Investment Committee

Item Number 3 – Open Session

Subject: 2023 ALM Study Discussion

Presenter(s): Geraldine Jimenez, Josh Diedesch and David Lamoureux

Item Type: Action

Date & Time: May 4, 2023 – 40 minutes

Attachment(s): Attachment 1 – Meketa Opinion Memo

PowerPoint(s): PowerPoint 1 – ALM Study Portfolio Options
PowerPoint 2 – 2023 ALM Study Discussion

Item Purpose

The purpose of this item is to present the fourth 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).

Recommendation

Staff recommends Portfolio Option A in Table 1 for the strategic asset allocation to invest the Teachers' Retirement Fund that includes the Defined Benefit Program, the Supplemental Benefit Maintenance Account, the Defined Benefit Supplement Program, and the Cash Balance Benefit Program. This strategic asset allocation option has the same expected return as the current asset allocation policy with slightly lower expected volatility due to a small increase in diversification. It maintains a high level of long-term allocation to liquid assets and downside protection with diversifying assets in Fixed Income, Risk Mitigating Strategies (RMS), and Cash. It also increases Fixed Income to fund its Private Credit Direct Lending strategy and it increases the allocation to Private Equity and Inflation Sensitive to expand private investments in the transition to a low carbon economy. All of these changes result in improved risk-adjusted returns for the portfolio.

Table 1. Long-Term Allocation Policy Target Recommendation

Asset Class	Option A (Recommended)	Current Policy	Change
Global Equity	38%	42%	**-4%**
Private Equity	14%	13%	**+1%**
Real Estate	15%	15%	
Inflation Sensitive	7%	6%	**+1%**
Fixed Income	14%	12%	**+2%**
Risk Mitigating Strategies	10%	10%	
Cash	2%	2%	

Executive Summary

This item presents four asset allocation options, including a staff recommendation, for the Investment Committee's consideration. At the March 2023 meeting, the Committee requested that Staff return with allocation options consistent with a 7% investment return assumption and a risk / return profile in a range similar to the current allocation policy. All four portfolios presented in this item reflect that guidance.

Background

The objective of this fourth step in the ALM study and, if needed, the fifth and final step, is to adopt the long-term asset allocation policy targets for the portfolio. The long-term policy targets are the single most important Investment Committee decision that affects the long-term success of the CalSTRS trust. The targets are also the "north star" for staff implementation of the portfolio, defining the Committee's strategic risk and return objectives of the portfolio.

At the March 2023 meeting, staff presented a range of portfolio options reflecting different risk-return profiles and resulting liability metrics. Staff recommended portfolios similar to the current policy targets as they have risk metrics that maintain or slightly improve the balance of full funding and risks of low funding, while maintaining similar levels of contribution rate risk. The Investment Committee requested staff return with portfolio options with an expected return of 7.0% to 7.4% After modeling portfolios in this range and considering feasibility of implementation, staff narrowed the range of expected returns to 7.2% to 7.4% The primary reason for this was consideration of staff's ability to implement the sizeable allocation shift in assets required to reach an expected return below 7.2% prior to the next ALM study in four years.

Table 2 shows the detailed asset class allocations, the investment risk and return metrics, and the key liability metrics of each option. It shows that each option maintains a risk-return profile

consistent with a 7% investment return assumption. It also shows that the options presented generally maintain similar key liability metrics, including likelihood of full funding, risk of high contribution rates, and the risk of low funding.

Table 2. Asset Allocation Option Summary Table

		Option A (Recommended)	**Option B**	**Option C**	**Option D**	**Current**
Policy Weights	Global Equity	38%	37%	36%	35%	42%
	Private Equity	14%	13%	13%	12%	13%
	Real Estate	15%	15%	15%	14%	15%
	Inflation Sensitive	7%	7%	6%	5%	6%
	Fixed Income	14%	16%	18%	22%	12%
	Risk Mitigating Strategies	10%	10%	10%	10%	10%
	Cash	2%	2%	2%	2%	2%
Risk/Return	Expected Return	7.4%	7.4%	7.3%	7.2%	7.4%
	Investment Return Assumption	7.0%	7.0%	7.0%	7.0%	7.0%
	Expected Volatility	10.1%	9.8%	9.7%	9.4%	10.4%
	Sharpe Ratio	0.402	0.401	0.401	0.397	0.392
Liability Metrics	Probability of Full Funding by 2046	58.6%	57.5%	56.6%	54.3%	58.4%
	Average Contribution Rate through 2046	21.5%	21.7%	21.8%	22.0%	21.5%
	Probability of <50% Funding at any point	21.2%	21.1%	21.0%	21.2%	23.0%
	Probability of <30% Funding at any point	5.3%	5.2%	5.1%	5.0%	6.2%

Relative to current asset allocation policy, Portfolio Option C and Portfolio Option D involve lower risk and return, but are still consistent with a 7% return assumption. They have small changes to the key liability metrics with a lower chance of full funding and slightly higher contribution rates, but slightly lower chance of low funding. Portfolio Option B has very similar metrics to the current portfolio with just a slightly lower level of risk and return.

Portfolio Option A, the recommended portfolio, maintains the same expected return as the current policy with a slight decrease in expected volatility. It provides an incremental shift in the asset allocation policy, minimizing cost while recognizing the uncertainty in projecting future returns and avoiding over-reacting to the short-term market environment. It also marginally improves diversification by shifting from Public Equity to Inflation Sensitive and Fixed Income.

Portfolio Option A does involve a small decrease in liquid assets with the modest shift from liquid Global Equity into Private Equity, Inflation Sensitive, and Fixed Income for Direct Lending. This option achieves two important objectives:

1. Increased allocation to private markets in Private Equity and Inflation Sensitive to support investments in the Sustainable Investments & Stewardship Strategies (SISS) portfolio and supports CalSTRS' Net Zero strategy. The shifts to Private Equity and Inflation Sensitive also provide further opportunity to provide improved risk-adjusted returns through the Collaborative Model.
2. Increased allocation to Fixed Income develops its Private Credit Direct Lending strategy. Developing the Direct Lending strategy in Fixed Income provides a valuable complement to the existing public Fixed Income portfolio. It offers the opportunity for improved risk-adjusted returns for the total fund, and has a modest diversification effect by shifting from Global Equity to a relatively more stable income profile in Direct Lending.

In forming the recommendation and the included portfolio options, staff considered a range of risks and objectives, including consistency with funding plan objectives, incremental changes with a focus on the long-term market environment, liquidity risk, climate transition risk, geopolitical risk, feasibility of implementation, and diversification. Staff also collaborated extensively with Meketa on the portfolio options, climate transition risk, and geopolitical risk.

Increases to Private Equity & Inflation Sensitive

The increase to Private Equity improves the long-term risk-adjusted return to the portfolio due to the higher risk-adjusted returns available in Private Equity relative to Global Equity. Some of the difference comes from alpha opportunities and the potential to earn an illiquidity premium in private markets. The increase to Inflation Sensitive slightly reduces the fund's exposure to Economic Growth risk. This increases the allocation to relatively more stable, income-driven investments that can sustain performance in inflationary periods and improves overall portfolio diversification.

Both changes increase allocation capacity for SISS private market investments in the low carbon transition. Transition risk modeling prepared by Meketa (discussed later in this item) suggests that a disorderly transition may lead to greater uncertainty and lower returns that negatively affect the long-term performance of the fund. Over the long term, investments that support an orderly transition should reduce risk and improve risk-adjusted returns.

Increase to Fixed Income

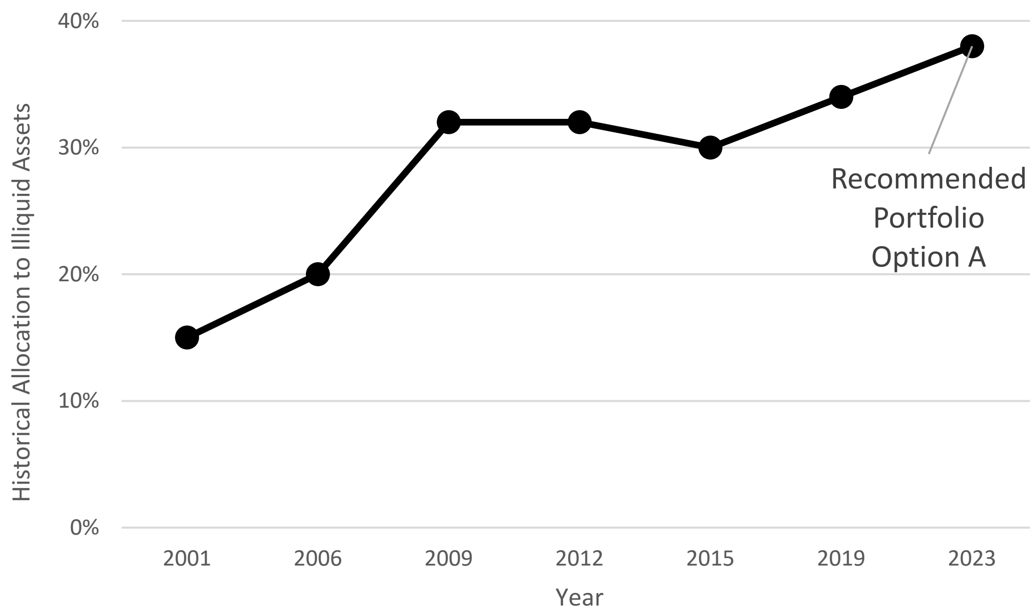
The 2% shift to Fixed Income will fund its Direct Lending strategy. Step 1 of the ALM, at the November 2022 Investment Committee and the February Board education session, introduced Direct Lending. The shift from Global Equity to Direct Lending provides a small reduction in Economic Growth risk, adding a modest diversification benefit. As a somewhat more stable income-driven strategy, Direct Lending also improves fund risk-adjusted returns and can serve as a valuable complement to public credit investments in Fixed Income.

Liquidity

Liquidity in the portfolio, especially in the strategic asset allocation, involves a couple of important considerations. One consideration is having sufficient liquid assets – assets / strategies that can be readily bought or sold, or "operational liquidity" – to meet ongoing obligations. These obligations include member benefit payments, private market capital calls, and derivative margin flows. Another important consideration for the ALM study is the degree of flexibility to rebalance the portfolio as needed while also funding long-term investment opportunities, or "strategic liquidity."

Staff uses a multi-faceted approach to manage these considerations in the portfolio implementation. This includes daily and weekly cash forecasting, oversight from the senior leadership team, and a cross-team approach to monitoring and managing potential liquidity needs and sources. This approach has developed over time as the allocation to illiquid assets has increased. Chart 1 shows the historical policy target for illiquid assets over time.

Chart 1. Historical Allocation to Illiquid Assets



Operational Liquidity

Staff uses a few different tools and approaches internally to ensure adequate liquidity to meet near-term obligations. This includes a projection of cash flows produced weekly that includes benefit payments and contributions, any supplemental payments, private market capital calls and distributions, and other strategy flows across asset classes. Staff conducts further stress testing and scenario analyses of private market cash flows and portfolio returns to assess potential

liquidity needs. This cash forecasting and modeling supports the decisions made by the senior leadership to determine an adequate level of portfolio liquidity and, if needed, decide the amount, timing, and source of additional liquidity needed.

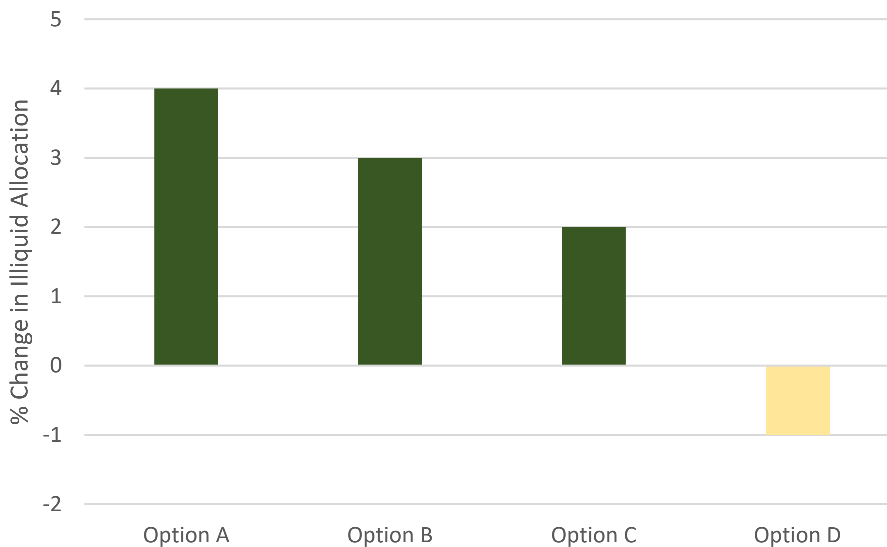
Strategic Liquidity

Long-term asset allocation analysis in the ALM study generally assumes that the portfolio can maintain investments at the long-term targets year after year. With private markets in the portfolio, however, the fund can deviate somewhat from these targets. Because private markets are largely illiquid – they can't be readily bought or sold without large transaction costs – these allocations can remain "sticky" for periods of time. This "stickiness" can lead to periods where the portfolio remains underweight or overweight private markets, with public markets offsetting the difference. The higher the allocation to private markets, the greater the chance there is an imbalance in the allocation. This imbalance can limit flexibility to reallocate to other strategies.

Increasing the Allocation to Illiquid Assets

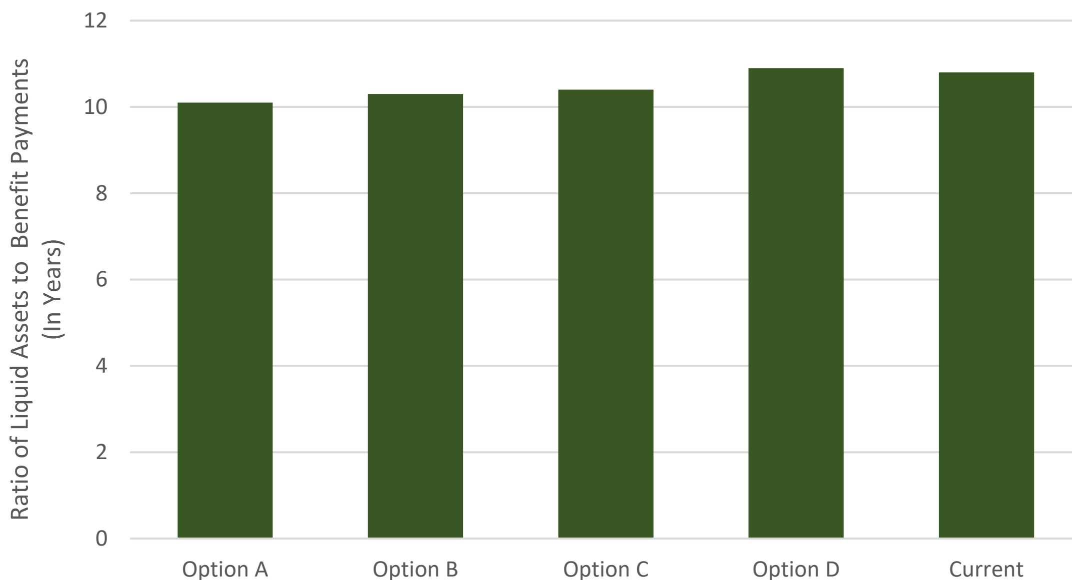
In assessing risks to operational liquidity and strategic liquidity in the ALM study, the total amount of liquid assets (including cash) is a simple but intuitive way to compare liquidity across different portfolio options. Staff has explored different approaches for quantifying whether a portfolio has sufficient liquidity, including simulations and scenario analyses of available liquidity to quantify the degree of flexibility to rebalance the portfolio and fund obligations. The result of these analyses led staff to focus on the total amount of illiquid assets in assessing risks associated with allocating to illiquid strategies. Chart 2 highlights the change in illiquid assets relative to the current asset allocation policy, showing that the recommended portfolio has a 4% higher allocation to illiquid assets versus the current portfolio.

Chart 2. Change in Illiquid Assets vs Current Policy



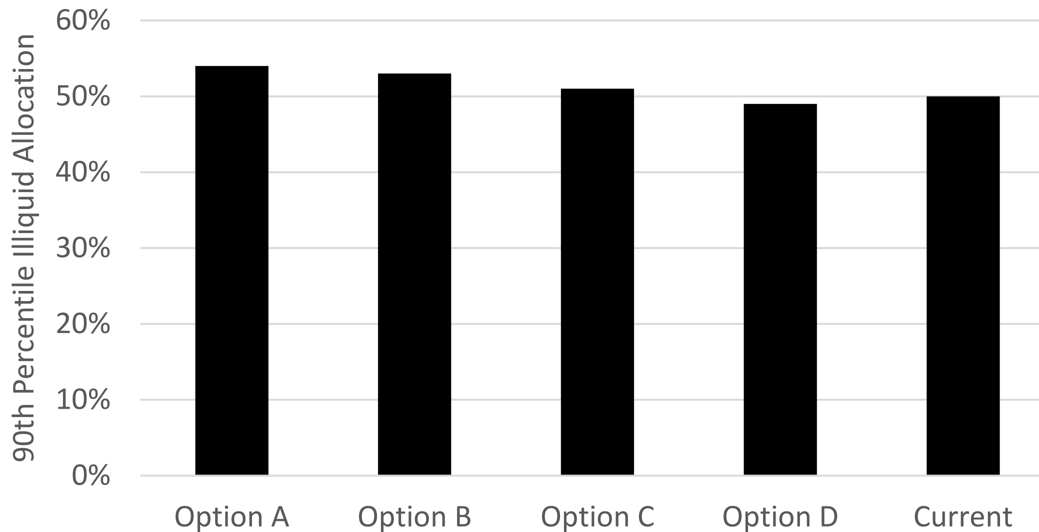
One measure of potential operational liquidity risk – having sufficient liquid assets to meet obligations – is the ratio of liquid assets to gross benefit payments. Chart 3 shows the ratio for all portfolio options and the current allocation policy. Option A, the recommended portfolio, has the lowest ratio at 10.1 versus the current portfolio at 10.8 and the most liquid portfolio, Option D, at 10.9. All the portfolios have a similar ratio of approximately 10. This means that, barring any other changes to the portfolio or any cash inflows, all portfolios have sufficient liquid assets to fund benefit payments in the near term.

Chart 3. Liquid Assets to Benefit Payments Ratio (Years of Benefit Payments)



Given the "stickiness" of illiquid assets over time, a higher allocation to these assets increases the likelihood that they reach a higher share of the overall portfolio allocation over time, limiting flexibility. To assess this risk, staff simulated the allocation to illiquid assets for the different portfolios. Based on this modeling, Chart 4 highlights the 90th percentile allocation to illiquid assets over time. It shows that for the current policy, there's approximately a 10% chance that illiquid assets exceed 50% of the portfolio over time. The recommended portfolio has a 10% chance of exceeding approximately 54% over time, the highest of the portfolios modeled.

Chart 4. Long-Term Illiquid Asset Risk



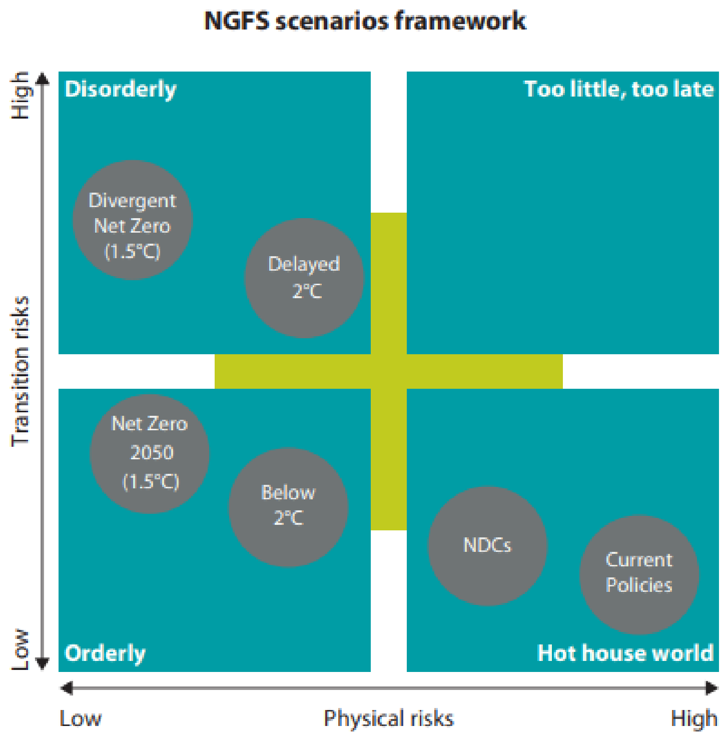
While the recommended portfolio includes a higher allocation to illiquid assets than the current policy, slightly raising the level of liquidity risk in the portfolio, staff believes the benefits of the increase outweigh the small increase in liquidity risk. The benefits include improved diversification and slightly higher risk-adjusted returns. Additionally, staff is enhancing and formalizing a balance sheet and liquidity management plan to address liquidity needs across the total fund.

Climate Transition Risk

Staff worked extensively with Meketa to understand potential transition risk in the strategic asset allocation. Integration of transition risk with the strategic asset allocation is a new and developing area of analysis. Staff recognizes the uncertainty associated with the long-term path of the low carbon transition and linking transition risk with the strategic allocation. But staff believes that uncertainty is ever-present in this study, particularly with the long-term capital markets assumptions and that understanding potential transition risk is an important tool in the ALM study.

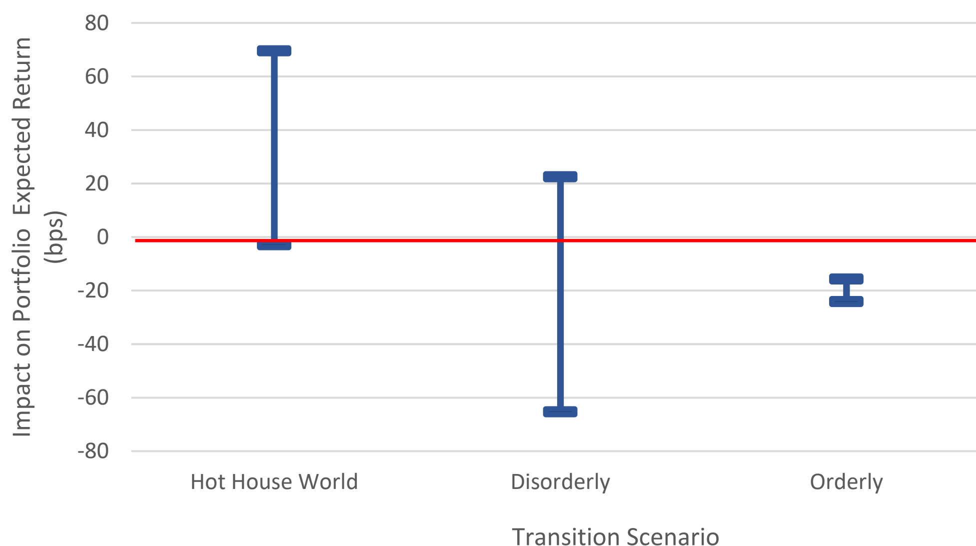
To help understand potential transition risk, staff identified a scenario framework consistent with the analysis provided in September 2022 supporting the 20% Global Equity allocation to the MSCI Low Carbon Target Index (LCT). In that analysis, staff sought to quantify the possible range of outcomes across six scenarios developed by the Network for Greening the Financial System (NGFS). For this ALM study, staff aggregated the six scenarios in the NGFS framework into three primary categories of transition risk: Orderly Transition, Disorderly Transition, and Hot House World. Figure 1 shows the NGFS scenario framework aggregation into the three categories.

Figure 1. NGFS Scenario Framework



Staff worked with Meketa to understand potential transition risk in the three primary NGFS categories for each of the four portfolio options considered here. Meketa's model seeks to relate the path of important macro-economic variables in the three different transition categories to long-term return outcomes in the four different portfolios. Chart 5 shows the potential range of effects on long-term returns for the portfolio options based on Meketa's modeling. The details of Meketa's modeling are in Meketa's Opinion Memo (Attachment 1).

Chart 5. Return Impact Under Different NGFS Transition Scenarios (through 2046)



After extensive collaboration with Meketa to understand their process and the analysis they conducted, staff identified the following key takeaways:

- The analysis reflects the assumption that the path to a low carbon future is not fully priced by the market.

- The range of possible outcomes across the three different scenario categories is wide but the differences between the four portfolio options are relatively small for any given category

- A disorderly transition could lead to more severely negative outcomes for the different portfolios. These negative outcomes would result from the delayed introduction of climate policies across geographies and the ensuing need to rapidly reduce emissions, likely resulting in price spikes and growth disruptions, in order to meet eventual decarbonization goals.

- The analysis focuses on potential transition risk effects over the period of the CalSTRS Funding Plan (until 2046). It's likely that incorporating physical risk beyond the timeframe of the funding plan analysis would have a profound effect on the results. This is especially true for the "Hot House World" category, where portfolio expected returns would almost certainly skew significantly negative over a long time period as it would capture the high, extreme long-term cost of physical climate risks in such a scenario.

- A critical component of this analysis is that it assumes investments in a broad index representative of each asset class and, importantly, does not reflect mitigation efforts like Global Equity's targeted 20% allocation to the MSCI ACWI LCT Index and CalSTRS' ongoing efforts to reduce emissions in the economy through corporate and policy maker engagement.

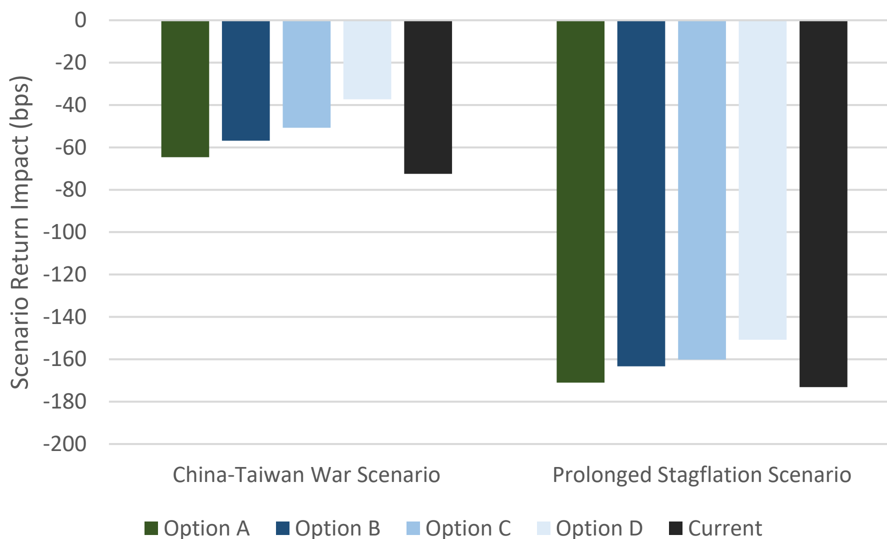
- The potential negative returns associated with the low carbon transition, as well as the possibly more severely negative outcomes in a disorderly transition, support ongoing long-term measurement and mitigation efforts like the LCT allocation and development of the Green-Olive-Grey framework to identify climate-related risks and opportunities in the private markets.

Macroeconomic Risk, Geopolitical Risk, and Diversification

Exposure to Economic Growth, particularly through Global Equity and Private Equity, is a major driver of portfolio risk and return. This exposure is the "engine" providing long-term returns to fund the CalSTRS Trust. In the shorter to medium term however, exposure to economic growth can lead to drawdowns in the portfolio from exposure to business cycle fluctuations, market dislocations, and geopolitical risk, among other sources.

Staff worked with Meketa to model two specific geopolitical scenarios discussed in the October 2022 Board offsite: a prolonged stagflation environment and a China-Taiwan armed conflict. Chart 6 shows the performance of the four portfolios and the current portfolio based on Meketa's modeling. It shows that the portfolios perform similarly, with the recommended portfolio Option A slightly better than the current policy. The two lower risk portfolios perform slightly better than the rest, as expected. But all the portfolios perform similarly.

Chart 6. Geopolitical Scenario Returns



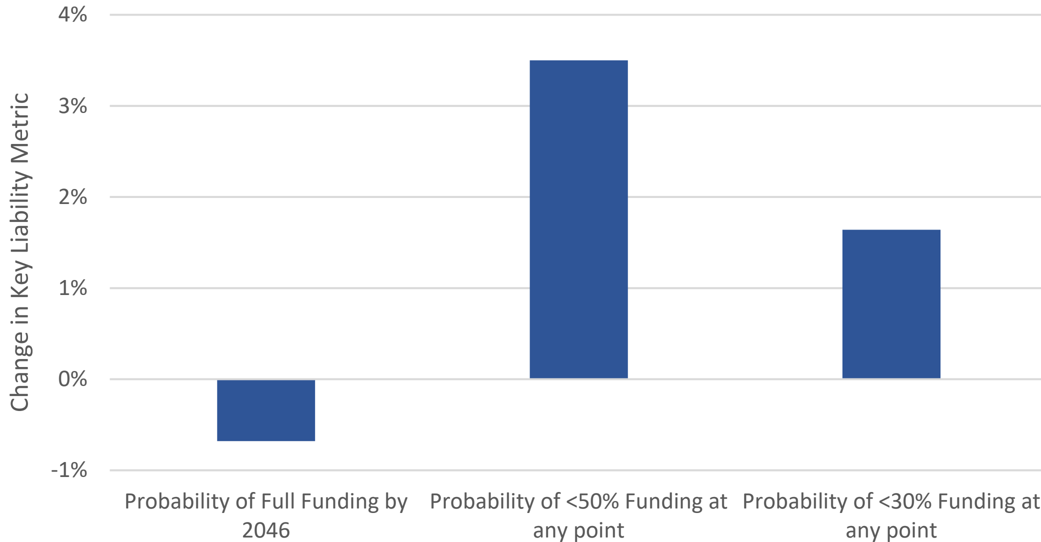
The Meketa analysis highlights two possible scenarios. But with a global portfolio invested in a range of markets, and with a significant exposure to Economic Growth, the fund is exposed to a wide range of possible risks. Some of these risks are readily foreseeable with uncertain timing, like periodic economic recessions. And some are nearly or completely unpredictable. The greatest mitigant against this wide range of possible risks is portfolio diversification.

By investing in assets exposed to a broader range of risk and return drivers – in other words, diversifying investments – the fund can smooth the long-term path of returns. As a mature pension plan with negative cash flows over the long-term, the fund benefits from this smoother path. And by investing in assets that tend to provide diversification to Economic Growth risk, the fund benefits significantly.

While Global Equity and Private Equity are the primary engines of long-term returns, Diversifying assets in Fixed Income, RMS, and Cash dampen drawdowns and help smooth long-term returns. Fixed Income primarily comprises short to medium term government and high-quality bonds. RMS comprises long-term government bonds and other strategies chosen specifically for their diversification properties.

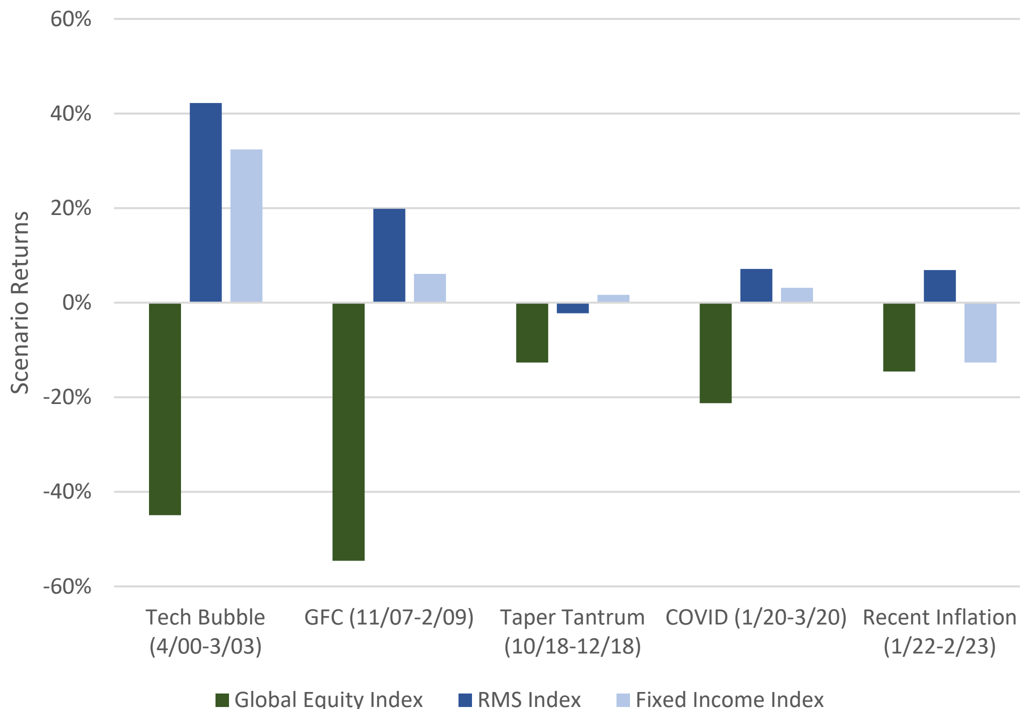
In the long-term, allocations to these diversifying strategies improves the likelihood of full funding and reduces the risk of low funding. Chart 7 highlights the difference between the current policy and a hypothetical portfolio with the same expected return but no Diversifying assets. Because this hypothetical portfolio lacks diversification, it has a lower chance of full funding and a higher risk of low funding.

Chart 7. Change in Key Liability Metrics (Hypothetical Portfolio Without Fixed Income or RMS)



The value of diversifying assets can also be readily seen in specific historical scenarios. These scenarios highlight that having a range of diversifying strategies in Fixed Income and RMS provides additional benefit to the fund. Chart 8 shows the performance of a broad global public equity benchmark, a Fixed Income benchmark, and an RMS benchmark in different historical drawdown periods.

Chart 8. Historical Return Scenarios



In all cases, the Diversifying assets (RMS Index and Fixed Income Index) outperformed the large drawdowns in the Global Equity Index. In most cases, they provided positive returns when equities were negative. And lastly, it shows that in some cases Fixed Income assets perform better and in others, RMS assets performed better, highlighting the value of a comprehensive approach to diversification.

Implementation & Policy Changes

Should the Investment Committee adopt the recommended portfolio? Staff will return with subsequent policy changes and an implementation plan to support the transition from the current policy to the new targets. Transition to the new targets is expected to take place in steps that depend on market opportunities. Potential policy changes include:

1. Updates to the new Investment Policy Statement

    a. The new long-term strategic asset allocation policy targets and transition plan

    b. Asset allocation ranges around the strategic targets allowing for increased rebalance flexibility

    c. The Opportunities Portfolio and SISS private investments as a component of the strategic asset allocation

    d. Balance Sheet/liquidity strategy

    e. Update the Cash Balance Program's asset allocation to mirror long-term strategic asset allocation targets adopted in the ALM study, including the allocation to Private Equity and Real Estate

2. Update the Fixed Income Investment Policy to include the 2% allocation to Direct Lending

3. Expand the Innovative Strategies Policy to incorporate the SISS and Opportunistic strategies up to 5% of the total fund

CONCLUSION

The long-term asset allocation decision involves balancing tradeoffs around risk and return, funding levels and contribution rates, and a wide range of possible scenarios in the economy, geopolitics, and more. Staff recommends adoption of Portfolio Option A as it balances funding levels and contribution rate changes while improving diversification; it maintains a significant long-term allocation to liquid assets; it offers incremental changes; it provides downside protection through the allocation to diversifying assets in Fixed Income, RMS, and Cash; and it gives needed flexibility to fund the Fixed Income Direct Lending strategy and private investments in the low carbon transition.

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.)*

March 02, 2023 Investment Committee - ALM Study Discussion

January 26, 2023 Investment Committee - 2023 ALM Study - Capital Market Assumptions

November 3, 2022 Investment Committee – ALM Study Step 1