



Investment Committee

Item Number 3 – Open Session

Subject: ALM Study Discussion

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Item Type: Information

Date & Time: March 2, 2023 – 45 minutes

Attachment(s): Attachment 1 – CalSTRS Funding Plan 2022

PowerPoint(s): 2022-23 ALM

Item Purpose

The purpose of this item is to introduce the third step in the Investment Committee 2022-23 Asset Liability Management Study (ALM). The ALM is governed by the [CalSTRS Investment Policy and Management Plan](#) (IPMP).

Executive Summary

This item presents a range of different strategic asset allocation risk levels for the Investment Committee's consideration. The portfolios presented combine the capital markets assumptions, which were adopted at the January 2023 meeting, with the [CalSTRS Funding Plan](#) to show the effects of different portfolio risk levels. These examples are not a final asset allocation, but they do represent reasonable allocations and levels of risk at different long-term rates of return.

Using these representative examples enables a comprehensive analysis and discussion of the risk-return tradeoff involved with selecting a long-term allocation, which in turn funds long-term pension obligations. During the meeting, Staff will seek feedback from the Investment Committee on a desirable level of risk. Based on that feedback, Staff will return in step 4 at the May 2023 meeting with asset allocation options consistent with the desired level of risk.

Background

The Investment Committee conducts an ALM study every four years. This four-year cycle aligns the review of actuarial assumptions with the asset allocation study and facilitates a more robust collaboration between Investments and Actuarial Resources. Alignment of actuarial assumptions with the asset allocation links the long-term asset allocation decision to the ability to meet

CalSTRS’ long-term obligations. The funding of CalSTRS’ long-term obligations comes from two major sources, Contributions and Investment Returns:

Pension Benefits = Contributions + Investment Returns - Expenses

Investment returns are the largest contributor to pension benefits over time and the strategic asset allocation is the main driver of long-term investment returns. When the CalSTRS Funding Plan was adopted by the California Legislature in 2014, it set a target for the Defined Benefit Program to reach full funding by 2046. The ALM framework seeks to balance investment risk, return, long-term funding, and contribution rates consistent with that objective. Contributions and funding for pension benefits modeled in this item are based on the rate setting parameters set in statute by the CalSTRS Funding Plan.

The modeling discussed in this item builds upon the first two steps in the ALM study that laid out the strategic risk factor framework and capital markets assumptions. For this analysis, the ALM team identified investible portfolios that meet a broad range of risk-return profiles to highlight the tradeoffs of risks, return, and impacts on the liabilities. The team then modeled the liability implications of each portfolio (ability to reach full funding, contribution rates, and risk of low funding levels).

This process highlights the tradeoffs between portfolio risk, portfolio return, funded status, and contribution rates. Since the modeling in this item relies on the capital markets assumptions adopted in January and the inherent uncertainty of these assumptions, there is a degree of uncertainty in all the risk and return metrics that follow. For each portfolio modeled, there are a few key metrics that summarize the ability of the portfolio to fund benefits. Table 1 summarizes these metrics.

Table 1. Investment & Liability Metrics Definitions

Investment Metrics	
Expected Long-Term Return	Based on strategic factor weights and the capital markets assumptions, the long-term return expected from a portfolio
Expected Portfolio Risk	The expected year-to-year variability in portfolio returns
Liability Metrics	
Probability of full funding	For a given portfolio, the likelihood that the fund is at 100% or higher funded status in 2046 as targeted in the Funding Plan.

Risk of low funding	For a given portfolio, the probability that the funded status falls below either 50% or 30% at any time before 2046
Contribution rate risk	For a given portfolio, the average combined state and employer contribution rates

Portfolio Modeling & Investment Return Assumption

To make relevant comparisons across the different portfolio allocations, each portfolio was modeled with liabilities that were calculated based on an investment return assumption in line with the expected return for each portfolio. For example, the portfolio with the lowest risk profile has an expected return of 6.5%. Liabilities, contribution rates, and funding levels for that portfolio were all derived based on a 6.5% investment return assumption. For portfolios with an expected return at 7% or above using the updated capital market assumptions, the investment return assumption was kept at 7%.

Note that based on the capital market assumptions approved by the Investment Committee in January, the current long-term asset allocation has an expected return of about 7.4%. The current portfolio return is near the highest feasible risk and return portfolios modeled. While portfolios with higher levels of risk and return are theoretically possible, they would require a substantial reduction in Diversifying assets from current levels.

Tradeoffs Across Different Risk Levels

Modeling different portfolio risk levels and the implications of these portfolios for the funding plan highlight a few key tradeoffs for investment risk and the funding plan. Some of the key tradeoffs involve:

- Investment risk and return across portfolio allocations
- The likelihood of full funding versus risk of low funding
- Higher contribution rates versus lower portfolio risk and funding risk

Risk-Return Tradeoff in the Portfolio Allocation

The basic principle of a risk-return tradeoff means earning higher returns generally requires acceptance of higher risk. The portfolio modeling reflects this concept: Increasing the long-term rate of return involves increasing the allocation to the higher-risk Economic Growth strategic risk factor and decreasing the allocation to the lower-risk Diversifying strategic risk factor.

Chart 1 shows the increase in long-term expected returns with increasing levels of expected risk for the portfolios modeled. As expected, risk gradually increases with levels of return.

Chart 1. Expected Long-Term Risk Versus Return

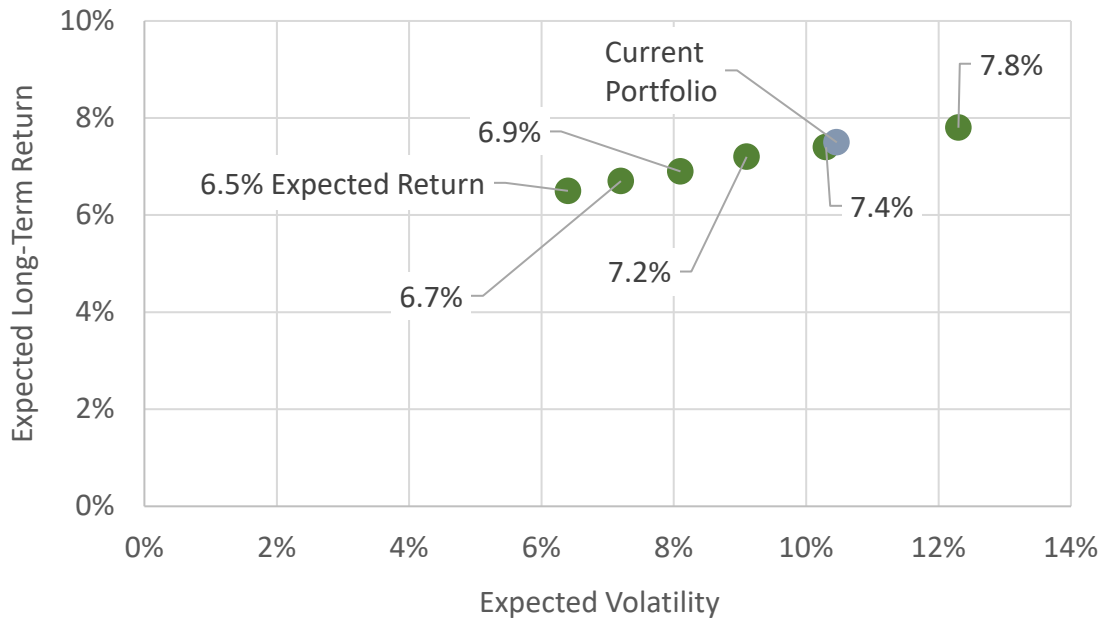
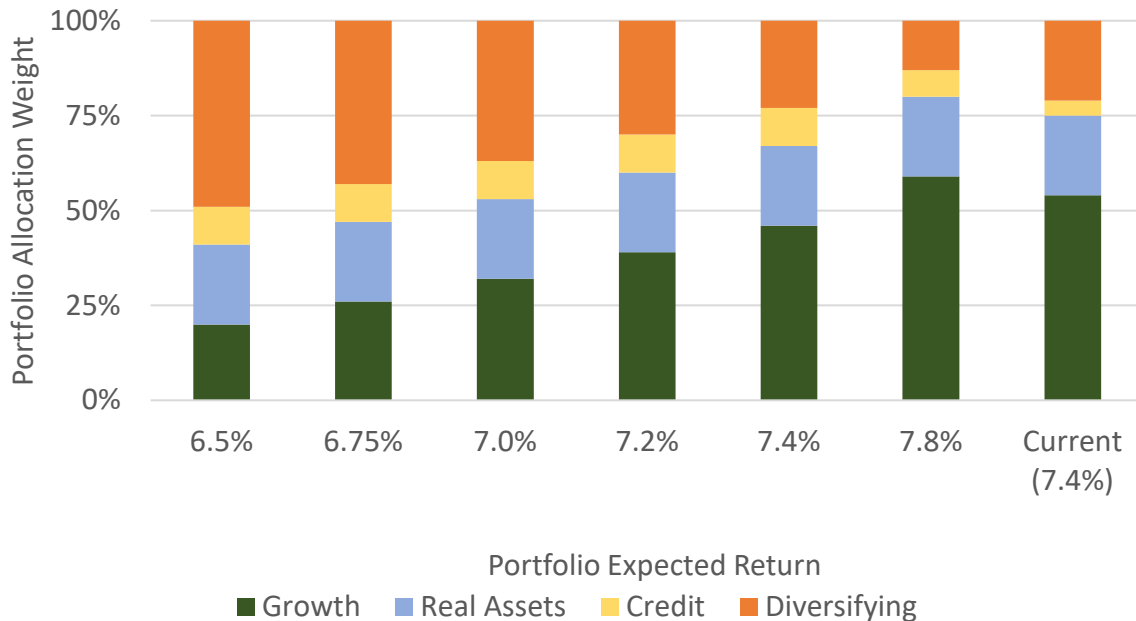


Chart 2 shows portfolio allocations across different return levels, with the portfolio return (and risk) increasing with the allocation to Growth. This is consistent with expectations and reflects the role of Growth as the primary engine of long-term returns in the portfolio.

Chart 2. Portfolio Allocations & Long-Term Returns



Funding Risk & Contribution Rates

As portfolios are being considered by the board through the ALM study, it is important to analyze the impact of each portfolio on the funding plan. For this purpose, Staff modeled the various portfolios and determined the probability of reaching full funding, the probability of low funding levels, and expected contribution rates for each portfolio.

Probability of Full Funding

Portfolios with higher expected returns and higher levels of portfolio risk will generally lead to a higher probability that CalSTRS will meet its goal of reaching full funding by 2046. Chart 3 illustrates the probability of full funding for the different expected return portfolios modeled by Staff.

Chart 3. Probability of Full Funding

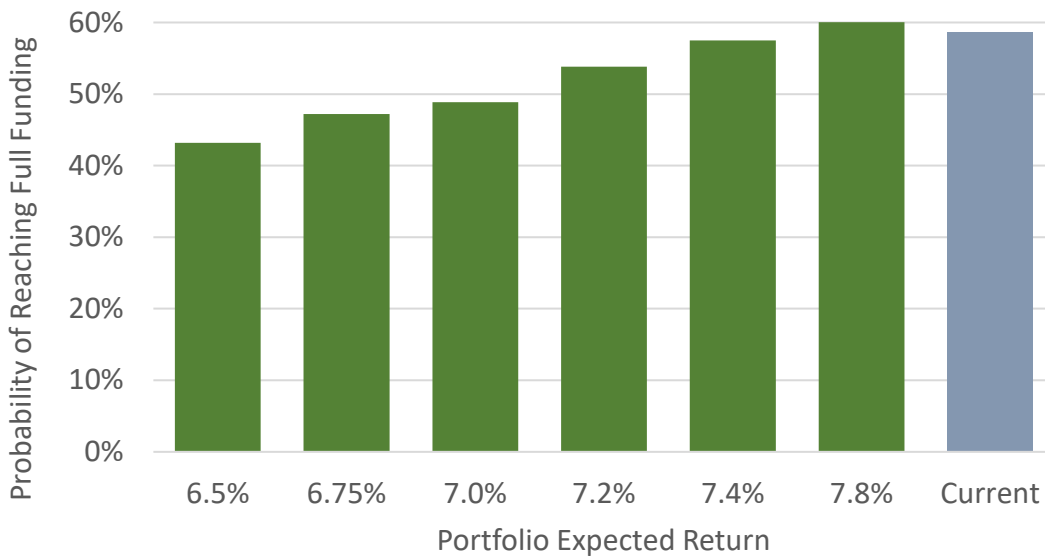


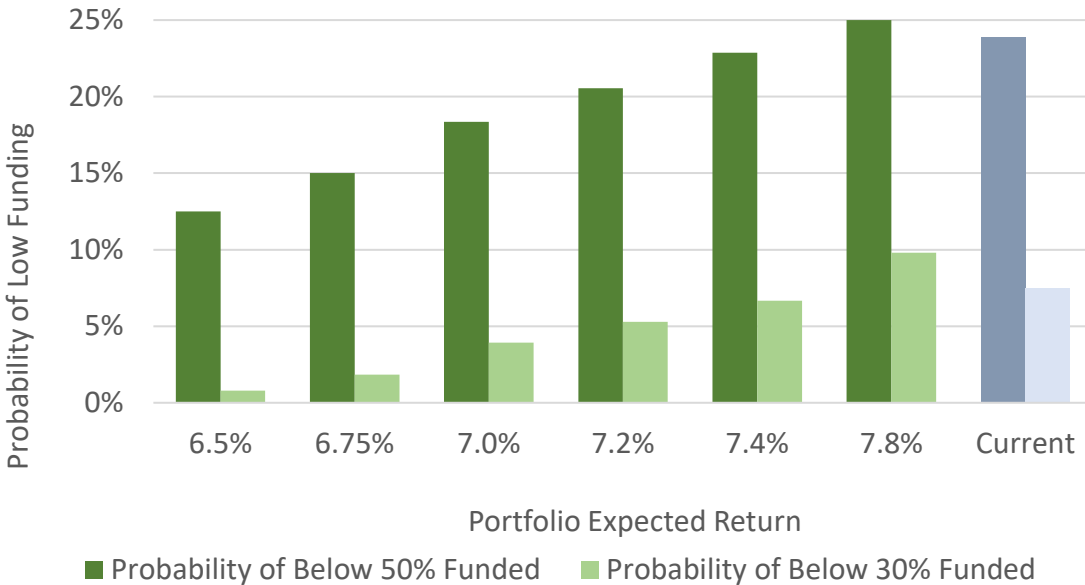
Chart 3 shows that the current portfolio has a probability of reaching full funding by 2046 of about 58%. Portfolios with expected returns near the current portfolio have very similar probabilities of reaching full funding. The lowest expected risk and return portfolio (6.5% expected return), has the lowest probability of reaching full funding by 2046 at about 43%.

Risk of Low Funding

Although portfolios with higher expected return and risks provide a higher probability of reaching full funding, their increased levels of risk also result in higher probabilities that CalSTRS will experience low funding levels between now and 2046. Chart 4 shows the

probability the CalSTRS Defined Benefit Program will drop to either 50% or 30% funded between now and 2046 for the portfolios modeled.

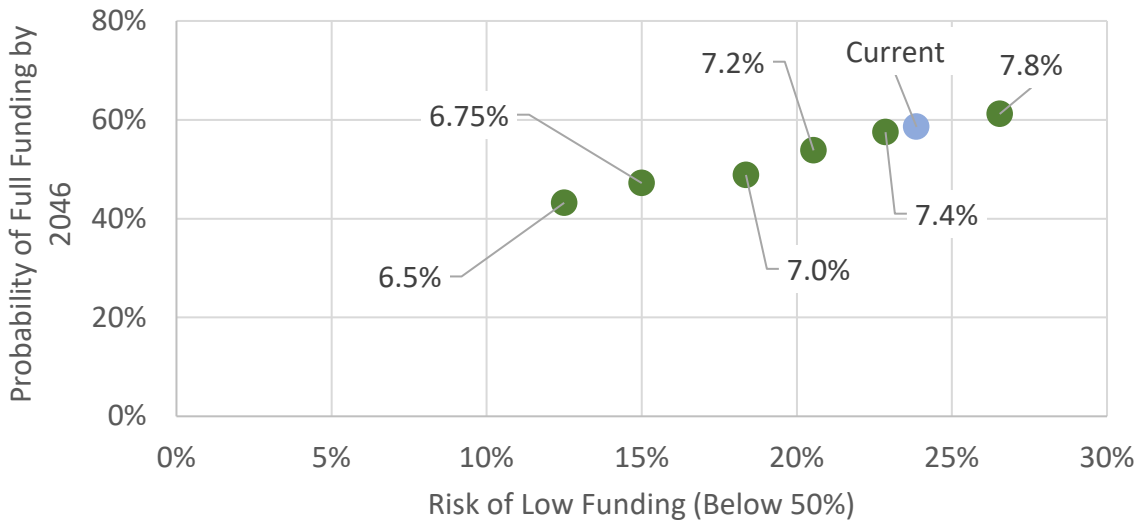
Chart 4. Risk of Low Funding



As Chart 4 shows, the highest risk and return portfolio has the highest probability that the Defined Benefit Program could fall below 50% funded or 30% funded. Portfolios like the current portfolio have similar to modestly lower levels of risk of low funding. The lowest risk and return portfolio have the lowest probability of dropping below either 50% funded or 30% funded. Note that falling below any of these levels would result in a situation where it would be unlikely or impossible to reach full funding by 2046 under the current funding plan.

The two previous charts highlight the risk of low funding and the probability of reaching full funding for different investment risk levels. Portfolios with higher expected returns and higher levels of risk will increase the chance of reaching full funding at the expense of a greater chance of seeing low funding levels. Chart 5 compares the risk of falling below 50% funded with the probability of reaching full funding by 2046 and further illustrates the tradeoff that reducing risk of low funding means reducing the risk of reaching full funding, and vice versa.

Chart 5. Risk of Low Funding vs Probability of Full Funding

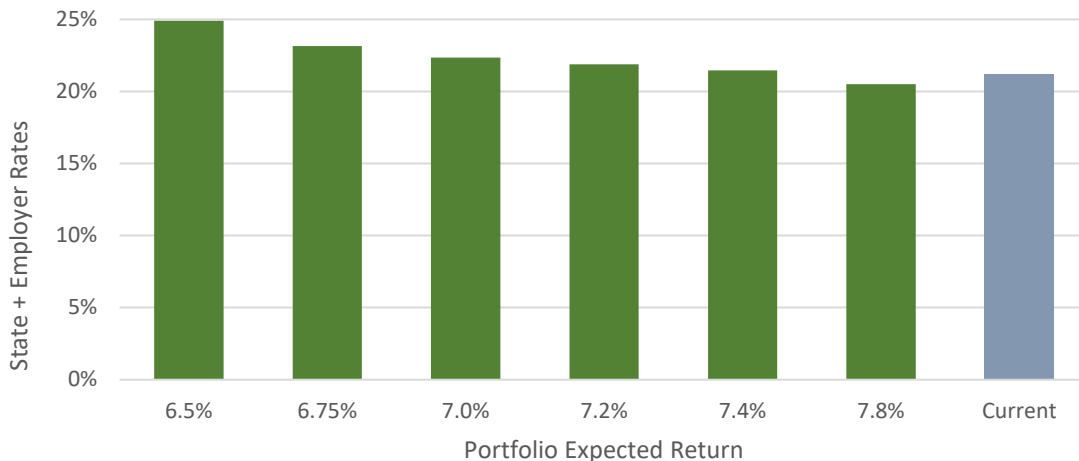


Contribution Rate Risk

It's also important to consider how various portfolios affect contribution rates for the state, employers, and members.

Generally, portfolios with higher expected returns and higher levels of risk tend to have lower average employer and state contribution rates to keep the funding plan on track of reaching full funding by 2046. Portfolios with lower expected returns and risk tend to have higher average contribution rates. Chart 6 shows the average combined state and employer contribution rate through 2046 for each modeled portfolio and highlights the tradeoff of higher contribution rates at lower investment risk levels.

Chart 6. Average Contribution Rates Through 2046



As expected, the highest risk and return portfolios have the lowest average combined contribution rate through 2046 at just above 20% of payroll, while the lowest risk and return portfolios have the highest combined average contribution rates of near 25%.

Member Contribution Rates

Member contribution rates could also be impacted by the portfolio selection. Currently, 2% at 60 members contribute 10.25% of their creditable compensation each year. This rate is set in statute and will not be impacted by the selection of the next portfolio by the board. The contribution rate for 2% at 62 members could change, however, and be impacted by portfolio selection. These members currently contribute 10.205% of their creditable compensation. This rate would be subject to change if the normal cost of the benefit were to increase by more than 1% of payroll. One of the key actuarial assumptions in the calculation of the normal cost is the assumed investment return.

Currently, the assumed investment return is 7%. Lowering the investment return assumption would impact the 2% at 62-member contribution rate. Under a 6.75% return assumption, the 2% at 62-member contribution rate would have to increase to 10.955% of creditable compensation. Under a 6.5% assumption, the 2% at 62-member contribution rate would have to increase to 11.455% of creditable compensation. Table 2 summarizes member contribution rates for the modeled portfolios.

Table 2. Member Contribution Rates

Portfolio Expected Return	6.5%	6.8%	7.0%	7.2%	7.8%	Current
Actuarial Resources-Recommended Investment Return Assumption	6.5%	6.75%	7.0%	7.0%	7.0%	7.0%
2% at 60- Members	10.25%	10.25%			10.25%	
2% at 62- Members	11.455%	10.955%			10.205%	

CONCLUSION

The strategic asset allocation decision involves a tradeoff between risk, return, funding, and contributions. If one area changes or is at risk of meeting its part of the equation, then another area must make up for the difference.

Increasing the chance of full funding in 2046 also increases the risk of low funding from higher risk of portfolio losses. Decreasing the risk of low funding increases the risk of higher contribution rate levels. The decision regarding an appropriate level of portfolio risk requires balancing the various aspects of risk and reward.

Table 3 summarizes these tradeoffs.

Table 3. Trade-Offs of Reducing Risk Below Current 7% Return Assumption

Expected Portfolio Risk	Lower
Expected Return	Lower
Likelihood of Full Funding	Lower
Risk of Low Funding	Lower
Risk of High Contribution Rates	Higher

In summary:

- a. Portfolios with higher levels of risk than the current portfolio increase the chance of full funding but also come with a material reduction in Diversification and higher risk of low funding.
- b. Portfolios with lower risk and return levels than the current portfolio reduce the risk of low funding but come with higher contribution rates and lower chance of reaching full funding.
- c. Portfolios with risk and return levels at or a little below the current portfolio have risk metrics that maintain or slightly improve the balance of full funding and risks of low funding and maintain similar levels of contribution rate risk. They also allow for continued implementation of the collaborative model, potential expansion of private credit, and involve less dramatic shifts in the asset allocation.

Staff is seeking Investment Committee feedback on the desired level of risk and return to guide and inform the asset allocation options to present in the May 2023 ALM item. Based on this feedback, Staff will return with portfolio allocation options consistent with the Investment Committee’s desired level of risk and return in the portfolio.

Strategic Plan Linkage: Goal 1 of the [CalSTRS Strategic Plan](#). Trusted stewards – Ensuring a well-governed, financially sound trust fund.

Board Policy Linkage: [CalSTRS Investment Policy and Management Plan](#)

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Optional Reference Material: *(prior board items, supplemental educational materials, etc.)*

January 26, 2023 Investment Committee - [2023 ALM Study - Capital Market Assumptions](#)

November 3, 2022 Investment Committee – [ALM Study Step 1](#)