Callan

October 26, 2021

MCERA Asset Liability Study Update

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Scope of the Project

Asset/Liability Study

Phase 1

- Review MCERA's current investment program
  - Strategic allocation to broad asset classes
  - Important to distinguish between "strategy" (i.e.—the target asset class/benchmark) and "implementation" (i.e.—the way the manager constructs the portfolio)
- Set asset class, portfolio expectations
  - Return, risk, correlation, and other considerations
  - Evaluate potential new asset classes/strategies

Phase 2

- Build integrated asset-liability model:
  - Reflect 6/30/2020 valuation results; confirm model assumptions, review with actuary. Roll valuation results forward to 6/30/21 to begin projections.
  - Deterministic projections – assume valuation assumptions are achieved
  - Simulation – apply Callan's capital market projections, insert capital market uncertainty, evaluate alternative investment strategies

Phase 3

- Develop preliminary asset-liability results
  - Confirm decision variables; ascertain risk tolerance and effective investment time horizon
  - Callan internal peer review of the study's results. Ongoing review and interaction with staff.
- Develop the final asset-liability study
  - Present finalized asset-liability results to MCERA Board of Trustees
  - MCERA Board selects an appropriate asset allocation

Proposed Timeline

Q3 2021

- Construct liability model in ProVal, starting with 2020 valuation results

October 2021-December 2021

- Callan presentation October 26: Overview of study process, review of current program, set capital market expectations, evaluate potential new strategies (Phase 1)
- Complete liability model, integrate asset mixes and develop projections and simulations (Phase 2)
- Review results with staff, actuary

January 2021

- Callan presentation: Deliver preliminary asset-liability study results for discussion with Board at January Board Meeting, focus on liability modeling (Phase 3). Consider alternative asset mixes

March 2021

- Callan presentation if needed: Deliver refined asset-liability study results. Complete study, adoption by Board

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Process Overview

Callan's Capital Markets Projections

Guiding objectives and process

Cornerstone of a prudent process is a long-term strategic investment plan

- Capital markets projections are key elements — set reasonable return and risk expectations for the appropriate time horizon
- Projections represent our best thinking regarding the long-term (10-year) outlook, recognizing our median projections represent the midpoint of a range, rather than a specific number
- Develop results that are readily defensible both for individual asset classes and for total portfolios
- Be conscious of the level of change suggested in strategic allocations for long-term investors: DB plan sponsors, foundations, endowments, trusts, DC participants, families, and individuals
- Reflect common sense and recent market developments, within reason

Callan's forecasts are informed by current market conditions, but are not built directly from them

- Balance recent, immediate performance and valuation against long-term equilibrium expectations

Purpose of Asset and Liability Study

- The cornerstone of a prudent process for pension plan, endowment, and foundation trustees (and any individual investor) is a careful and thorough examination of their long-term strategic plan.
- Explicitly acknowledge change and uncertainty in the capital markets.
- Establish reasonable rate-of-return and risk expectations.
- Incorporate material changes in strategic plan policies and demographics
  - Funding policy, benefit formula, eligibility, early retirement, COLA, decrement tables
  - Board is currently in discussion with the plan actuary to evaluate discount rate, inflation, and funding policy changes
- Reflect changes in regulations
  - Public pension: GASB 67 and 68
- Project and evaluate impact on assets, liabilities and funded status.
- Confirm an investment policy to meet return and risk objectives in relation to funding, accounting and policy goals.
- If no material changes have occurred, an asset allocation review should still be conducted every 3 – 5 years.

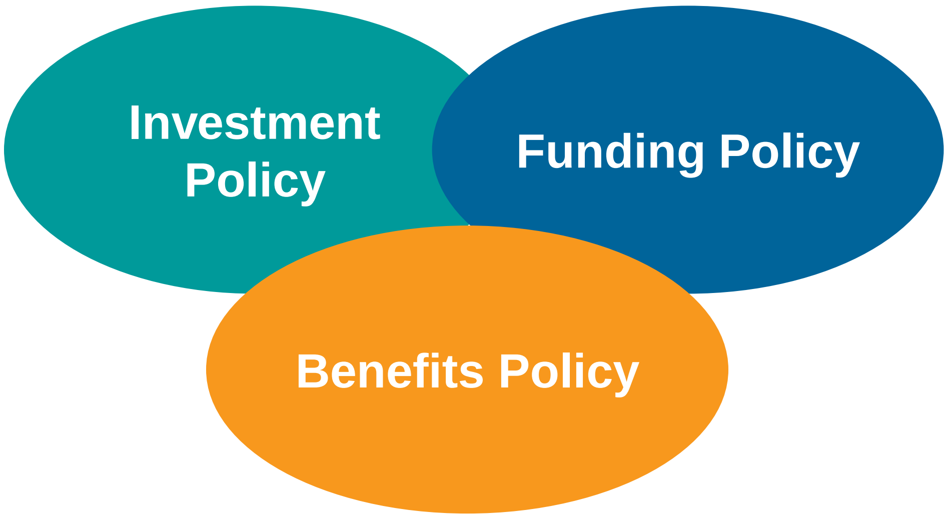
Where Does Asset Allocation Fit In Strategic Planning?

Integration of Key Operational Policies

We evaluate the interaction of the three key policies that govern a retirement plan with the goal of establishing the best investment policy

Investment Policy

- How will the assets supporting the benefits be invested?
- What risk and return objectives?
- How to manage cash flows?



Funding Policy

- How will the benefits/deficits be paid for (funded)?
- What are the actuarial assumptions to use?

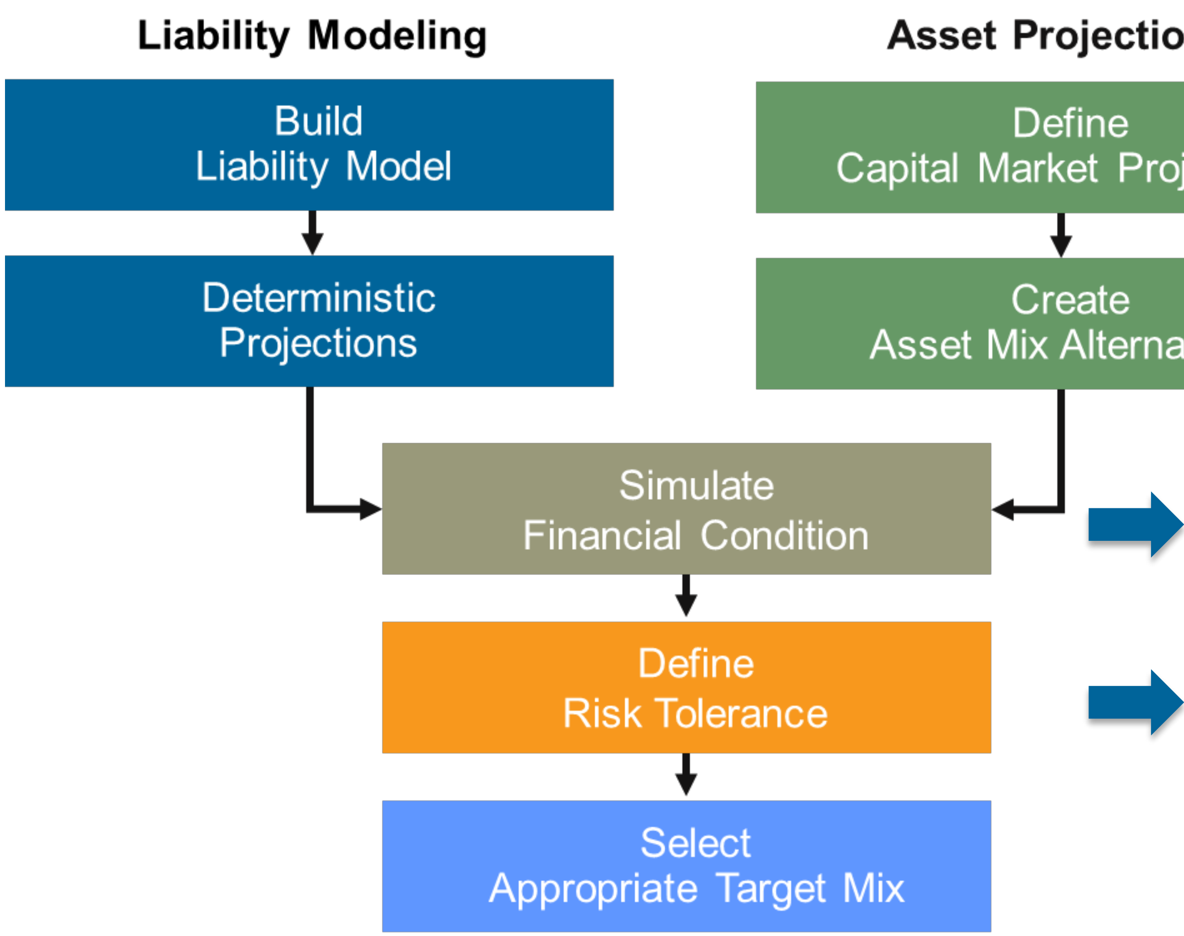
Benefits Policy

- What type/kind of benefits?
- What level of benefit?
- When and to whom are they payable?

Defining MCERA's Risk Tolerance

Factors Critical to Decision-Making

- Size of the Plan
- Current funded status
- Expected funding requirements
- Plan status (open to new participants; existing members still accrue benefits)
- Time horizon
- Liquidity needs:
  - Benefit payment less contributions
  - Funding policy can impact liquidity needs
- Liability growth rates
- Willingness to take risk:
  - Sensitivity to size of contribution or contribution volatility
- Financial ability to take risk



- Generate 2,000 simulations per year, per asset mix to capture possible future economic scenarios and their effect on the portfolio
  - Start simulations at 7/1/2021
  - Actual Investment experience reflected in FY 2021

- Alternative economic scenarios to be tested
  - Potential recovery paths, historic stressed periods

Investment Policy Process

Broad Definitions are Most Appropriate for Asset Allocation Policy Analysis

- Investment policy study is focused on capital market risk and return
  - Asset allocation policy is based on acceptable asset classes and acceptable level of investment uncertainty
- An asset class is a group of securities or investment strategies that have similar financial characteristics; behave similarly in response to market conditions; and behave differently from the securities (or strategies) contained in other asset classes.

Equity	Fixed Income	Real Assets	Absolute Return
US Equity Non-US Equity Private Equity	Bonds Short Term Cash	Private Public	Private Public
US Large Cap US Mid/Small Cap Non-US Developed Non-US Emerging Private Equity	US Investment Grade Global Fixed Income	Private Real Estate Public Real Assets: REITs Commodities TIPS Natural Resource Equity	Hedge Funds Multi-Asset Class Strategies Liquid Alternatives

Liability Model and Key Actuarial Assumptions – 2020 Actuarial Valuation

Variable	Value
As of 6/30/2020	
Total Actuarial Liability	$3,124.8mm
Market Value of Valuation Assets	$2,625.3mm
Unfunded Actuarial Liability	$499.5mm
Market Funded Status	84.0%
Employer Contribution for FYE 2019	29.68%
Employer Contribution for FYE 2020	30.53%

Key Actuarial Assumptions	Description
Investment Return	6.75%
Price Inflation	2.50%
Salary Scale	3.0%, plus longevity & promotion
COLA	2%-4% caps, vary by plan and tier

- Asset-liability projections will be based on the 6/30/2020 actuarial report for the MCERA Plan
- 2020-21 investment experience will be reflected in projections; net return on Plan assets for FY 20 was 3.26%, and was substantially higher for FY 21 of 30.03%
- Employer contributions shown above are blended rates incorporating multiple plan groups and tiers, and reflect the employers' share of normal cost plus substantial contributions to pay down the unfunded actuarial liability.
- Employee contributions are in addition to the rates shown above, and vary by plan group.
- Board is considering changes to funding and contribution policy, in discussion with the plan actuary. Callan will incorporate the board's decisions in the asset-liability study.

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2021 Capital Markets Expectations & Impact on MCERA Policy Target

Continued Surge in Global Equity Markets in 2Q21

Small cap leads in both U.S. and global ex-U.S. markets

Global equity continued to surge in 2Q

- Year-over-year returns from June are eye-popping:
  - *S&P 500: +41%*
  - *MSCI World ex-USA: +34%*
  - *Emerging Markets: +41%*
  - *U.S. Small Cap: +62% (!)*
- The recovery has been concentrated in a few stocks (FAANG + Friends), all U.S. mega cap.
- Market rotation to small cap and value with the flip from a “COVID trade” to a “GDP growth trade” in November
- Economic recovery now looking very strong in 2021, into 2022. Fed projects GDP growth of 7.0% in 2021, although 2Q came in at 6.6% and 1Q was revised down to 6.3%. Latest IHS forecast for Q3 is 3.4 (!)
- Initial distribution challenges and resistance to vaccination stalled the achievement of widespread inoculation in the U.S. Restricted availability of the vaccine outside the U.S. held back inoculation rates in countries around the globe.

Returns for Periods ended 6/30/21

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	8.24	44.16	17.89	14.70	9.87
S&P 500	8.55	40.79	17.65	14.84	9.76
Russell 2000	4.29	62.03	16.47	12.34	9.33
Global ex-U.S. Equity					
MSCI World ex USA	5.65	33.60	10.36	5.70	5.37
MSCI Emerging Markets	5.05	40.90	13.03	4.29	--
MSCI ACWI ex USA Small Cap	6.35	47.04	11.97	7.02	6.60
Fixed Income					
Bloomberg Barclays Aggregate	1.83	-0.33	3.03	3.39	5.14
90-day T-Bill	0.00	0.09	1.17	0.63	2.17
Bloomberg Barclays Long Gov/Credit	6.44	-1.86	5.45	7.30	7.48
Bloomberg Barclays Global Agg ex-US	0.92	4.60	1.63	0.99	3.79
Real Estate					
NCREIF Property	1.72	5.42	5.74	8.59	9.04
FTSE Nareit Equity	12.02	38.02	6.31	9.41	10.23
Alternatives					
CS Hedge Fund	3.02	16.60	5.63	4.24	7.05
Cambridge Private Equity*	9.48	54.21	18.83	15.07	15.52
Bloomberg Commodity	13.30	45.61	2.40	-4.44	1.31
Gold Spot Price	3.26	-1.61	6.05	1.66	6.33
Inflation - CPI-U	2.57	5.39	2.43	1.87	2.22

*Cambridge PE data through 03/31/21
Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

MCERA Asset Classes - Return and Risk

Asset Class	10-Year Compound Return	Projected Standard Deviation	Real Return
Broad Domestic Equity	6.60%	17.95%	4.60%
Global ex-US Equity	6.80%	20.70%	4.80%
Domestic Fixed Income	1.75%	3.75%	-0.25%
Private Equity	8.00%	27.80%	6.00%
Real Assets	**5.55%**	**12.20%**	**3.55%**
Cash Equivalents	1.00%	0.90%	-1.00%

- Total Real Assets portfolio:
  - 8% private real estate, 7% public real assets
  - Public real assets = 25% TIPS, 25% Commodities, 25% REITs, 25% Natural Resource Equity
- The new Opportunistic allocation has a 0% target, so it is not included in these projections.

Source: Callan LLC

MCERA Asset Classes - Correlation

	Broad Domestic Equity	Global Ex-U.S. Equity	Domestic Fixed	Real Assets	Private Equity	Cash Equivalents	Inflation
Broad Domestic Equity	1.00						
Global Ex-U.S. Equity	0.82	1.00					
Domestic Fixed	-0.10	-0.12	1.00				
Real Assets	0.81	0.79	-0.07	1.00			
Private Equity	0.80	0.78	-0.19	0.71	1.00		
Cash Equivalents	-0.06	-0.10	0.15	-0.01	0.00	1.00	
Inflation	-0.01	0.01	-0.25	0.20	0.06	0.05	1.00

Source: Callan LLC

MCERA - 2021 Efficient Mixes

Real Assets Constrained to 15% of Portfolio

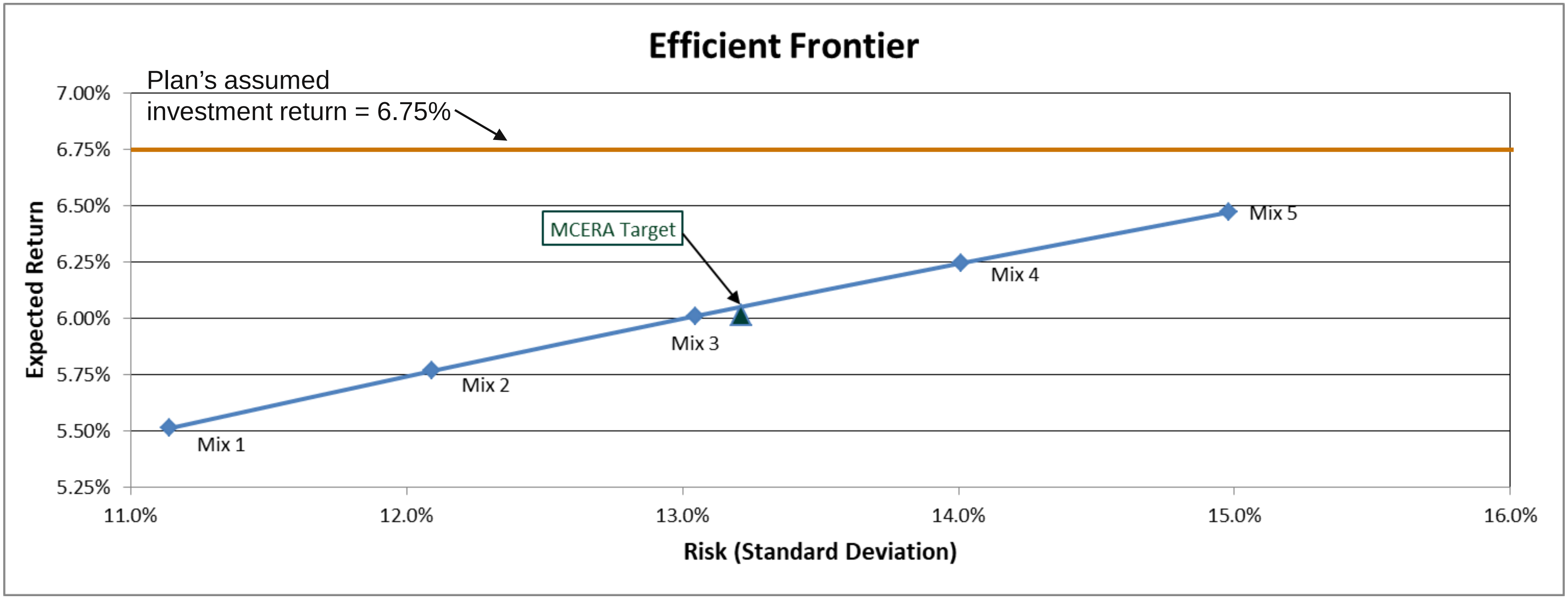
				Alternative Asset Mixes - 15% Real Assets				
Asset Class	**MCERA Target**	**Min Alloc**	**Max Alloc**	**Mix 1**	**Mix 2**	**Mix 3**	**Mix 4**	**Mix 5**
Broad US Equity	32%	0%	100%	24%	27%	29%	32%	34%
Broad International Equity	22%	0%	100%	16%	17%	19%	20%	22%
Broad US Fixed Income	23%	0%	100%	35%	30%	25%	20%	15%
Real Assets	15%	15%	15%	15%	15%	15%	15%	15%
Private Equity	8%	0%	100%	10%	11%	12%	13%	14%
Totals	**100%**			**100%**	**100%**	**100%**	**100%**	**100%**
Expected Return	6.0%			5.5%	5.8%	6.0%	6.2%	6.5%
Real Return	4.0%			3.5%	3.8%	4.0%	4.2%	4.5%
Risk (Standard Deviation)	13.2%			11.1%	12.1%	13.0%	14.0%	15.0%
% equity	62%			50%	55%	60%	65%	70%
% fixed income	23%			35%	30%	25%	20%	15%
% real assets	15%			15%	15%	15%	15%	15%

- Mixes are constrained to hold 15% real assets
- Maximum private equity allocation = 25% of public equity exposure
- No new asset classes included
- The current target mix is efficient and lies on the efficient frontier
- Real assets expands the real estate allocation category to include other real assets, all publicly traded: TIPS, commodities, natural resource equity and REITs. Real estate remains the core, with added diversification.

Source: Callan LLC

MCERA - 2021 Efficient Frontier – Nominal Return

Maximum Private Equity Allocation = 25% of Public Equity Exposure

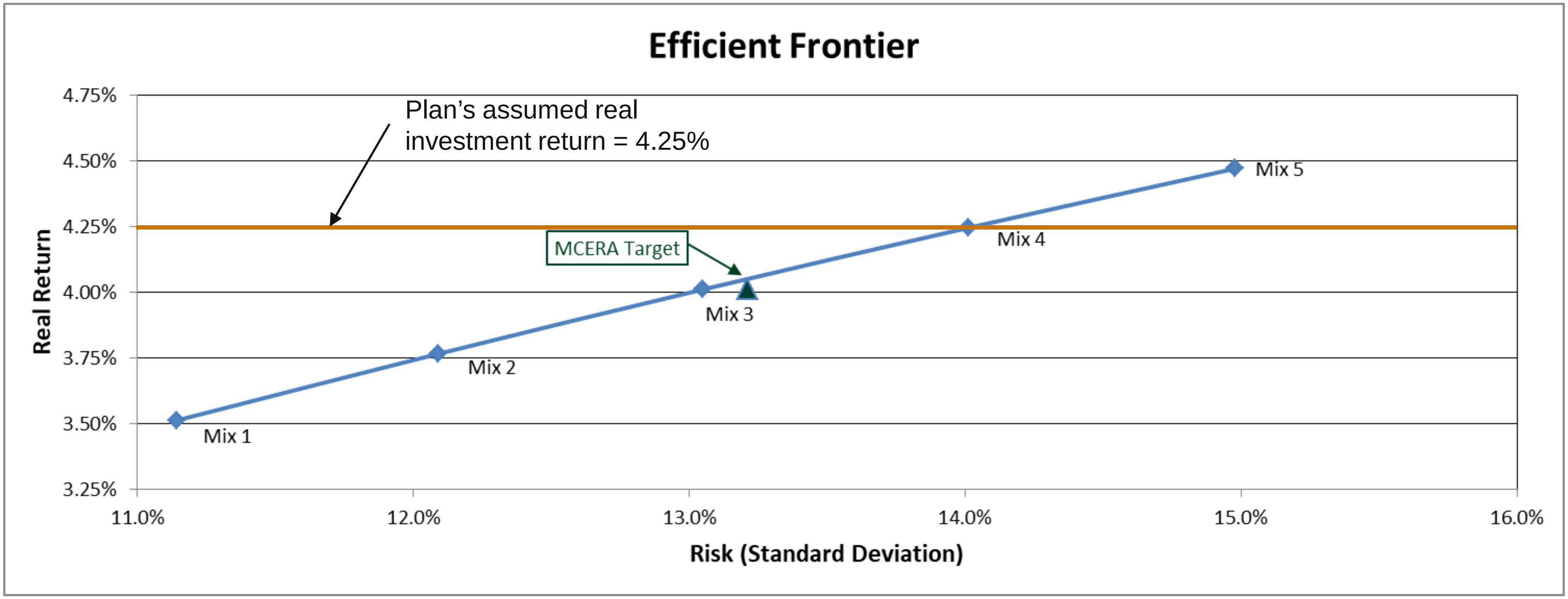


- MCERA's asset allocation target is an optimal allocation, since it lies on the efficient frontier depicting risk and return.
- Current target is a well-diversified portfolio that includes fixed income, public equity, private equity and real assets, including private real estate.

Source: Callan LLC

MCERA - 2021 Efficient Frontier – Real Return

Maximum Private Equity Allocation = 25% of Public Equity Exposure

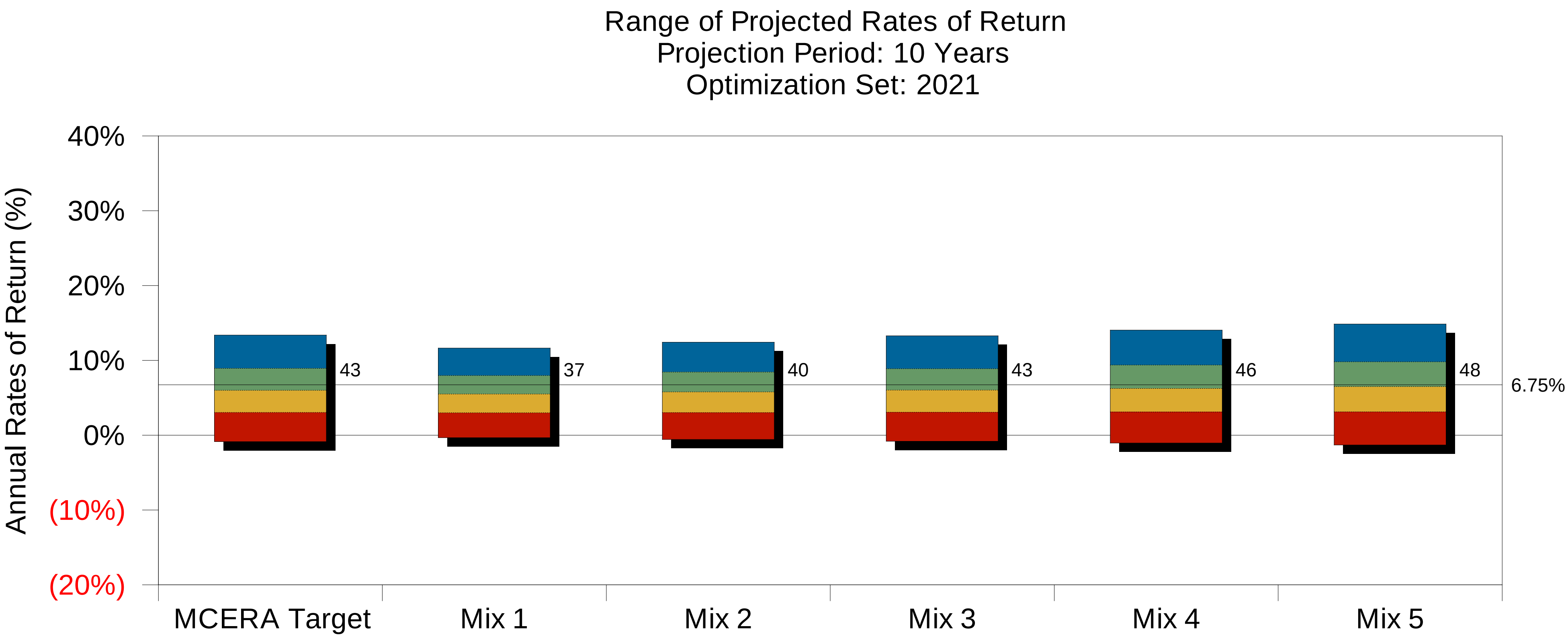


- MCERA's long term nominal return assumption of 6.75% and inflation assumption of 2.5% suggest a long term real return target of 4.25%.
- Callan's 10-year return expectation for the target asset allocation is 6.0%, and combined with our inflation assumption of 2.0%, yields a real return expectation of 4.0%, lower than the 4.25% assumed in the actuarial valuation.

Source: Callan LLC

Projected Rates of Return – Ten Years

Maximum Private Equity Allocation = 25% of Public Equity Exposure



	MCERA Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
5th Percentile	13.4%	11.7%	12.4%	13.3%	14.1%	14.9%
25th Percentile	8.9%	8.0%	8.4%	8.9%	9.4%	9.8%
Median	6.0%	5.5%	5.8%	6.0%	6.3%	6.5%
75th Percentile	3.1%	3.0%	3.0%	3.1%	3.1%	3.1%
95th Percentile	(0.8%)	(0.3%)	(0.6%)	(0.8%)	(1.0%)	(1.3%)
Prob > 6.75%	43.0%	36.6%	39.9%	43.0%	45.5%	47.9%

Source: Callan LLC

2021 Capital Market Expectations – Nominal vs Real

Modest Return Expectations Across All Asset Classes

- The expected return for the MCERA Policy Target Mix is 6.0%, 75 bps below the 6.75% return assumed in the actuarial valuation.
- The Plan has a reasonable chance of achieving this result over 10 years (43% probability). Looking to the real return, the gap is smaller. The real return embedded in the valuation (6.75% - 2.5% inflation = 4.25%) is 25 bps higher than Callan's expected real return (6.0% - 2.0% inflation = 4.0%).
- While return expectations are low relative to long-term history for the next five- to ten-year horizon, MCERA will need to retain a strong orientation toward risk assets (equity) in pursuit of return to achieve its funding goals.
- Whether the plan should pursue more or less exposure to risk assets than the current policy target mix should not be unduly influenced by subdued expectations for the shorter-term 5-10 year horizon. We do not believe investors are likely to be compensated for greater risk taking in the shorter term.

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Integration of Assets and Liabilities and the Final Study

Asset/Liability Study Process

Liability Model and Projected Cash Flows

Pension Plan Equation: Benefits + Expenses = Investment Return + Contributions

Callan builds the liability model

- Uses data from plan actuary (Segal)

Liability Assumptions

- Funding Policy
  - Employee contributions
  - Employer contributions
- Benefit Policy
  - Benefit formulas
  - Cost of living increases
- Demographics
  - Ratio of Active vs Retirees
  - Average age
  - Population growth
  - Salary increases
  - Mortality table – longevity risk management
  - Discount rate

Asset/Liability Study

Simulate Financial Condition

- Asset mixes are compared and evaluated on both absolute and relative basis.
  - Absolute measures are used to evaluate objectives: returns, funded ratios.
  - Relative measures compare probable outcomes across asset mixes.
- Asset mixes are analyzed through the use of simulated returns.
  - Values are based on 2,000 simulated returns over a 10-year projection time period.
  - Median results represent the mid point of the simulated outcomes (1,000 returns worse, 1,000 better).
  - 95th percentile results represent the highest return of the worst 5% of simulations.
  - Forecast range of returns is used to show the probable ranges of contributions and funded status.
- Observe patterns of results across Asset Mixes
  - Focus is on Median and 95th percentile market values, returns and funded ratios.

Key Decision Variables to Consider

- The range of actuarial liability
- Present value of future contributions
- Range of the market (or actuarial) value of Plan assets
- Funded Ratio
- Liquidity and cash flow needs
- Present value of future unfunded liability
- Ultimate Net Cost
  - Ultimate net cost combines contributions paid in over the planning horizon plus the value of the unfunded liability at the end of the projection period.

Summary Comments

Considerations in the selection of the Investment Policy

- Financial strength of the Plan Sponsor
  - Contribution volatility
- Financial strength of the Plan
  - Funded Status: Assets/Liabilities
- Investment goals & objectives
  - Absolute return
  - Relative return
  - Funded status
- Time Horizon
- Liquidity needs
- Risk tolerance of decision makers
  - Volatility of short term results

Defining Risk Tolerance

Factor	Public Pension and Taft-Hartley	Corporate Pension	Endowment and Foundation
Investment Goal	✓	✓	✓
Time Horizon	✓	✓✓	✓
Liquidity Needs	✓	✓	✓
Willingness to take Risk	✓	✓	✓
Size of Plan/Fund relative to Sponsor	✓	✓✓	✓
Financial Strength of Sponsor	✓	✓✓	✓
Absolute Return Target	✓✓✓		✓✓✓
Projected Funded Status	✓✓	✓	
Contribution Volatility	✓✓	✓	
Liability Characteristics	✓	✓✓	
Financial Statement Sensitivity		✓	
Permissible Investments	✓		
Spending Volatility			✓
Peer Group Comparison	✓	✓	✓

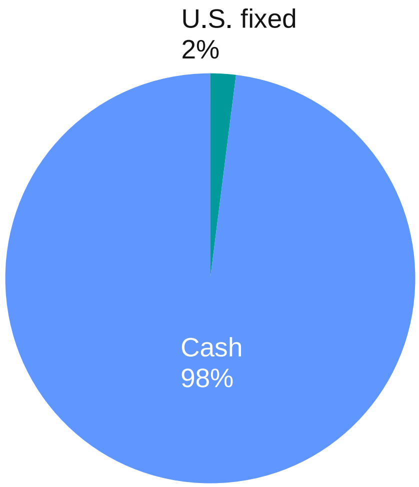
Summary

- The asset/liability study will enable MCERA to evaluate the financial condition of the pension plan under alternative investment scenarios into the future.
- Only modest changes have been made to funding and benefit policy since the last asset/liability study in 2017; study will fully incorporate these changes and reflect the valuation and projection results of the actuary.
- Key actuarial assumptions will be included as Callan develops our liability projection model:
  - Mortality/longevity
  - Salary growth
  - Assumed rate of return
- The modeling process will begin using the 2020 valuation
  - The 6/30/2021 asset results will be incorporated (net return of 30.03%)
  - Liabilities and assets rolled forward to 6/30/2021
  - Incorporate expected changes to liabilities stemming from any assumption or policy changes adopted by the Board
    - Discount rate, inflation, real return
    - Resetting amortization bases, or amortizing the 2020-21 investment gain over a different time period
    - Contingency reserve

Appendix

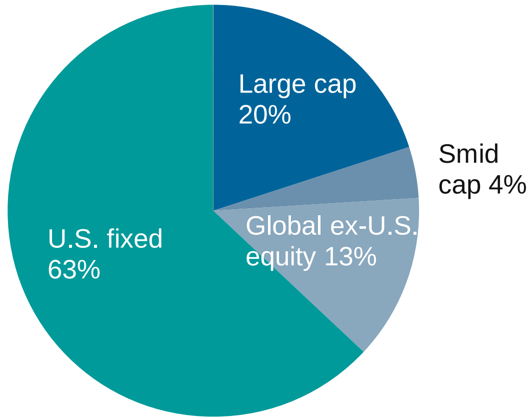
7% Expected Returns Over Past 30+ Years

Increasing Complexity



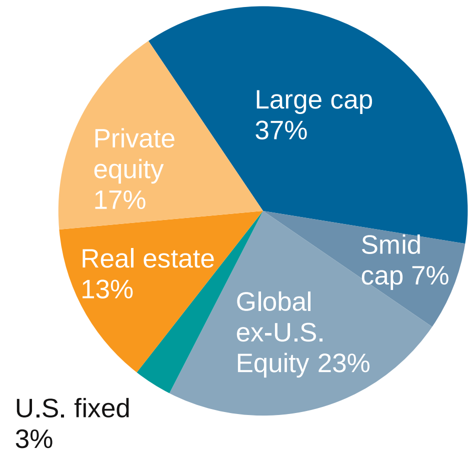
1991

Return:	**7.0%**
Risk:	**1.1%**



2006

Return:	**7.0%**
Risk:	**6.7%**



2021

Return:	**7.0%**
Risk:	**17.3%**

Increasing Risk

In 1991, our expectations for cash and broad U.S. fixed income were 6.95% and 8.95%, respectively

Return-seeking assets were not required to earn a 7% projected return

15 years later, an investor would have needed over a third of the portfolio in public equities to achieve a 7% projected return, with 6x the portfolio volatility of 1991

Today an investor is required to include 97% in return-seeking assets to earn a 7% projected return at almost 16x the volatility compared to 1991

Source: Callan LLC

2021–2030 Callan Capital Markets Assumptions

Asset Class	Index	Projected Return			Projected Risk	
		1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	Projected Yield
Equities						
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.60%	17.95%	1.95%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.50%	17.70%	2.00%
Smid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.70%	21.30%	1.75%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.80%	20.70%	2.80%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.50%	19.90%	3.00%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.90%	25.15%	2.35%
Fixed Income						
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr Gov / Credit	1.50%	1.50%	-0.50%	2.00%	1.55%
Core U.S. Fixed	Bloomberg Barclays Aggregate	1.80%	1.75%	-0.25%	3.75%	2.50%
Long Government	Bloomberg Barclays Long Government	1.35%	0.60%	-1.40%	12.50%	3.00%
Long Credit	Bloomberg Barclays Long Credit	2.95%	2.45%	0.45%	10.50%	4.65%
Long Government/Credit	Bloomberg Barclays Long Gov / Credit	2.30%	1.80%	-0.20%	10.35%	4.00%
TIPS	Bloomberg Barclays TIPS	1.80%	1.70%	-0.30%	5.05%	2.35%
High Yield	Bloomberg Barclays High Yield	4.85%	4.35%	2.35%	10.75%	6.70%
Global ex-U.S. Fixed	Bloomberg Barclays Global Agg xUSD	1.15%	0.75%	-1.25%	9.20%	1.80%
Emerging Market Sovereign Debt	EMBI Global Diversified	3.90%	3.50%	1.50%	9.50%	5.95%
Alternatives						
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.75%	14.10%	4.40%
Private Infrastructure	MSCI Global Infra / FTSE Dev Core 50/50	7.00%	6.00%	4.00%	15.45%	4.60%
Private Equity	Cambridge Private Equity	11.50%	8.00%	6.00%	27.80%	0.00%
Private Credit	n/a	7.15%	6.25%	4.25%	14.60%	6.25%
Hedge Funds	Callan Hedge FOF Database	4.25%	4.00%	2.00%	8.00%	0.00%
Commodities	Bloomberg Commodity	3.80%	2.25%	0.25%	18.00%	2.00%
Cash Equivalents	90-Day T-Bill	1.00%	1.00%	-1.00%	0.90%	1.00%
Inflation	CPI-U		2.00%		1.50%	

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

2021–2030 Capital Markets Assumption Correlations

	Broad U.S. Equity	Large Cap	Smid Cap	Gl ex-U.S. Equity	Dev ex-U.S. Equity	Em Market Equity	Short Dur	Core U.S. Fixed	Long Gov	Long Credit	Long Gov / Credit	TIPS	High Yield	Global ex-U.S. Fixed	Em Market Debt	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
Broad U.S. Eq	**1.00**																						
Large Cap	1.00	**1.00**																					
Smid Cap	0.93	0.90	**1.00**																				
Gl ex-U.S. Equity	0.82	0.81	0.80	**1.00**																			
Dev. ex-U.S. Eq	0.78	0.77	0.77	0.98	**1.00**																		
Em Market Eq	0.80	0.79	0.76	0.93	0.84	**1.00**																	
Short Duration	-0.06	-0.06	-0.08	-0.08	-0.06	-0.10	**1.00**																
Core U.S. Fixed	-0.10	-0.10	-0.12	-0.12	-0.11	-0.14	0.81	**1.00**															
Long Gov	-0.15	-0.15	-0.16	-0.15	-0.13	-0.16	0.67	0.84	**1.00**														
Long Credit	0.27	0.28	0.25	0.26	0.26	0.24	0.64	0.80	0.69	**1.00**													
Long Gov / Cr	0.09	0.09	0.07	0.09	0.09	0.07	0.71	0.88	0.90	0.94	**1.00**												
TIPS	-0.08	-0.08	-0.08	-0.09	-0.09	-0.10	0.56	0.65	0.53	0.52	0.57	**1.00**											
High Yield	0.72	0.71	0.68	0.71	0.69	0.69	-0.01	0.00	-0.08	0.40	0.20	0.06	**1.00**										
Gl ex-U.S. Fixed	0.01	0.01	0.00	0.06	0.05	0.08	0.48	0.50	0.42	0.49	0.50	0.40	0.12	**1.00**									
Em Market Debt	0.53	0.53	0.51	0.56	0.52	0.58	0.08	0.12	0.05	0.35	0.24	0.18	0.60	0.15	**1.00**								
Core Real Estate	0.71	0.71	0.66	0.67	0.66	0.63	-0.01	-0.04	-0.09	0.24	0.10	-0.02	0.53	-0.02	0.36	**1.00**							
Private Infra	0.72	0.72	0.67	0.69	0.68	0.65	0.00	0.01	-0.03	0.27	0.15	-0.02	0.50	0.03	0.35	0.76	**1.00**						
Private Equity	0.80	0.80	0.76	0.78	0.76	0.74	-0.10	-0.19	-0.21	0.15	-0.01	-0.14	0.59	0.06	0.43	0.60	0.62	**1.00**					
Private Credit	0.74	0.73	0.70	0.72	0.70	0.69	0.00	-0.06	-0.10	0.28	0.12	-0.09	0.63	0.06	0.48	0.56	0.52	0.68	**1.00**				
Hedge Funds	0.78	0.78	0.73	0.76	0.74	0.73	0.10	0.14	0.07	0.39	0.27	0.09	0.64	0.05	0.55	0.52	0.47	0.60	0.61	**1.00**			
Commodities	0.26	0.26	0.25	0.25	0.25	0.25	-0.10	-0.10	-0.10	0.01	-0.04	0.10	0.15	0.15	0.19	0.21	0.18	0.23	0.17	0.23	**1.00**		
Cash Equiv	-0.06	-0.06	-0.08	-0.10	-0.10	-0.10	0.30	0.15	0.08	-0.05	0.01	0.12	-0.11	0.00	-0.07	0.00	-0.07	0.00	-0.06	-0.04	-0.02	**1.00**	
Inflation	-0.01	-0.02	0.02	0.01	0.00	0.03	-0.21	-0.25	-0.23	-0.25	-0.26	0.08	0.05	-0.10	0.00	0.10	0.06	0.06	0.06	0.15	0.29	0.05	**1.00**

– Relationships between asset classes are as important as standard deviation

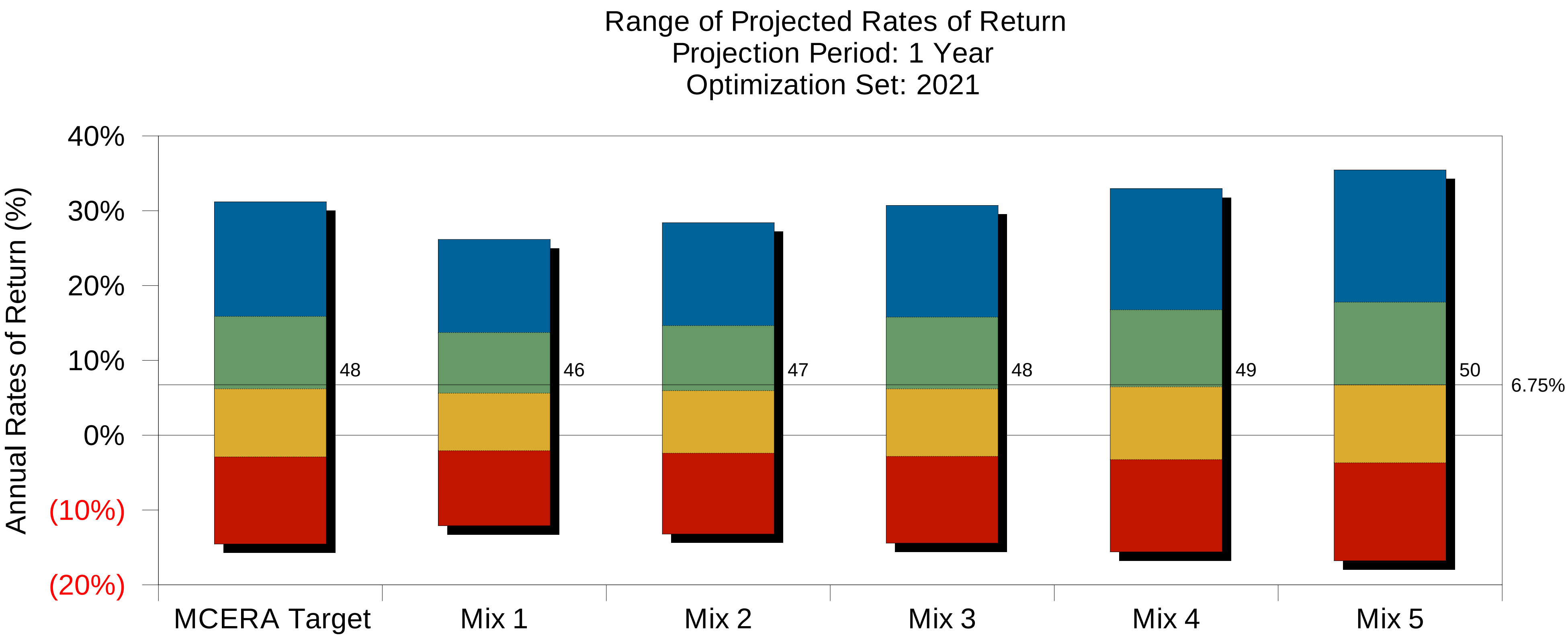
– To determine portfolio mixes, Callan employs mean-variance optimization

– Return, standard deviation, and correlation determine the composition of efficient asset mixes

Source: Callan LLC

Projected Rates of Return – One Year

Maximum Private Equity Allocation = 25% of Public Equity Exposure

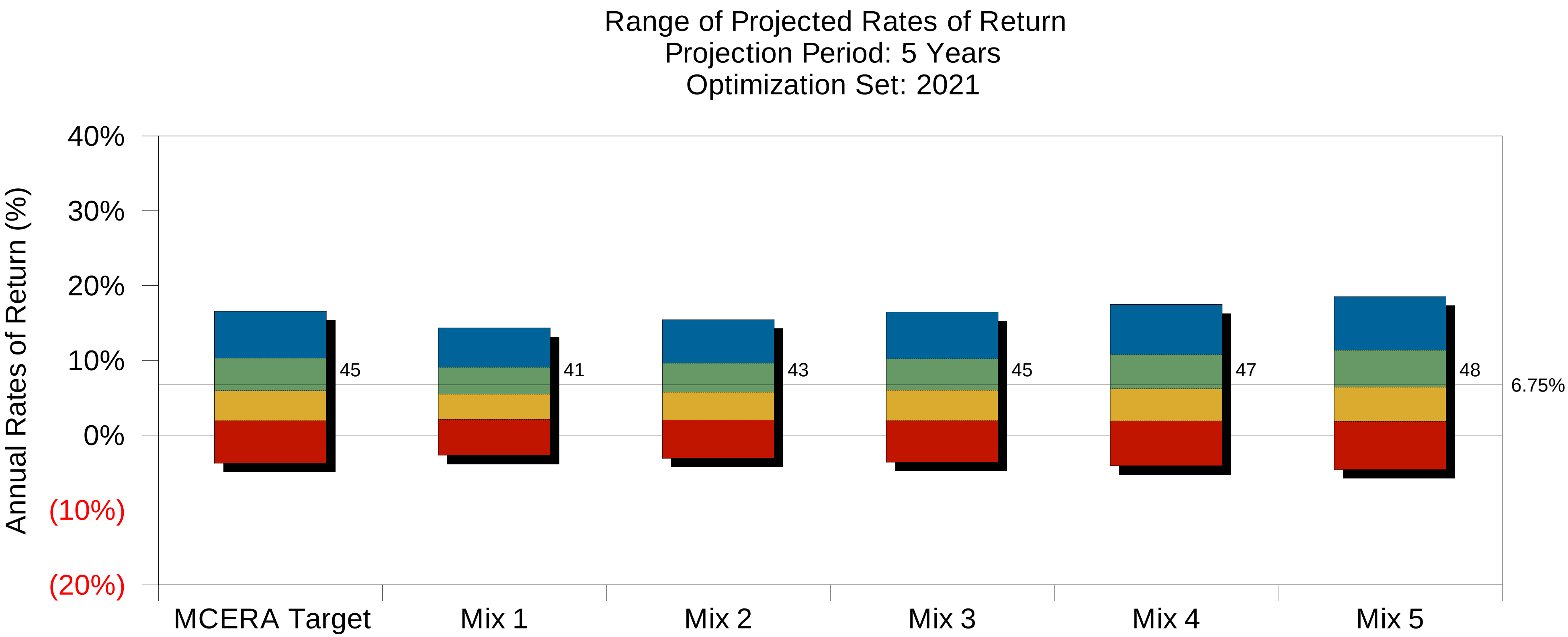


	MCERA Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
5th Percentile	31.2%	26.2%	28.4%	30.7%	33.0%	35.5%
25th Percentile	15.9%	13.7%	14.6%	15.8%	16.8%	17.8%
Median	6.2%	5.6%	6.0%	6.2%	6.5%	6.7%
75th Percentile	(2.9%)	(2.0%)	(2.4%)	(2.8%)	(3.3%)	(3.7%)
95th Percentile	(14.5%)	(12.1%)	(13.2%)	(14.4%)	(15.6%)	(16.8%)
Prob > 6.75%	48.4%	46.1%	47.1%	48.2%	49.3%	50.0%

Source: Callan LLC

Projected Rates of Return – Five Years

Maximum Private Equity Allocation = 25% of Public Equity Exposure



	MCERA Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
5th Percentile	16.6%	14.3%	15.4%	16.5%	17.5%	18.5%
25th Percentile	10.3%	9.1%	9.6%	10.2%	10.8%	11.4%
Median	6.0%	5.5%	5.8%	6.0%	6.2%	6.4%
75th Percentile	1.9%	2.1%	2.1%	2.0%	1.9%	1.8%
95th Percentile	(3.7%)	(2.7%)	(3.1%)	(3.6%)	(4.1%)	(4.6%)
Prob > 6.75%	45.0%	40.6%	42.8%	45.1%	46.9%	48.5%

Source: Callan LLC

Disclaimers

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