



March 8, 2021


TO: Each Trustee,
Board of Investments

SUBJECT: Board of Investments Meeting on March 10, 2021 – Agenda Item IX.A.

Attached please find the Strategic Asset Allocation Asset Liability Overview presentation which was inadvertently left out of the agenda packet. (The presentation included in the agenda packet is a duplicate of the presentation for Agenda Item VIII. A.)

February 25, 2021

TO: Trustees – Board of Investments

FROM: Jude Pérez 
Principal Investment Officer

FOR: March 10, 2021 Board of Investments Meeting

SUBJECT: **STRATEGIC ASSET ALLOCATION ASSET LIABILITY OVERVIEW**

One of the Board of Investments' ("BOI") core responsibilities is setting LACERA's strategic asset allocation ("SAA"). The SAA is the key driver of long-term risk and returns for the Total Fund, and therefore, is a vital component as LACERA pursues its mission to produce, protect, and provide the promised benefits.

To date, the BOI has seen presentations covering asset-liability management, the effects of the coronavirus pandemic on the economy and capital markets, and the implications of investing in a low global interest rate environment. Meketa also discussed potential ways to refine strategies given the changes in market conditions since the last SAA review as well as discussing the capital market expectation process. As communicated in previous BOI meetings, the SAA review cycle will continue over the next four months, culminating at the end of the 2021 fiscal year.

This month, Meketa's presentation will cover an overview of the asset-liability study. The presentation will also highlight the various analyses that can be used as part of an SAA review process. These analyses include frameworks such as mean-variance optimization, scenario analysis, stress testing, simulation-based optimization, climate impact, risk budgeting, and value at risk analysis. These frameworks will be used in LACERA's current SAA study, including considerations for liquidity stress testing and impacts related to the sequence of returns. The objective is to measure risk through different lenses and to help set expectations, as no single framework can give a complete picture of the challenges and risks facing investors. The goal is to use a variety of tools to build a more complete picture of risks and help meet LACERA's objectives through the SAA process.

Meketa will review the attached presentation at the March 2021 BOI meeting.

Attachment

Noted and Reviewed:



Jonathan Grabel
Chief Investment Officer
JP

Presentation to the
Los Angeles County Employees
Retirement Association

Asset Liability Overview



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Asset Liability Overview

Background

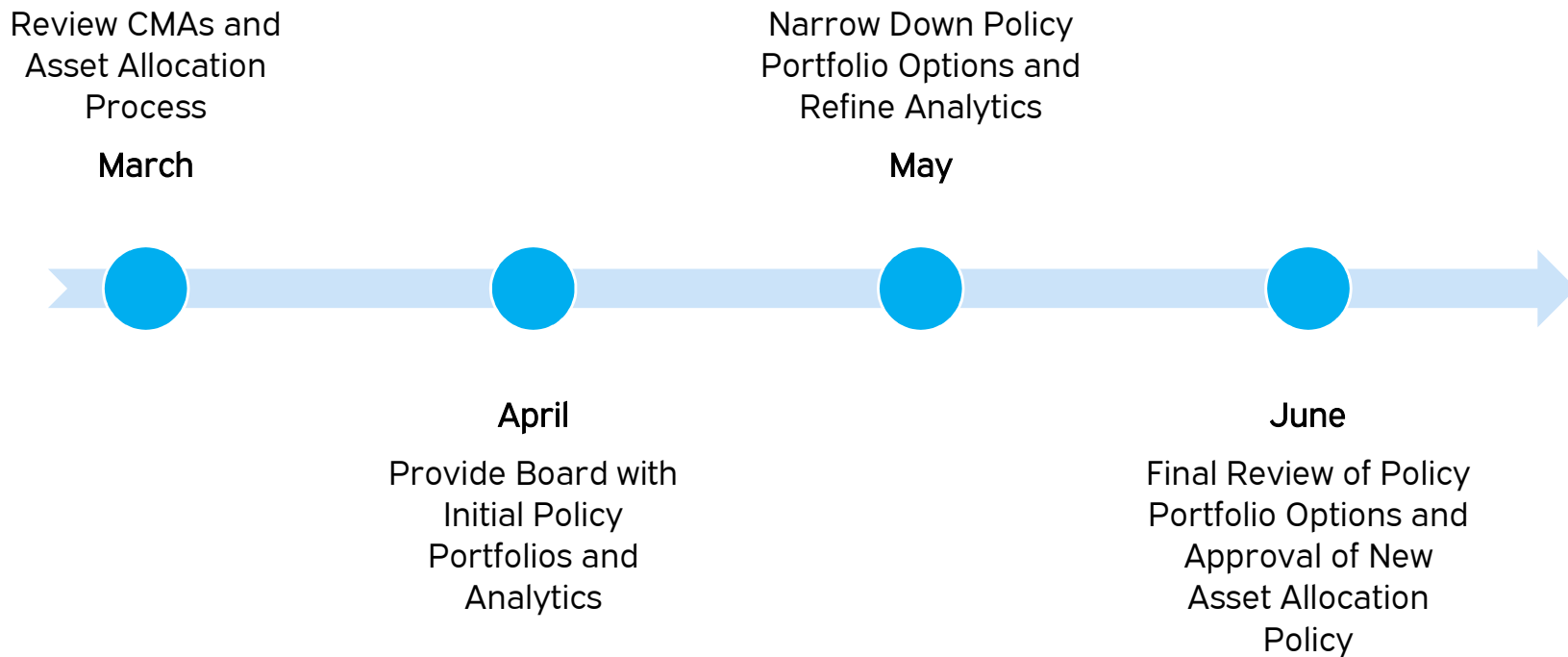
- This presentation highlights various analyses we conduct as part of our asset allocation review process.
 - We have included some of the most commonly used analyses.
- These analyses provide a more complete picture of various policy options.
- Each asset allocation review can include some or all of these analytics.
 - The objective is to try to measure risk through different lenses and to help set expectations.



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Asset Liability Overview

Timeline





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Asset Liability Overview

Our Asset Allocation Philosophy

- The asset allocation decision is likely to have the largest impact of any decision you make.
- Asset allocation is the process of accepting and managing both long term risk and opportunity.
 - Explicitly, it is the decision of how much to invest in distinct asset classes.
 - Implicitly, it is also the determination of how much and what types of risks you are willing to accept.
- Hence, asset allocation and risk management should be intricately linked with one another.
 - Using the best tools available helps us understand this relationship.
- LACERA believes that long-term strategic asset allocation will be the primary determinant of risk and return outcomes.



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Asset Liability Overview

The Mosaic Approach

- The real world risks and objectives faced by investors are complex and often conflicting.
 - These cannot be summarized in a single statistic.
 - Rather, we use a variety of tools to build a more complete picture.
- We have access to both commonly used industry tools, and specialized, proprietary tools developed by our internal team.

Mean-Variance Optimization	Tracking Error vs. Peers
Risk Budgeting	Historical Scenario Analysis
Alpha Assumptions	Factor Stress Tests
Sequence of Returns Impact	Liquidity Stress Tests
Big Data Simulations	Economic Regime Analysis
High Dimension Optimization	Simulation-Based Optimization



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Asset Allocation and Risk Management

- Mean Variance Optimization (MVO) is the traditional starting point for determining asset allocation.
 - It's familiar, easy to use, and produces a discrete output...but it has shortcomings.
- It is important to be aware of these shortfalls and address them when doing an asset allocation or asset-liability study.
 - Be humble, but rigorous, about the models.
 - The tools we use are continuing to evolve to address the shortcomings.



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Asset Liability Overview

Value at Risk¹

Scenario:	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
VaR (%):				
One Month	-8.2	-7.5	-8.2	-8.7
Three Months	-13.3	-12.2	-13.3	-14.1
VaR (\$ mm):				
One Month	-1,373	-1,255	-1,373	-1,456
Three Months	-2,226	-2,042	-2,226	-2,360

- Value at Risk (VaR) measures the expected worst-case loss in a portfolio over a specific time period, based on a certain confidence level.

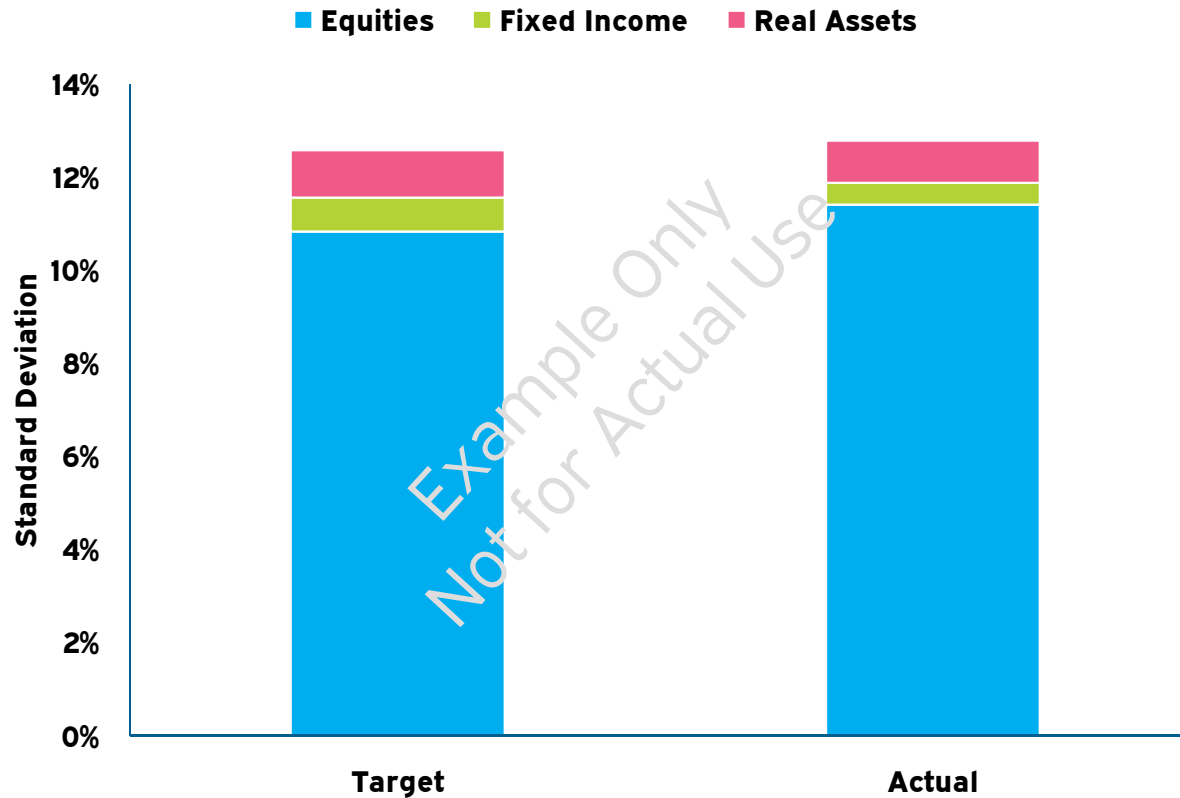
¹ Calculated with a 99% confidence level and based upon Meketa's 2019 Annual Asset Study. CVaR represents the average loss past the 99th percentile.



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Asset Liability Overview

Risk Budgeting Analysis¹ (Absolute Contribution to Risk)



- Risk budgeting allows the Trustees to gauge the relative scale of various types of investment risks in policy portfolios.

¹ Contribution to risk is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio.



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Asset Liability Overview

Historical Negative Scenario Analysis¹ (Cumulative Return)

Scenario:	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
Taper Tantrum (May – Aug 2013)	-0.5	-1.0	-0.8	-0.6
Global Financial Crisis (4Q07 through 1Q09)	-23.3	-19.7	-23.1	-24.8
Popping of the TMT Bubble (Apr 2000 – Sep 2002)	-8.1	-3.2	-7.7	-9.9
LTCM (Jul – Aug 1998)	-7.7	-6.8	-7.7	-8.4
Interest Rate Spike (1994)	0.8	-0.4	1.0	0.7
Crash of 1987 (Sept – Nov 1987)	-10.4	-9.2	-10.4	-11.2
Strong US Dollar (1Q81 through 3Q82)	4.1	7.2	5.4	4.0
Volcker Recession (Jan – Mar 1980)	-3.7	-4.1	-4.0	-3.7
Stagflation (1Q73 through 3Q74)	-20.7	-18.2	-20.5	-22.1

- Comparing negative historical market scenarios helps Trustees understand which policies perform the best through a variety of different types of stressful capital market environments.

¹ In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.



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Asset Liability Overview

Stress Testing: Impact of Market Movements (Expected Return under Stressed Conditions)¹

What happens if (over a 12-month period):	Current Policy (%)	Policy A (%)	Policy B (%)	Policy C (%)
10-Year T-Bond rates rise 100 bp	5.5	4.5	5.3	5.9
10-Year T-Bond rates rise 200 bp	3.3	1.6	2.9	3.7
10-Year T-Bond rates rise 300 bp	0.5	-1.7	-0.1	0.9
BBB Spreads widen by 50 bp, HY by 200 bp	5.1	4.9	5.0	5.3
BBB Spreads widen by 300 bp, HY by 1000 bp	-26.5	-24.1	-26.3	-27.8
Trade-weighted US \$ gains 10%	2.4	3.0	2.5	2.1
Trade-weighted US \$ gains 20%	4.8	6.0	4.9	4.2
Equities decline 10%	-6.3	-5.4	-6.1	-6.6
Equities decline 25%	-15.8	-13.6	-15.3	-16.6
Equities decline 40%	-25.2	-21.8	-24.5	-26.5

- Stress testing the different policies will help Trustees to better understand the impact of major market movements.

¹ Assumes that assets not directly exposed to the factor are affected nonetheless.



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Asset Liability Overview

Liquidity Stress Test

- We conduct an extreme stress test to analyze the LACERA's liquidity needs. Specifically, we would evaluate whether LACERA could:
 - Continue to meet its benefit obligations and expenses (including any obligations to fund commitments to Private Market managers),
 - While staying within its target allocation ranges,
 - And at what cost (i.e., to what extent would it be forced to sell stressed or distressed assets)?
- The scenario is designed to be extreme.
 - In Years 1 – 3, we use the returns produced by each asset class in 4Q07, 2008, and 1Q09, respectively. In Years 4 – 5, we assume flat (0%) returns for each asset class (i.e., no rebound).
 - We assume net cash outflows based on actuarial data and unfunded capital commitments.
 - We assume closed-end funds offer no liquidity in years 1 – 4, and very limited liquidity in year 5.
 - We assume open-end and hedge funds offer no liquidity in years 1 – 3, and limited liquidity in years 4 and 5.
- We assume the Plan would rebalance toward its policy targets each year.

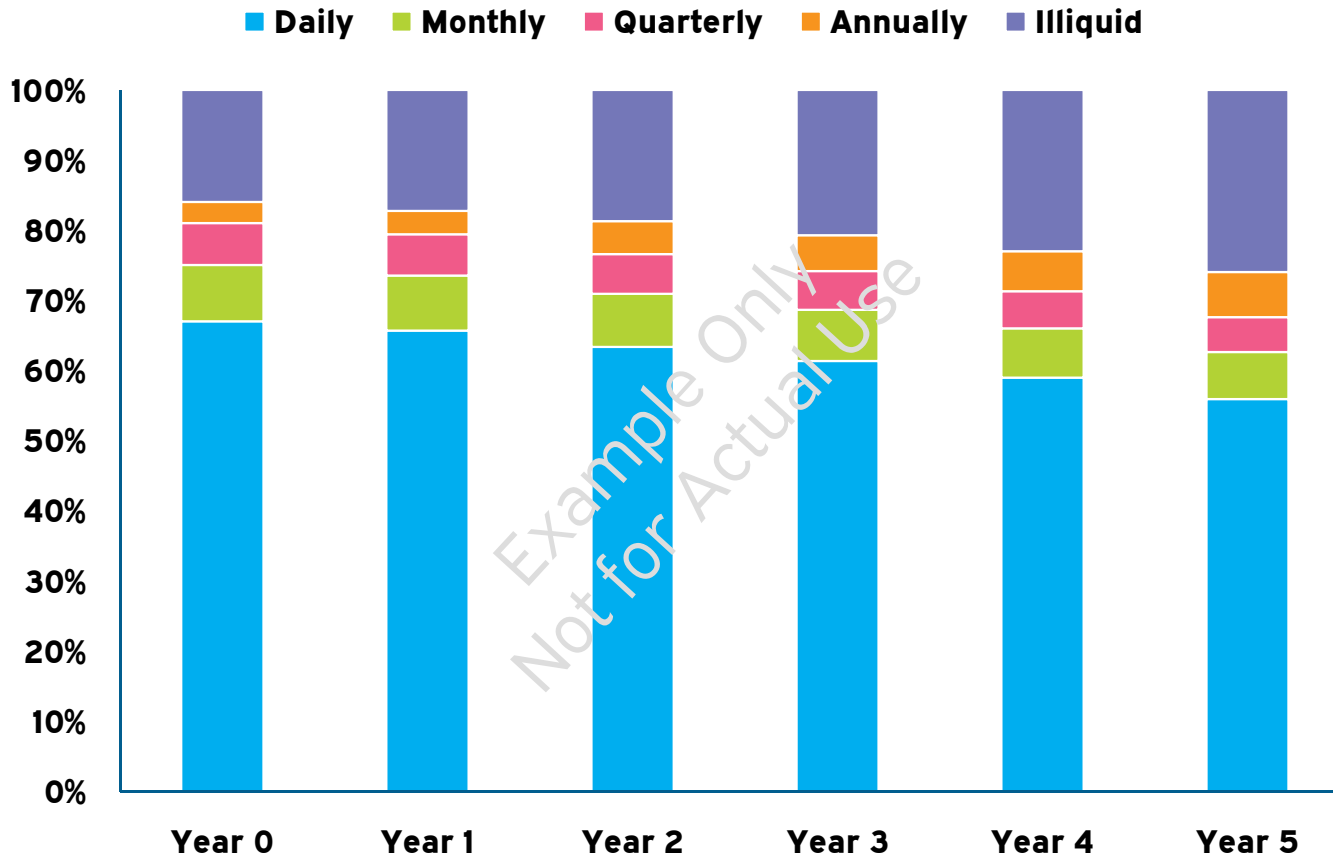
¹ We can either use the model of the client's actuary, that of a third-party actuary, or our own liability model.



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Asset Liability Overview

Liquidity Stress¹ Test: Impact on Liquidity (for Current Allocation)



¹ Assuming a decline resembling 2008-2009 spread out over five years.

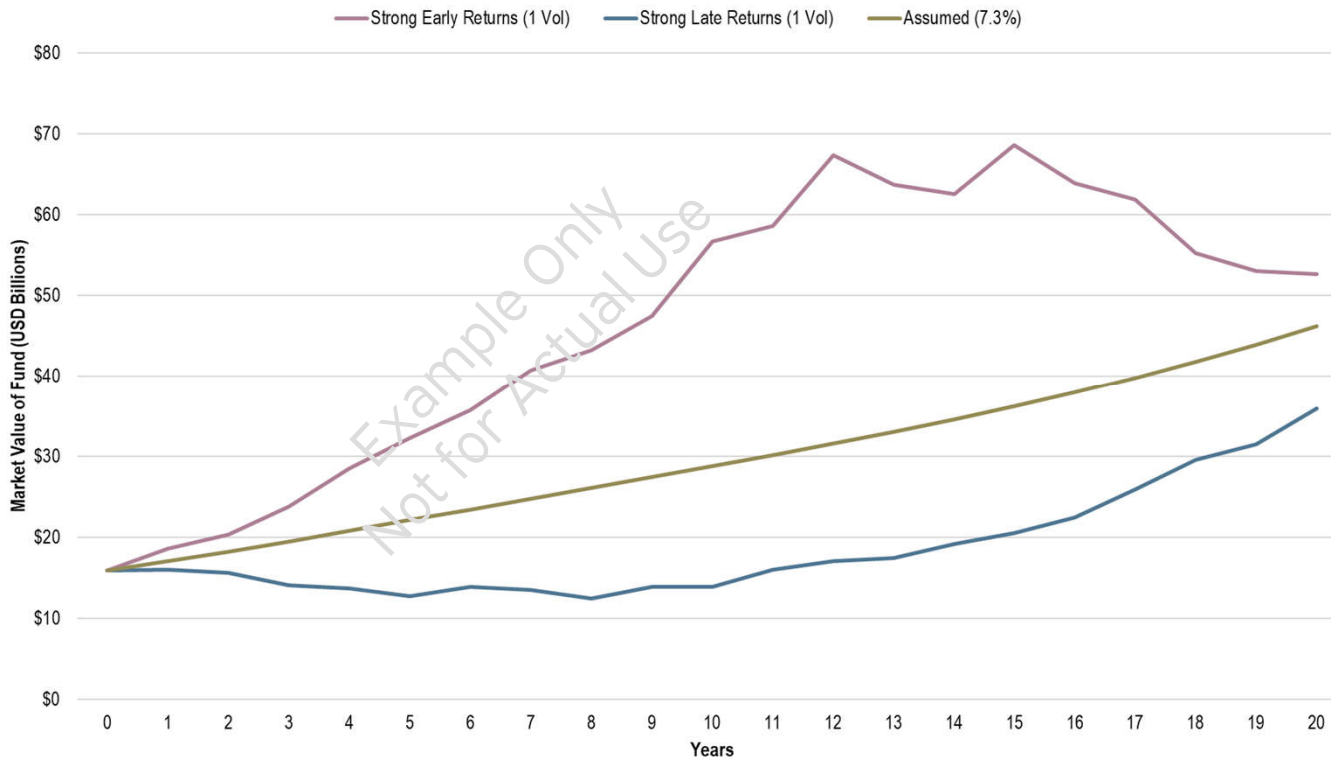


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Asset Liability Overview

Sequence of Returns: Significant Impact with Negative Cash Flows

- LACERA believes that the pattern of returns matters because volatility levels and the sequence of gains and losses can impact funded status and contribution rates.
- Negative cash flows make it much harder for a fund to recover after a market downturn.





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Asset Liability Overview

Simulation Based Optimization

- Meketa utilizes a proprietary, customizable simulation model.
 - The model is based on bootstrapped historical simulations.
- Asset classes/time series exhibit dynamic relationships and behavior.
 - Returns are based on adjusted history.
- Thousands of multi-year simulations are run that incorporate the liability structure.
 - Each potential portfolio is run through the same simulations (e.g., the same set of 10,000 30-year simulations).

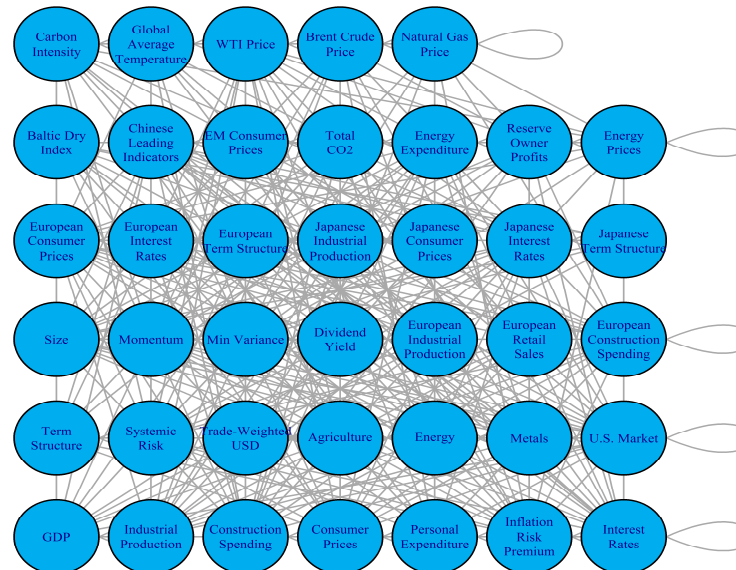
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Asset Liability Overview

How Does the Meketa Model Work?



We take historical factor definitions and their past behaviors to generate direct and indirect relationships among factors. We then use these relationships to generate “simulations” that forecast these factors into the future.

- Each simulation can be thought of as a way the world *could* look in the future.
- We then review the simulations with characteristics we’re interested in.



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Asset Liability Overview

Modeling the Asset Allocation Impact of Climate Change: Physical, Policy, and Technological Change

Meketa has developed analysis of a set of climate change scenarios to evaluate the impact on different asset classes over the next thirty years.

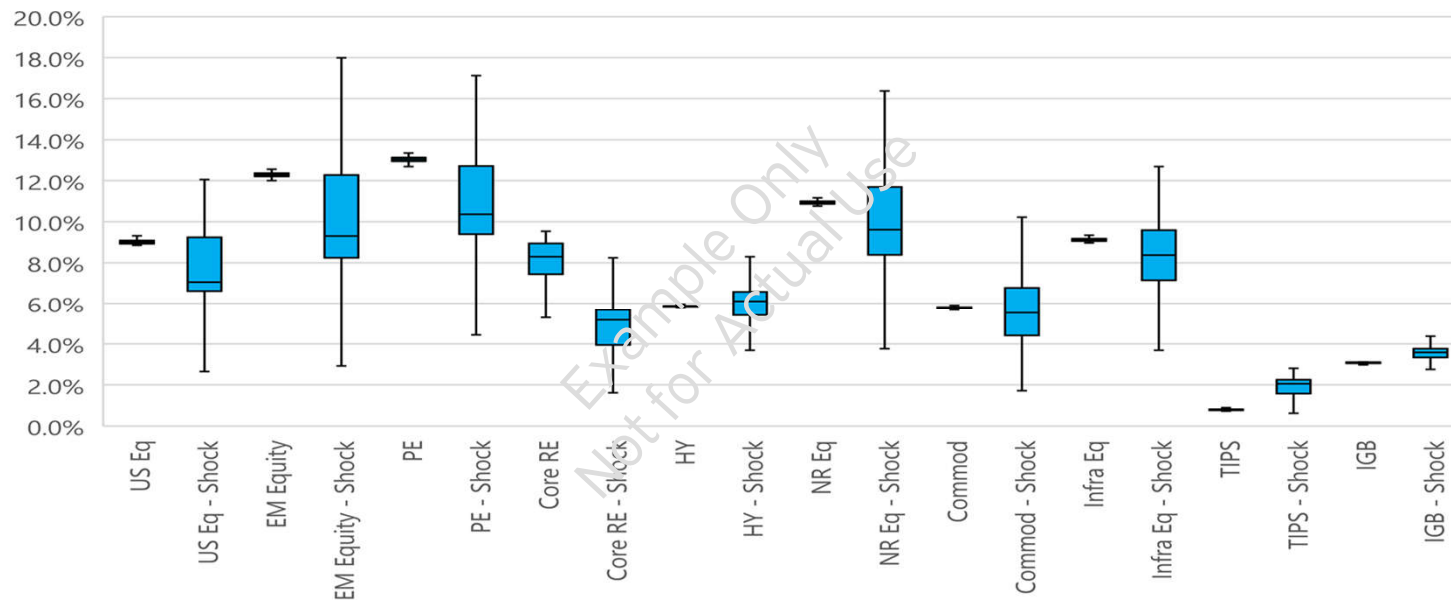
- Physical Change: What happens if global temperatures increase by 2.0°C by 2050?
 - We selected simulations where 2.0°C warming occurred by 2050.
- Policy Change: What happens if a \$100/tCO₂ carbon tax is implemented over the next decade?
 - We selected simulations with rises in oil and natural gas prices consistent with the taxation amount and removed simulations where fossil fuel reserve owners had increasing profits.
- Technology Change: What does a world with 3% improvement (i.e., reduction) in carbon intensity of electricity generation look like?
 - We selected simulations where 3% annual intensity improvements occurred within 10 years. Importantly, we made no assumptions about why the improvements occurred.
- Meketa will incorporate climate change scenarios into its stress testing of policy portfolios and show a carbon aware portfolio relative to policy portfolios.



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Asset Liability Overview

Scenario 1: Temperature Increase of 2.0°C by 2050 (annualized %)¹



- Equity returns trend lower than baseline but with upside potential to make up difference.
- Real estate returns are challenged; infrastructure is only a little lower returning than in the baseline but with high variability.
- Natural resources and commodities have returns close to baseline with positive outlier scenarios.
- IGBs and TIPS do moderately better than baseline while high yield is consistent with baseline.

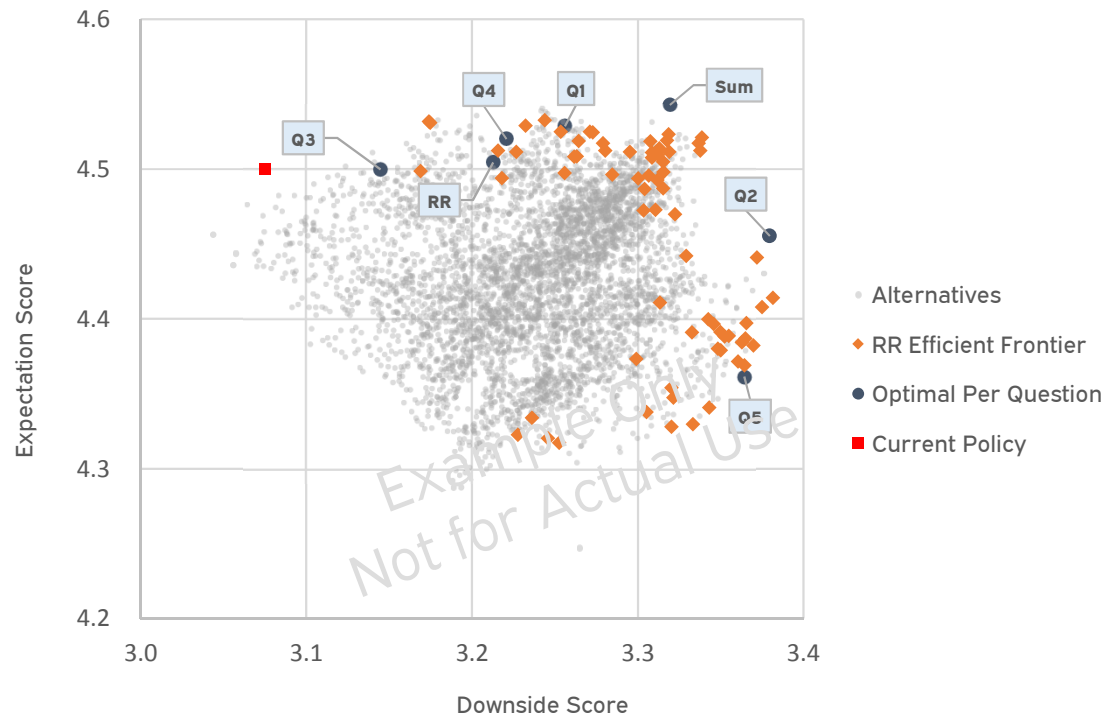
¹ A boxplot shows the spread and center of the data set. The median is shown as the center line in the box, the first and third quartiles are at the ends of the boxes and the min and max data points are the end points of the plotted lines.



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Asset Liability Overview

Quantifying Survey Results



- As part of the Strategic Asset Allocation study, the BOI was asked to complete a brief survey to solicit Trustee input of key considerations, risks, and implementations for the strategic asset allocation study.
- These results will be quantified to frame the optimization parameters and guide the policy portfolio selection process.



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Asset Liability Overview

Next Steps

- Presenting the Asset Liability Study, and possible iterations thereafter.
- Discussing suitability of benchmarks.
- Approving Strategic Asset Allocations for the Pension Trust and OPEB Trust.