

June 17, 2026



**Mendocino County Employees'
Retirement Association**

MCERA Board Education

Greg DeForrest, CFA
Fund Sponsor Consulting

Claire Telleen, CFA
Fund Sponsor Consulting

Hannah Vieira
Fund Sponsor Consulting

MCERA Board Education Calendar

FY 2026 – 2027

June

Asset Allocation by
Function

July

Direct Investing
Considerations

August

Quarterly Investment Update

September

Liquidity Management &
Active Risk Budgeting

October

Risk Mitigation & Private
Equity Education

November

Actuarial Valuation
Presentation
Quarterly Investment Update

December

Private Credit Education

January

Capital Market Expectations
California Retirement
System Investment
Experience Review

February

Investment Philosophy
Review
Quarterly Investment Update

March

Asset Liability Study

April

Mid Cap Value Strategy
Update
Performance Measurement
Framework

May

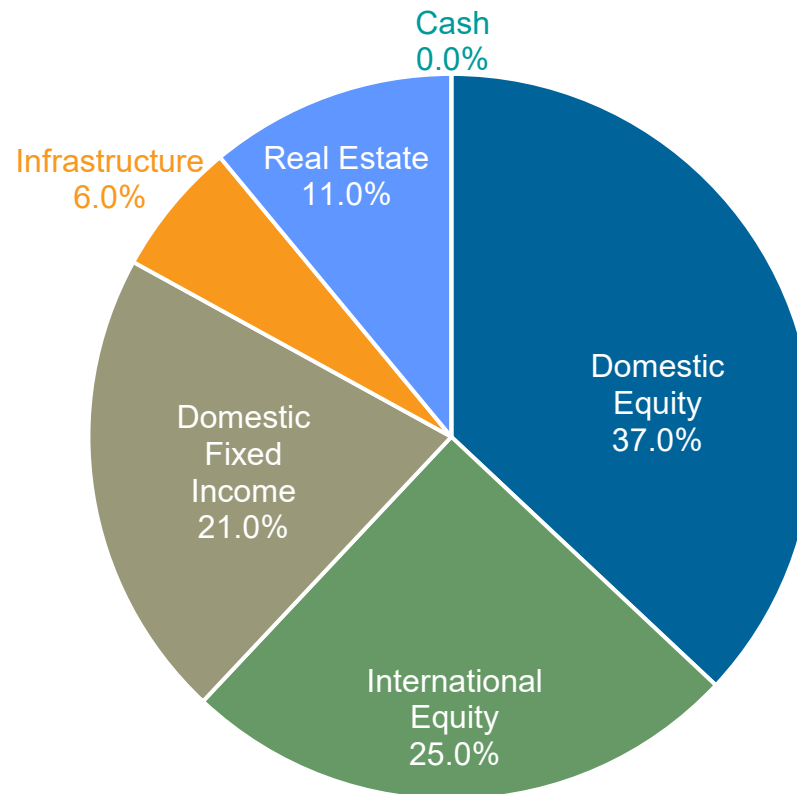
Investment Policy Statement
Update
Quarterly Investment Update

Modern Portfolio Theory and Risk Allocation

Asset Allocation as of March 31, 2026

The portfolio's asset allocation is determined through an asset allocation study and codified in the policy statement.

Target Asset Allocation



Modern Portfolio Theory

PORTFOLIO SELECTION*

HARRY MARKOWITZ
The Rand Corporation

THE PROCESS OF SELECTING a portfolio may be divided into two stages. The first stage starts with observation and experience and ends with beliefs about the future performances of available securities. The second stage starts with the relevant beliefs about future performances and ends with the choice of portfolio. This paper is concerned with the second stage. We first consider the rule that the investor does (or should) maximize discounted expected, or anticipated, returns. This rule is rejected both as a hypothesis to explain, and as a maximum to guide investment behavior. We next consider the rule that the investor does (or should) consider expected return a desirable thing *and* variance of return an undesirable thing. This rule has many sound points, both as a maxim for, and hypothesis about, investment behavior. We illustrate geometrically relations between beliefs and choice of portfolio according to the “expected returns—variance of returns” rule.

One type of rule concerning choice of portfolio is that the investor does (or should) maximize the discounted (or capitalized) value of future returns.¹ Since the future is not known with certainty, it must be “expected” or “anticipated” returns which we discount. Variations of this type of rule can be suggested. Following Hicks, we could let “anticipated” returns include an allowance for risk.² Or, we could let the rate at which we capitalize the returns from particular securities vary with risk.

The hypothesis (or maxim) that the investor does (or should) maximize discounted return must be rejected. If we ignore market imperfections the foregoing rule never implies that there is a diversified portfolio which is preferable to all non-diversified portfolios. Diversification is both observed and sensible; a rule of behavior which does not imply the superiority of diversification must be rejected both as a hypothesis and as a maxim.

* This paper is based on work done by the author while at the Cowles Commission for Research in Economics and with the financial assistance of the Social Science Research Council. It will be reprinted as Cowles Commission Paper, New Series, No. 60.

1. See, for example, J. B. Williams, *The Theory of Investment Value* (Cambridge, Mass.: Harvard University Press, 1938), pp. 55-75.

2. J. R. Hicks, *Value and Capital* (New York: Oxford University Press, 1939), p. 126. Hicks applies the rule to a firm rather than a portfolio.

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Modern Portfolio Theory (MPT) provides investors with one of the most powerful quantitative tools for constructing “efficient portfolios” by considering three important capital market inputs:

- *Expected Returns*
- *Standard Deviation (Risk)*
- *Correlations (Diversification)*

MPT was published by Harry Markowitz in 1952

- “Portfolio Selection”, *Journal of Finance*, 1952

MPT facilitates the quantification of portfolio diversification by incorporating correlations

Normally Distributed Asset Class Returns

Bell curve

Modern Portfolio Theory assumes that all asset class returns are “normally distributed” (symmetric bell-shaped probability curve)

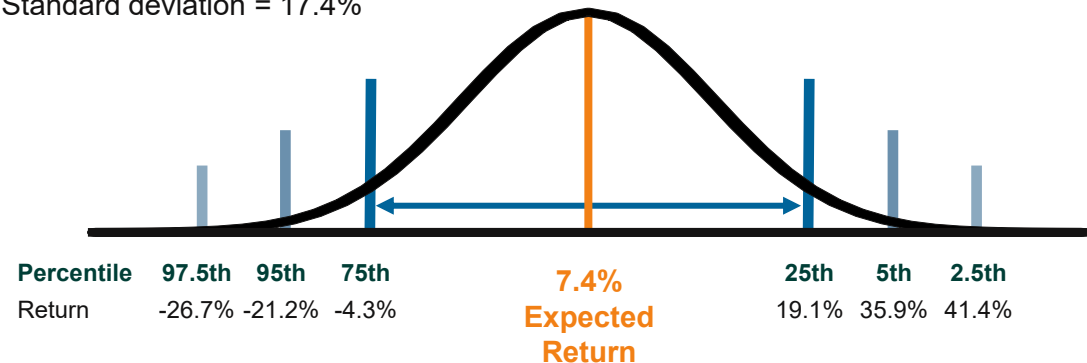
Benefits of the assumption:

- The returns of portfolios constructed from normally distributed asset class returns are also normally distributed
- Returns, risks, and correlations of the underlying asset classes are the only assumptions needed to determine the return and risk of the portfolio
- Normal distributions allow us to calculate probabilities of returns and perform Monte Carlo simulation

U.S. Broad Equity

Expected Return = 7.4%

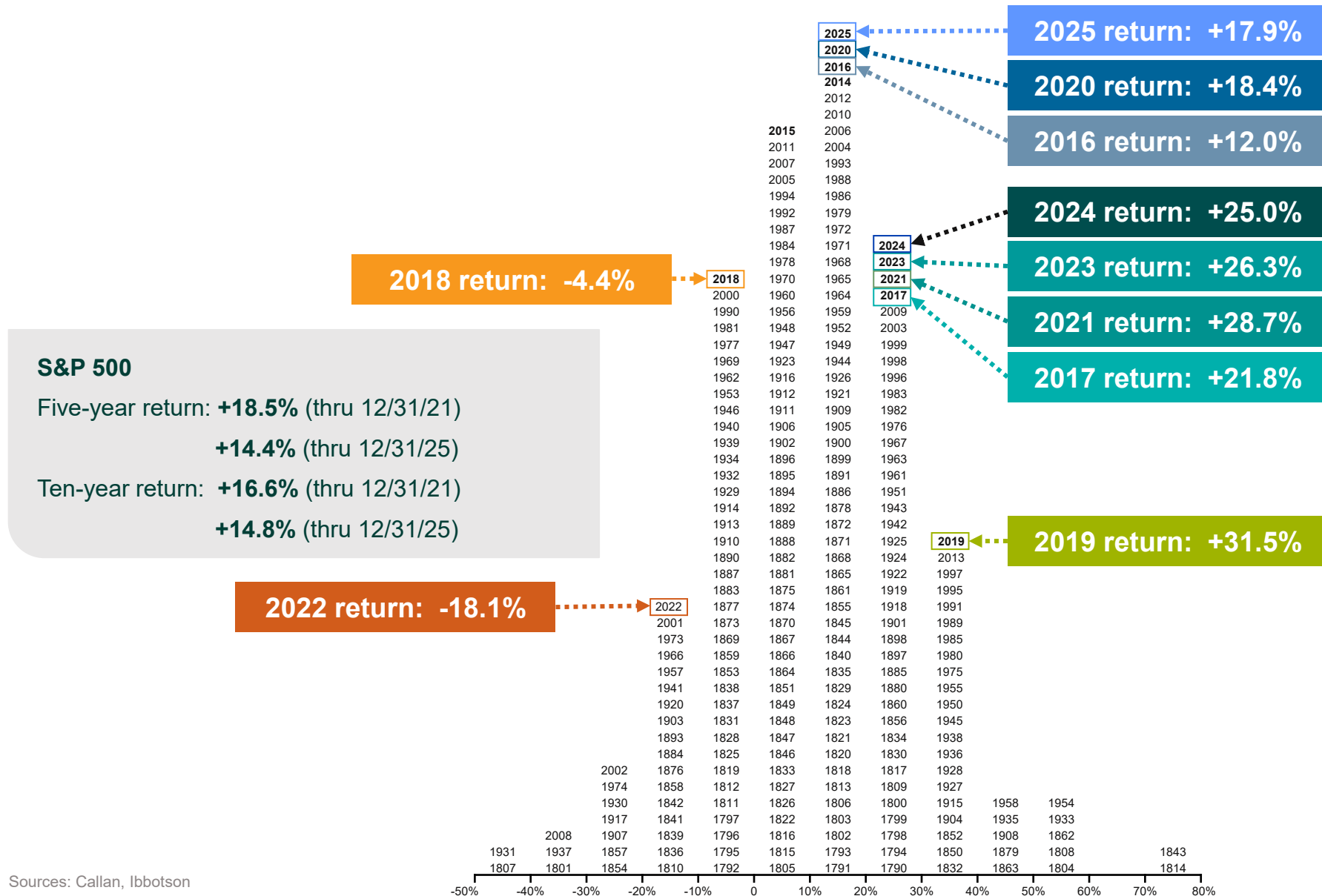
Standard deviation = 17.4%



50% probability of return between
-4.3% and 19.1%

Stock Market Returns by Calendar Year

Performance in perspective: History of the U.S. stock market (235 years of returns)

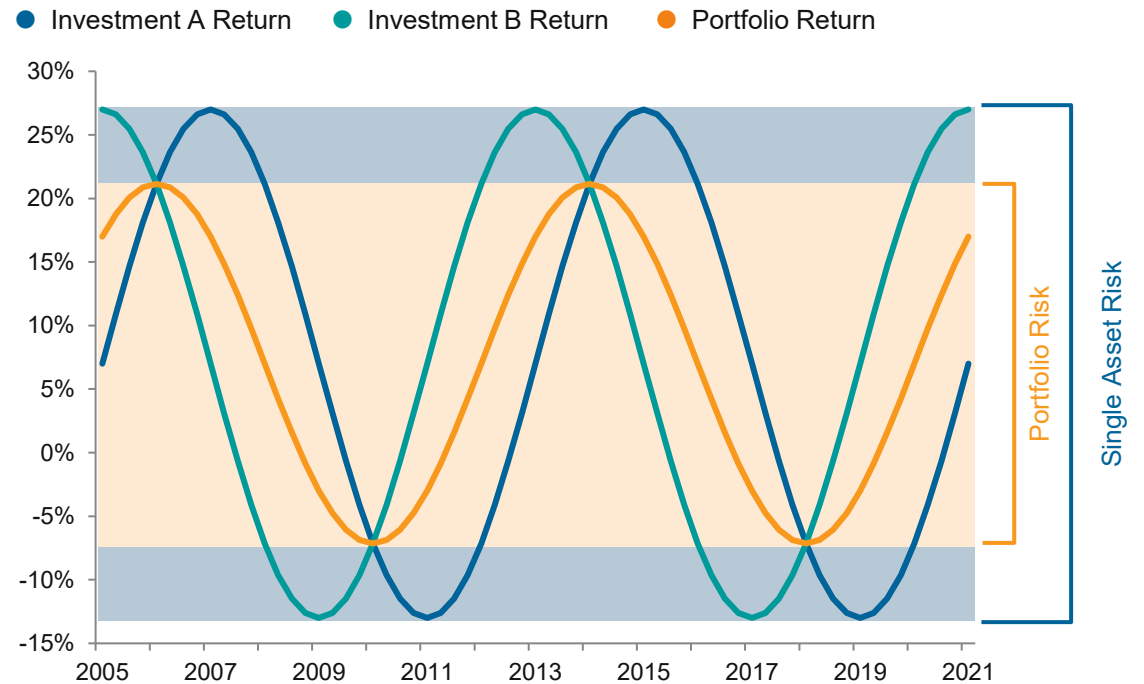


Sources: Callan, Ibbotson

Correlation

Diversification

- Diversification occurs when asset classes have different return cycles
- Diversifying asset classes need not have different returns and risks
- Asset classes with the same expected returns and risks but different return cycles can still diversify each other



Correlations Can Vary over Time

Historical correlation of the S&P 500 and the Bloomberg Aggregate

Rolling 36 Month Correlation Relative To S&P:500 for 30 Years Ended December 31, 2025



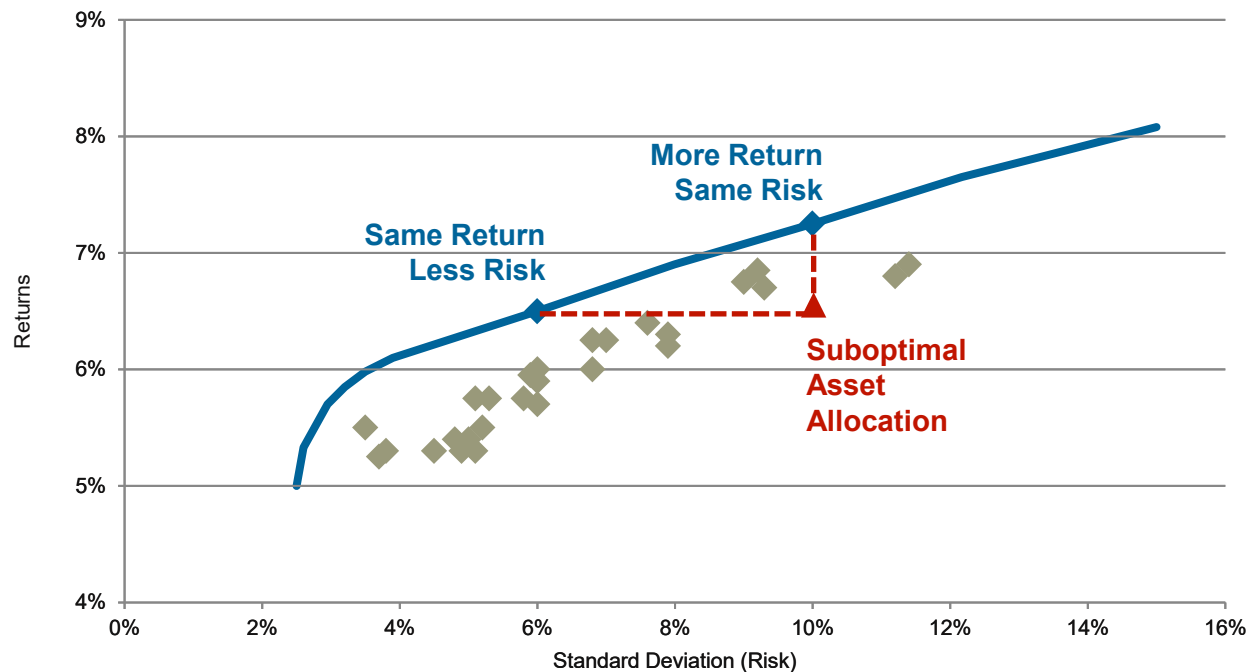
Correlations are not always stable

Fixed income's correlation with equities increased in 2022 when rapidly rising interest rates (falling bond prices) drove a decline in equity prices

However, in market crises such as the GFC and the collapse of Tech bubble, a “flight to quality” effect has made fixed income a very strong diversifier with equities

Moving from Asset Classes to Portfolios

Mean-variance optimization



Capital Market Projections

1. Expected Returns
2. Risks
3. Correlations

Mean-Variance Optimization

Mathematically finds the highest returning portfolio for each level of risk – an “efficient portfolio”

Select Portfolio

An efficient portfolio is selected based on multiple factors

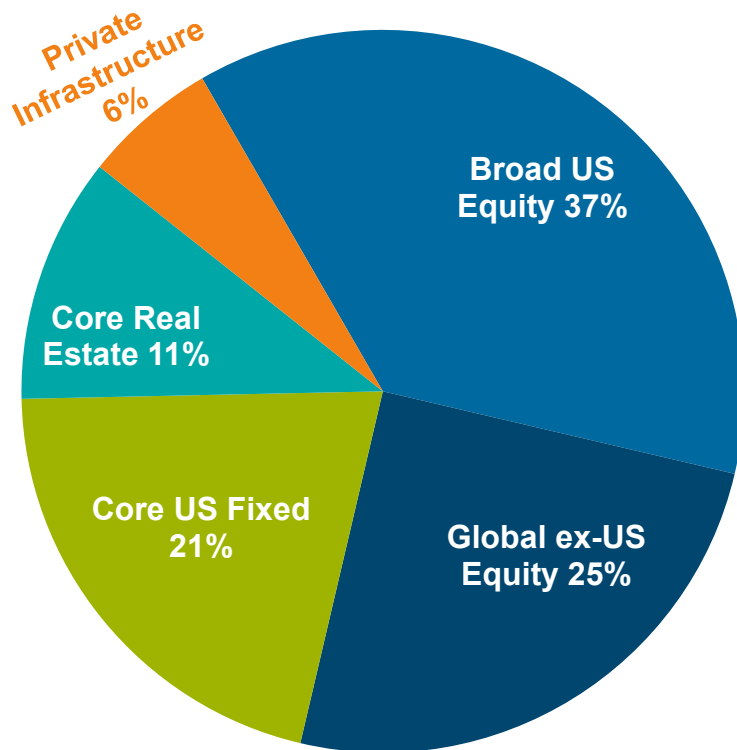
Return, Risk and Correlation

Asset Class	MCERA Target Weight	2026 Expected Return*	2026 Expected Risk
Equities			
Broad US Equity	37%	7.35%	17.35%
Global ex-US Equity	25%	7.45%	21.25%
Fixed Income			
Core US Fixed	21%	4.75%	4.45%
Alternatives			
Core Real Estate	11%	6.25%	14.00%
Private Infrastructure	6%	6.35%	15.25%
MCERA Total Fund		7.10%	12.40%

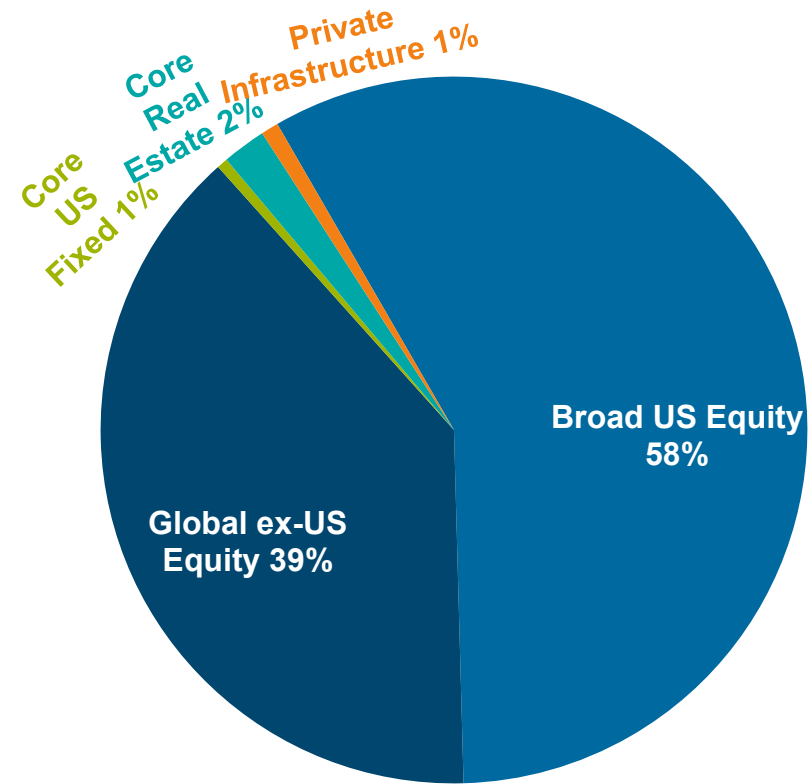
Asset Class Correlations					
Broad US Equity	1.0				
Global ex-US Equity	0.8	1.0			
Core US Fixed	0.1	0.1	1.0		
Core Real Estate	0.4	0.3	0.2	1.0	
Private Infrastructure	0.5	0.5	0.2	0.7	1.0
	Broad US Equity	Global ex-US Equity	Core US Fixed	Core Real Estate	Private Infra

Where Does Portfolio Volatility (Risk) Actually Come From?

Asset Allocation (Capital Weights)



Contribution to Risk



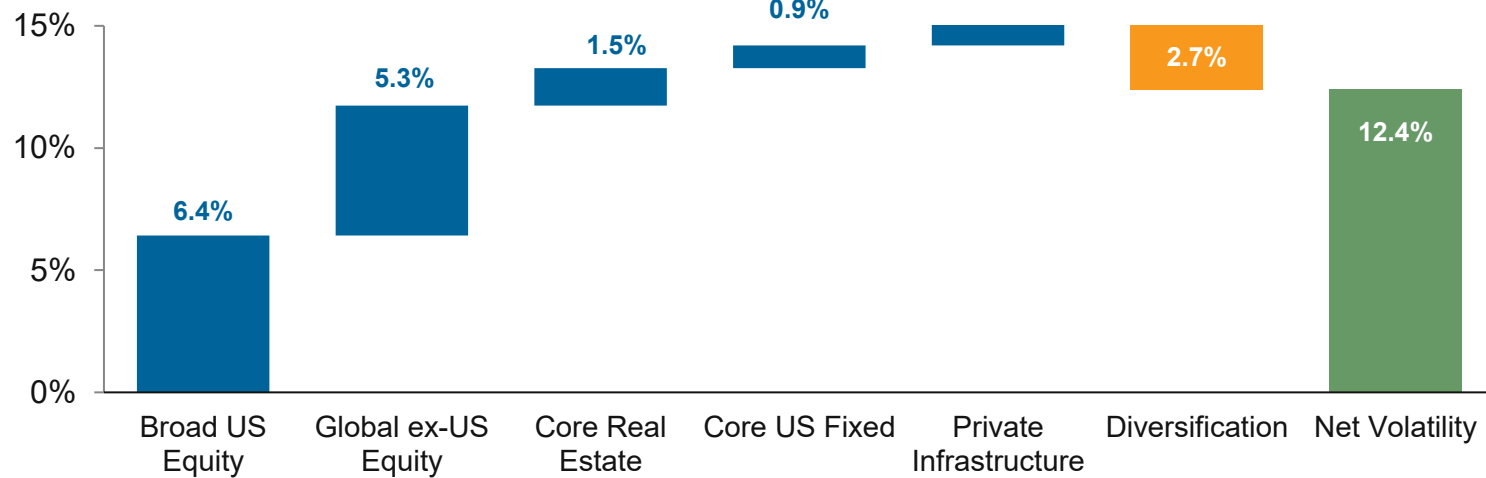
2026

Return: 7.1%

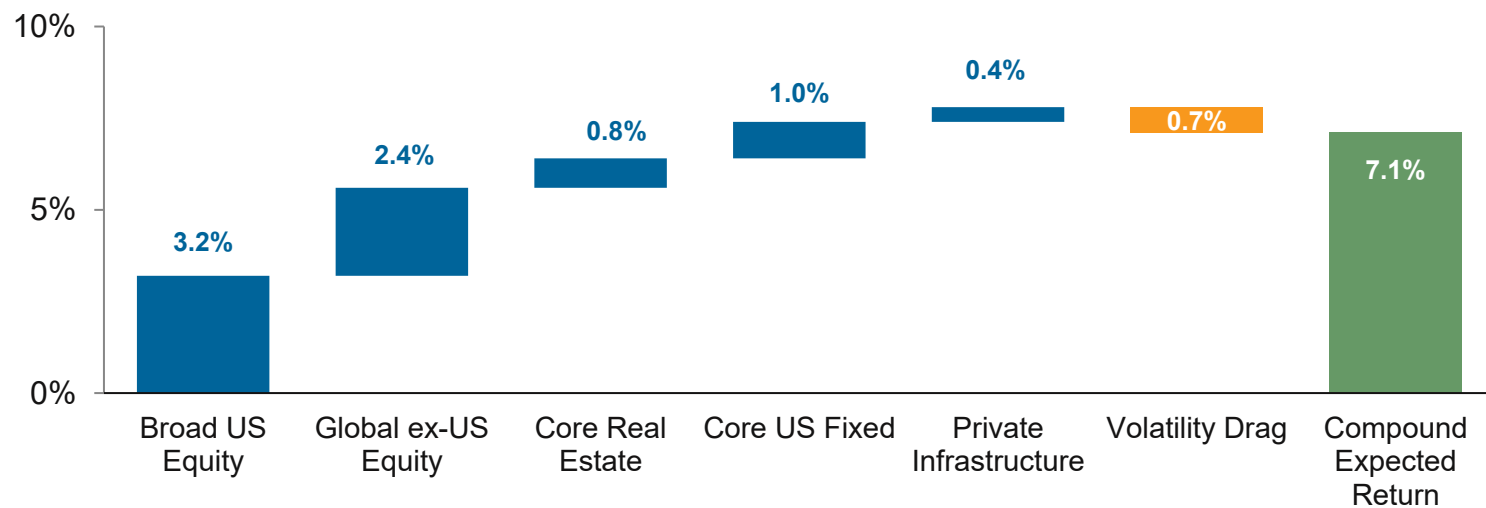
Risk: 12.4%

Benefits of Diversification

Contribution to Volatility

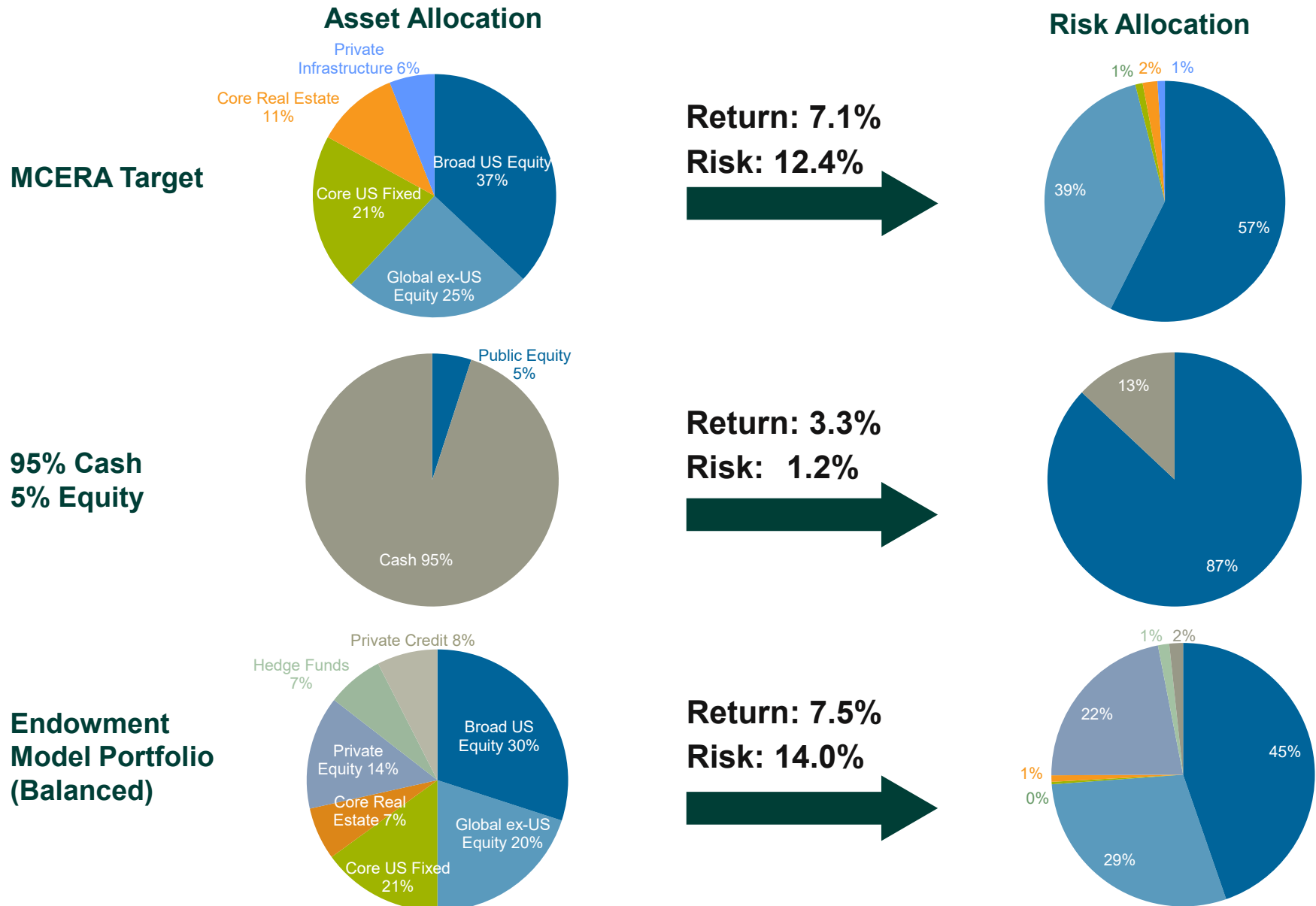


Contribution to Return



Asset Allocation vs. Risk

Dollars invested and risk assumed are fundamentally different concepts



Asset Allocation by Asset Class and Purpose

Asset Class Considerations

Is each portfolio objective clearly defined, measurable, and investable?

Expected Benefits

- Return enhancement
- Risk reduction
- Inflation protection
- Diversification

Potential Trade-Offs

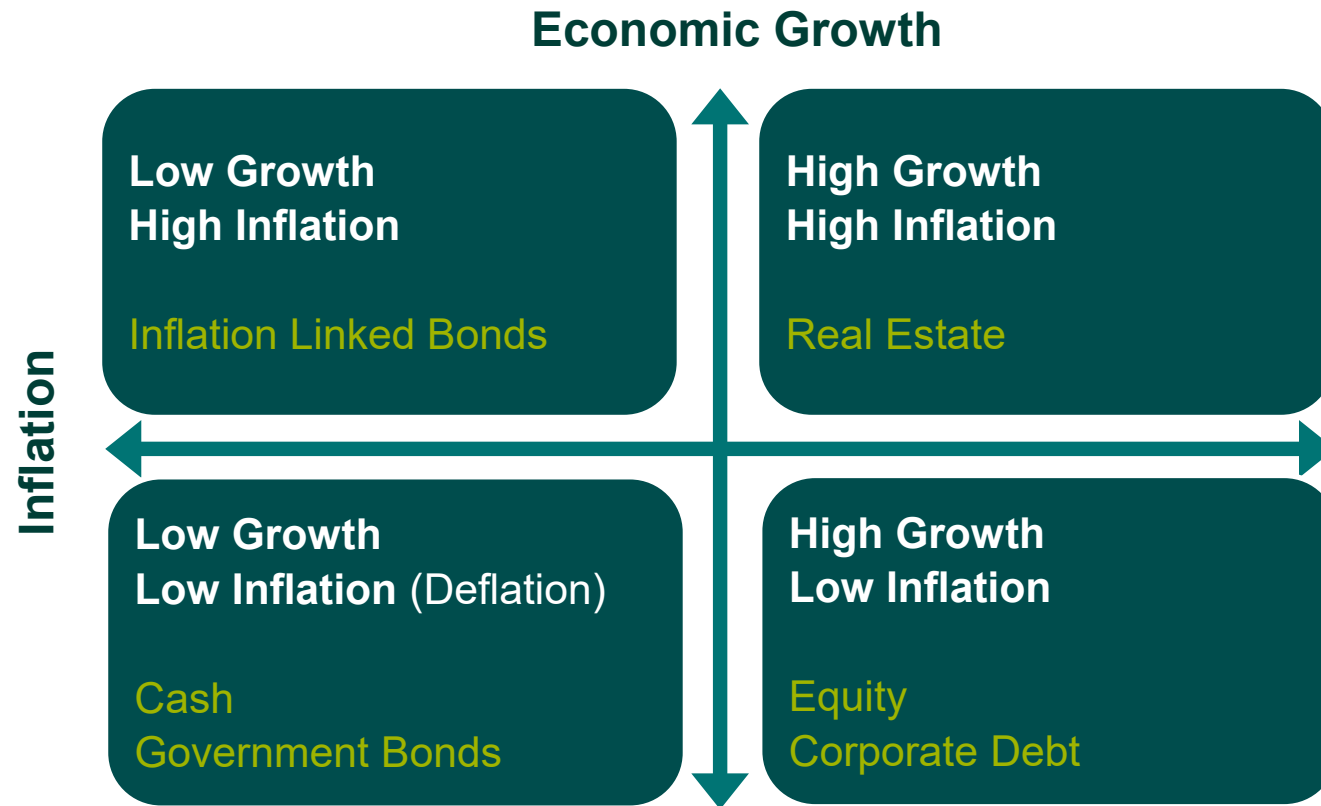
- Higher fees
- Reduced liquidity
- Increased complexity
- Limited transparency
- Implementation risk

Key Question

Does the expected benefit justify the cost, complexity, and risk introduced to the portfolio?

Economic Regime Framework

Asset classes in different regimes



- Diversification seeks exposure to a range of potential economic outcomes.
- The quadrants are illustrative and do not imply equal probabilities or allocations.
- Asset class performance may differ from the outcomes shown, particularly depending on whether inflation is expected or unexpected.

Asset Allocation by Purpose

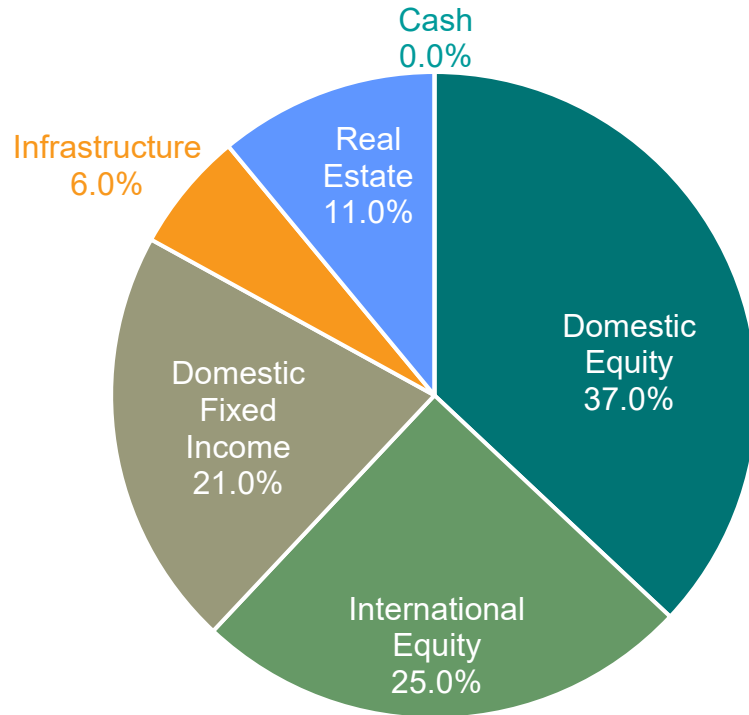
Goal-Based Investing



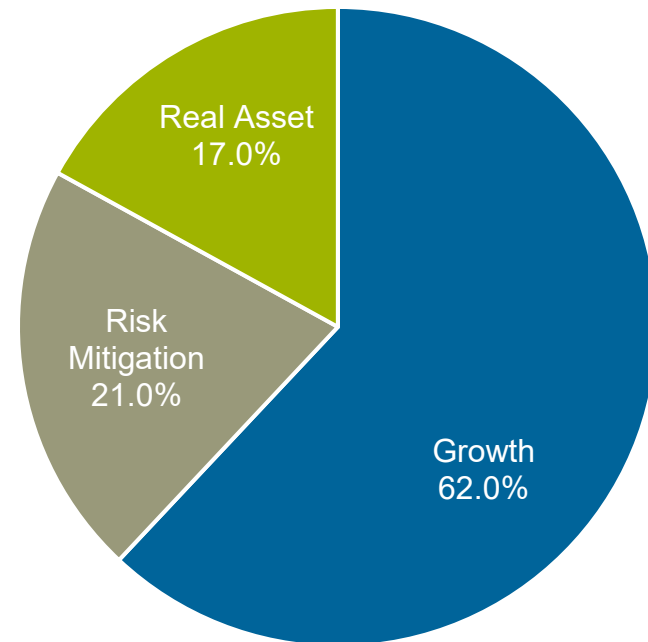
Asset Allocation by Purpose

While equities represent 62% of assets, they account for approximately 94% of portfolio risk

Asset Allocation Target



Asset Allocation by Purpose



Function	Capital Weight	Risk or Volatility Contribution
Growth	62%	90%+
Risk Mitigation	21%	Very little
Real Assets	17%	Moderate



1. Asset allocation should be evaluated based on the functions each allocation serves, not simply its asset class label.
2. Capital allocation and risk allocation are not the same.
3. Growth-oriented assets drive the majority of expected return—and the majority of portfolio risk.
4. Every allocation should have a clearly defined, measurable, and investable objective.
5. Effective portfolio construction involves allocating both capital and risk across complementary portfolio functions.

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