Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 14

MEETING DATE: June 16, 2021

SUBJECT: Asset Liability Modeling Study

SUBMITTED FOR: ___ Consent ____ Deliberation and Action _X_ Receive and File

RECOMMENDATION

Staff recommends that the Board receive and file the asset liability modeling (ALM) study presentation by SCERS' general investment consultant, Verus Advisory, and Staff.

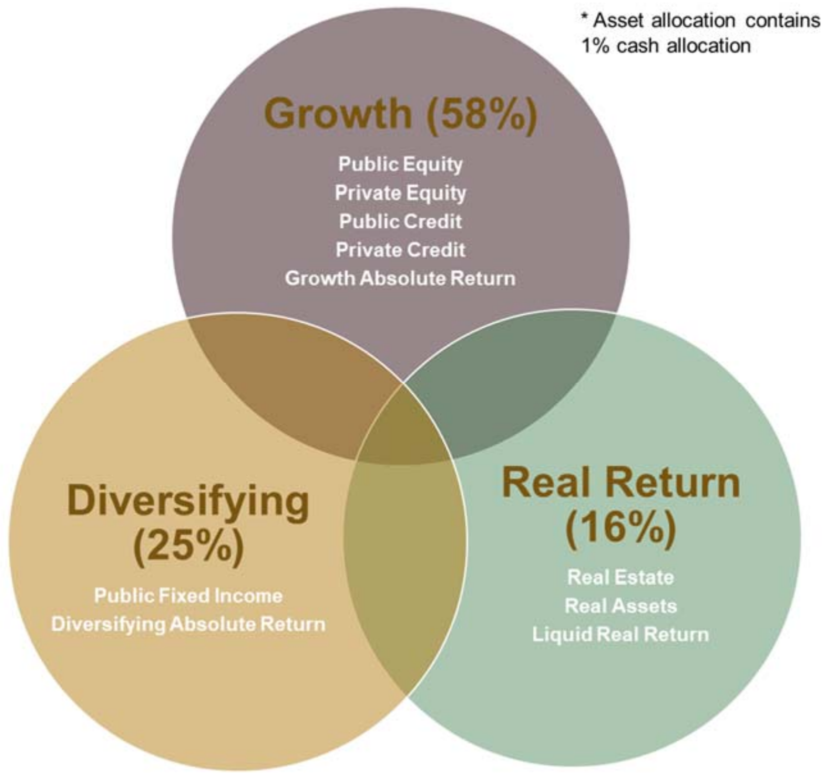
PURPOSE

This item supports the 2021 Annual Investment Plan, which identifies conducting an asset liability modeling study in 2021, and supports SCERS' Master Investment Policy Statement, which calls for an ALM study to be conducted at least every five years.

BACKGROUND

Over the past few months, SCERS has been working on an ALM study with the assistance of SCERS' general consultant, Verus.

SCERS' current strategic asset allocation takes a functional approach that blends traditional and alternative asset classes, and links asset classes exposed to similar economic environments and risk factors. The asset allocation breaks the portfolio into three asset categories, Growth, Diversifying, and, Real Return, with greater complexity reserved at the asset class level.

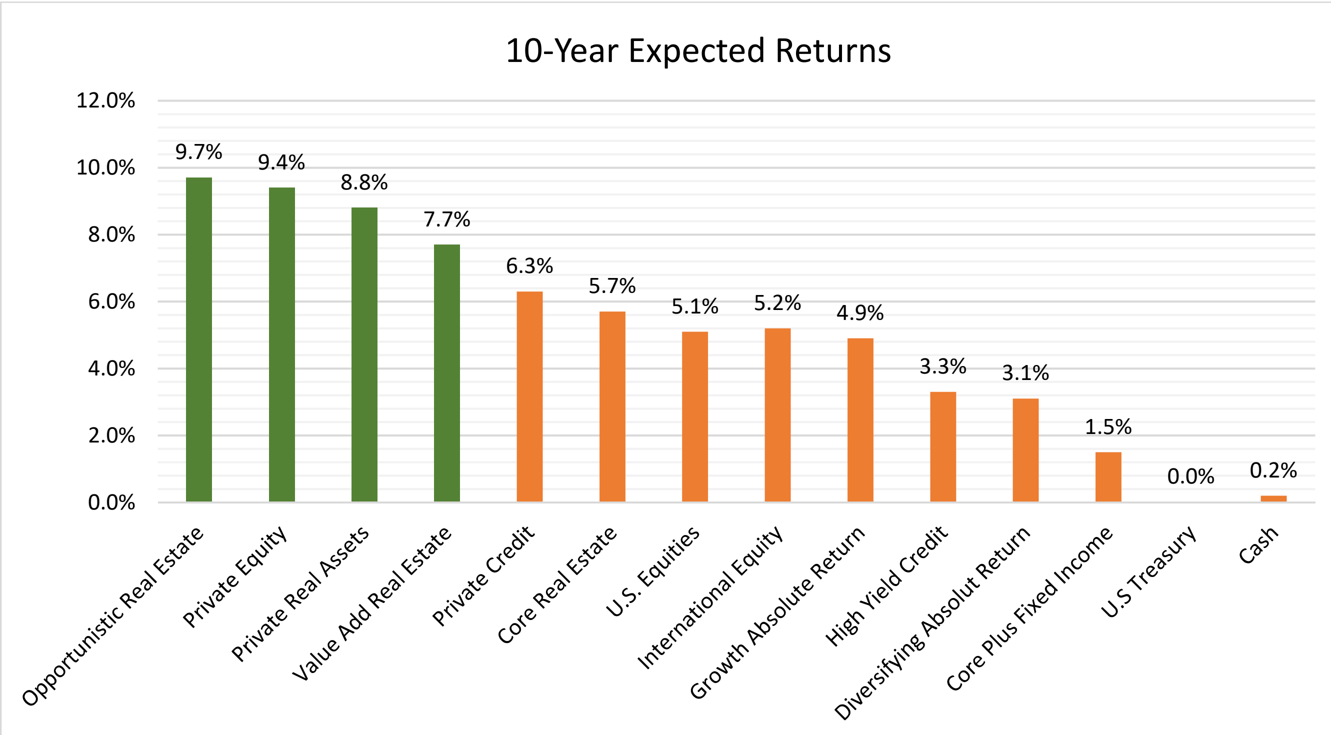


The strategic asset allocation takes a somewhat risk-balanced approach that emphasizes having enough return-generating, growth assets to drive performance toward the actuarial rate of return, but also maintaining enough uncorrelated/diversifying, cash-flowing, and inflation-sensitive assets to reduce downside risk and the range of outcomes that the portfolio is subject to. It has a meaningful allocation to private/illiquid assets, but a reasonable liquidity profile as measured by an annual liquidity analysis conducted by Verus.

The last asset allocation study in 2017 concluded with significant changes to SCERS' portfolio, which are still being implemented today, so it is anticipated that recommended changes from this ALM study should be less significant, and will build upon the 2017 study by retaining a functional asset allocation framework. A greater focus has been placed on sizing of existing assets classes, evaluating the role of certain portfolio segments, and portfolio construction modifications within asset classes.

With the low interest rate environment and the strong returns that most market segments have experienced over the past few years, current capital market assumptions (CMAs) show that most asset classes have seen their expected returns decrease and expected risk increase. Using updated CMAs, SCERS' current strategic asset allocation models to a 5.4% return, versus SCERS' 6.75% actuarial rate of return. The 5.4% return is down from a modeled expected return of 6.5% in January 2020 using last year's CMAs.

As noted during the April Board meeting, the only asset classes that currently have a return expectation above SCERS' actuarial rate of return include private equity, non-core real estate (opportunistic and value add), and private real assets.



These asset classes currently make up only approximately 18.5% of SCERS' asset allocation, so to model a portfolio near the actuarial rate SCERS would need to increase the allocation to these segments and reduce exposure to lower returning segments such as fixed income, which would increase SCERS' risk profile, including its illiquid footprint. A 60/40 (public equity/fixed income) portfolio has historically returned over 7%; however, the projected 10-year return is well under 5%, due to the muted returns for both public equity and fixed income.

At April's Board meeting, Verus presented several wide-ranging asset allocation mixes that could move toward and/or meet SCERS' actuarial rate of return of 6.75%. There were two asset mixes that modeled to the actuarial rate. One of the mixes increased SCERS' exposure to Private Equity from its current target of 9% to 24%, combined with a reduction in lower-returning fixed income and cash exposures, to move the portfolio to the actuarial rate of return of 6.75%. This represented an unrealistic portfolio, as it would significantly reduce SCERS' liquidity profile in addition to reducing a bulk of the uncorrelated 'anchor to safety' fixed income assets.

Another mix added portfolio leverage to increase returns to the actuarial rate. While this is not an avenue that Staff and Verus would recommend for SCERS at this time, the use of portfolio wide leverage is used by some institutional investors for a variety of reasons, including increasing returns.

The April modeling also included a couple of less wide-ranging portfolios that would move SCERS closer to the actuarial rate, though still below the target return. The April meeting concluded with direction for Verus and Staff to come back at a subsequent meeting with more fine-tuned asset mix modeling for the Board to evaluate.

PORTFOLIO CONSIDERATONS

The objective of the June meeting is to present several less ranging, and more realistic asset mixes, that can move SCERS a bit closer the actuarial rate, while maintaining a reasonable risk profile.

Another objective of the June meeting is to run though the major asset classes to highlight some sizing and structuring considerations, including which asset classes might support a larger allocation, and to identify portfolio segments that might not have as important of a role going forward.

A few meaningful structural changes have been modeled and are described below, and are also reflected within the asset allocation mixes that Verus is presenting.

Global Equities:

Within the modeled asset allocation mixes, Verus and Staff have modeled the Public Equity portfolio as one Global Equity asset class, rather than separate asset classes for Domestic Equity and International Equity. Viewing public equities through a broad global lens simplifies the portfolio at a higher level, and makes sense given that the primary risk factor for public equities is the equity risk premium. Under a broader Global Equity classification, SCERS would still allocate to domestic, international, and emerging markets mandates, but they would be wrapped under one umbrella, and benchmarked against a global equity benchmark.

The bulk of the investment manager universe is comprised of domestic and international specific mandates, and style and market capitalization specific mandates; however, there is a growing number of global mandates that have the flexibility to invest across geographies, and also have less constraint around style and market capitalization. It would be difficult to invest in these types of mandate under the current Domestic Equity and International Equity structure; however, they could serve a complementary role and fit within a global equity structure.

The modeled Global Equity structure could also include other less constrained equity type mandates, similar to those that currently reside in the Global Absolute Return portfolio. These include equity long/short strategies, which are long biased equity strategies, but which have the ability to short stocks for alpha and risk management purposes. Equity long/short strategies also tend to have a beta of less than one, meaning they are less sensitive to the market, and seek to earn equity-like returns with less risk. Another example is an event driven strategy that takes concentrated long-biased activist equity positions, and which to seeks to earn higher returns than traditional equity benchmarks.

The structure of the Global Equity asset class would be determined subsequent to the completion of the asset liability modeling study, and would include considerations around the mix between geographies, target allocations to passive versus active, and style and market capitalization considerations, as well as any incorporation of global and less constrained equity mandates.

Global Fixed Income:

The Global Fixed Income segment was added to SCERS' portfolio in 2013 to expand the opportunity set within the fixed income markets, and diversify SCERS' fixed income portfolio across additional risk factors and sources of return. The Global Fixed Income mandate has flexible investment guidelines with a dynamic investing approach across countries, rates, currencies, and to a lesser extent credit. It takes an opportunistic approach to investing across markets globally, and as a result tends to be a more complex mandate with greater levels of volatility. Global Fixed Income originally resided within a broad fixed income asset class, but was moved to the newly created Diversifying asset category in 2017, along with a dedicated U.S. Treasury mandate and the Core Plus Fixed Income allocations.

Removing the Global Fixed Income segment from the modeling is a two-fold consideration. First, from a capital market assumption perspective, Global Fixed Income has a very low expected return of only 0.3%, which is well below that of U.S. Treasuries (0.7%) and Core Plus Fixed Income (1.5%). It also has a higher risk profile, as measured by standard deviation. Verus and Staff believe that there are better long-term yielding and returning opportunities in other asset classes with more attractive risk/return profiles, including real estate and infrastructure.

Second, the actual mandate that has been implemented since 2013, while a compelling strategy, doesn't fit with the role of the Diversifying asset category, which has the following broad objectives:

- Help preserve capital in periods of market distress, particularly in periods of low and falling growth.
- Enhance diversification by exhibiting low or negative correlation with both equity and credit markets.
- Maintain a positive return profile over time.

The current mandate invests through a commingled fund that takes an opportunistic approach to allocating across government bonds and currencies, with smaller allocations to credit. Over a cycle, it tends to favor the bonds and currencies from countries with higher GDP growth rates than those of safe haven developed market bonds and currencies, particularly G3 and G7 countries. The return potential is higher than other fixed income mandates within the Diversifying asset category; however, it also has a higher risk profile that tends to translate to negative performance in periods of market distress, and has higher levels of correlation to the performance of Growth assets.

Growth Absolute Return:

SCERS' current Absolute Return portfolio has a target allocation of 10% and is broken out into two separate segments of SCERS' total portfolio. The Growth Absolute Return portfolio has a 3% target allocation and resides within the Growth asset category. The Diversifying Absolute Return portfolio has a 7% target allocation and resides within the Diversifying asset category. The distinction is to separate those strategies that typically do well during a more favorable economic environment and have higher correlations and betas to equity and credit markets, from those strategies that have low to negative correlation to equity and credit markets and serve as a diversifier to the more growth oriented segments of SCERS' portfolio.

Growth Absolute Return strategies tend to be more equity and credit centric, with higher standard deviations and positive equity and credit beta and correlations, while the Diversifying Absolute Return strategies within the Diversifying asset category tend to be diversifiers to SCERS' Growth asset category and overall portfolio. They have less long-biased equity and credit exposures, and lower standard deviations and correlations than Growth Absolute Return strategies.

Examples of the more growth oriented and correlated absolute return strategies that typically reside within the Growth Absolute Return portfolio include equity long/short, event driven, and credit/distressed strategies, whereas the Diversifying Absolute Return segment will generally contain market neutral, global macro, and multi-strategy strategies.

Staff and consultants believe that the current Absolute Return structure, with separate Growth and Diversifying segments adds greater complexity than is needed. The Diversifying Absolute Return segment serves an important and distinct role within SCERS' portfolio, given it tends to emphasize a lower sensitivity to broad market performance (i.e., less correlated returns), while still generating a positive absolute return profile over time, and also serve as a complement to SCERS' traditional fixed income assets, such as Treasuries and Core Plus Fixed Income. Diversifying Absolute Return, along with Traditional Fixed Income, are SCERS' primary pure play diversifiers for the total portfolio, and should remain a dedicated asset class.

However, the Growth Absolute Return exposures are often just a less constrained form of public equity and public credit. While there are many attractive strategies, such as equity long/short, event driven, and credit within the segment, it doesn't need to be a dedicated segment/asset class within the total portfolio, and can potentially be incorporated into other parts of the Growth asset category, such as the Global Equity and Public Credit portfolios, in modest amounts. Therefore, Verus has removed the Growth Absolute Return portfolio from the modeled mixes.

Private Markets - Sizing Considerations:

As noted earlier, the only asset classes that currently have a 10-year return expectation above SCERS' actuarial rate of return include private equity, non-core real estate (opportunistic and value add), and private real assets, so it is reasonable to consider increasing allocations to these asset classes, if portfolio level liquidity supports it. Below is a rundown of the sizing considerations for the private market assets classes, including Private Equity, Private Credit, Real Estate, and Real Assets.

<u>Private Equity:</u>

SCERS' Private Equity portfolio has generated strong performance on an absolute and relative basis. Using Cliffwater performance data as of December 31, 2020, the Private Equity portfolio has generated net returns of 24.5%, 21.3%, and 17.1% over the 3, 5, and since inception periods. This compares to the Cambridge Associates Global Private Equity and Venture Capital benchmark returns of 17.8%, 17.0%, and 14.2%, respectively. The Private Equity portfolio has also kept pace with the long-term policy objective of the asset class (Russell 3000 Index + 3%) of 17.1%.

The Private Equity portfolio is a mature portfolio with positive cash flows, meaning there is generally more cash distributed back to SCERS than capital going out through capital calls. The current allocation is 10.5%, above the target allocation of 9%, and the overweight is attributed to strong relative performance of the asset class, and it is expected to come down toward the 9% target over the intermediate term. Another dynamic related to private equity is that there are more attractive opportunities available on an annual basis, both through follow on investments with existing managers and new managers, than SCERS has capital available to allocate. Within the capital market assumptions, private equity also has one of the highest expected returns of the major asset classes, at 9.4%. For all of these reasons, Verus modeled increasing allocations to Private Equity.

Private Credit:

The Private Credit asset class was created in 2017 with a 4% target allocation, though SCERS has been making private credit investments since 2011 (through the Private Equity portfolio prior to the creation of a dedicated asset class). SCERS has been implementing investments to this asset class over the last four years, making a variety of investments mostly across traditional direct lending strategies, while also adding some higher returning opportunistic credit lending strategies. The current allocation sits at approximately 2%, and Staff and Cliffwater expect to reach the 4% target allocation in 2023. While there is a substantial amount of institutional capital allocating to private credit, which has emphasized the importance of portfolio construction and implementation, Staff and Cliffwater are comfortable with the approach that SCERS has taken, and the performance that the asset class has generated to date.

Capital market assumptions point to an expected return of 6.3% for private credit, which is slightly short of SCERS' actuarial rate; however, the majority of the return for private credit is contractual yield, so the strategy generates almost immediate and substantial cash flows. SCERS' since inception net return for Private Credit is 9.4% (going back to 2011), which exceeds the Credit Suisse Leveraged Loan plus 2% benchmark.

Given that SCERS is still a couple of years from reaching the 4% target allocation, Verus modeled additional mixes with a 4%-5% allocation to reflect the attractive characteristics of the asset class.

Real Estate:

SCERS' Real Estate asset class has a target allocation of 7%, and is broken up between core and non-core (value-add and opportunistic) strategies. Core investments make up the bulk of the allocation, and rely on a combination of income and returns, while non-core strategies have a higher risk profile and a higher return as well. SCERS is fully allocated to Real Estate, and has generally run above the 7% target due to strong performance and holding a higher allocation by design as the Real Asset portfolio was being built out.

SCERS' Real Estate portfolio has generated strong performance on an absolute and relative basis. Using Townsend performance data as of March 31, 2021, the Real Estate portfolio has generated net returns of 6.4%, 8.1%, and 8.4 over the 3, 5, and since inception periods. This compares to the NFI-ODCE + 35bps returns of 4.4%, 5.7%, and 6.5%, respectively.

Similar to Private Equity, for the Real Estate portfolio, there are more attractive opportunities available on an annual basis, than SCERS has capital available to allocate, particularly in the non-core strategies. Within the capital market assumptions, real estate also has one of the higher expected returns of the major asset classes, particularly within the non-core segments, where value-add and opportunistic real estate are expected to return, 7.7% and 9.7%, respectively. For these reasons, Verus modeled increasing allocations to Real Estate. The increase would most likely be proportional between core and non-core, in order to stay within the policy guidelines for the two segments.

<u>Real Assets:</u>

The Real Assets asset class was created in 2011 with a 6% target allocation, which was revised to a 7% target in 2017. Underlying investments include infrastructure, energy, and to a lesser degree agriculture, timber, and other natural resources, implemented through the private markets. The current allocation sits at approximately 5.2%, and Staff and Cliffwater expect to reach the 7% target allocation in 2025.

Capital market assumptions point to a robust expected return of 8.8% for real assets, which is well above SCERS' actuarial rate of 6.75%. SCERS' Real Assets portfolio has generated strong performance on an absolute and relative basis. Using Cliffwater performance data as of December 31, 2020, the Real Assets portfolio has generated net returns of 4.8%, 7.7%, and 8.0% over the 3, 5, and since inception periods. This compares to the custom blended benchmark returns of 2.4%, 6.3%, and 5.6%, respectively. However, the Real Assets portfolio can experience significant volatility, particularly within the energy space, such as in early 2020.

A case can be made to increase the allocation to Real Assets based on the good performance SCERS has experienced, the expected return of the asset class going forward, and the strong cash flow and inflation sensitive characteristics of the underlying assets. However, real assets is a maturing and evolving market, and the opportunity set on an annual basis can be more episodic compared to other private market asset classes, such as private equity. SCERS also has to be realistic as to how much capital can be effectively deployed in the asset class, both through open- and closed-end investment funds, as the opportunity set is more limited.

Staff and Consultants have also discussed the portfolio structure for Real Asset going forward. The current structure targets 45% infrastructure, 35% energy, and 20% other (agriculture, timber, and other natural resources). The expectation is that going forward there will be a greater emphasis on the evolving infrastructure segment, and less of a targeted emphasis on energy (more likely to be an opportunistic approach based on the macro environment and the opportunity set). For these reasons, Verus modeled Real Assets at various levels, from the current target of 7% up to a 9% allocation.

Opportunities:

SCERS' Opportunities portfolio does not have a fixed allocation, but instead has a permissible range of 0% to 5%. As of December 30, 2020, the actual allocation stood at less than 0.1%. Investments in the Opportunities portfolio consists of tactical strategies offering attractive risk-return attributes. Potential opportunities may be short term, niche, non-traditional, or opportunistic in nature, and may exist across the range of asset classes. Any potential Opportunities investment will draw its capital allocation from the asset class that is most comparable to the risk-return characteristic of the investment. Given the tactical approach of the Opportunities portfolio, it is possible there will be no investments made in any given year, which has occurred over the past several years.

SCERS' asset allocation has changed significantly since the Opportunities portfolio was created. Many opportunistic-like investments have been allocated directly within asset classes such as Private Equity (distressed), Private Credit, and non-core Real Estate over the past number of years, and several of SCERS' hedge fund managers are structured to invest in tactical opportunities when they present themselves. Moving forward, Staff and Consultants guide toward eliminating the Opportunities portfolio, and consider any future tactical and opportunistic investment opportunities directly within the asset class with the closest risk-return characteristics of the opportunity under consideration.

UPDATED ASSET ALLOCATION MIXES

The asset mixes being presented at the June meeting incorporate the structural portfolio considerations above, and include several mixes that move SCERS closer to the actuarial rate, while maintaining a reasonable risk profile. All of the mixes fall short of the 6.75% actuarial rate, with Mix 4 generating the higher expected return at 6.0%, but with a higher risk profile and a significant increase toward illiquid private market asset classes. These mixes are being presented to receive further feedback and direction from the Board, and it is expected that a final mix will be presented to the Board for consideration at a following meeting.

Most of the mixes have a higher allocation to illiquid private market assets, and therefore a reduced liquidity profile for the overall portfolio. Illiquid private market investments are defined as closed-end investment funds, which are often 10-year fund structures, within Private Equity, Private Credit, Non-Core Real Estate, and approximately 75% of the Real Assets allocation. The other 25% for Real Assets represent open-end funds, which offer quarterly liquidity. It should be noted that Private Credit is considered illiquid; however, many direct lending funds have 5-year fund structures, rather than 10-year, and because most of the return is comprised of contractual yield, cash flows back to investors more quickly.

Below is a description of the asset mixes modeled by Verus:

- **Mix 1** – This portfolio mix assumes that SCERS does not have the appetite to increase exposure to illiquid asset classes, and therefore reallocates the Growth Absolute Return and Global Fixed Income exposures to other liquid market segments. All other asset class allocations are held constant relative to the current portfolio. The overall weightings to the three assets categories, Growth, Diversifying, and Real Return do not change. The Growth Absolute Return exposure is reallocated to Global Equity and Public Credit, and the Global Fixed Income exposure is reallocated to Core Plus Fixed Income.

This mix has a slightly higher expected return of 5.5%, versus 5.4% for the current portfolio, and has a slightly higher risk profile with a standard deviation of 11.3%, versus 11.2% for the current portfolio. The risk adjusted return as measured by the Sharpe Ratio remains at 0.50. From a liquidity perspective, the target allocation to illiquid closed-end private market investments remains the same as the current portfolio, at 20% of the total portfolio.

- **Mix 2** – This portfolio mix reallocates the Growth Absolute Return and Global Fixed Income exposures to private market asset classes that have higher expected returns going forward. At the asset category level, it maintains the same weighting to Growth assets, decreases Diversifying assets slightly, and reallocates this exposure to Real Return assets, and has a higher inflation sensitivity and cash flow profile than the current portfolio.

  The Growth Absolute Return exposure is reallocated to Private Equity and Private Credit, and the Global Fixed Income exposure is reallocated mostly to Real Estate, with a lesser amount moving to Core Plus Fixed Income for liquidity considerations. This mix also rotates some of the U.S. Treasury exposure to Core Plus Fixed Income as it is higher yielding and has a higher expected return. Global Equity, Public Credit, Diversifying Absolute Return, the dedicated Cash allocation, Liquid Real Return, and Real Assets are held constant with this mix. Maintaining the current allocation to Liquid Real Return is the purest way to invest around short-term inflation, whereas the Real Return private market assets (Real Estate and Real Assets) invest toward a longer-term strategic perspective on inflation.

  This mix has a moderately higher expected return of 5.7%, versus 5.4% for the current portfolio, and has a moderately higher risk profile with a standard deviation of 11.5%, versus 11.2% for the current portfolio. The risk adjusted return as measured by the Sharpe Ratio increases to 0.52, versus the current portfolio's 0.50. The allocation to illiquid closed end private market investments increases to 24% of the total portfolio, so SCERS' liquidity profile with this mix decreases moderately.

- **Mix 3** – At the asset category level, this portfolio mix decreases exposure to Growth assets, increases exposure to Diversifying and Real Return assets, while marginally increasing returns and further increasing the inflation sensitivity and cash flow profile of the portfolio. Within the Growth asset category, the Growth Absolute Return segment is eliminated. Global Equity, which has seen a reduction in its going forward expected return, is reduced by 4%, Public Credit is held constant, and both Private Equity and Private Credit increase marginally. Within the Diversifying asset category, the Global Fixed Income allocation is eliminated, the U.S. Treasury, Diversifying Absolute Return, and dedicated Cash allocations are held constant, and the Core Plus Fixed Income allocation is increased by 5%. Within the Real Return asset category, the Real Estate and Real Assets allocations increase, while the Liquid Real Return allocation is reduced.

This mix has a moderately higher expected return of 5.7% (same as Mix 2), versus 5.4% for the current portfolio, but has a lower risk profile with a standard deviation of 10.8%, versus 11.2% for the current portfolio. The risk adjusted return as measured by the Sharpe Ratio increases to 0.54, versus the current portfolio’s 0.50, and is the highest of the modeled mixes. The allocation to illiquid closed-end private market investments increases to 26% of the total portfolio, so this mix has a larger increase in private markets exposure than Mix 2.

- **Mix 4** – At the asset category level, this portfolio mix slightly decreases exposure to Growth assets, significantly decreases exposure to Diversifying assets, and significantly increases Real Return assets. The adjustments to Diversifying and Real Return are the largest of the mixes. Within the Growth asset category, the Growth Absolute Return segment is eliminated, Global Equity is reduced by 1%, Public Credit and Private Credit are held constant, and Private Equity increases by 3% (the most of the mixes). Within the Diversifying asset category, the Global Fixed Income allocation is eliminated, and the remaining allocations are held constant (Core Plus Fixed Income, U.S. Treasury, Diversifying Absolute Return, and dedicated Cash). Within the Real Return asset category, the Real Estate and Real Assets allocations increase to the highest levels of any mix, while the Liquid Real Return allocation is reduced.

  This mix has the highest expected return of the mixes, at 6.0%, but still below the 6.75% actuarial rate. It also has the highest risk profile of the mixes, with a standard deviation of 11.9%. The risk adjusted return as measured by the Sharpe Ratio is the second highest of the mixes, at 0.53. From a liquidity perspective, the target allocation to illiquid closed-end private market investments increases to 29% of the total portfolio, the largest of the mixes.

Similar to the April meeting, the modeling by Verus also incorporates SCERS’ liability data, and demonstrates the impact that the various modeled mixes would have on SCERS’ funded ratio and employer/employee contributions, through stochastic and risk metrics.

LIQUIDITY ANALYSIS

Most of the modeled mixes conducted by Verus have increasing allocations to private markets, and therefore a lower liquidity profile. Verus has conducted a liquidity analysis of SCERS’ plan as part of the ALM study, which analyzes potential implications on SCERS’ liquidity and cash flow needs related to private markets exposure, both at its current level and any potential increasing levels. Verus also conducts a liquidity analysis annually as part of SCERS’ Cash Management Policy. For the June meeting, Verus has conducted a liquidity analysis for SCERS’ current policy portfolio as well as for Mix 4, which are the most liquid and least liquid portfolios,, respectively. When Verus fine tunes the modeling toward a recommended mix, a full liquidity analysis will be conducted on that asset allocation mix.

Verus breaks SCERS' assets into different liquidity categories. The most liquid include public equity and fixed income strategies, which tend to have daily liquidity. Absolute return, core real estate, and core infrastructure invested through open-end funds tend to have 30 to 90 day liquidity; however, these strategies can also see liquidity move to one year in a stressed liquidity environment, in which a fund could be subject to exit queues and investor gates. The least liquid category consists of illiquid assets such as private equity, private credit, much of private real assets, and non-core real estate. These assets are invested within multi-year fund structures, so liquidity, for purposes of Verus' analysis, is measured at one year, and for the most part are considered illiquid, unless sold in the secondary private markets at a discount to fair value.

Verus' approach to liquidity studies analyzes a plan's liquidity by comparing a plan's liquid assets and cash inflows to a plan's cash outflows, and is measured over a 5-year period.

Cash inflows include:

- Liquid financial assets
- Employer and employee contributions
- Investment Income
- Distributions from illiquid assets (i.e., private equity; private credit; real assets; real estate)

Cash outflows include:

- Member benefit payments
- Capital calls for illiquid assets
- Plan expenses

Verus generates a measure for liquidity called a Liquidity Coverage Ratio (LCR), which measures whether a plan has enough cash flows and liquid assets to meet cash outflows over a 5-year period, without having to sell illiquid assets to cover liquidity needs. The LCR for the current policy is 2.7, meaning it has 2.7x coverage in liquidity available relative to SCERS' spending needs over the next 5 years. Verus views any measure greater than 1.0 as sufficient liquidity; however, a measure above 2.0 is optimal. The 2.7 measure increased from last year's LCR of 2.2, as it incorporated increased contribution rates associated with SCERS' recently reduced actuarial rate of return (from 7.0% to 6.75%). Mix 4 is the least liquid mix that Verus modeled, and it has a LCR of 2.0, which is still viewed as a good liquidity profile, but on the fringe of what is considered optimal. The other mixes, in particular Mixes 2 and 3, would be expected to fall somewhere between an LCR of 2.0 and 2.7.

Verus also uses a more conservative measure called a Modified Liquidity Coverage Ratio (MLCR). While the LCR measure is useful in understanding SCERS' liquidity profile, it assumes that SCERS would be comfortable selling all types of liquid assets in a drawdown period to meet the plan's liquidity needs. The MLCR only includes those liquid assets that SCERS would likely favor selling in a stressed market environment, including U.S. Treasuries and core plus fixed income. Verus views a reading above 1.0 as an optimal measure for the MLCR, which translates to a plan not being in a position of needing to sell any liquid <u>risk</u> assets, such as public equities, to meet planned obligations over the 5 years following a market dislocation. SCERS' current asset allocation has an MLCR of 1.3, and Mix 4 has an MLCR of 1.0, which puts it right on the fringe of an optimal target. The LCR and MLCR should be viewed in conjunction to one another.

CONCLUSION

As communicated at the April meeting, and as the Verus modeling demonstrates, current 10-year forecasted returns do not realistically model to SCERS' 6.75% actuarial rate of return, unless the risk profile of the plan increases significantly. In considering asset allocation adjustments, there is a trade-off between taking on more risk to potentially generate higher returns versus maintaining a sufficient level of diversifying and cash-flowing assets to reduce downside risk and the range of outcomes to which the portfolio is subject, and therefore accepting a lower projected return than what is assumed.

A consideration in balancing this dilemma is that capital market assumptions are just that—assumptions, and they change yearly based on the movements of the markets and path of drivers of the market, such as interest rates. SCERS' historical experience shows that in a given year the actual return will vary significantly from the actuarial rate; sometimes higher and other times lower. It is important to understand that SCERS' actual experience will fall within a broad range of outcomes around the modeled median return, so caution should be placed in putting too large a weighting on a single number.

It should also be noted that the gap between expected returns and the actuarial return can potentially be closed through implementation and the generation of excess returns. As an example, over the past 3-year, 5-year, and 10-year periods, SCERS has earned excess returns of 1.0%, 1.3%, and 0.34%, respectively, net of fees, over the policy index benchmark. While there is variability to earning excess returns, and they are difficult to earn consistently, they do provide a potential mechanism to close some of the gap.

The final asset allocation selection should not necessarily be made solely to achieve a desired return assumption, but rather should be made within a holistic framework, by also identifying the proper blend of asset mixes that will provide a certain level of diversification that will best allow SCERS to achieve its desired outcomes. It should also be noted that while an asset liability study is conducted once every three to five years, an asset allocation study can be conducted more frequently. So regardless of the asset allocation changes made during this study, the asset allocation can be re-evaluated prior to the next ALM study as CMAs adjust.

Staff and Verus do not recommend sweeping changes to SCERS' strategic asset allocation, but rather marginal tweaks, and believe that Mix 2 and Mix 3 contain the most attractive attributes in meeting SCERS' broad plan and portfolio objectives. Based on feedback and input from the Board, Staff and Verus expect to come back at a future meeting with a final recommended mix incorporating the attributes of Mixes 2 and 3.

ATTACHMENTS

- Verus Asset/Liability Modeling Presentation

Prepared by:	Reviewed by:
/S/	/S/
Steve Davis Chief Investment Officer	Eric Stern Chief Executive Officer

Verus

PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS

JUNE 2021

Asset/Liability Modeling Presentation V2

Sacramento County Employees' Retirement System

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Verus

VERUSINVESTMENTS.COM

SEATTLE 206-622-3700
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I. Introduction

Summary

Objectives:

— Review refined asset allocation mixes, and asset class considerations, and provide direction to Staff and Verus for a final portfolio mix

Summary Findings:

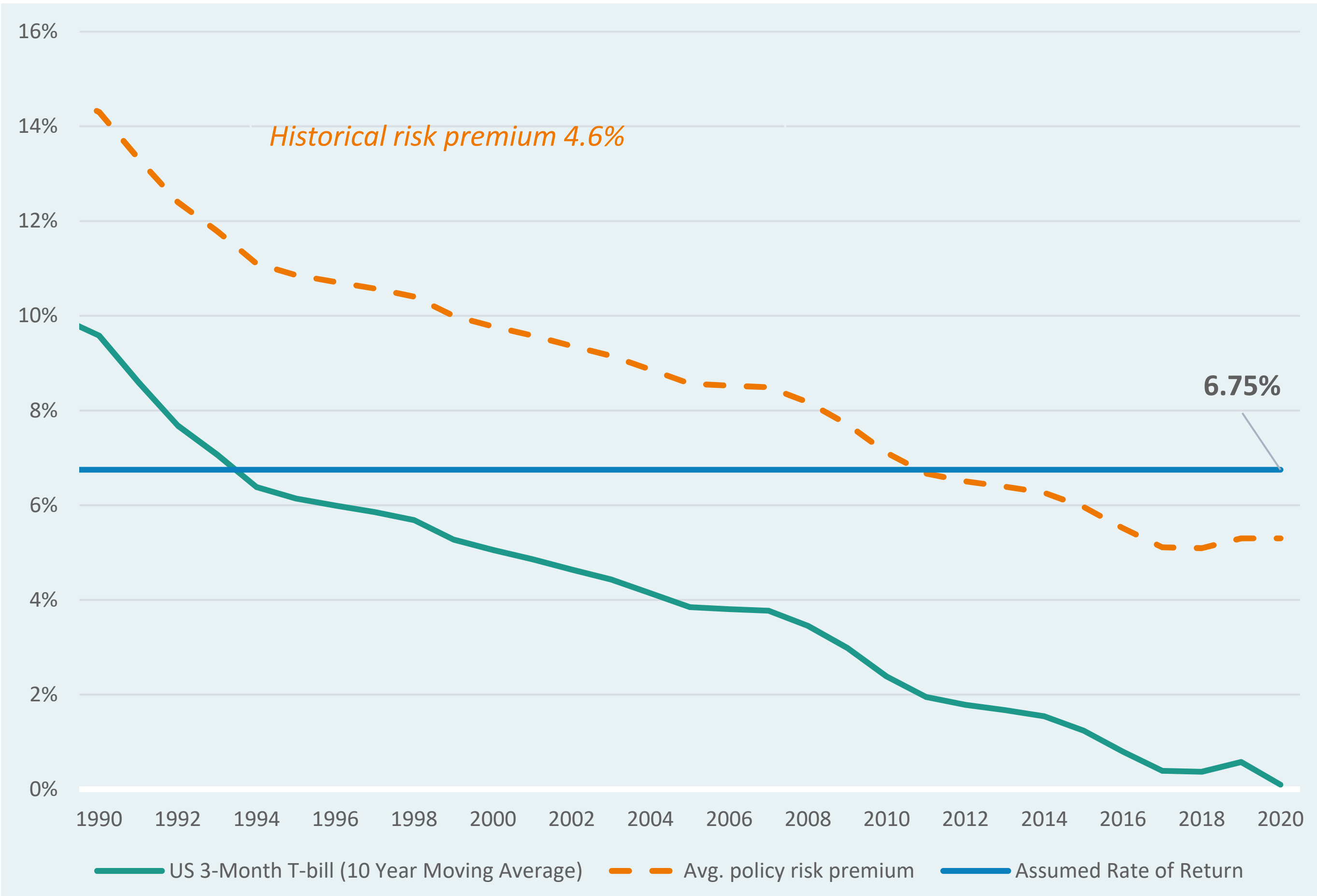
— Muted return expectations create challenges in hitting the actuarial rate, without assuming excessively high risk and illiquidity

— Modeled mixes move SCERS' return profile marginally toward the actuarial rate, while maintaining ample diversification

— Liquidity analysis shows that SCERS' liquidity profile can support moderate increases to higher returning and cash flowing illiquid private markets

Achieving 6.75% return used to be easier…

WHAT THE MARKET CAN PROVIDE



As of 12/31/2020. Avg. policy risk premium calculated using a domestic 60/40 portfolio (60% S&P 500 / 40% 10-year T Bonds from 1928-1977; 60% S&P 500 / 40% BBgBarc Agg. from 1977-2020). 10-year trailing T-Bill as of 12/31/2020 = 0.1%

[1]Based on Verus CMA's

10-year capital market assumptions

Projected returns based on Verus & Cliffwater Capital Market Assumptions (CMA'S); 10-year return projected series

II. Public Equity

Public Equity

PUBLIC EQUITY ALLOCATION – CURRENT POLICY

Public Equity	Allocation	Benchmark
U.S. Large Cap	18.0%	Russell 3000
U.S. Small Cap	2.0%	
International Developed	16.0%	MSCI ACWI ex US
Emerging Markets	4.0%	

PUBLIC EQUITY ALLOCATION - PROPOSED

Public Equity	Allocation	Benchmark
Global Equity	40.0%	Blended Index

— We are recommending that SCERS adopt a global equity allocation policy

— Moving away from a strict cap-weighted and geographic target will open the universe of investable strategies, such as global or less constrained equity strategies, to complement existing structure

— Don’t anticipate meaningful changes to the current manager line-up in public equity

— Public equity performance will be measured against a custom blend of sub strategies which we will bring back to the Board at a later meeting

— Individual managers will continue to be measured against their strategy benchmark

III. Fixed Income

Diversifying Fixed Income

Fixed Income allocation – current policy

Public Equity	Allocation
U.S. Treasuries	5.0%
Core Plus Fixed Income	10.0%
Global Fixed Income	3.0%
Total	**18%**

Fixed Income allocation – Proposed Policy

Public Equity	Allocation
U.S. Treasuries	5.0%
Core Plus Fixed Income	10.0%
~~Global Fixed Income~~	~~3.0%~~
Total	**15%**

Recommending SCERS maintain a strategic asset allocation to US investment grade and government backed fixed income

- Recommending that SCERS eliminate the 3% strategic allocation to global fixed income
  - There are better long-term yielding higher return opportunities elsewhere
  - Develop market sovereign debt expected returns meaningfully lower than US debt expected returns
  - The "flight to quality" benefits of non-US sovereign debt can be obtained through US Treasuries
  - A dedicated allocation to global fixed income can be challenging with manager implementation
    - Excess volatility due to country and currency factors makes a global allocation inconsistent with its intended role in diversifying the portfolio
- Final mix between U.S. Treasuries and Core Plus Fixed Income to be determined

IV. Alternatives

Absolute Return

ABSOLUTE RETURN - CURRENT POLICY

Segment	Asset Category	Allocation	Primary Strategies	Benchmark
Growth Absolute Return	Growth	3.0%	Equity Long/Short; Event Driven; Credit	HFRI FoF Index +1%
Diversifying Absolute Return	Diversifying	7.0%	Market Neutral; Global Macro; Multi Strategy	HFRI Conservative Index

ABSOLUTE RETURN – PROPOSED POLICY

Segment	Asset Category	Allocation	Primary Strategies	Benchmark
Diversifying Absolute Return	Diversifying	7.0%	Market Neutral; Global Macro; Multi Strategy	HFRI Conservative Index

- Recommend that SCERS eliminate the 3% strategic allocation to Growth Absolute Return from the Absolute Return portfolio
- Growth Absolute Return exposures are often just a less constrained form of public equity and public credit
  - Doesn’t need to be a dedicated segment/asset class within the total portfolio
  - Underlying strategies can potentially be incorporated into other parts of the Growth asset category
- Absolute Return will consist of only Diversifying Absolute Return strategies going forward
  - Diversifying Absolute Return serves an important and distinct role – total portfolio diversification and uncorrelated returns

Private Equity

PRIVATE EQUITY - CURRENT POLICY

	Asset Category	Allocation	Benchmark
Private Equity	Growth	9%	Cambridge PE/VC

PRIVATE EQUITY - MODELED

	Asset Category	Allocation	Benchmark
Private Equity	Growth	9%-12%	Cambridge PE/VC

- Verus modeled mostly increased allocations to Private Equity – between 9% and 12%
  - Private Equity portfolio has generated strong performance on an absolute and relative basis
  - Mature portfolio with positive cash flows
  - More opportunities available on an annual basis than available capital to allocate
  - Per capital market assumptions, private equity has one of the higher expected returns of the major asset classes (9.4%)

Private Credit

PRIVATE CREDIT - CURRENT POLICY

	Asset Category	Allocation	Benchmark
Private Credit	Growth	4%	CS Leveraged Loan + 2%

PRIVATE CREDIT - MODELED

	Asset Category	Allocation	Benchmark
Private Credit	Growth	4%-5%	CS Leveraged Loan + 2%

- Verus modeled a range of allocations to Private Credit – between 4% and 5%
  - Private Credit portfolio has generated strong performance on an absolute and relative basis
  - Robust expected returns (via capital market assumptions) of 6.3%
    - Majority of the return is cash flowing contractual yield

Real Estate

REAL ESTATE- CURRENT POLICY

	Asset Category	Allocation	Benchmark
Real Estate	Real Return	7%	NFI-ODCE + 35bps

REAL ESTATE - MODELED

	Asset Category	Allocation	Benchmark
Real Estate	Real Return	7%-11%	NFI-ODCE + 35bps

— Verus modeled a range of allocations to Real Estate – between 7% and 11%

- — Real Estate portfolio has generated strong performance on an absolute and relative basis
- — Cash flow and inflation sensitive characteristics
- — Robust capital market assumptions, non-core real estate has one of the higher expected returns of the major asset classes (7.7% - 9.7%)
- — More opportunities available on an annual basis than available capital to allocate

Real Assets

REAL ASSETS - CURRENT POLICY

	Asset Category	Allocation	Benchmark
Real Assets	Real Return	7%	Blended Index

REAL ASSETS - MODELED

	Asset Category	Allocation	Benchmark
Real Assets	Real Return	7%-9%	Blended Index

- Verus modeled a range of allocations to Real Assets – between 7% and 9%
  - Real Assets portfolio has generated strong performance on an absolute and relative basis
  - Per capital market assumptions, real assets has one of the higher expected returns of the major asset classes (8.8%)
  - Cash flow and inflation sensitive characteristics
- Limiting considerations
  - Evolving opportunity set - less robust than other private market segments
  - Portfolio construction going forward – potential diminished role of energy

Opportunities

OPPORTUNITIES - CURRENT POLICY

	Allocation	Range	Benchmark
Opportunities	0%	0%-5%	SCERS Total Fund Policy Index

- Opportunities portfolio does not have a fixed allocation - permissible range of 0% to 5%
- Short term, niche, non-traditional, or opportunistic in nature investments
  - Draws capital from asset class with most comparable risk-return profile
- Actual allocation stands at less than 0.1%
- Evolution of SCERS' total portfolio has resulted in opportunistic-like investments allocated directly to underlying asset classes
  - Limits the need for dedicated Opportunities portfolio going forward

V. Deterministic

Mixes: Allocations

	Current Policy	Mix 1	Mix 2	Mix 3	Mix 4	Return (g)	Standard Deviation	Sharpe Ratio (a)
Global Equity	40	42	40	36	39	*5.2*	*17.3*	*0.37*
Public Credit	2.0	3.0	2.0	2.0	2.0	*3.1*	*10.7*	*0.31*
Growth Absolute Return*	3.0	0.0	0.0	0.0	0.0	*4.9*	*7.8*	*0.60*
Private Equity*	9.0	9.0	11.0	10.0	12.0	*9.4*	*20.0*	*0.52*
Private Credit*	4.0	4.0	5.0	5.0	4.0	*6.3*	*6.0*	*0.84*
Total Growth Assets	***58***	***58***	***58***	***53***	***57***			
Core Plus Fixed Income	10.0	13.0	13.0	15.0	10.0	*1.5*	*4.0*	*0.50*
US Treasury	5.0	5.0	3.0	5.0	5.0	*0.7*	*6.7*	*0.10*
Global Fixed Income	3.0	0.0	0.0	0.0	0.0	*0.3*	*7.4*	*0.05*
Diversifying Absolute Return*	7.0	7.0	7.0	7.0	7.0	*3.1*	*3.9*	*0.71*
Cash	1.0	1.0	1.0	1.0	0.0	*0.2*	*1.2*	-
Total Diversifying	***26***	***26***	***24***	***28***	***22***			
Real Estate**	7.0	7.0	9.0	9.0	11.0	*5.7*	*12.6*	*0.50*
Liquid Real Return	2.0	2.0	2.0	1.0	1.0	*4.8*	*8.4*	*0.56*
Private Real Assets*	7.0	7.0	7.0	9.0	9.0	*8.8*	*16.5*	*0.58*
Total Real Return	***16***	***16***	***18***	***19***	***21***			
Total Allocation	**100**	**100**	**100**	**100**	**100**			

* Provided by Cliffwater

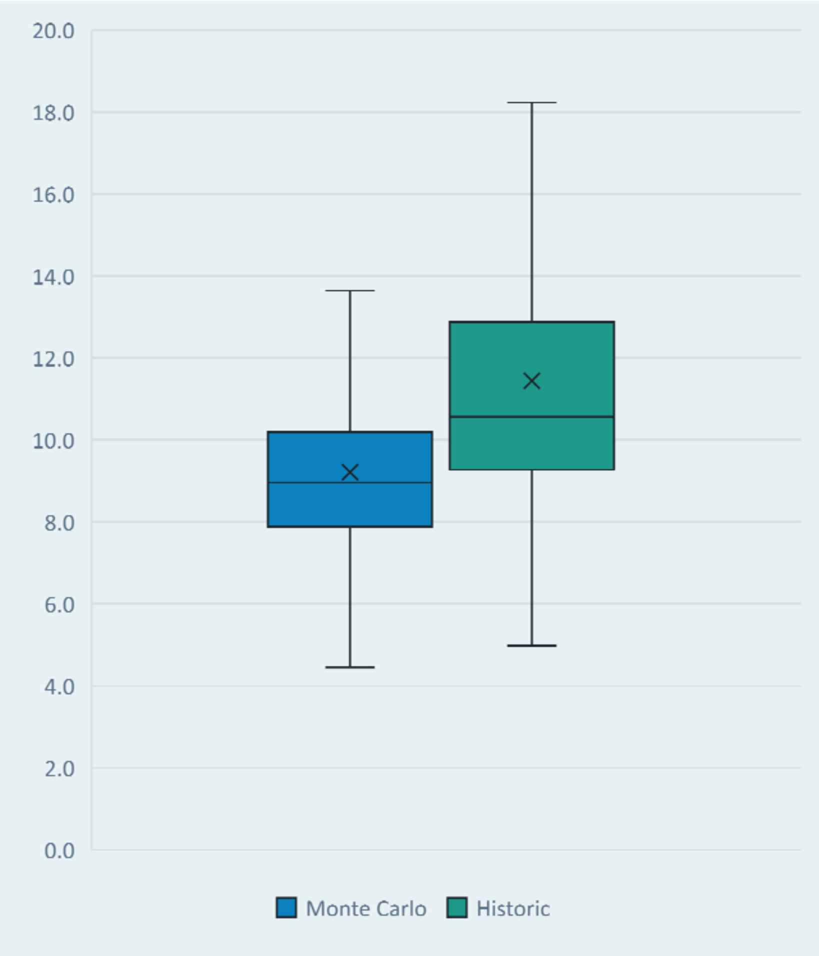
** Real Estate is a blend of Core, Value-add and Opportunistic strategies. Return shown is for Core RE

Mixes: Analysis

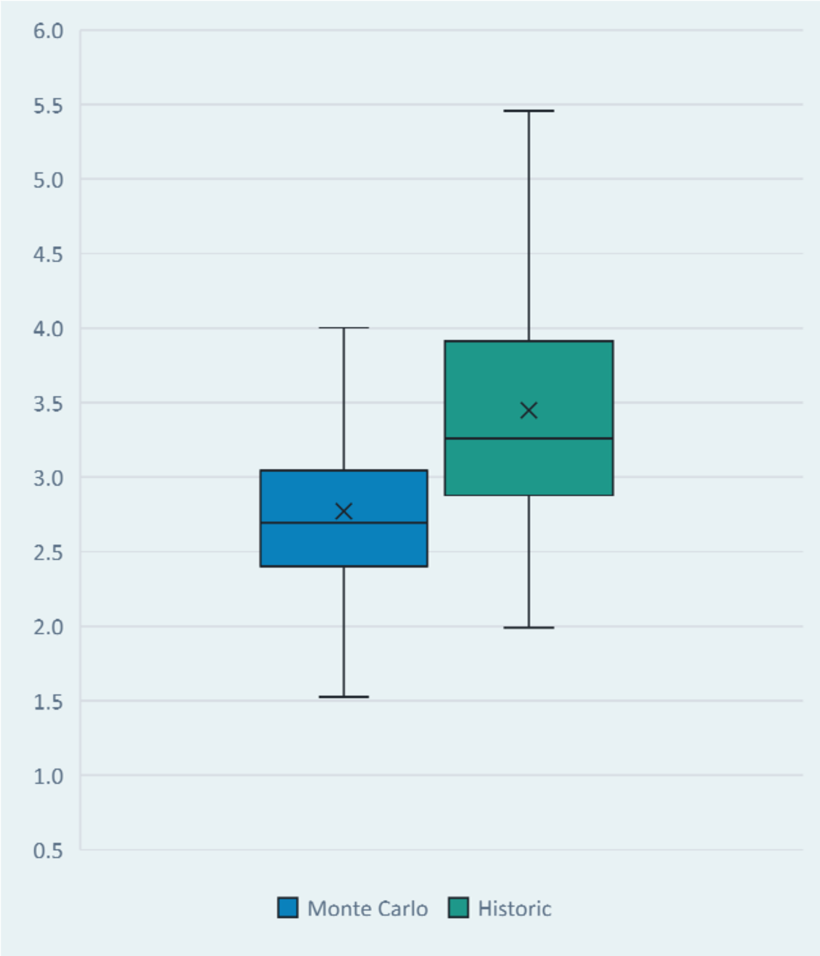
	Current Policy	Mix 1	Mix 2	Mix 3	Mix 4
Mean Variance Analysis					
Forecast 10 Year Return	***5.4***	***5.5***	***5.7***	***5.7***	***6.0***
Standard Deviation	11.2	11.3	11.5	10.8	11.9
Return/Std. Deviation	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
1st percentile ret. 1 year	*-17.4*	*-17.6*	*-17.6*	*-16.6*	*-18.1*
Sharpe Ratio	0.50	0.50	0.52	0.54	0.53
% of Portfolio liquid	63.0%	63.0%	61.0%	60.0%	57.0%
% of Portfolio illiquid	37.0%	37.0%	39.0%	40.0%	43.0%

Liquidity Coverage Ratio - Policy

1-YEAR LCR



5-YEAR LCR



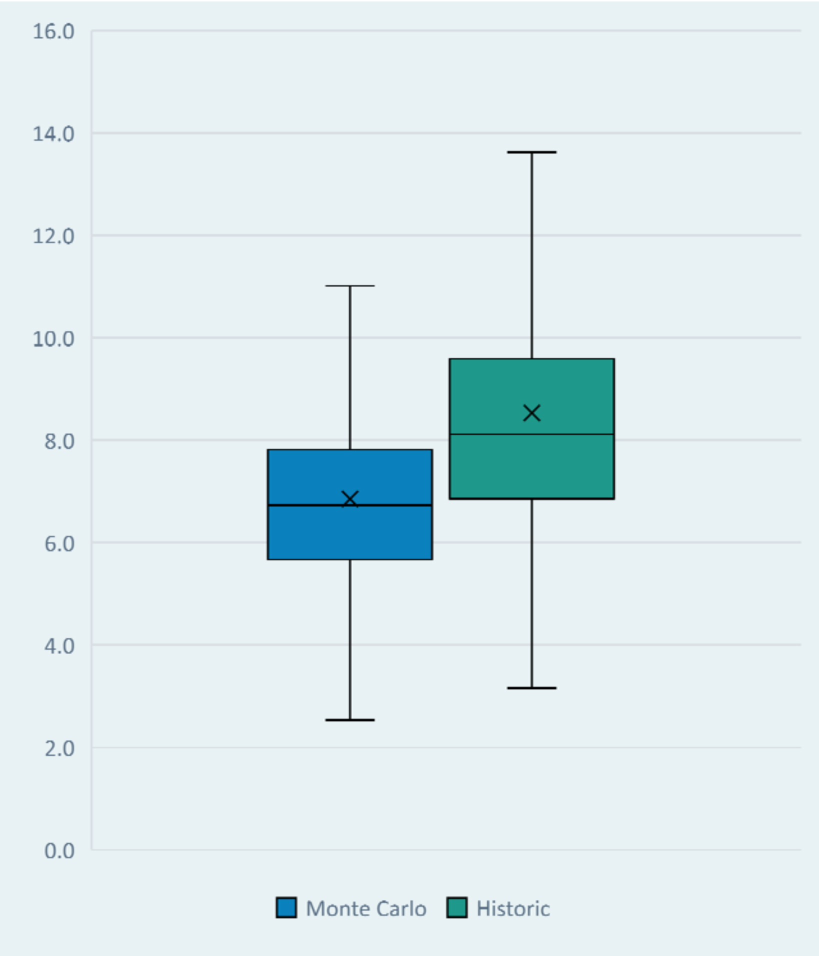
5-year LCR median outcome is 2.7 with 50% of all observations between 2.4-3.1

5-year MLCR median outcome is 1.3 with 50% of all observations between 1.3-1.4

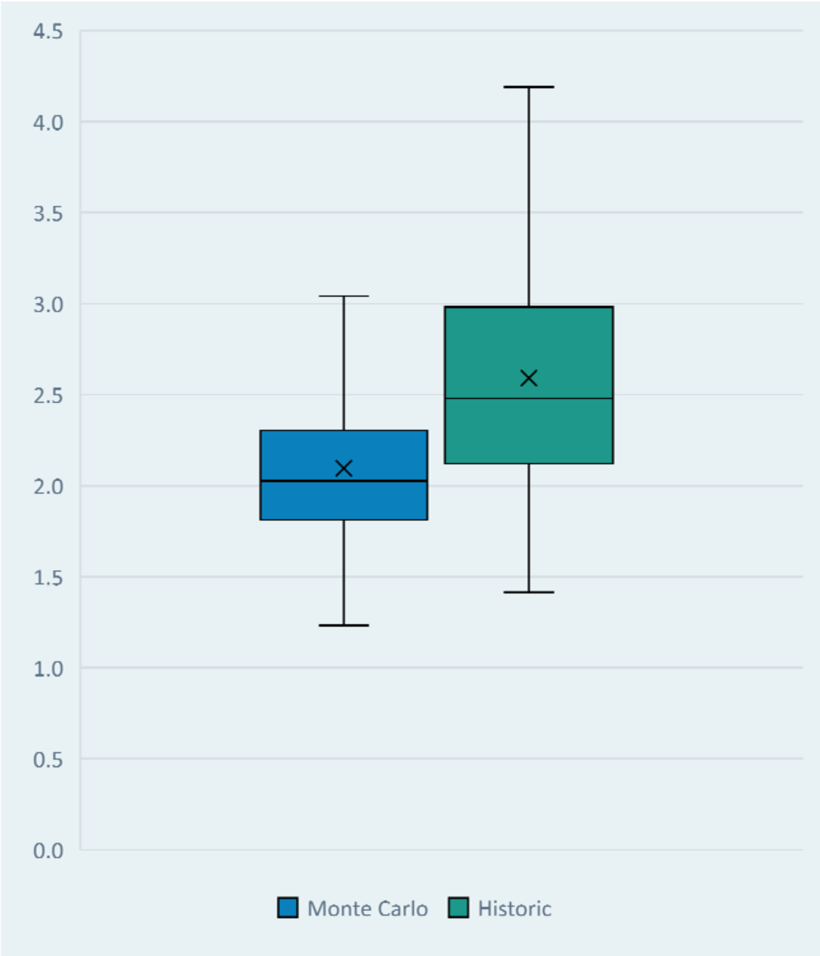
– *Actuarial information provided by Segal*
– *Private market projections for capital calls and distributions provided by Cliffwater and Townsend*

Liquidity Coverage Ratio – Mix 4

1-YEAR LCR



5-YEAR LCR



5-year LCR median outcome is 2.0 with 50% of all observations between 1.8-2.3

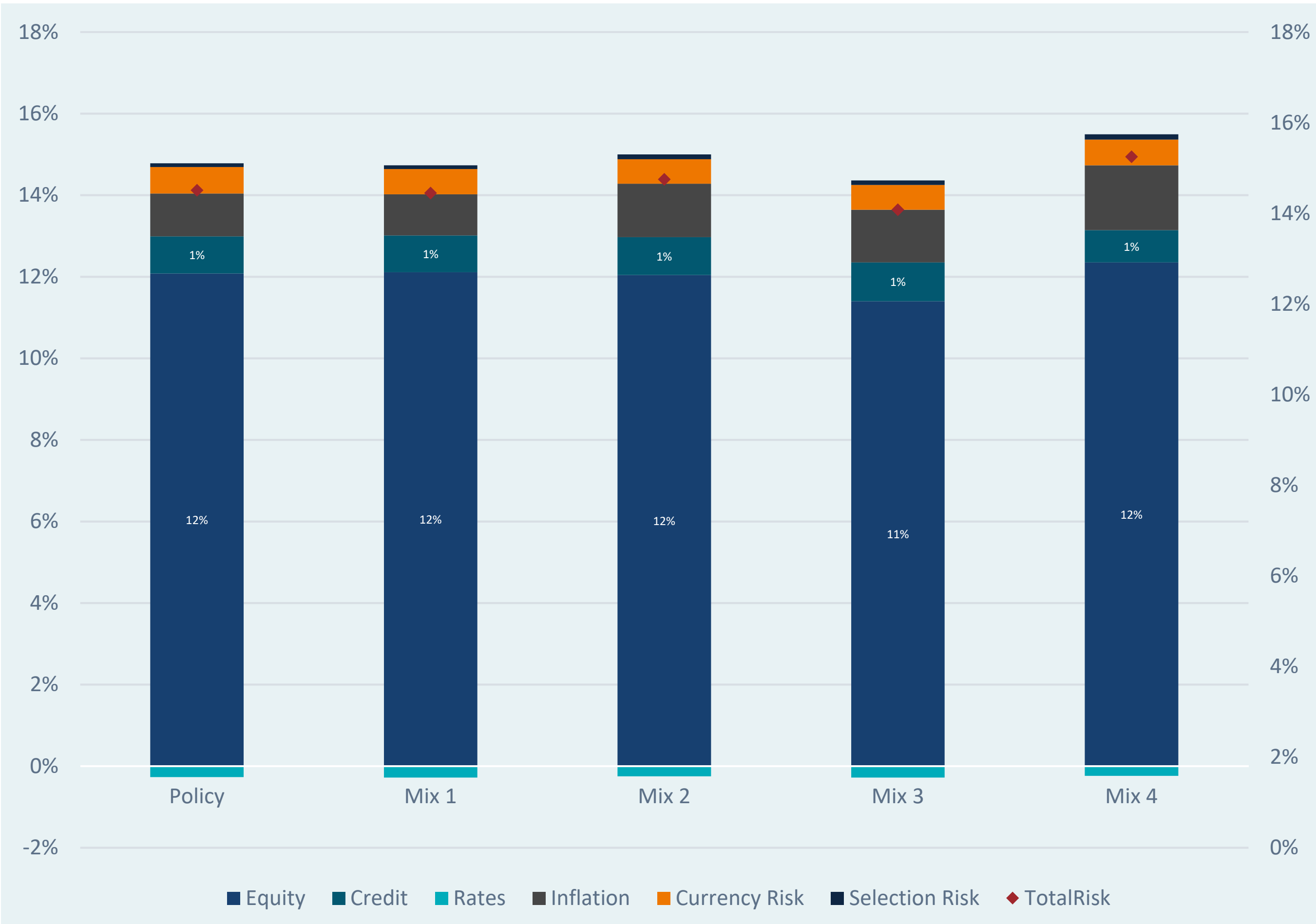
5-year MLCR median outcome is 1.0 with 50% of all observations between 0.9-1.0

– *Actuarial information provided by Segal*
– *Private market projections for capital calls and distributions provided by Cliffwater and Townsend*

VI. Stochastic & Risk

Risk Decomposition

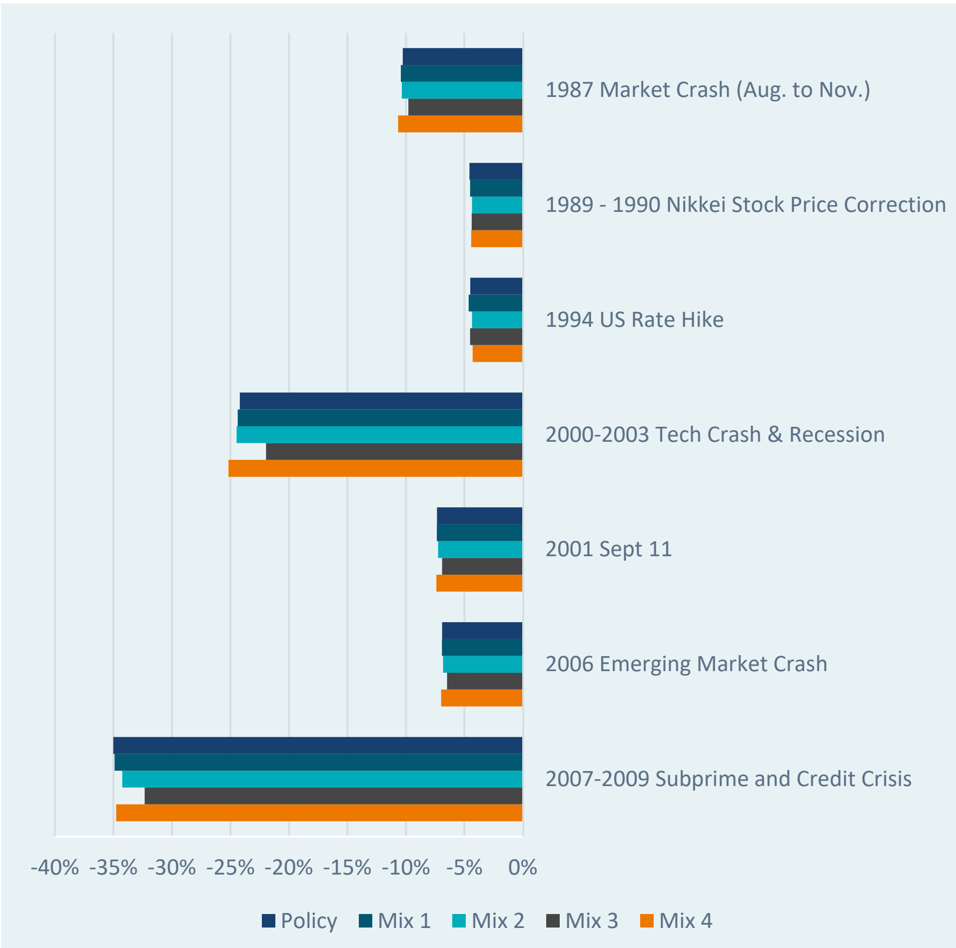
BARRAONE RISK DECOMPOSITION: 1-YEAR PROJECTED VOLATILITY & BREAKOUT



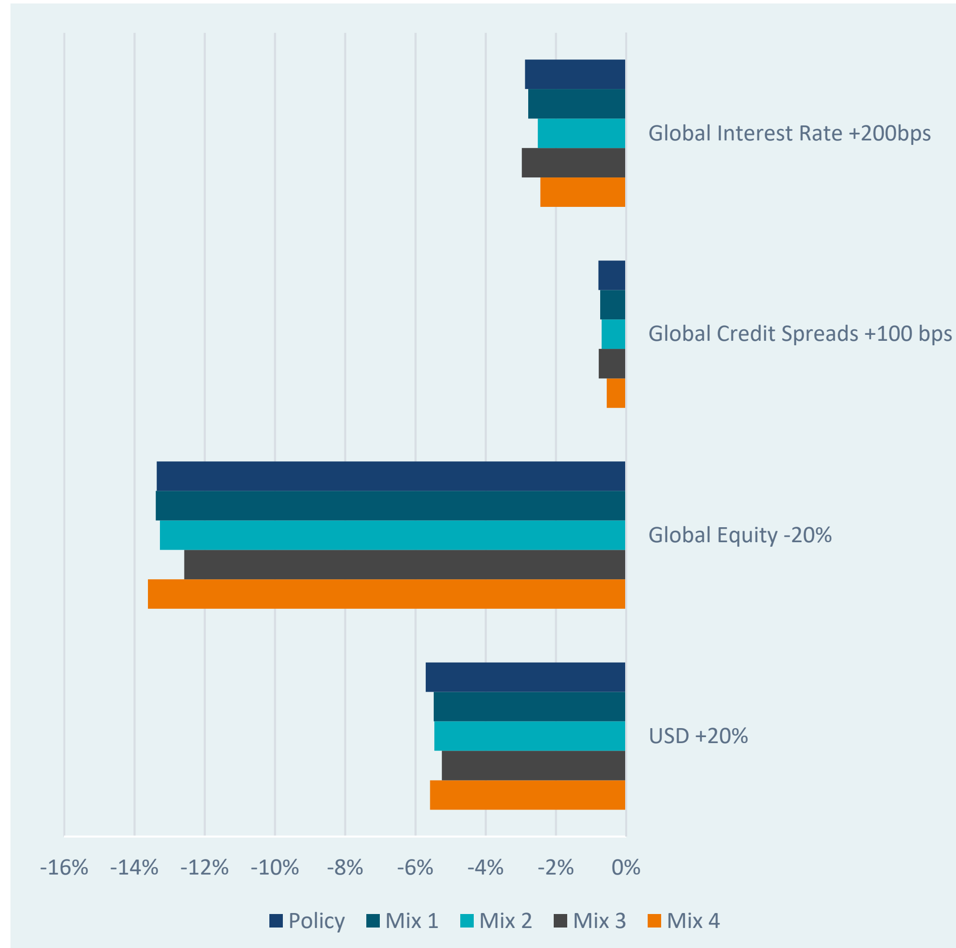
Source: MSCI BarraOne

Scenario and Stress Test

SCENARIO ANALYSIS



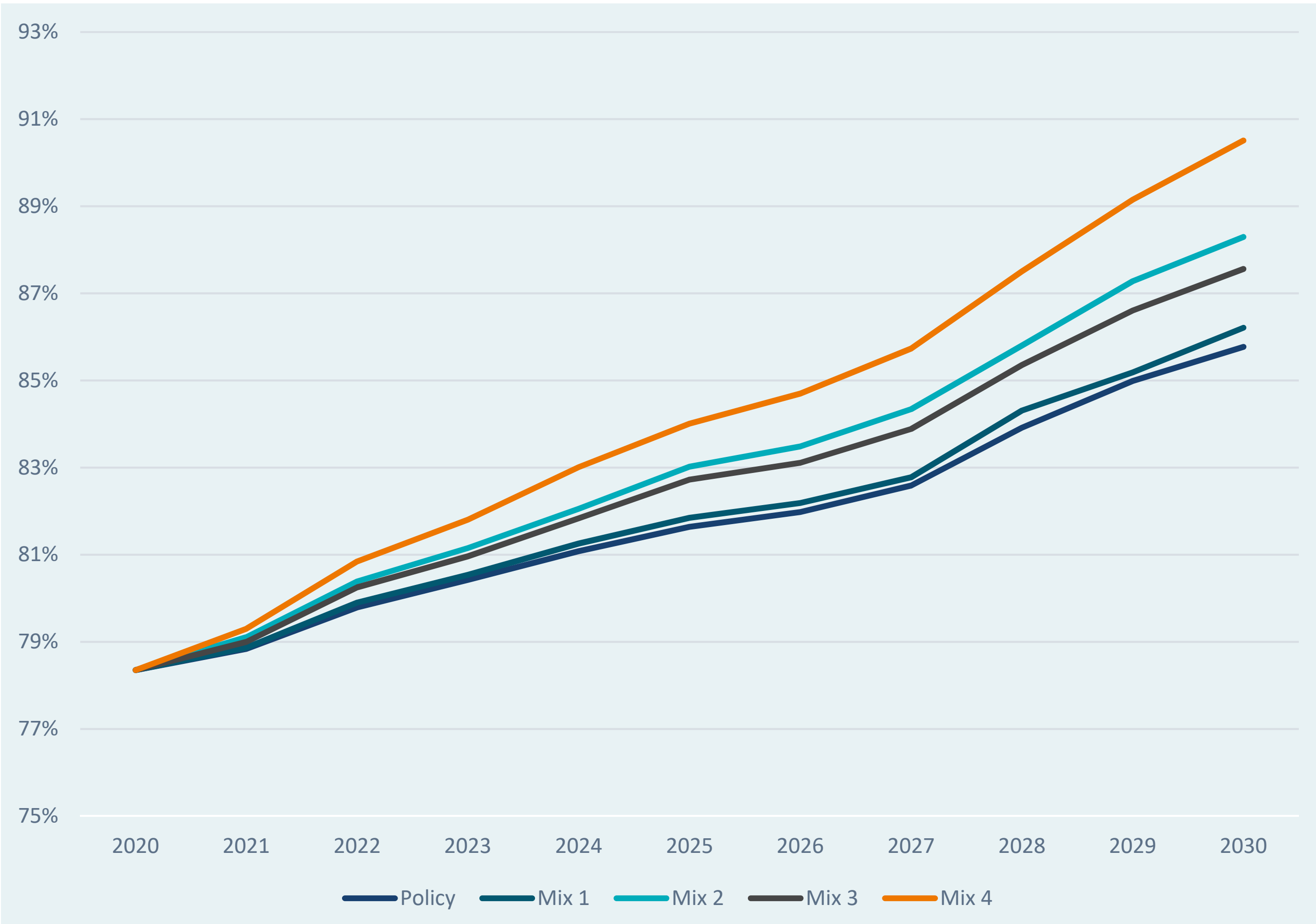
STRESS TEST



Source: MSCI BarraOne

Mix Median Projections

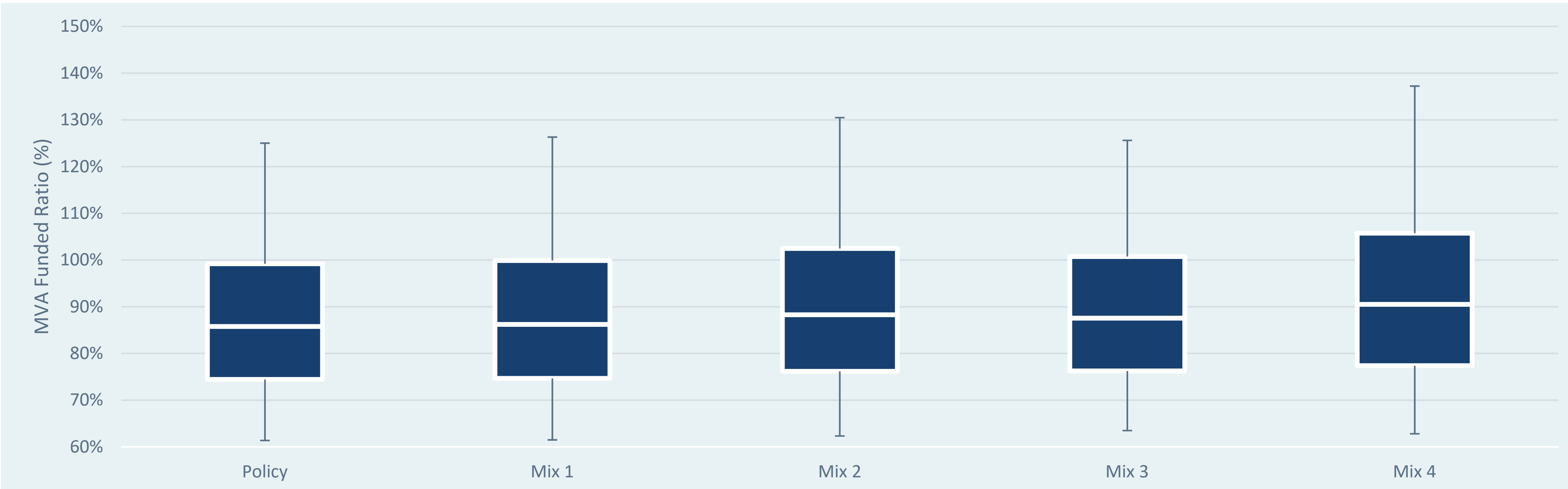
50TH PERCENTILE OUTCOME: MARKET VALUE ASSETS FUNDED RATIO BY MIX



source: Verus

Range of Funded Ratio Outcomes

MARKET VALUE OF ASSETS FUNDED RATIO: END OF YEAR 10

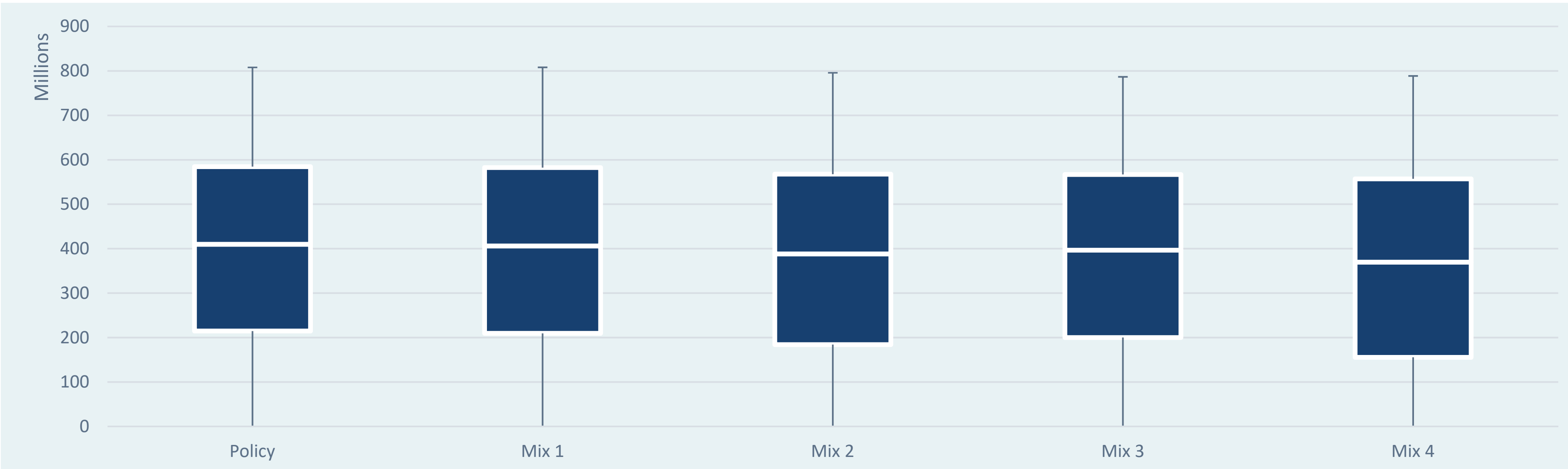


	Policy	Mix 1	Mix 2	Mix 3	Mix 4
Best Case (95%)	125.0%	126.3%	130.5%	125.6%	137.2%
Upper Quartile (75%)	99.2%	99.9%	102.5%	100.8%	105.7%
Median Outcome (50%)	85.8%	86.2%	88.3%	87.6%	90.5%
Lower Quartile (25%)	74.5%	74.7%	76.2%	76.3%	77.4%
Worst Case (5%)	61.4%	61.5%	62.3%	63.5%	62.8%

Source: Verus

Range of Employer Contribution Outcomes

EMPLOYER CONTRIBUTION ($): END OF YEAR 10



	Policy	Mix 1	Mix 2	Mix 3	Mix 4
Worst Case (95%)	807.9M	808.0M	795.7M	786.6M	788.5M
Lower Quartile (25%)	584.6M	582.4M	567.7M	567.0M	557.1M
Median Outcome (50%)	409.8M	406.3M	388.2M	396.7M	369.7M
Upper Quartile (75%)	214.8M	209.6M	184.3M	200.2M	155.7M
Best Case (5%)	0.0M	0.0M	0.0M	0.0M	0.0M

Source: Verus

VII. Conclusion

Conclusion

- As the new mixes reveal, we are recommending small tweaks to the current policy allocation
- Staff and Verus believe Mix 2 & 3 have the most attractive attributes but would like to put forth a final recommendation at a future Board Meeting

VIII. Appendix

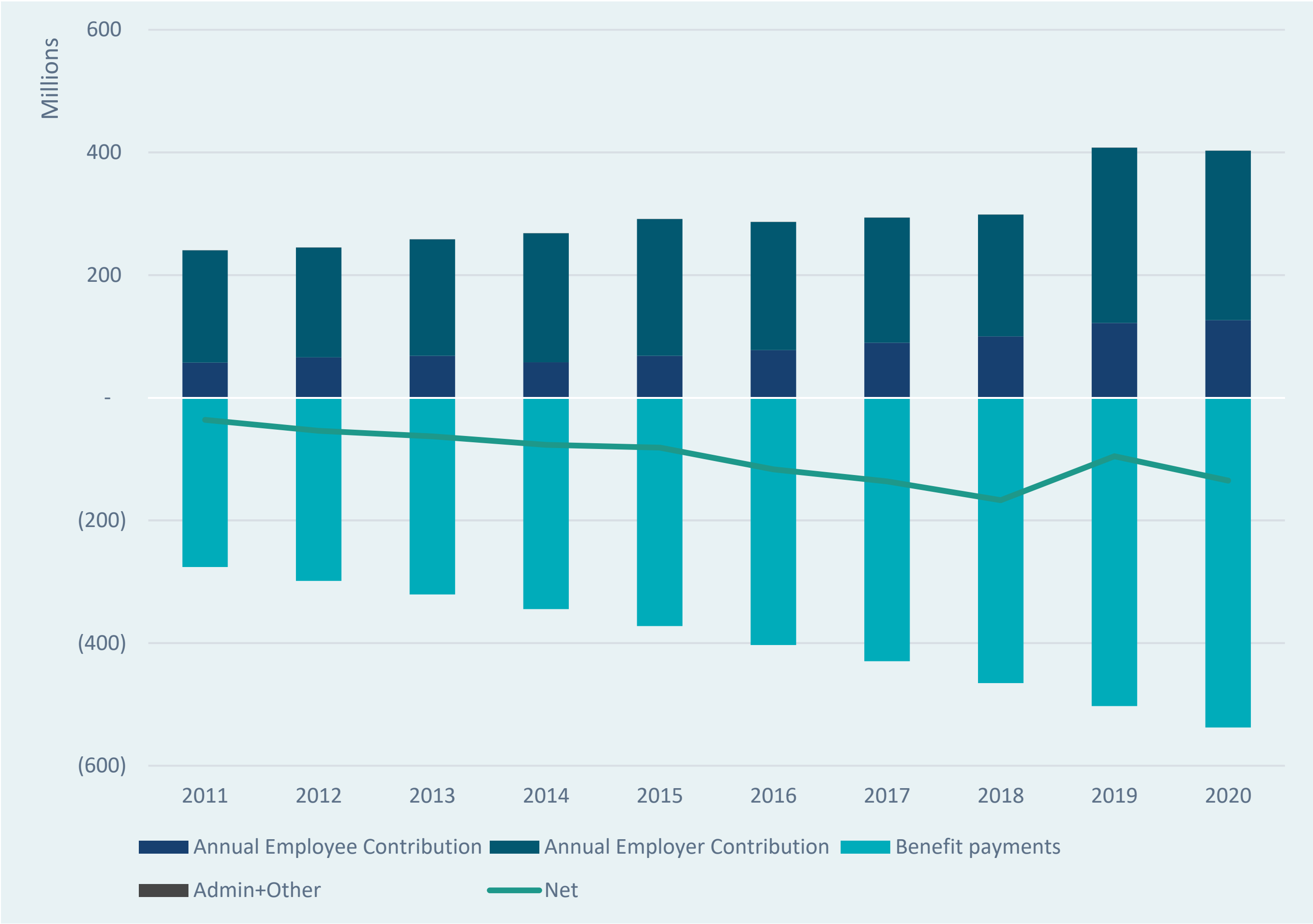
Historical Funded Status

SCERS HISTORICAL FUNDED STATUS

Source: SCERS Actuarial Valuation 6/30/2020

Historical Cashflow

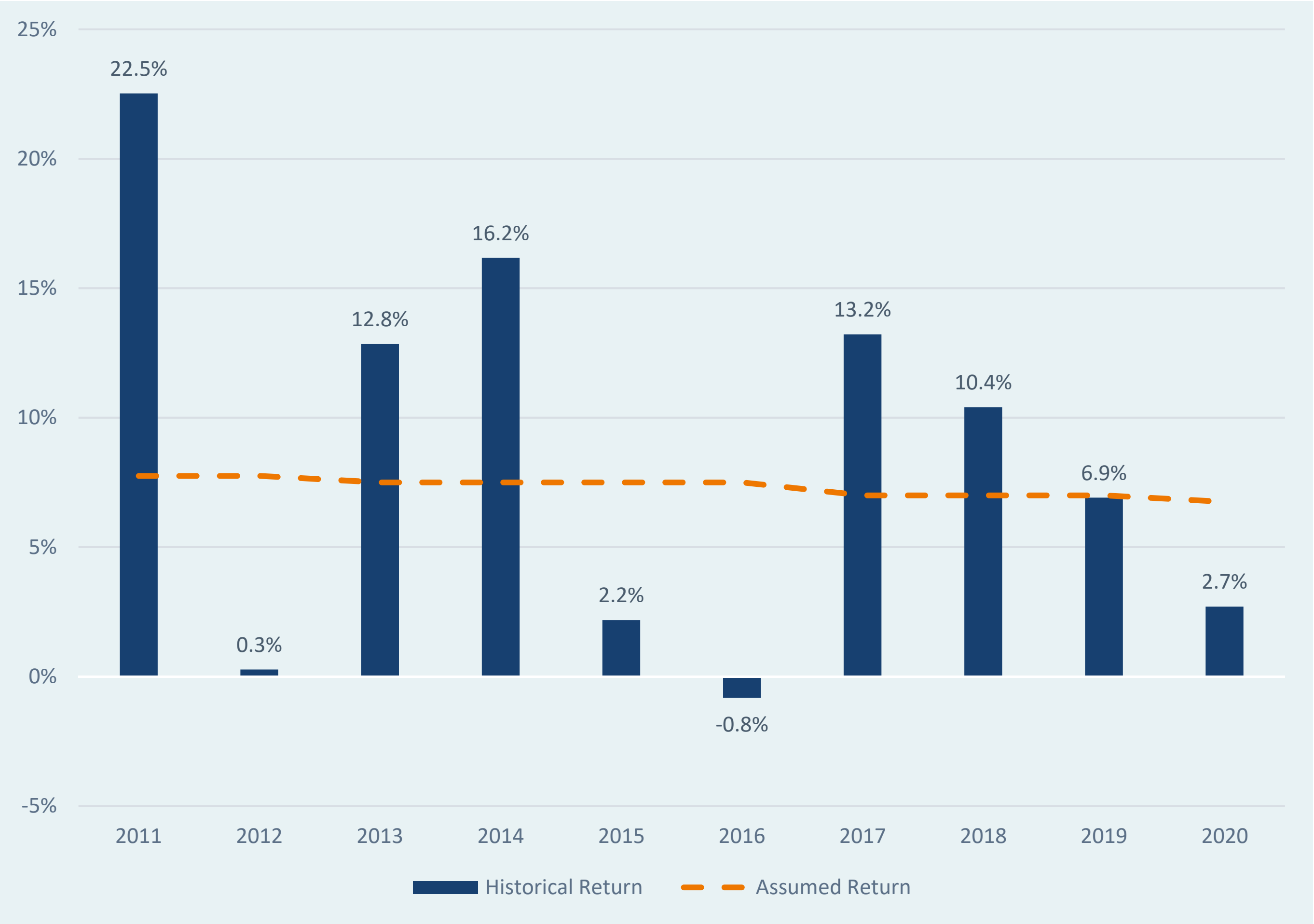
SCERS HISTORICAL CASHFLOW



Source: SCERA 2020 CAFR

Historical Return

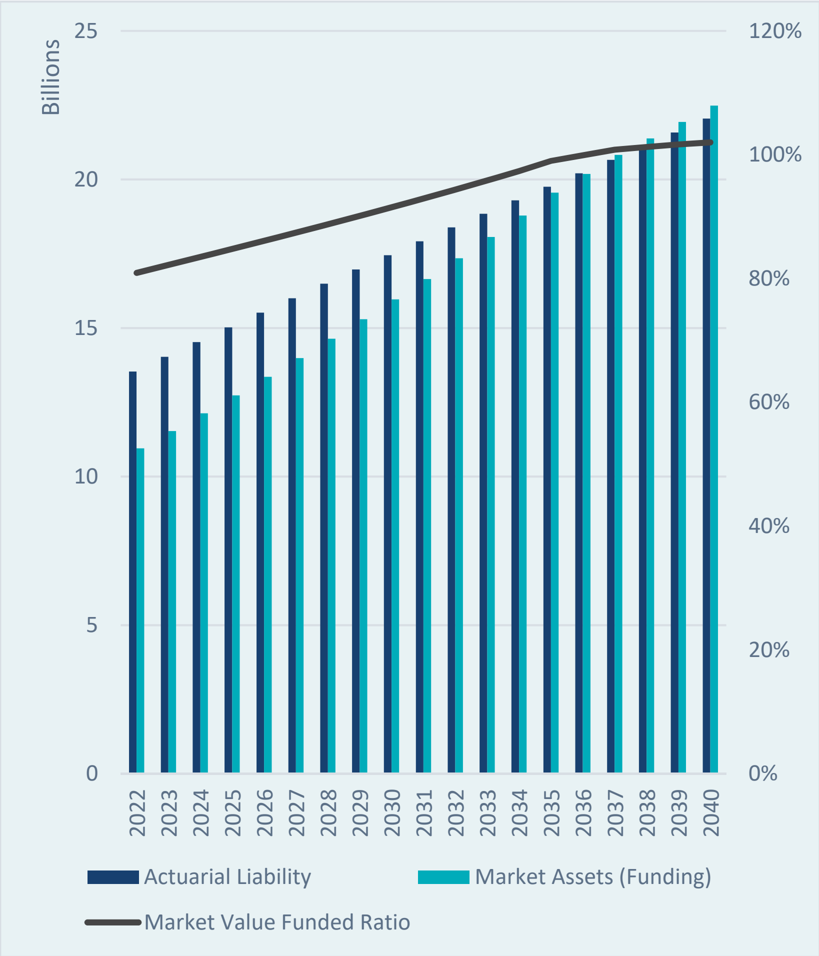
SCERS HISTORICAL RETURN



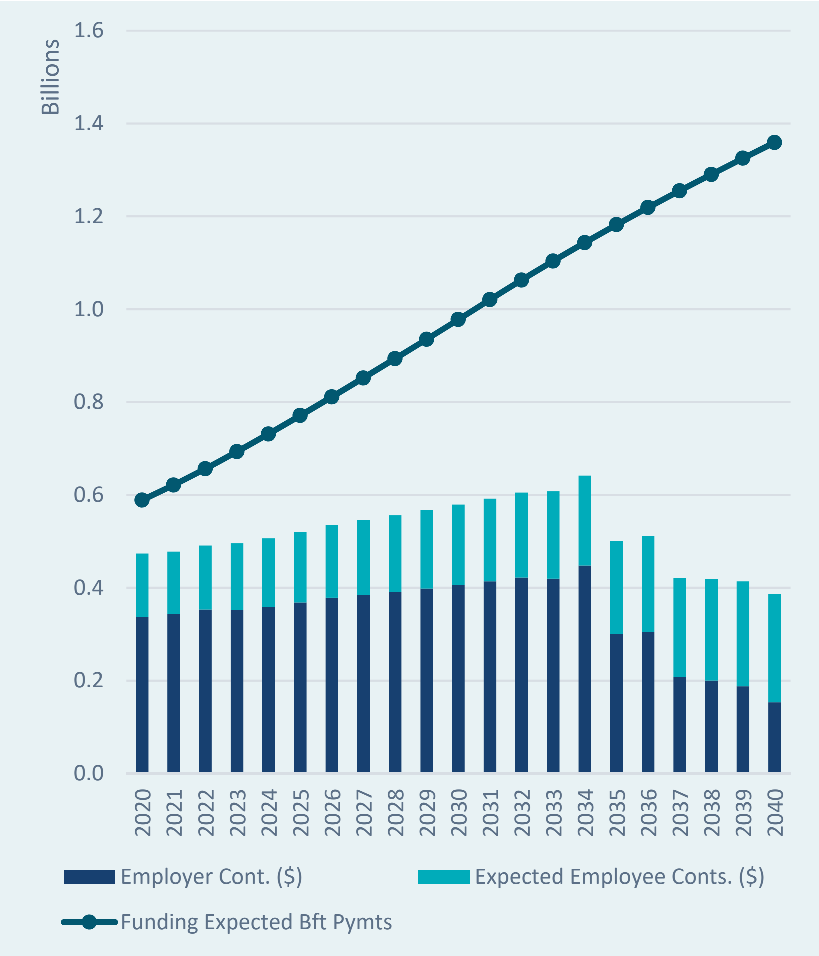
Source: SCERS 2011-2020 Actuarial Valuations

Baseline Projection: 6.75% Return

FUNDED STATUS PROJECTION: 6.75% RETURN



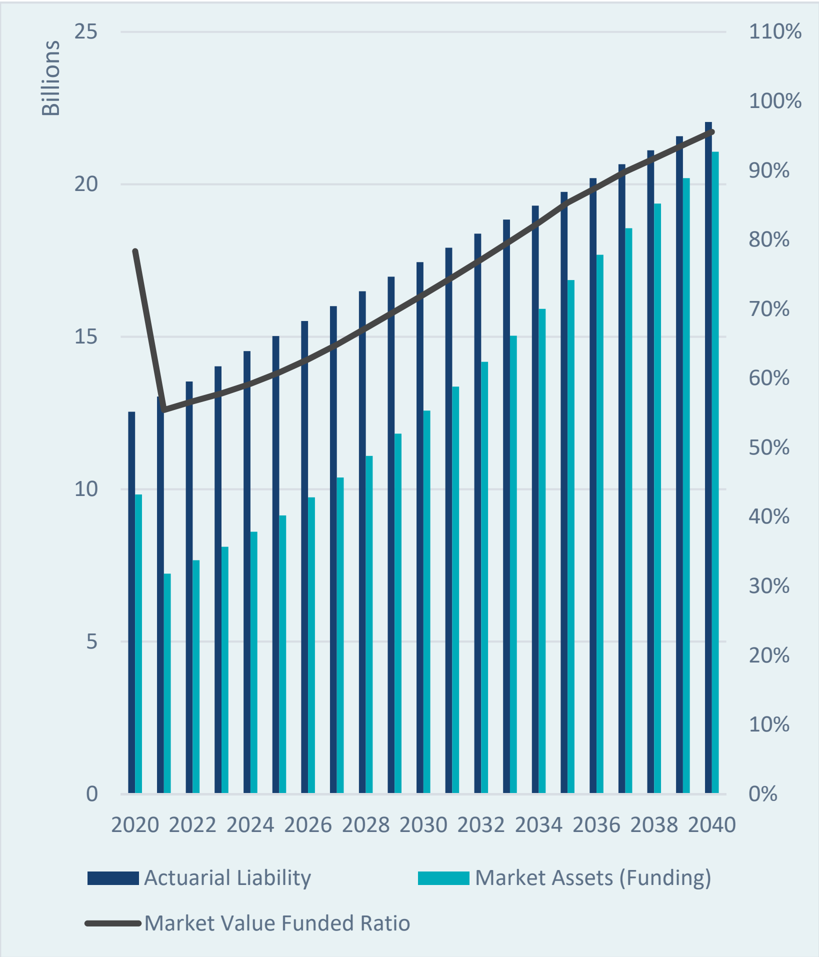
CASHFLOW PROJECTION: 6.75% RETURN



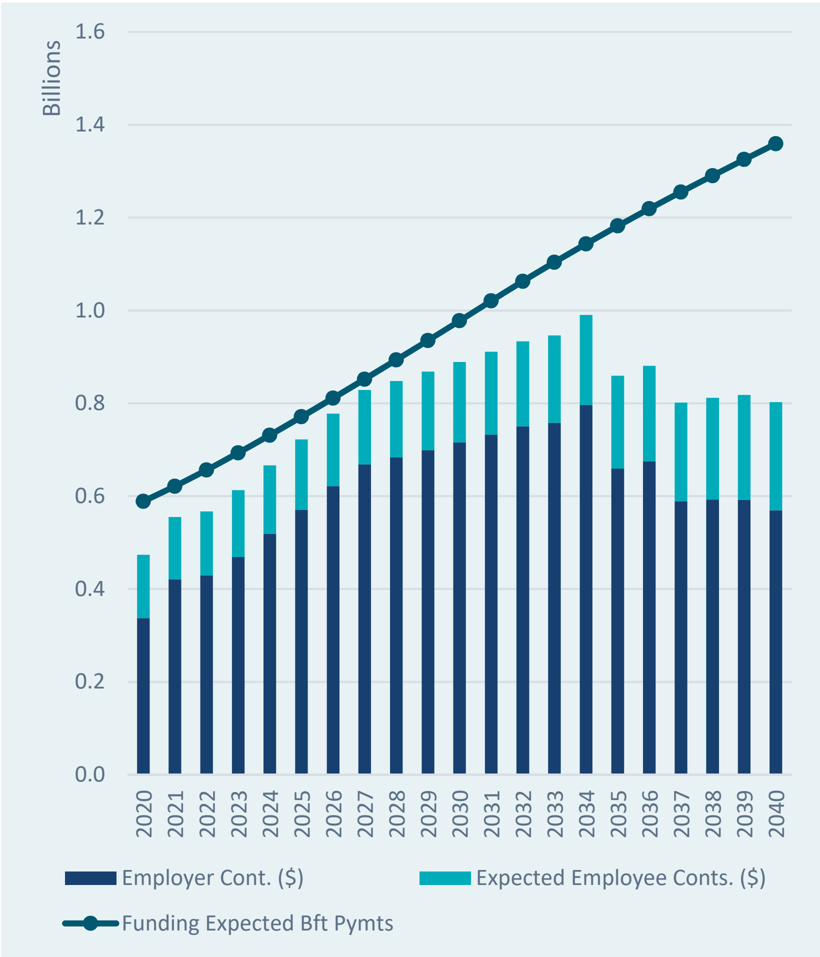
Source: Verus. Inflation assumed to be equivalent to the actuarial assumption of 2.75%

Drawdown Projection: -25% Year 1

FUNDED STATUS PROJECTION: -25% YR1 6.75% THEREAFTER



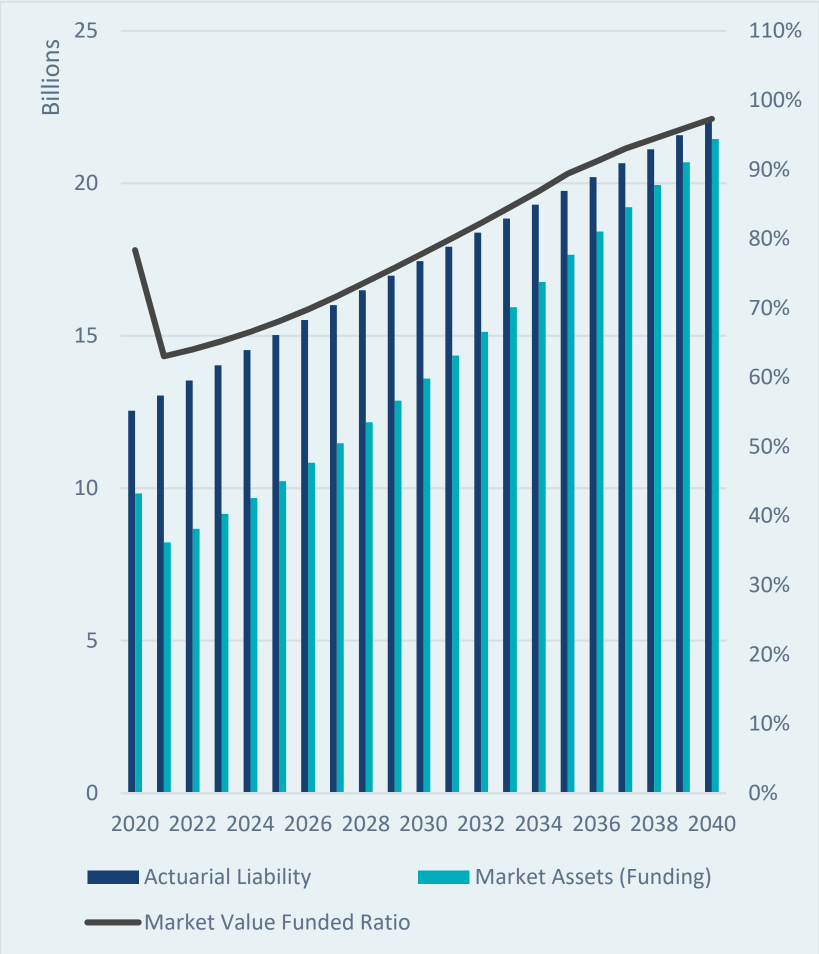
CASHFLOW PROJECTION: -25% YR1 6.75% THEREAFTER



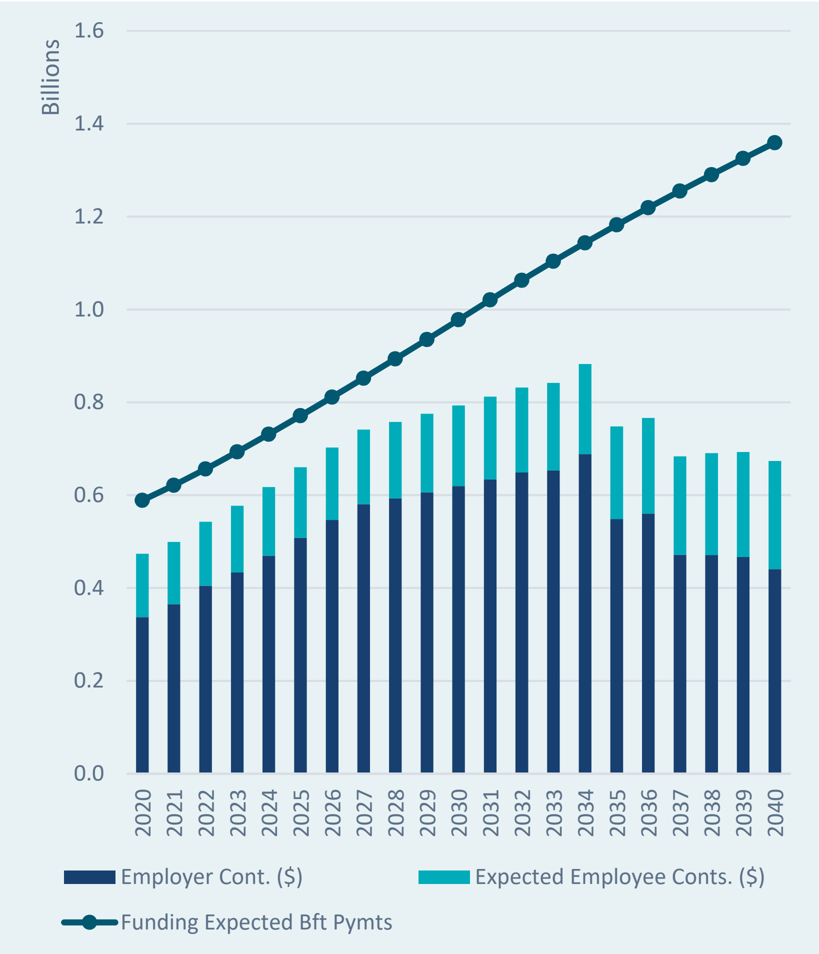
Source: Verus. Inflation assumed to be equivalent to the actuarial assumption of 2.75%

Drawdown Projection: -15% Year 1

FUNDED STATUS PROJECTION: -15% YR1 6.75% THEREAFTER



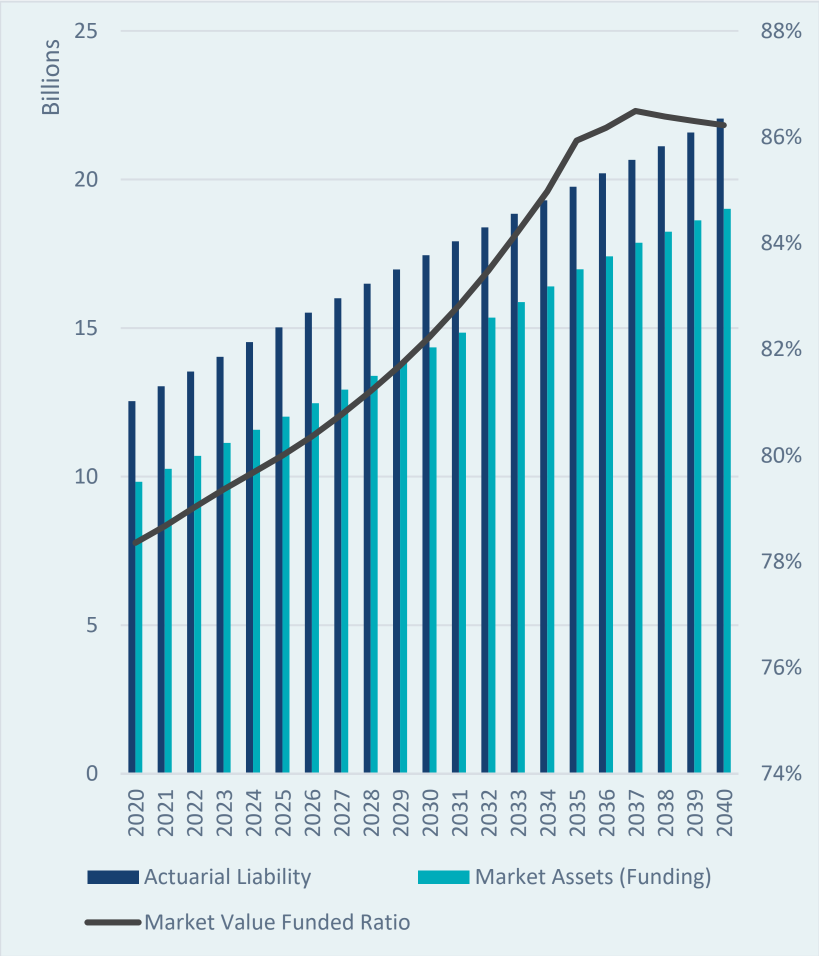
CASHFLOW PROJECTION: -15% YR1 6.75% THEREAFTER



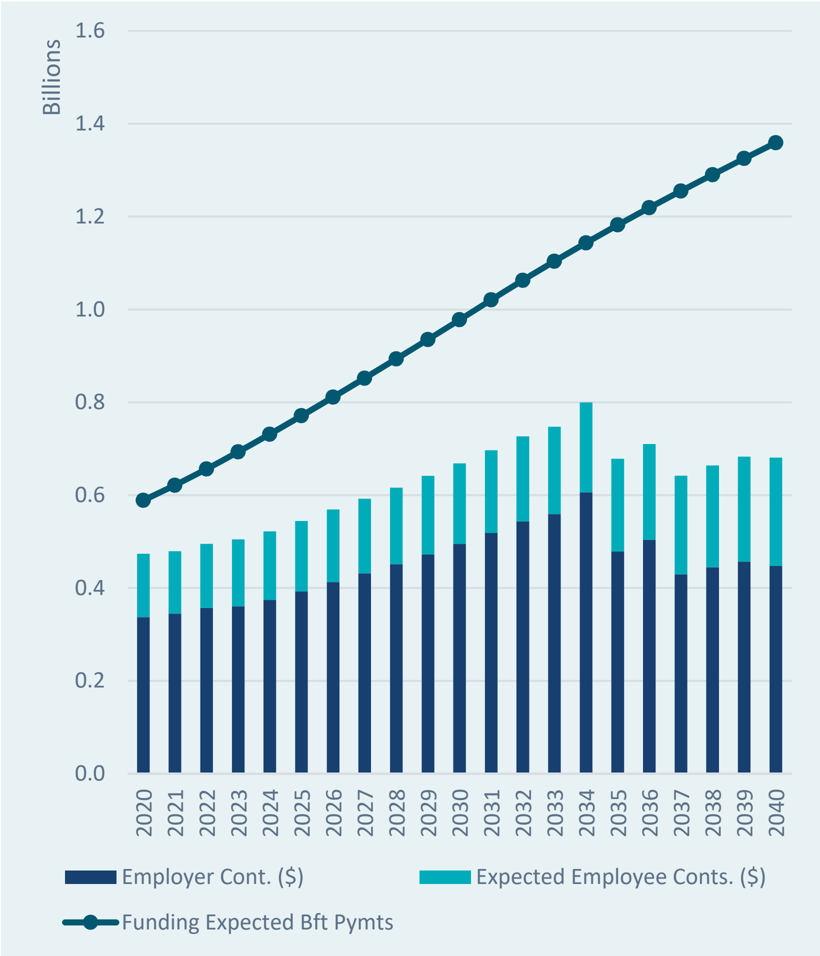
Source: Verus. Inflation assumed to be equivalent to the actuarial assumption of 2.75%

5.5% Return Projection

FUNDED STATUS PROJECTION: 5.5% RETURN



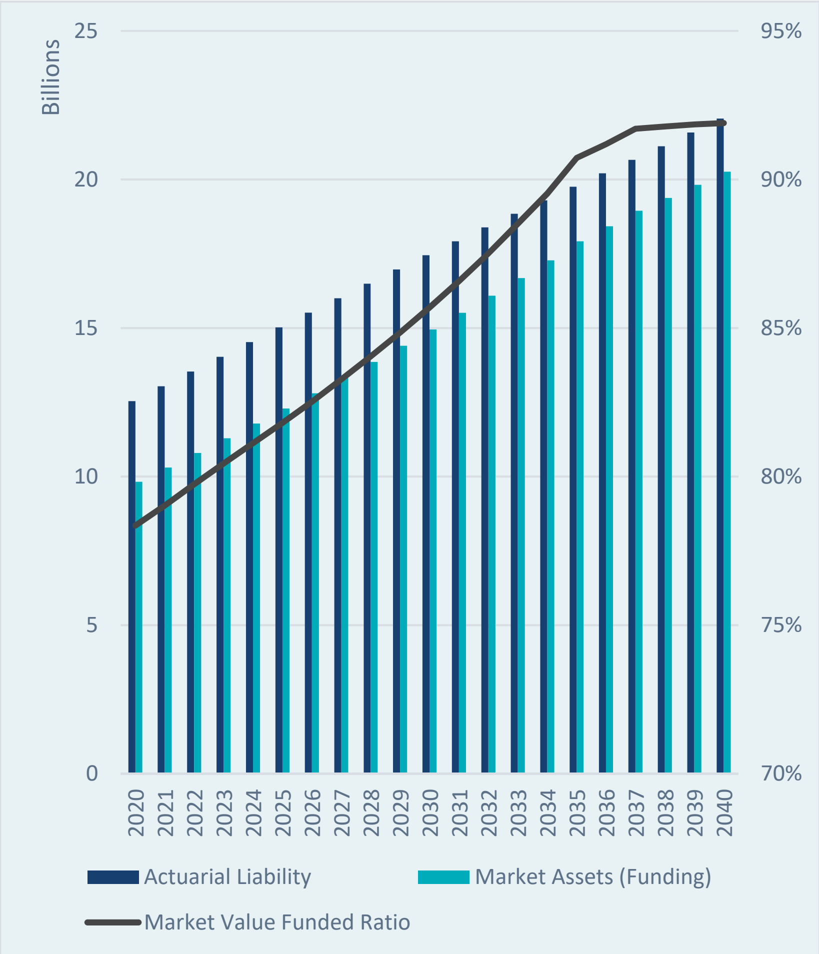
CASHFLOW PROJECTION: 5.5% RETURN



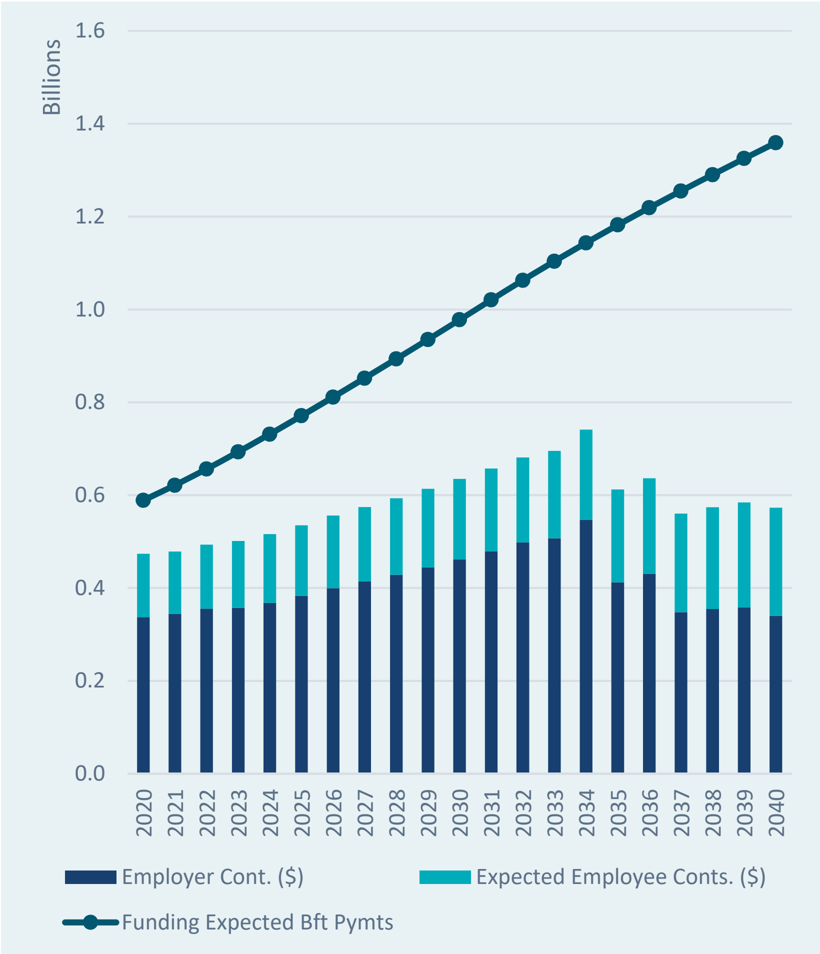
source: Verus. Inflation assumed to be equivalent to the actuarial assumption of 2.75%

6.0% Return Projection

FUNDED STATUS PROJECTION: 6.0% RETURN



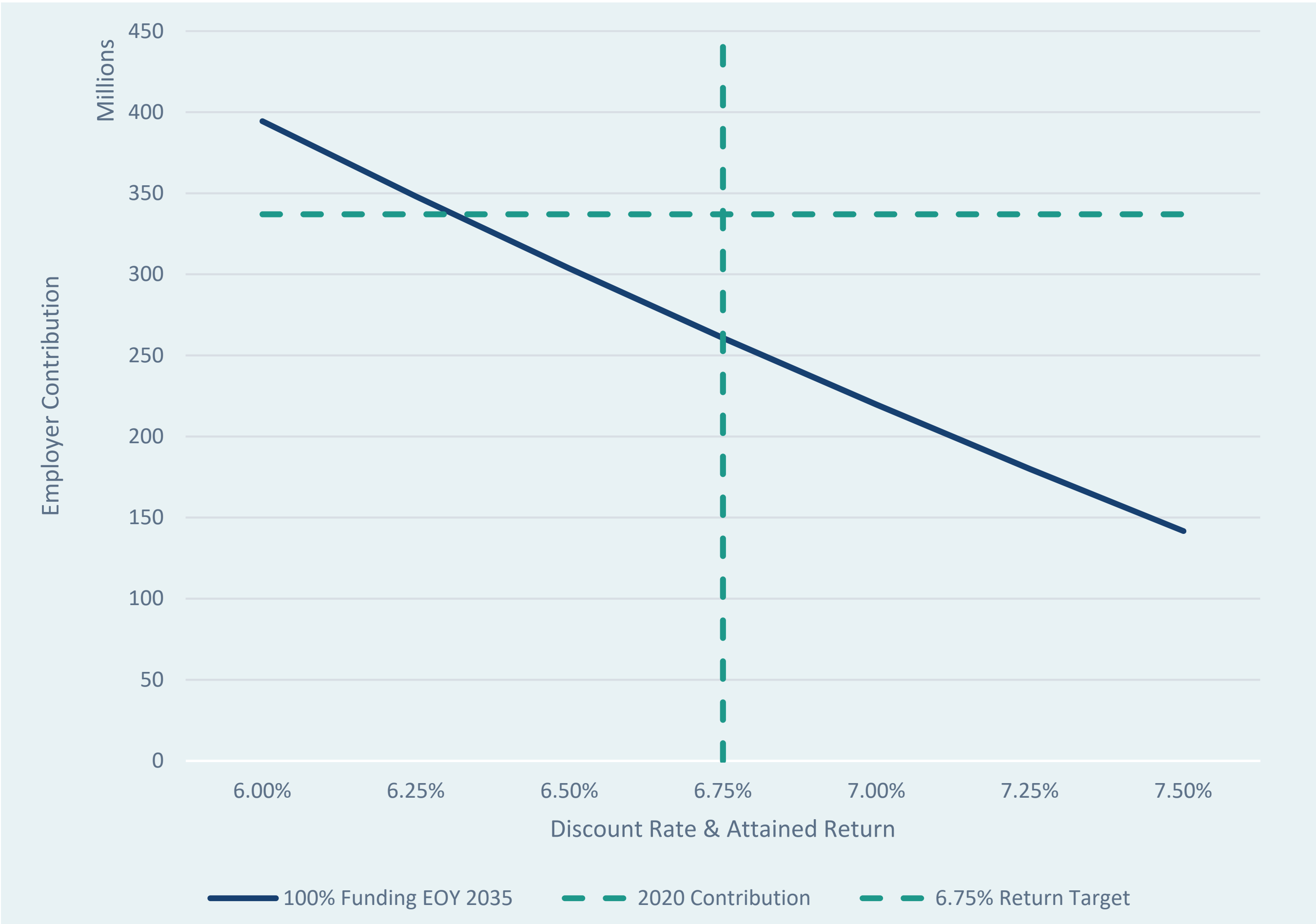
CASHFLOW PROJECTION: 6.0% RETURN



source: Verus. Inflation assumed to be equivalent to the actuarial assumption of 2.75%

Full Funding: 20 Year Horizon

SCERS CONTRIBUTIONS NECESSARY TO FULL FUND IN 20 YEARS



Source: Verus

LCR

Does the plan need to sell illiquid assets to cover cash outflows over a 1-year & 5-year period?

This is the same LCR formula used in prior liquidity models

$$Liquidity\ Coverage\ Ratio\ (LCR) = \frac{\begin{gathered}Liquid\ Financial\ Assets\ (normal\ market\ condition)\\ \sum(Distributions\ from\ Illiquid\ Assets)\\ \sum\left(\frac{Employer}{Employee}\ Contributions\right)\\ \sum(Investment\ Income)\end{gathered}}{\begin{gathered}\sum(Benefit\ Payments)\\ \sum(Capital\ Calls\ for\ Illiquid\ Assets)\\ \sum(Plan\ Expenses)\end{gathered}}$$

LCR Value	Implication
<1	The plan will need to sell illiquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan will not be required to sell illiquid assets to cover liquidity needs