



Los Angeles County Employees Retirement Association

# Investments Division

## OPEB MASTER TRUST

## PERFORMANCE REPORT

For the quarter ended  
September 30, 2022

review

An aerial photograph of Los Angeles at sunset. The city skyline is visible in the background, with the sun setting behind the mountains, creating a warm orange and pink glow. The foreground shows residential areas with palm trees and a river or canal.

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opeb trust

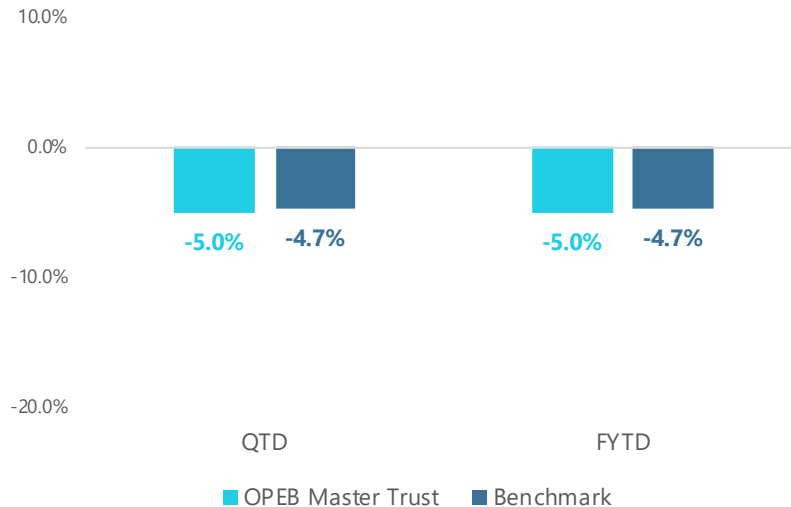
# Quarterly Snapshot

for the quarter ended September 30, 2022



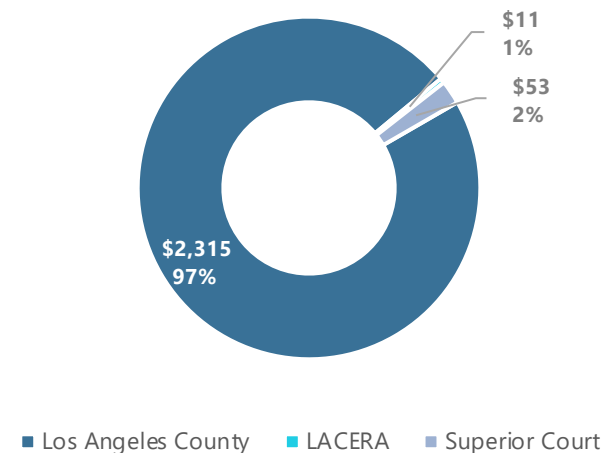
Los Angeles County Employees Retirement Association

## Performance (net)



## Sub-Trust Ownership

(mm)



### Ending Market Value

2,378

↓ -1%  
from prior quarter

### Sharpe Ratio<sup>1</sup>

0.2

↓ -45%  
from prior quarter

### Batting Average<sup>2</sup>

40%

↑ 7%  
from prior quarter

### Standard Deviation<sup>1</sup>

14.6

↑ 9%  
from prior quarter

### Tracking Error<sup>1</sup>

1.1

↑ 274%  
from prior quarter

1. 3-year annualized.  
2. Percentage of managers that outperformed the benchmark for the quarter.

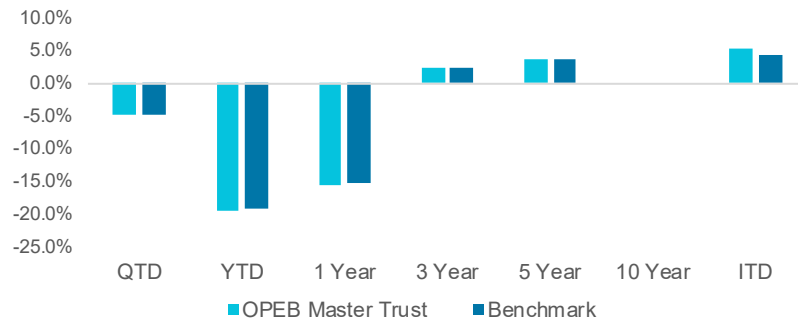
# Summary

for the quarter ended September 30, 2022



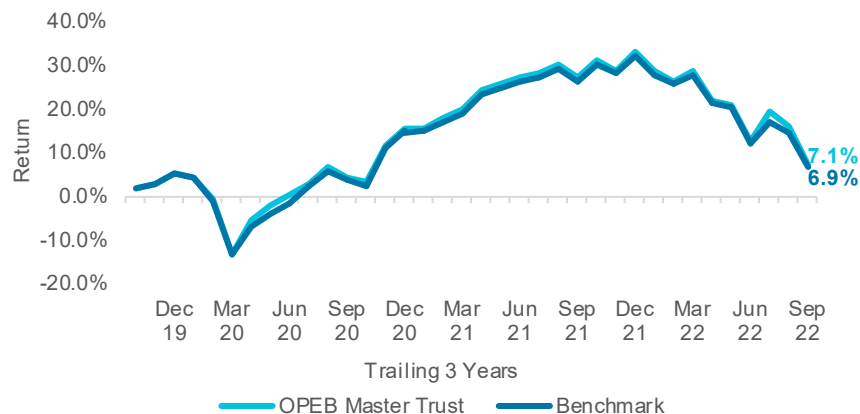
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## Performance (net)



	QTD	YTD	1 Year	3 Year	5 Year	10 Year	ITD
<b>OPEB Master Trust</b>	<b>-5.0%</b>	<b>-19.4%</b>	<b>-15.7%</b>	<b>2.3%</b>	<b>3.8%</b>	<b>--</b>	<b>5.2%</b>
Benchmark	-4.7%	-19.2%	-15.2%	2.2%	3.6%	--	4.3%
Excess	-0.3%	-0.2%	-0.4%	0.1%	0.2%	--	0.8%
Sub-Trusts							
Los Angeles County	-5.0%	-19.4%	-15.7%	2.3%	3.8%	--	4.7%
LACERA	-5.0%	-19.5%	-15.8%	2.3%	3.8%	--	4.7%
Superior Court	-5.2%	-19.4%	-15.6%	2.2%	3.7%	--	5.4%

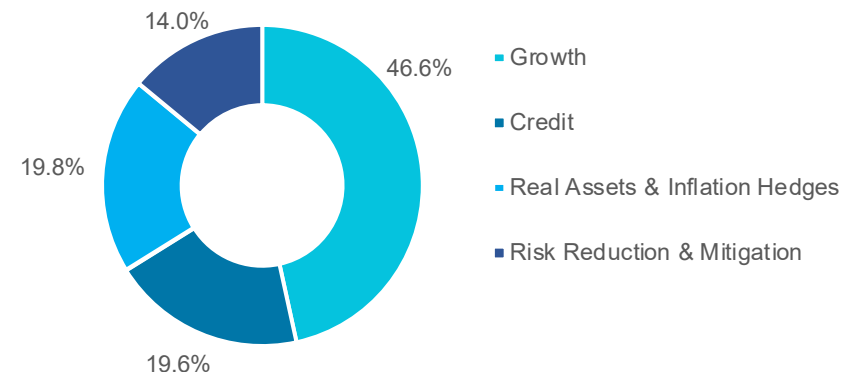
## Cumulative Return



## Functional Category

	QTD	FYTD	1 Year	3 Year	5 Year
<b>OPEB Growth</b>	<b>-6.6%</b>	<b>-6.6%</b>	<b>-21.0%</b>	<b>3.9%</b>	<b>4.4%</b>
OPEB Growth Policy Benchmark	-7.1%	-7.1%	-21.5%	3.5%	4.1%
Excess	0.5%	0.5%	0.6%	0.4%	0.4%
<b>OPEB Credit</b>	<b>-0.3%</b>	<b>-0.3%</b>	<b>-10.1%</b>	<b>-1.0%</b>	<b>--</b>
OPEB Credit Policy Benchmark	-0.4%	-0.4%	-10.2%	-0.6%	--
Excess	0.1%	0.1%	0.1%	-0.4%	--
<b>OPEB Real Assets &amp; Inflation Hedges</b>	<b>-7.7%</b>	<b>-7.7%</b>	<b>-9.5%</b>	<b>1.9%</b>	<b>--</b>
OPEB RA & IH Policy Benchmark	-2.4%	-2.4%	-4.7%	3.6%	--
Excess	-5.3%	-5.3%	-4.8%	-1.7%	--
<b>OPEB Risk Reduction &amp; Mitigation</b>	<b>-3.7%</b>	<b>-3.7%</b>	<b>-11.7%</b>	<b>-2.4%</b>	<b>0.6%</b>
OPEB RR & M Policy Benchmark	-4.9%	-4.9%	-12.8%	-2.9%	0.2%
Excess	1.2%	1.2%	1.1%	0.5%	0.4%

## Exposure



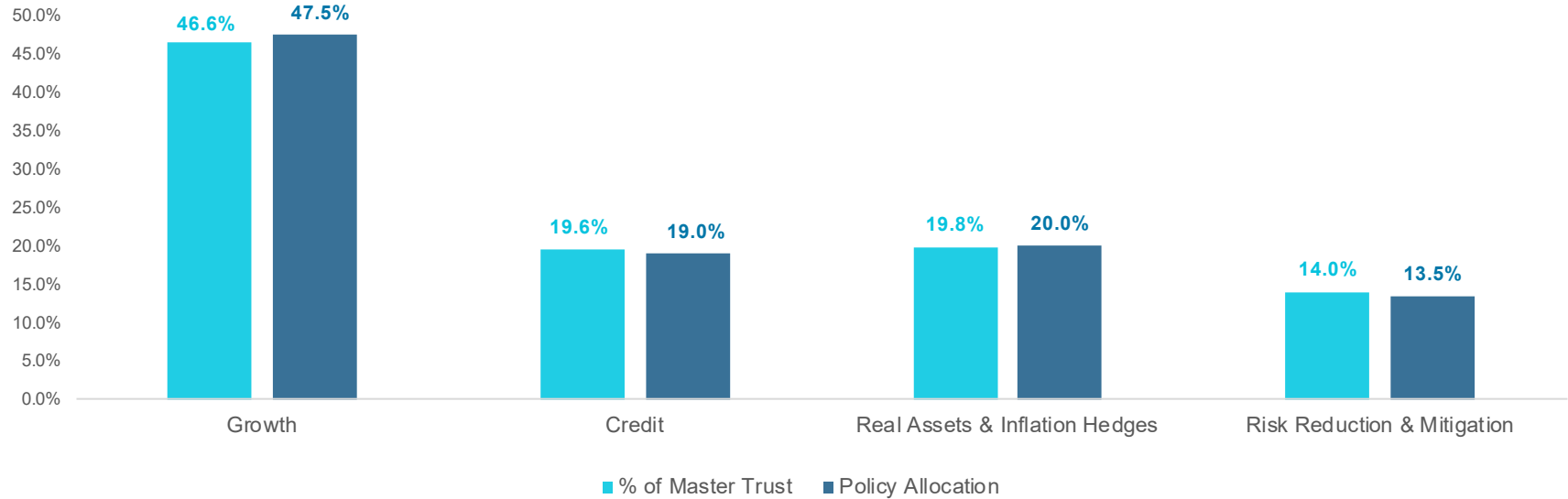
# Asset Allocation

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## Actual vs. Policy



	Ending Market Value (mm)	% of Master Trust	Policy Allocation	Over / Under (%)	Over / Under (mm)
<b>OPEB Master Trust</b>	<b>2,378</b>	<b>100.0%</b>	<b>100.0%</b>		
Growth	1,107	46.6%	47.5%	-0.9%	-22
Credit	465	19.6%	19.0%	0.6%	13
Real Assets & Inflation Hedges	472	19.8%	20.0%	-0.2%	-4
Risk Reduction & Mitigation	333	14.0%	13.5%	0.5%	12
Operational Cash	0	0.0%			

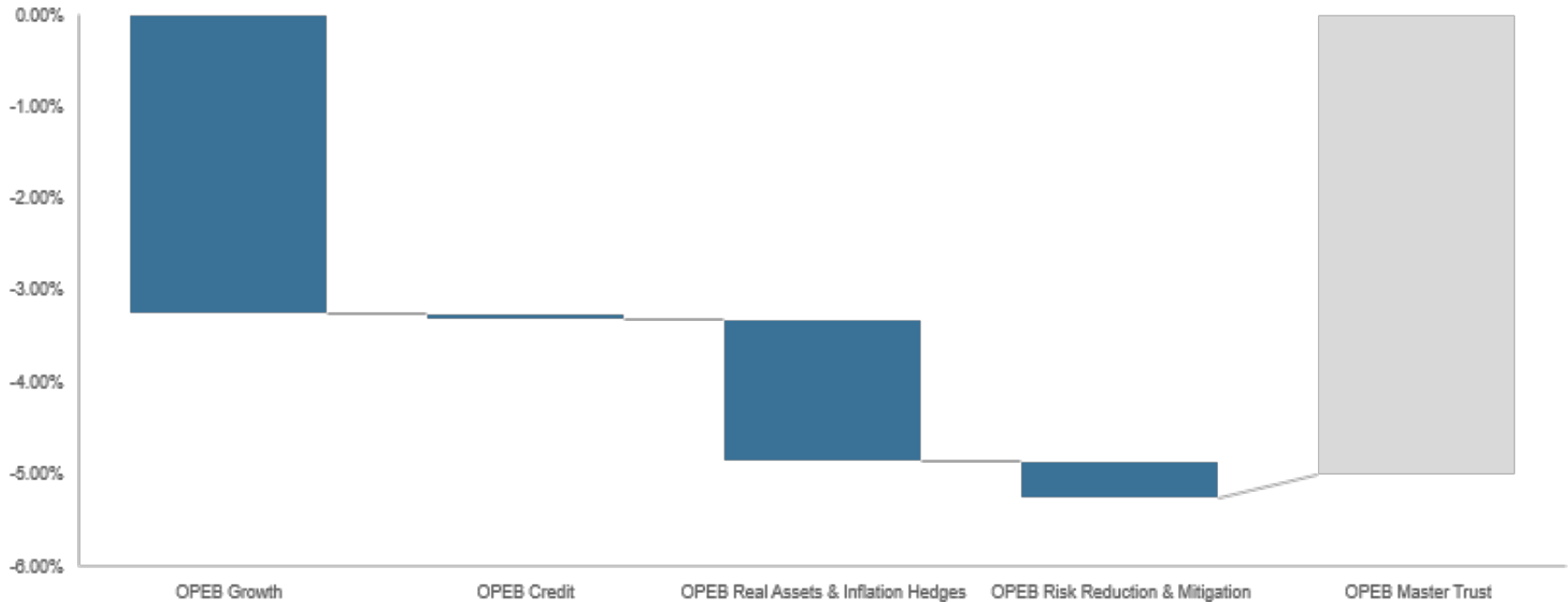
# Contribution to Return

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## QTD Contribution to Return



Functional Category		Contributors		Detractors	
OPEB Growth	-3.26%	OPEB BlackRock Bank Loans	0.18%	OPEB Global Equities	-3.26%
OPEB Credit	-0.06%	OPEB SSGA Cash	0.01%	OPEB BTC REITs	-1.05%
OPEB Real Assets & Inflation Hedges	-1.54%			OPEB BTC IG Bonds	-0.36%
OPEB Risk Reduction & Mitigation	-0.40%			OPEB BTC TIPS	-0.30%
OPEB Master Trust	-5.02%			OPEB BTC EM Debt	-0.19%

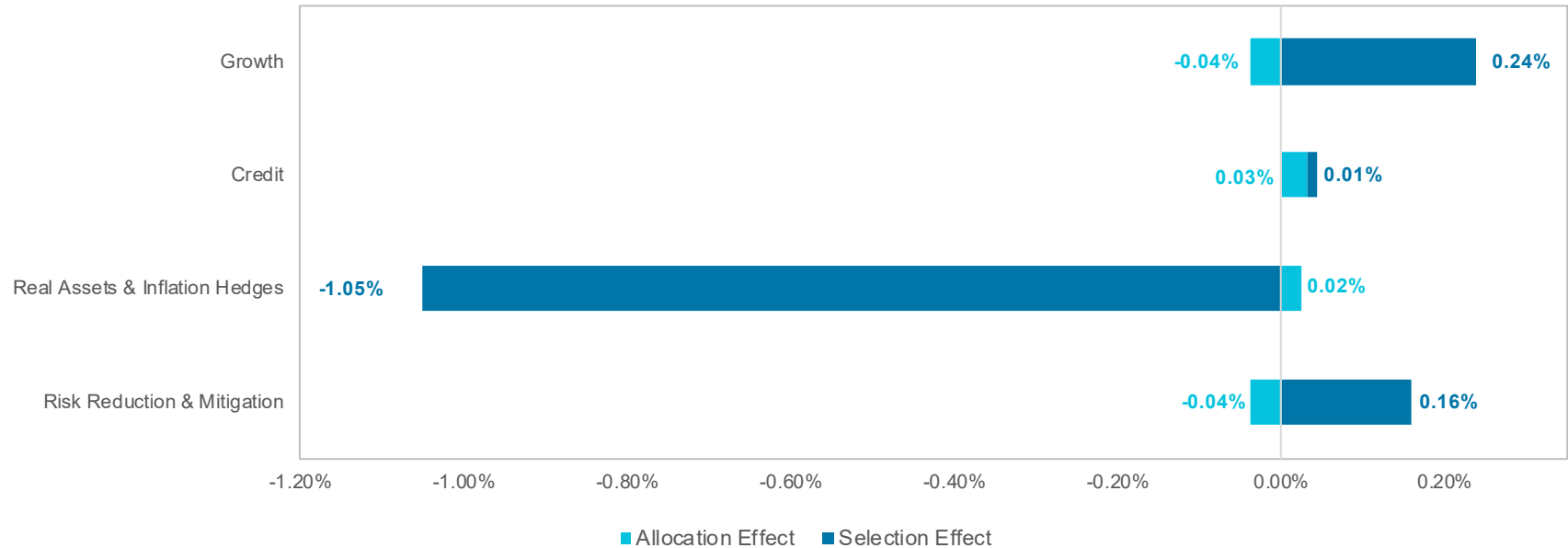
# Return Attribution

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## QTD Performance Attribution<sup>1</sup>



	Ending Market Value (mm)	% of Master Trust	Policy Allocation	Portfolio Return	Benchmark Return	Allocation Effect	Selection Effect	Total Value Add
<b>OPEB Master Trust</b>	<b>2,378</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-5.0%</b>	<b>-4.7%</b>	<b>-0.02%</b>	<b>-0.64%</b>	<b>-0.69%</b>
Growth	1,107	46.6%	47.5%	-6.6%	-7.1%	-0.04%	0.24%	0.21%
Credit	465	19.6%	19.0%	-0.3%	-0.4%	0.03%	0.01%	0.04%
Real Assets & Inflation Hedges	472	19.8%	20.0%	-7.7%	-2.4%	0.02%	-1.05%	-1.05%
Risk Reduction & Mitigation	333	14.0%	13.5%	-3.7%	-4.9%	-0.04%	0.16%	0.11%
Operational Cash	0	0.0%						

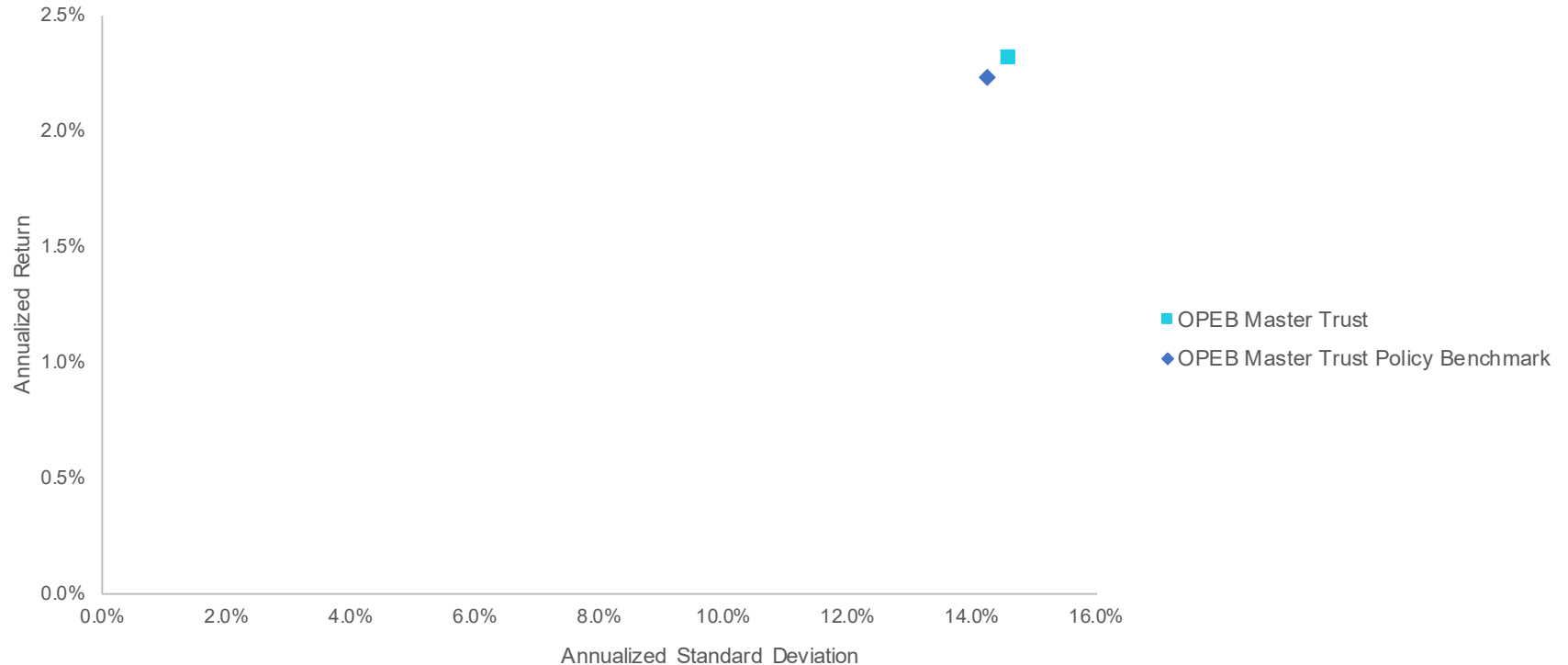
1. Total Value Add includes Interaction Effect.



# Risk vs. Return

for the quarter ended September 30, 2022

## 3 Year (Annualized)<sup>1</sup>



	Annualized Return	Standard Deviation	Sharpe Ratio	Information Ratio	Beta	Tracking Error
<b>OPEB Master Trust</b>	<b>2.3%</b>	<b>14.6%</b>				
OPEB Master Trust Policy Benchmark	2.2%	14.3%	0.19	0.07	1.02	1.1%

1. Composite risk statistics are relative to the policy benchmark.

# Performance Detail

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## Annualized Net Returns

	% of Total Fund	Ending Market Value (mm)	Prior Quarter Ending MV (mm)	QTD	YTD	1 Year	3 Year	5 Year	10 Year	ITD	Inception Date
<b>OPEB Master Trust</b>	<b>100.0%</b>	<b>2,378</b>	<b>2,394</b>	<b>-5.0%</b>	<b>-19.4%</b>	<b>-15.7%</b>	<b>2.3%</b>	<b>3.8%</b>	--	<b>5.2%</b>	<b>Feb-2013</b>
OPEB Master Trust Policy Benchmark				-4.7%	-19.2%	-15.2%	2.2%	3.6%	--	4.3%	
Sub-Trusts											
Los Angeles County	97.3%	2,315	2,327	-5.0%	-19.4%	-15.7%	2.3%	3.8%	--	4.7%	Feb-2013
LACERA	0.4%	11	11	-5.0%	-19.5%	-15.8%	2.3%	3.8%	--	4.7%	Feb-2013
Superior Court	2.2%	53	56	-5.2%	-19.4%	-15.6%	2.2%	3.7%	--	5.4%	Jul-2016
<b>OPEB Growth</b>	<b>46.6%</b>	<b>1,107</b>	<b>1,200</b>	<b>-6.6%</b>	<b>-25.6%</b>	<b>-21.0%</b>	<b>3.9%</b>	<b>4.4%</b>	--	<b>7.4%</b>	<b>Jul-2016</b>
OPEB Growth Policy Benchmark				-7.1%	-26.1%	-21.5%	3.5%	4.1%	--	7.0%	
OPEB Global Equities	46.6%	1,107	1,200	-6.6%	-25.6%	-21.0%	3.9%	4.4%	--	5.7%	Mar-2014
MSCI ACWI IMI Net				-6.6%	-25.7%	-21.2%	3.6%	4.2%	--	5.4%	
<b>OPEB Credit</b>	<b>19.6%</b>	<b>465</b>	<b>476</b>	<b>-0.3%</b>	<b>-10.0%</b>	<b>-10.1%</b>	<b>-1.0%</b>	--	--	<b>0.8%</b>	<b>Jul-2018</b>
OPEB Credit Policy Benchmark				-0.4%	-10.6%	-10.2%	-0.6%	--	--	1.2%	
OPEB Liquid Credit	19.6%	465	476	-0.3%	-10.1%	-10.1%	--	--	--	-10.1%	Sep-2021
OPEB Liquid Credit Policy Benchmark				-0.3%	-10.6%	-10.2%	--	--	--	-10.2%	
OPEB BlackRock Bank Loans	9.9%	235	239	1.9%	-3.1%	-2.5%	1.7%	--	--	2.4%	Jul-2018
S&P/LSTA Leverage Loan				1.4%	-3.3%	-2.5%	2.2%	--	--	2.7%	
OPEB BTC EM Debt LC	3.8%	91	94	-4.9%	-18.5%	-20.7%	-7.4%	--	--	-3.7%	Jul-2018
JPM GBI-EM Global Diversified				-4.7%	-18.6%	-20.6%	-7.1%	--	--	-3.3%	
OPEB BTC High Yield Bonds	5.9%	139	143	-0.9%	-14.9%	-14.4%	-1.0%	--	--	1.3%	Jul-2018
BBG BARC US Corp HY				-0.6%	-14.7%	-14.1%	-0.5%	--	--	1.7%	
<b>OPEB Real Assets &amp; Inflation Hedges</b>	<b>19.8%</b>	<b>472</b>	<b>475</b>	<b>-7.7%</b>	<b>-16.8%</b>	<b>-9.5%</b>	<b>1.9%</b>	--	--	<b>3.3%</b>	<b>Jul-2018</b>
OPEB RA & IH Policy Benchmark				-2.4%	-12.4%	-4.7%	3.6%	--	--	4.5%	
OPEB BTC Commodities	4.0%	94	93	-4.2%	14.0%	12.2%	13.6%	--	--	7.1%	Jul-2018
Bloomberg Commodity Index Total Return				-4.1%	13.6%	11.8%	13.5%	--	--	7.1%	
OPEB BTC REITS	9.8%	234	241	-10.5%	-29.4%	-17.3%	-3.5%	--	--	1.2%	Jul-2018
DJ US SELECT REAL ESTATE SECURITIES				-10.4%	-29.4%	-17.2%	-3.3%	--	--	1.4%	
OPEB BTC TIPS	6.1%	144	141	-5.1%	-13.6%	-11.6%	0.9%	--	--	2.1%	Jul-2018
Bloomberg U.S. Treasury: U.S. TIPS				-5.1%	-13.6%	-11.6%	0.8%	--	--	2.0%	
<b>OPEB Risk Reduction &amp; Mitigation</b>	<b>14.0%</b>	<b>333</b>	<b>242</b>	<b>-3.7%</b>	<b>-11.6%</b>	<b>-11.7%</b>	<b>-2.4%</b>	<b>0.6%</b>	--	<b>0.7%</b>	<b>Jul-2016</b>
OPEB RR & M Policy Benchmark				-4.9%	-12.8%	-12.8%	-2.9%	0.2%	--	0.3%	
OPEB BTC Investment Grade Bonds	11.2%	266	193	-4.8%	-14.5%	-14.6%	-3.2%	--	--	0.0%	Jul-2018
BBG BARC Agg				-4.8%	-14.6%	-14.6%	-3.3%	--	--	0.0%	
OPEB SSGA Cash	2.8%	67	49	0.5%	0.7%	0.7%	0.8%	1.5%	--	1.1%	Feb-2013
OPEB Cash Policy Benchmark				0.4%	0.6%	0.6%	0.7%	1.2%	--	0.8%	

# risk reports

# Summary

for the quarter ended September 30, 2022

## Risk Summary

	Value
<b>Total Risk</b>	<b>11.90</b>
Benchmark Risk	12.11
Active Risk	1.26
Portfolio Beta	0.98
Effective Duration	1.54

## Contribution to Risk

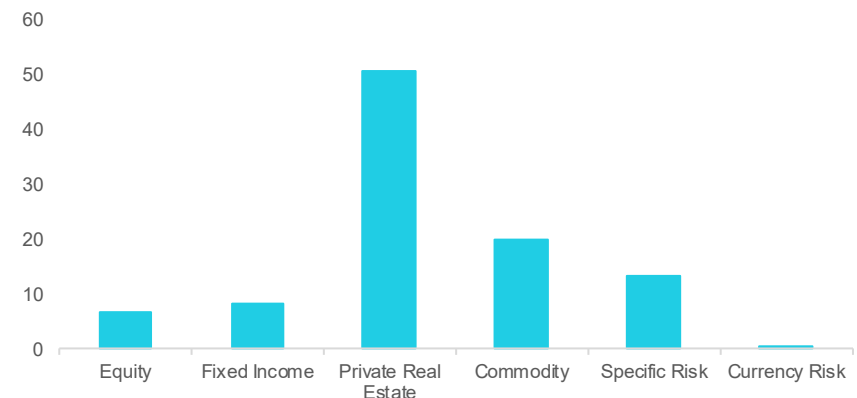


	Mkt Value (mm)	Weight%	Total Risk	Risk Contribution	%CR to TR
<b>Total Fund</b>	<b>2,378</b>	<b>100.0%</b>	<b>11.90</b>	<b>11.90</b>	<b>100.00</b>
Growth	1,107	46.6%	19.03	8.74	73.49
Credit	465	19.6%	4.69	0.73	6.10
Real Assets and Inflation Hedges	472	19.9%	12.74	2.31	19.46
Risk Reduction and Mitigation	333	14.0%	4.56	0.11	0.95

## Risk Decomposition

Risk Source	Portfolio			Active		
	Risk Contribution	%Risk	Correlation	Risk Contribution	%Risk	Correlation
<b>Total Risk</b>	<b>11.90</b>	<b>100.00</b>	<b>1.00</b>	<b>1.26</b>	<b>100.00</b>	<b>1.00</b>
Local Market Risk	11.28	94.77	1.00	1.26	99.89	1.00
Common Factor Risk	11.23	94.41	1.00	1.09	86.49	0.93
Equity	10.33	86.86	0.99	0.09	6.94	0.06
Fixed Income	0.90	7.54	0.61	0.11	8.49	0.27
Private Real Estate	0.00	0.00	0.00	0.64	50.75	0.49
Commodity	0.00	0.00	0.00	0.25	19.81	0.43
Specific Risk	0.04	0.35	0.06	0.17	13.40	0.37
Currency Risk	0.62	5.23	0.59	0.00	0.11	0.02

## Active Risk from Risk Factors



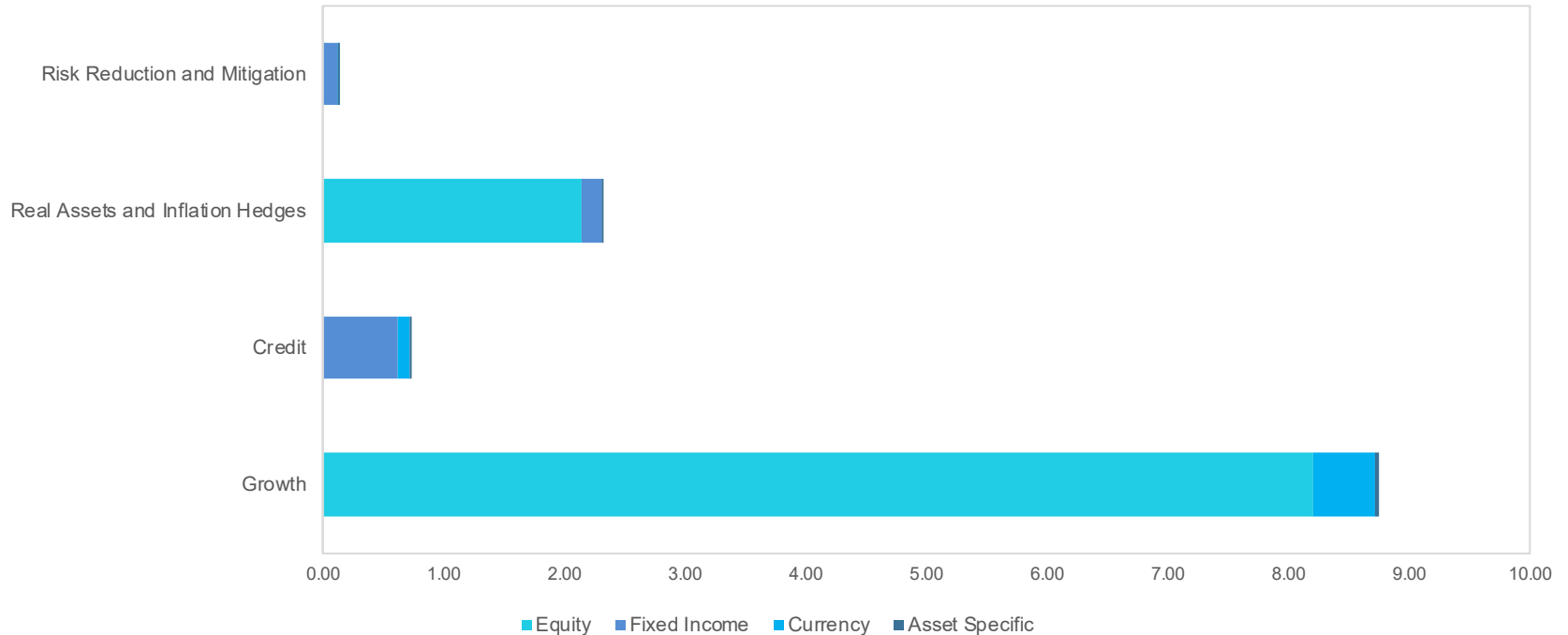
# Risk Contribution Breakdown

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## By Risk Type

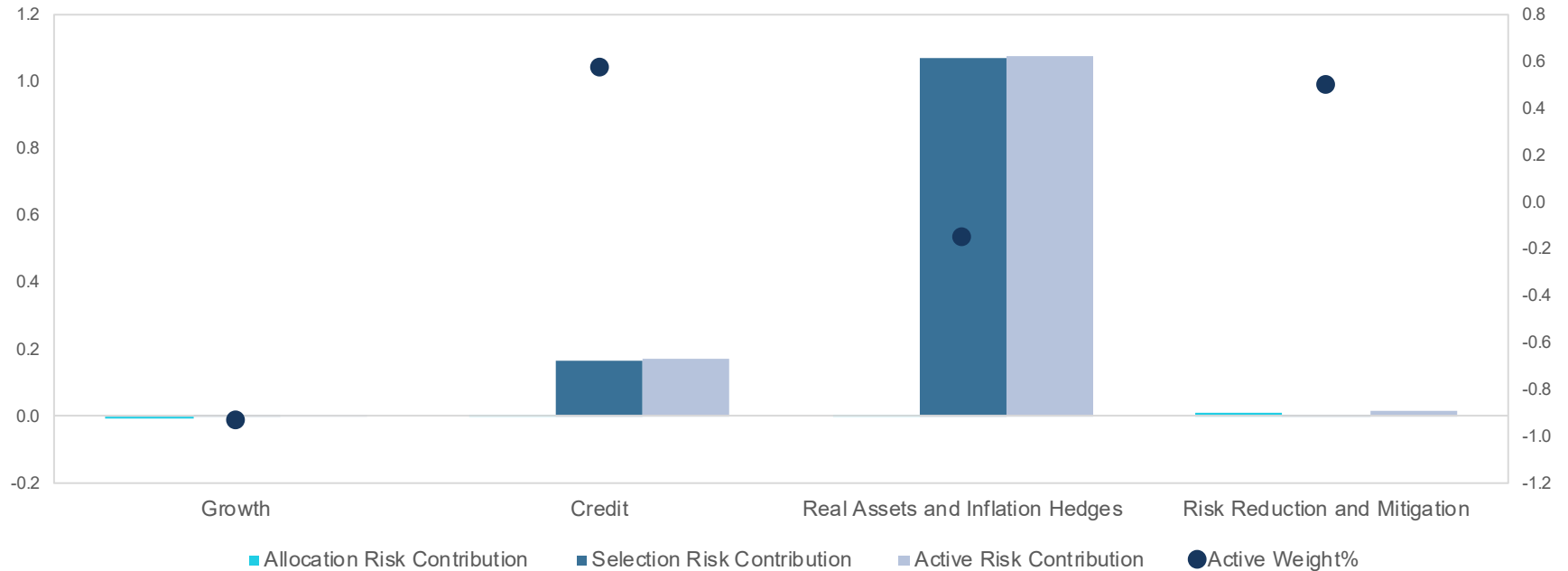


Functional Category	Mkt Value	Weight%	Total Risk	%CR to Total Risk	Port Risk Contribution	Equity	Fixed Income	Currency	Asset Specific
<b>Total Fund</b>	<b>2,378</b>	<b>100.0%</b>	<b>11.90</b>	<b>100.00</b>	<b>11.90</b>	<b>10.33</b>	<b>0.90</b>	<b>0.62</b>	<b>0.04</b>
Growth	1,107	46.6%	19.03	73.49	8.74	8.20	0.00	0.52	0.03
Credit	465	19.6%	4.69	6.10	0.73	0.00	0.61	0.11	0.01
Real Assets and Inflation Hedges	472	19.9%	12.74	19.46	2.31	2.13	0.17	0.00	0.01
Risk Reduction and Mitigation	333	14.0%	4.56	0.95	0.11	0.00	0.11	0.00	0.00

# Allocation Selection

for the quarter ended September 30, 2022

## Active Total Risk



Functional Category	Active Weight%	Allocation			Selection			Active Risk Contribution
		Volatility	Correlation	Risk Contribution	Volatility	Correlation	Risk Contribution	
<b>Active Total Risk</b>				<b>0.02</b>			<b>1.24</b>	<b>1.26</b>
Growth	-0.93	7.52	0.01	0.00	0.08	0.12	0.00	0.00
Credit	0.57	8.28	0.14	0.01	2.40	0.35	0.16	0.17
Real Assets and Inflation Hedges	-0.15	6.05	-0.50	0.00	6.05	0.89	1.07	1.08
Risk Reduction and Mitigation	0.50	12.87	0.19	0.01	1.87	0.00	0.00	0.01

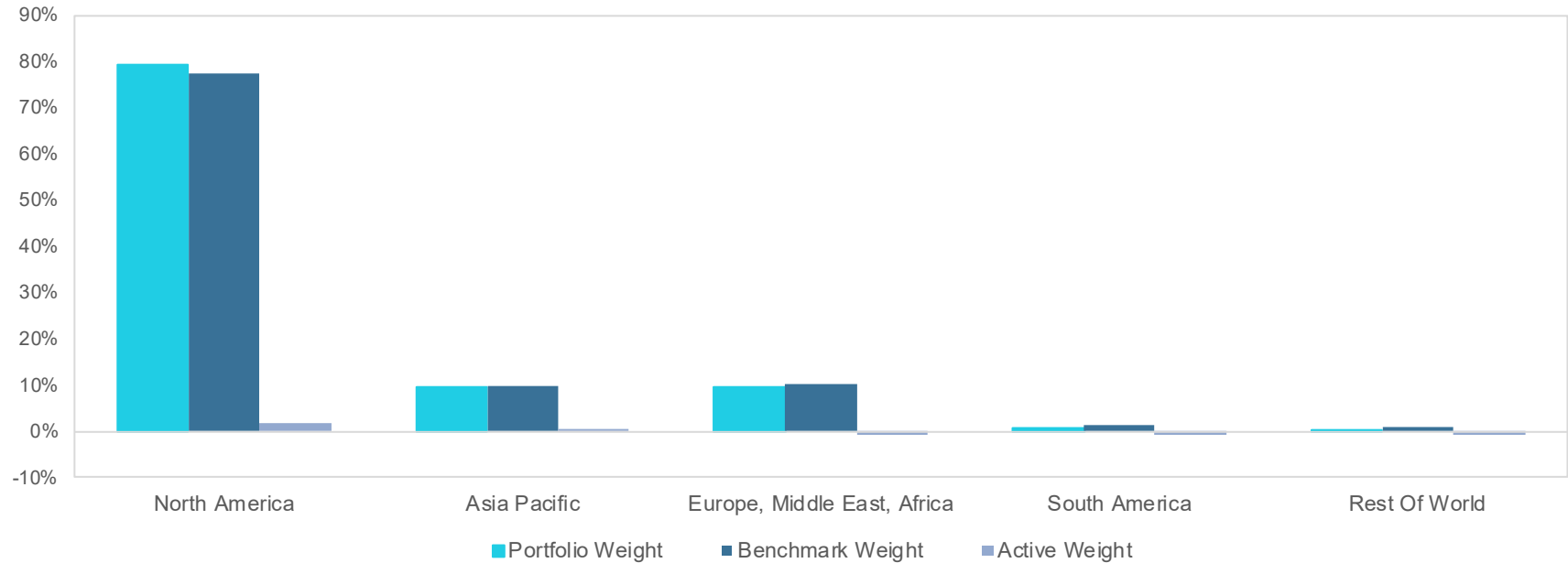
# Portfolio Allocation

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## By Region



Region	Weight%			Total Risk	Active Risk CR	% of Active TR	MC to Total Tracking Error
	Portfolio	Benchmark	Active				
<b>Total Fund</b>	<b>100.00%</b>	<b>100.00%</b>	<b>0.00%</b>	<b>11.90</b>	<b>1.26</b>	<b>100.00</b>	<b>0.01</b>
North America	79.30%	77.34%	1.96%	11.45	1.16	91.53	0.01
Asia Pacific	9.82%	9.66%	0.17%	13.98	0.02	1.66	0.01
Europe, Middle East, Africa	9.65%	10.48%	-0.83%	17.57	0.09	7.35	-0.02
South America	0.84%	1.42%	-0.59%	21.41	0.00	-0.06	0.00
Rest Of World	0.39%	1.10%	-0.71%	8.35	-0.01	-0.48	0.01

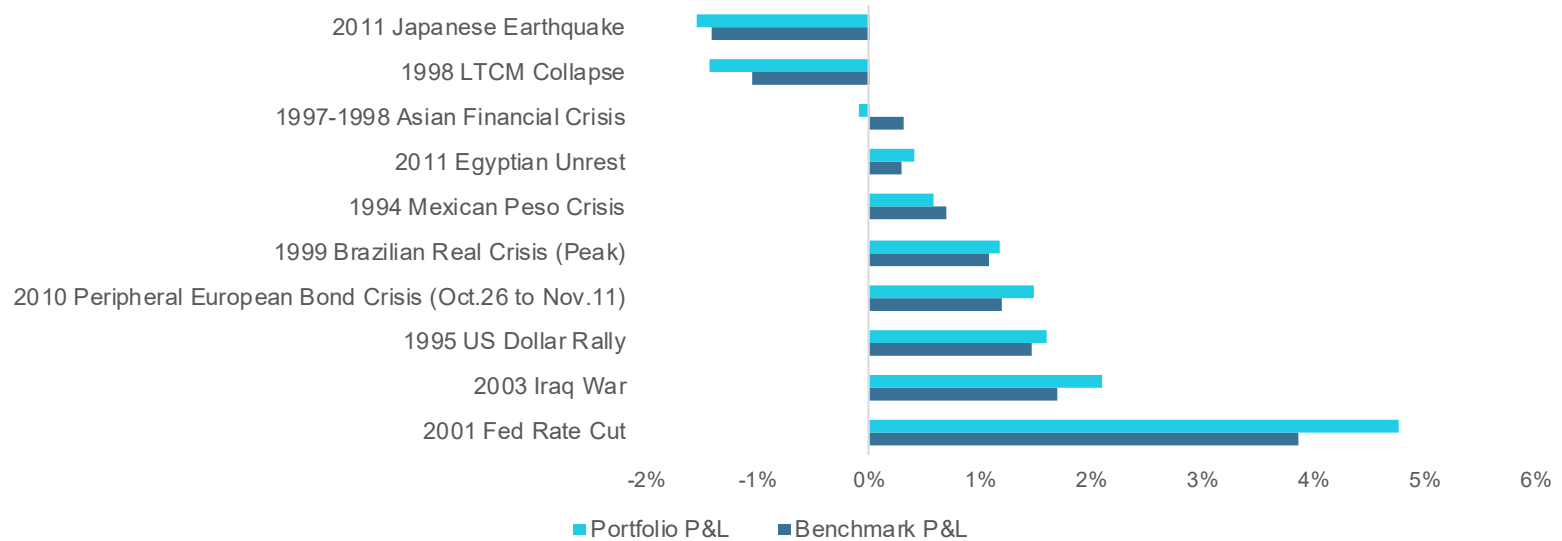
# Stress Tests

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## Top 10 Best Stress Scenarios



Scenario	Portfolio P&L	Benchmark P&L	Market Change (\$)
2001 Fed Rate Cut	4.76%	3.87%	124,124,576
2003 Iraq War	2.09%	1.70%	54,628,592
1995 US Dollar Rally	1.60%	1.47%	41,681,673
2010 Peripheral European Bond Crisis	1.49%	1.20%	38,865,462
1999 Brazilian Real Crisis (Peak)	1.18%	1.08%	30,670,404
1994 Mexican Peso Crisis	0.58%	0.70%	15,092,700
2011 Egyptian Unrest	0.41%	0.28%	10,591,924
1997-1998 Asian Financial Crisis	-0.10%	0.32%	(2,566,038)
1998 LTCM Collapse	-1.44%	-1.04%	(37,453,153)
2011 Japanese Earthquake	-1.55%	-1.41%	(40,548,845)



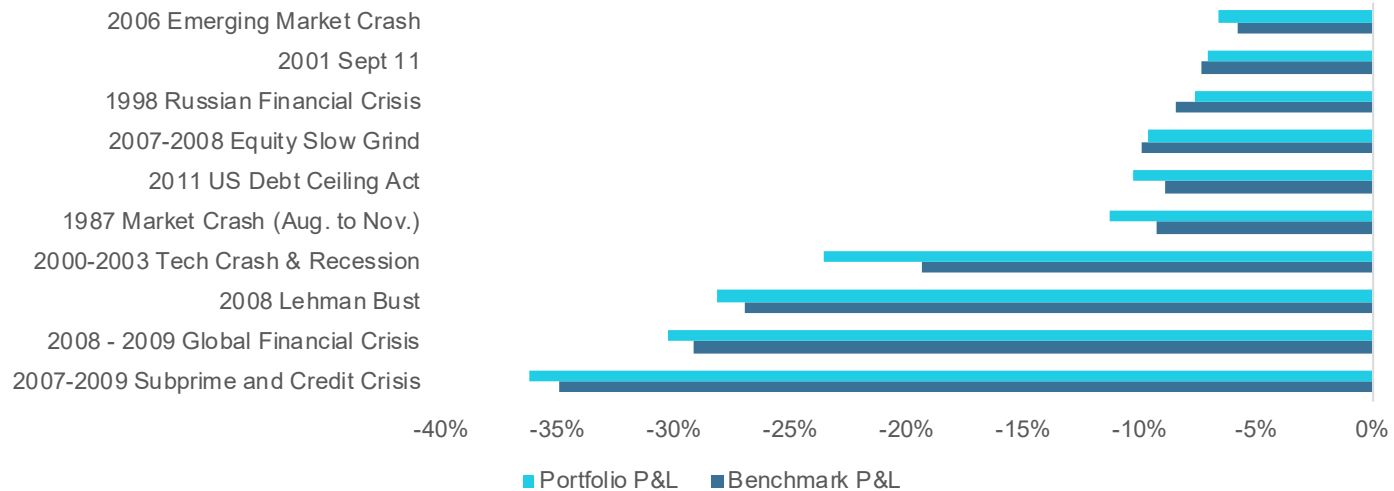
# Stress Tests

for the quarter ended September 30, 2022



Los Angeles County Employees Retirement Association

## Top 10 Worst Stress Scenarios



Scenario	Portfolio P&L	Benchmark P&L	Market Change (\$)
2007-2009 Subprime and Credit Crisis	-36.22%	-34.94%	(944,529,833)
2008 - 2009 Global Financial Crisis	-30.24%	-29.13%	(788,706,073)
2008 Lehman Bust	-28.13%	-26.95%	(733,723,008)
2000-2003 Tech Crash & Recession	-23.57%	-19.38%	(614,660,564)
1987 Market Crash (Aug. to Nov.)	-11.31%	-9.33%	(295,039,101)
2011 US Debt Ceiling Act	-10.32%	-8.96%	(269,277,974)
2007-2008 Equity Slow Grind	-9.66%	-9.89%	(251,914,283)
1998 Russian Financial Crisis	-7.60%	-8.49%	(198,130,869)
2001 Sept 11	-7.09%	-7.38%	(184,858,693)
2006 Emerging Market Crash	-6.61%	-5.84%	(172,362,084)

# appendix

# Benchmark Definitions

## Current Composition

	Weight	Component
<b>Master Trust</b>		
OPEB Master Trust Policy Benchmark		
	48%	OPEB Growth Policy Benchmark
	19%	OPEB Credit Policy Benchmark
	20%	OPEB RA & IH Policy Benchmark
	14%	OPEB RR & M Policy Benchmark
<b>Growth</b>		
OPEB Growth Policy Benchmark		
	95%	MSCI ACWI IMI Net
	5%	OPEB Private Equity Custom Benchmark
<b>Credit</b>		
OPEB Credit Policy Benchmark		
	87%	OPEB Liquid Credit Policy Benchmark
	13%	OPEB Illiquid Credit Policy Benchmark
OPEB Liquid Credit Policy Benchmark		
	38%	Bloomberg U.S. Corporate High Yield
	46%	CS Leveraged Loan Index
	8%	JPMorgan EMBI Global Diversified Index
	4%	JPM GBI-EM Global Diversified Index
	4%	JPM CEMBI Broad Diversified
<b>Real Assets &amp; Inflation Hedges</b>		
OPEB RA & IH Policy Benchmark		
	45%	OPEB Real Estate Custom Benchmark
	5%	S&P Global Natural Resources Index
	15%	Bloomberg Commodity Index Total Return
	5%	DJ Brookfield Global Infra Comp
	30%	Bloomberg U.S. Treasury: U.S. TIPS
<b>Risk Reduction &amp; Mitigation</b>		
OPEB RR & M Policy Benchmark		
	67%	Bloomberg U.S. Aggregate
	19%	Bloomberg U.S. Treasury: Long
	15%	OPEB Cash Policy Benchmark
OPEB Cash Policy Benchmark		
	100%	FTSE 3-Month US Treasury Bill

## A

### ANNUAL RETURN

The total return of a security over a specified period, expressed as an annual rate of interest.

### ACTIVE RISK

The expected standard deviation of the differential return between the portfolio and the benchmark. Active total risk arises from active management, and it is the result of active weights (deviations from the benchmark at the asset level) and therefore active exposures; for passively managed portfolios, it is referred to as “total tracking error.”

### ACTIVE RISK CONTRIBUTION

Percent contribution to active total risk (or tracking error). The percent of active total risk that an individual asset or risk source contributes. For example, a % CR to Active Total Risk of 10% indicates that 10% of the portfolio’s active total risk is arising from the active position in that particular asset.

## B

### BASIS POINTS (BPS)

One one-hundredth of one percent. One hundred basis points equal one percent.

### BETA

A measure of the volatility of a stock relative to the overall market. A beta of less than one indicates lower risk than the market; a beta of more than one indicates higher risk than the market.

## D

### DURATION

A measure of the price sensitivity of a bond portfolio to changes in interest rates.

## F

### FUTURES CONTRACT

Agreement to buy or sell a specific amount of a commodity or financial instrument at a particular price and a stipulated future date.

## H

### HIGH YIELD BOND

A bond with a low investment quality and credit worthiness, usually with a rating of BB or less.

## I

### INFORMATION RATIO

The excess return (alpha) per unit of active risk (tracking error).

### INTERNAL RATE OF RETURN (IRR)

A total rate of return that gives full weight to the size and timing of cash flows over the period measured and fully reflects unrealized gains and losses in addition to realized gains and losses, interest and dividend income.

## M

### MC TO TOTAL TRACKING ERROR

This value represents the change in the active risk of an asset's portfolio or group that would result from a one percent increase in the asset's effective position plus an equal short position in the benchmark.

## S

### SHARPE RATIO

Average return earned in excess of the risk-free rate per unit of total risk.

### STANDARD DEVIATION

Statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution. The greater the degree of dispersion, the greater the risk.

## T

### TIME-WEIGHTED RETURN (TWR)

A measure of the compound rate of growth in a portfolio. Often used to compare the returns of investment managers because it eliminates the distorting effects on growth rates created by inflows and outflows of money.

### TOTAL RISK

The total (gross) risk to an asset (or portfolio), which is the standard deviation of the asset's total return distribution, expressed in percent. Total risk is forecasted using MSCI Barra's multiple factor models. The total risk for an asset depends on the asset's exposures to the risk factors, the factor variance/covariance matrix, and the forecast selection risk of the asset.

### TOTAL RISK CONTRIBUTION

The percent of total risk that an individual asset or risk source contributes. For example, a % CR to Total Risk of 10% indicates that 10% of the portfolio's total risk is arising from the portfolio's position in that particular asset.

## Y

### YIELD TO MATURITY

The return a bond earns on the price at which it was purchased if it were held to maturity. It assumes that coupon payments can be reinvested at the yield to maturity.