that affect retirement benefits will have more of an impact than assumptions that only affect death, disability or termination benefits. Since retirement rates, salary increases and post-retirement mortality all affect the valuation of retirement benefits, these assumptions generally have a much greater impact on contribution rates than do other demographic assumptions.

Changes in economic assumptions generally have a greater impact on required contributions than changes in demographic assumptions. This is because these assumptions generally affect all benefits before and after retirement.

Analysis

Review of Economic Assumptions Other Than the Discount Rate

To perform actuarial valuations, actuaries use certain economic assumptions to set required contributions. The economic assumptions used by ACTO to determine liabilities and set contribution rates are price inflation, wage inflation, payroll growth and the discount rate.

The summary of the result of the review of economic assumptions is as follows:

- **Price Inflation:** Currently, the Board has approved an annual price inflation assumption of 2.75 percent which has been unchanged since 2012. Since the 2012 study, price inflation has consistently been under 2 percent per year. Going forward, market indicators point to an expectation that future price inflation in the range of 2.00 to 2.50 percent per year. ACTO recommends that the inflation assumption be decreased from 2.75 percent to 2.50 percent per year. This would place the assumption closer to the levels expected in the financial markets and predicted by economic models.

- **Wage Inflation:** Currently, the real wage inflation assumption is 0.25 percent. Historical data shows that increases in total compensation have generally outpaced price inflation by close to one percent; however, increasing health care costs and pension contributions leave little room for wage increases. In the current economic environment, ACTO believes that low real wage inflation in the public sector is likely to continue in the near term and is not recommending a change in this assumption.

- **Payroll Growth:** The payroll growth assumption is used as the payment escalation rate when amortizing the unfunded liability of open plans as a level percentage of payroll in accordance with the current Board policy. The current assumption is that the aggregated payroll of open plans will grow at a rate of 3 percent per year. This equates to 2.75 percent for price inflation plus 0.25 percent for real wage inflation. Since ACTO is recommending the price inflation assumption be reduced to 2.50 percent per year, the recommendation is that the annual payroll growth assumption be reduced by 0.25 percent to 2.75 percent.

Review of Demographic Assumptions

In addition to the economic assumptions, actuaries use demographic assumptions to set required contributions. These demographic assumptions include mortality rates, retirement rates, termination rates, disability rates (both industrial and non-industrial), and rates of salary increases due to seniority and promotion.

Life expectancies in the developed world are improving and this is consistent with the data in the Experience Study. Mortality improvements are reflected in CalPERS mortality rates. This is consistent with actuarial standards and best practices. Recent research indicates a slowing in the levels of mortality improvement. This is consistent with the data observed in the Experience Study.

The summary of the result of the review of demographic assumptions is as follows:

- **Mortality:** The review of mortality rates has shown that members have approximately the same post-retirement life expectancy as currently assumed. ACTO is recommending using a 15-year mortality improvement projection using 90 percent of Scale MP 2016. The 15 years was determined to be the years of projection needed to approximate the liabilities determined for the system if it were to adopt a fully generational mortality assumption. Under the proposed assumptions, the life expectancy of males is decreasing on average by about 0.1 years and is remaining unchanged for females.

- **Retirement:** The review of retirement rates has shown a continued trend of members electing to retire earlier in the State CHP and POFF plans. This was observed in the Public Agency Police 2% at 50 and 3% at 55 benefit formulas plans as well as Public Agency miscellaneous members subject to the 2% at 60 benefit formula. The review showed slightly later retirement age for most other members. No changes are being proposed for Public Agency fire members.

- **Salary Scale:** The review showed a continuation of the trend of higher than expected salary increases for Public Agency safety members and CHP members. ACTO recommends minor changes for most other groups.

- **Disability Retirement:** The review of disability experience revealed a continued trend downward in the last four years. In most cases, the proposed rates produce lower numbers of disability. No changes in assumptions are being proposed for State Miscellaneous Tier 1 males, Public Agency Police or CPO.

- **Mortality Contingency Load:** This load is applied to termination liabilities when a plan enters the Terminated Agency Pool (TAP). Given recent mortality experience plus the inclusion of assumed future mortality improvements in the base termination liabilities, ACTO recommends a reduction in this load from 7% to 5%.

- **Other:** Mixed results for other assumptions that have minimal overall impact on cost. These are described in detail in the experience study report.

See Attachment 1 for the Experience Study report detailing the development of all actuarial assumptions.

Discount Rate Selection

The primary economic assumption is the discount rate. This is the sum of assumed price inflation and the expected long-term real rate of return. In December 2016, the Board acted to lower the discount rate from 7.50 percent to 7.00 percent (phased in over three years). For the State and Public Agency plans, the June 30, 2016 valuations were completed using a discount rate of 7.375 percent (2.75 percent inflation plus 4.625 percent real return) and are scheduled to use 7.25 percent for the June 30, 2017 valuations. The implementation of this phase in for School employers is one valuation year behind the State and Public Agency plans. The ultimate reduction to 7.00 percent is scheduled for the June 30, 2018 valuations, but the Board left open the possibility that the ALM process could lead to an ultimate discount rate of something other than 7.00 percent.

At the time this agenda item was submitted, the Board had reviewed results of the ALM process but had not selected one of the four candidate portfolios presented. However, it is expected this decision will have been made prior to the time this agenda item is formally presented to the Board on December 19, 2017.

If the Board selects Portfolio C, ACTO recommends the Board maintain its previous discount rate decision of 7.25 percent for the June 30, 2017 valuations and 7.00 percent for the June 30, 2018 valuations (with a one year lag for School employers). In addition, under this scenario ACTO recommends that the proposed change in the price inflation assumption be implemented in two steps in conjunction with the decreases in the discount rate. For the June 30, 2017 valuations, ACTO recommends a price inflation assumption of 2.625 percent. For the June 30, 2018 valuations, a price inflation assumption of 2.50 percent is recommended. The phase in of the inflation rates for School employers will be one year behind the State and Public Agency plans.

In the event the Board adopts Portfolio A, Portfolio B, or Portfolio D, ACTO recommends a corresponding change to the discount rate. Our recommendations for each of these candidate portfolios are as follows:

Portfolio A – 6.50 percent discount rate beginning with the June 30, 2017 actuarial valuations and a price inflation assumption of 2.50 percent.

Portfolio B – 6.75 percent discount rate beginning with the June 30, 2017 actuarial valuations and a price inflation assumption of 2.50 percent.

Portfolio D – 7.25 percent discount rate beginning with the June 30, 2017 actuarial valuations and a price inflation assumption of 2.50 percent.

External Review of Experience Study

Under a Letter of Engagement, Cheiron, Inc. (Cheiron) was retained to perform a comprehensive review of the1997-2015 Experience Study. The scope of their review included price inflation, wage growth and payroll growth assumptions as well as the assessment of proposed rates for demographic assumptions.

Based on their review of the 1997-2015 Experience Study, Cheiron believes that the proposed assumptions are reasonable, appropriate and developed in accordance with generally accepted actuarial principles.

Cheiron suggested some areas in which adjustments should be considered. More detail on these alternatives and recommended technical changes can be found in Attachment 4. ACTO plans to consider these recommended technical changes in the next experience study.

See Attachment 4 for a copy of Cheiron's review of the Experience Study.

Impact on Employer Contribution Rates

The estimated impact of the recommended assumption changes other than the discount rate on the total employer contribution rate and the total normal cost are listed in Attachment 2. Also, included in Attachment 2 are illustrative financial impacts of a change in the discount rate should the Board select Portfolio A, Portfolio B, or Portfolio D.

Budget and Fiscal Impacts

The Experience Study and review of assumptions was prepared internally and reviewed externally. Funding was already identified within existing budgetary resources.

Benefits and Risks

Actuarial assumptions determine the expected costs of the plan. The actual long term costs of the plan will be revealed as the plan's experience is realized. Assumptions that align with future expectations are necessary if costs are to remain stable. Assumptions that are overly optimistic produce artificially low current costs but lead to significantly higher future costs. The opposite is true for assumptions that are overly pessimistic. The long-term relatively stable costs of the plan depend on actual benefits and expenses paid and actual investment earnings being realized.

By adopting the proposed assumptions, CalPERS ensures that the resulting contribution requirements reflect, to the extent possible, the true cost of the plan under the actuarial methodology and policies adopted by the Board.

Attachments
Attachment 1 – Experience Study
Attachment 2 – Impact on Contribution Rates
Attachment 3 – Review of Actuarial Assumptions Presentation
Attachment 4 – Cheiron Review of Experience Study

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