

City of Quincy Retirement System

December 31, 2021

Interim Update

Agenda

1. Executive Summary
 - December Market Overview
 - Manager Highlights
2. Interim Update as of December 31, 2021
3. Asset Allocation Review
4. Disclaimer, Glossary & Notes

Executive Summary

Economic and Market Update
Data as of November 30, 2021

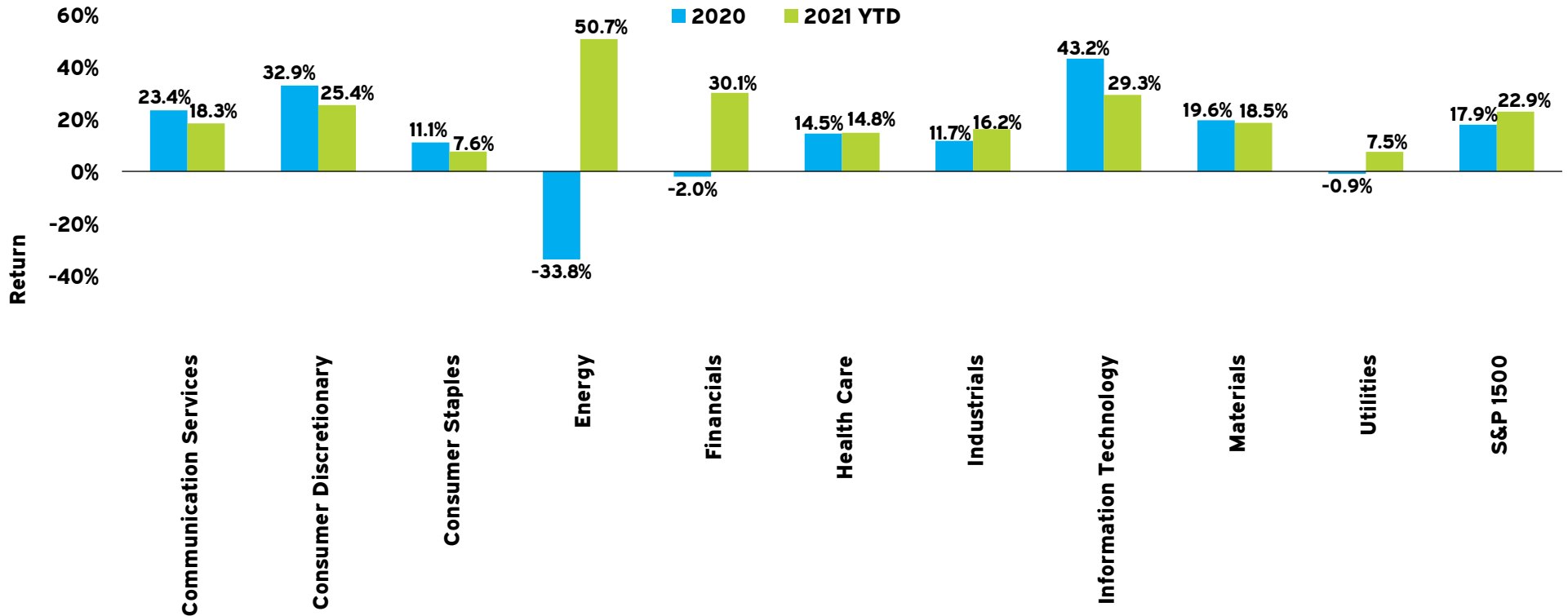
Market Returns¹

Indices	November	YTD	1 Year	3 Year	5 Year	10 Year
S&P 500	-0.7%	23.2%	27.9%	20.4%	17.9%	16.2%
MSCI EAFE	-4.7%	5.8%	10.8%	9.8%	9.2%	7.4%
MSCI Emerging Markets	-4.1%	-4.3%	2.7%	9.3%	9.5%	5.2%
MSCI China	-6.0%	-19.2%	-16.9%	6.7%	9.2%	7.8%
Bloomberg Barclays Aggregate	0.3%	-1.3%	-1.2%	5.5%	3.7%	3.0%
Bloomberg Barclays TIPS	0.9%	5.6%	6.8%	8.5%	5.2%	3.1%
Bloomberg Barclays High Yield	-1.0%	3.3%	5.3%	7.4%	6.3%	6.9%
10-year US Treasury	1.4%	-3.2%	-3.8%	6.3%	3.5%	2.7%
30-year US Treasury	3.4%	-2.6%	-4.0%	12.6%	7.3%	5.0%

- Global equity markets posted negative returns for the month of November as persistently higher prices threatened growth outlooks. US equities returned -0.7%, but outperformed international markets which experienced larger losses given uncertainties related to COVID-19 cases rebounding and potential new restrictions. Very high natural gas prices remain a threat to the economic recovery in Europe, while weak results in China continue to weigh on broader emerging markets.
- In November, the US bond market (Bloomberg Barclays Aggregate) and TIPS posted modest gains, while high yield bonds declined in the risk-off environment. Longer-dated Treasury securities had the strongest relative results as yields declined due to the easing of long-term inflation expectations.

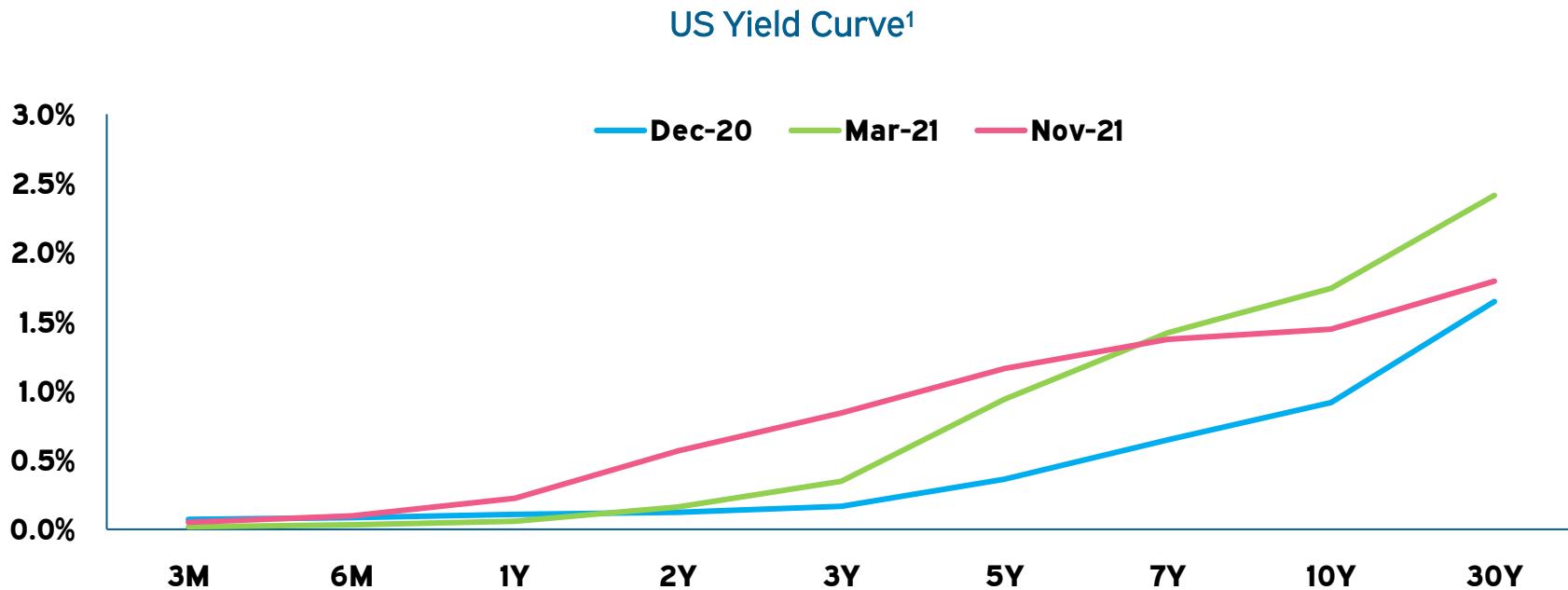
¹ Source: Investment Metrics and Bloomberg. Data is as of November 30, 2021.

Sector Returns¹



- In a reversal of the trend from last year, energy continues to lead the way on a year-to-date basis, followed by financials and technology.
- All sectors pulled back in November, particularly the energy sector as concerns around the Omicron variant grew.

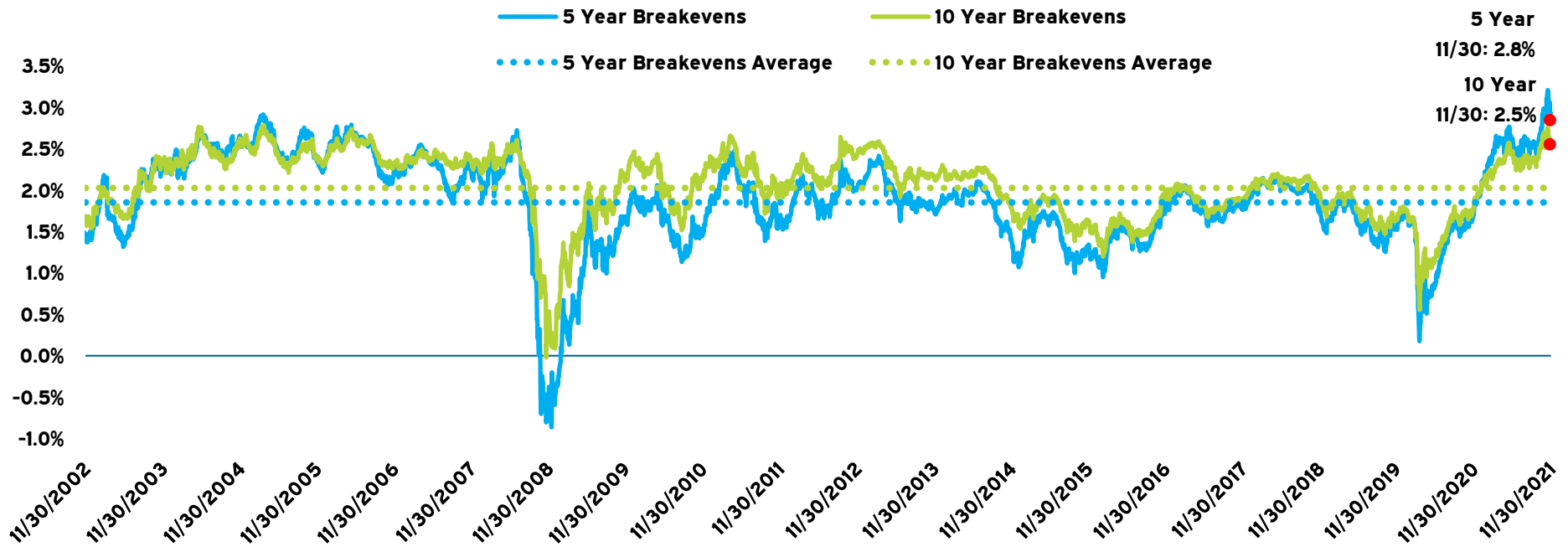
¹ Source: Bloomberg. Data is as of November 30, 2021.



- During the first half of 2021, the Treasury yield curve steepened on both higher growth and inflation expectations as vaccines were deployed and economic growth prospects improved on the opening of the economy.
- Over the latter-half of the year, shorter-dated yields have remained largely anchored close to 0% given the Federal Reserve’s continued low policy rate. Rates in the 2-year to 5-year sector have increased as the FOMC signaled that policy rates may need to be tightened more aggressively than previously anticipated. Longer-term rates have come down given the expectation of tighter monetary policy and potentially peaking inflation.

¹ Source: Bloomberg. Data is as of November 30, 2021.

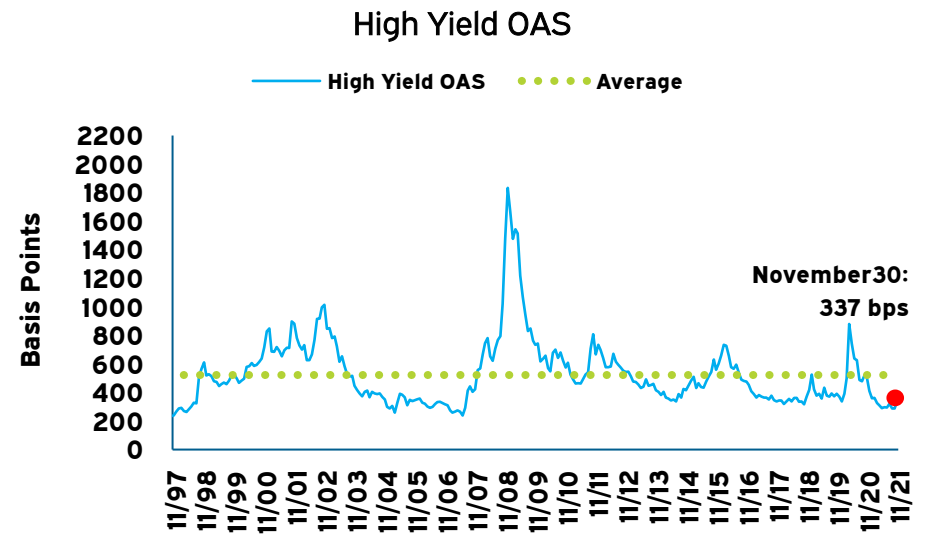
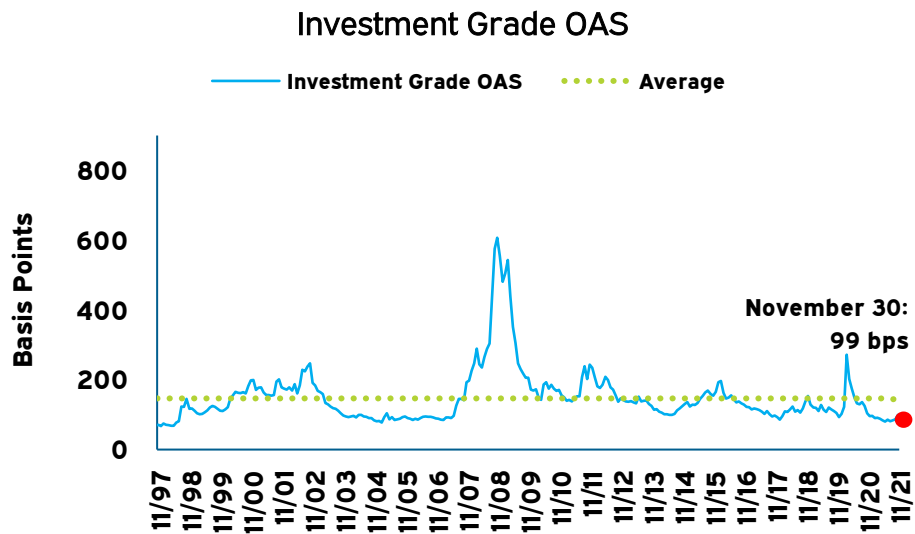
Breakeven Inflation¹



- By the end of November, inflation expectations moderated somewhat, but remain well above the Fed's 2% target.
- The economy reopening, supply chain issues potentially persisting as new variants of the virus increase the risk of re-shuttering sectors of the global economy, and wage pressures remain key drivers of inflation expectations.
- Additionally, changes to Fed policy focused on an average inflation target may play a role in inflation market dynamics and, specifically, the risk that consumer inflation expectations get entrenched at higher inflation growth rates.

¹ Source: Bloomberg. Data is as of November 30, 2021.

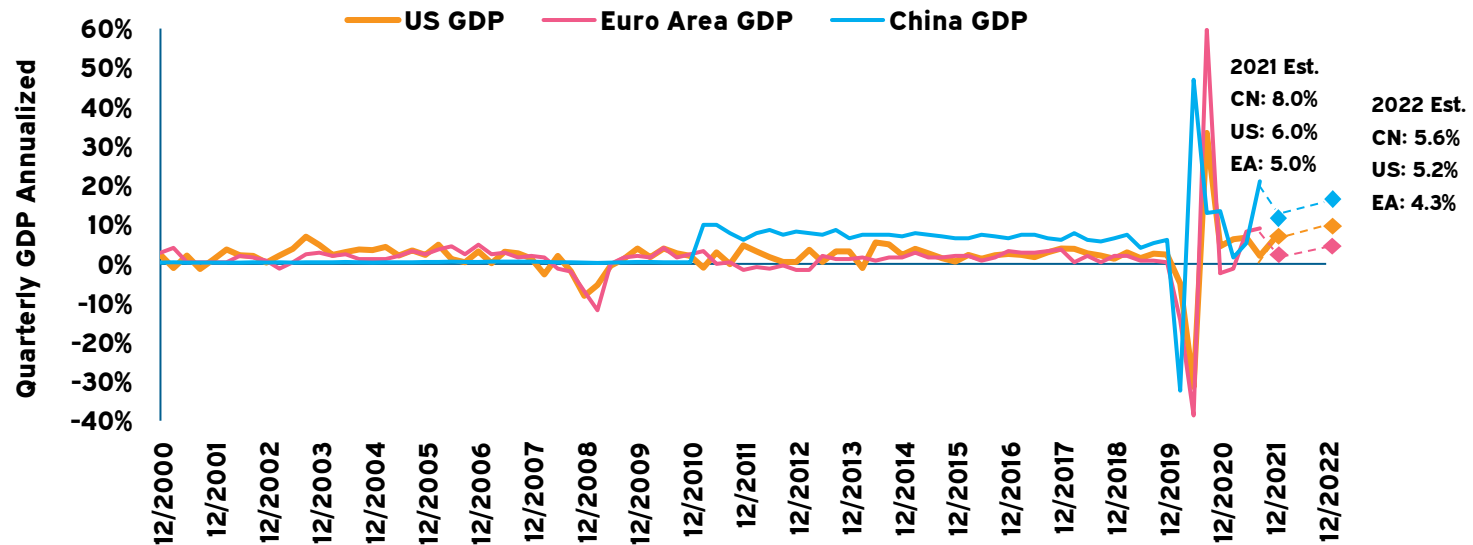
Credit Spreads (High Yield & Investment Grade)¹



- Credit spreads (the spread above a comparable maturity Treasury) for investment-grade and high yield corporate debt remain historically narrow despite continued economic uncertainty and a modest spike in credit risk late in the month on the discovery of the new virus variant (Omicron).
- Policy support and the search for yield in a low-rate environment have been key drivers in the decline in US credit spreads to below long-term averages, particularly for high yield issuers.

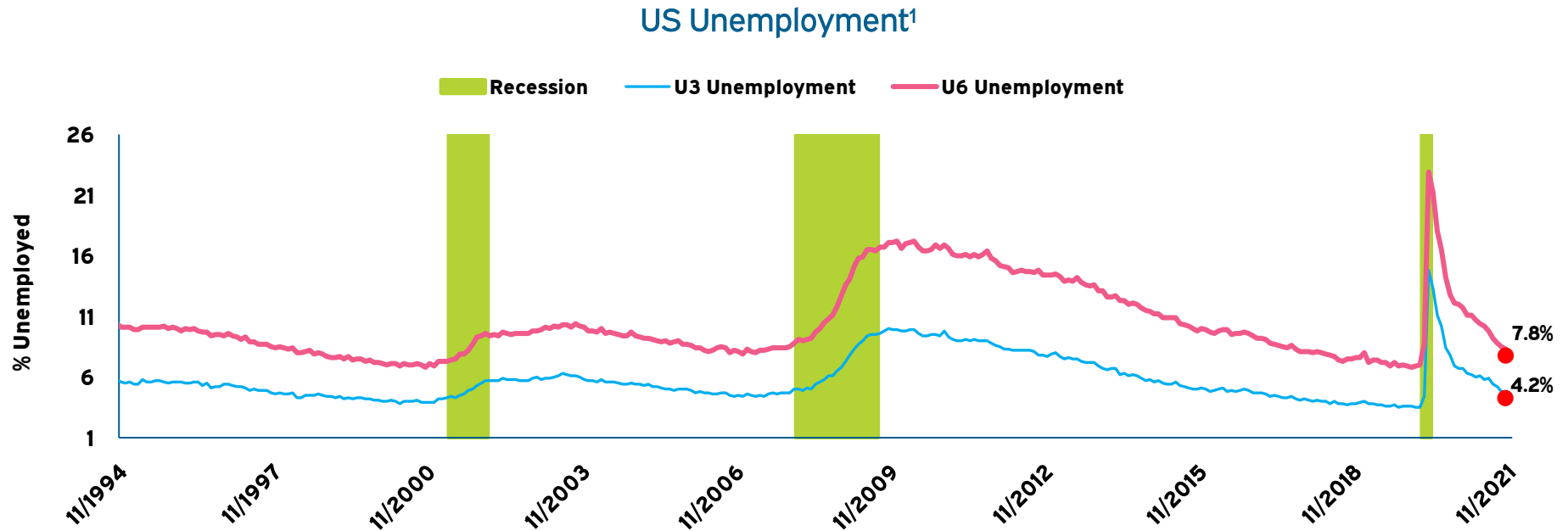
¹ Source: Barclays Live. Data represents OAS and is as of November 30, 2021.

GDP Data Shows Projected Improvements in 2021¹



- In late 2020 and early 2021, major economies grew at rates far above potential. These very high rates of growth are not expected to continue, with projections continuing to decline due to supply disruptions, reopening trends moderating, and some countries continuing to struggle with the virus.
- The US is expected to grow faster than the euro area this year and next, with some growth pulled forward due to the relative success in distributing the vaccine and a substantially larger fiscal stimulus response to the pandemic.
- China is projected to grow at 8.0% in 2021 and 5.6% in 2022 both above the expected US growth rate. Questions remain, though, about the highly levered property market and government regulations.

¹ Source: Bloomberg, and IMF; Euro Area and China figures annualized by Meketa. Projections via October 2021 IMF World Economic Outlook and represent annual numbers.



- The US labor market continues to recover, and the unemployment rate (U3) fell from 4.6% to 4.2% in November. It still remains above pre-pandemic levels though, but far below the pandemic peak.
- The broader measure of unemployment (U6) that includes discouraged and underemployed workers also continued to decline but remains much higher at 7.8%. Also, the labor force participation rate remains quite low at 61.8% and is below the 63.4% level of January 2020.
- Continued pandemic related concerns, childcare issues, and a mismatch of skills and available jobs have contributed to the labor market issues. The track of the unemployment rate from here will be a key consideration in the Federal Reserve's pace of reducing its policy support.

¹ Source: Bloomberg. Data is as of November 30, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

Manager Highlights

Acadian Emerging Markets Small Cap

- Acadian outperformed its benchmark for the month, returning 6.8% vs 4.2% for the MSCI Emerging Markets Small Cap Index.
 - Key sources of positive active return included stock selection in Taiwan, a combination of stock selection and an overweight position in South Korea, and a combination of stock selection and an underweight position in China.
- Since inception, the strategy has returned 8.7%, beating the benchmark by 2.8% over that same period.

Brown Small Cap Fundamental Value

- Brown outperformed the Russell 2000 Value index by 1.7% in December, posting a return of 5.8% vs the benchmark's 4.1%.
 - Stock selection drove the positive performance in December.
- Since inception, Brown has returned 10.7%, trailing the benchmark, which has returned 12.6% over that same period.

Axiom International Small Cap

- Axiom lagged its benchmark in December by 2.7%, returning 1.9% vs. the benchmark return of 4.6%.
 - Stock selection in the Industrials and Consumer Discretionary sectors along with stock selection withing Japanese equities were the biggest headwinds to relative performance.
- Since inception, the strategy has returned 39.9%, well above the benchmark's return of 30.1% over that same period.

Driehaus Emerging Markets Growth

- Driehaus underperformed is benchmark in December by 1.4%, returning 0.5% vs the benchmark's 1.9% monthly return.
 - Stock selection in the Communication Services sector as well as exposure to Brazilian and Uruguayan stocks detracted from performance for the month.
- Since inception, the strategy has returned 14.8%, well outpacing the benchmark return of 8.3% over that same period.

Interim Update
As of December 31, 2021

Allocation vs. Targets and Policy				
	Current Balance	Current Allocation	Policy	Policy Range
US Equity	\$109,237,692	23%	24%	19% - 29%
Developed Market Equity	\$58,912,294	13%	13%	8% - 18%
Emerging Market Equity	\$54,343,666	12%	12%	7% - 17%
Investment Grade Bonds	\$28,613,948	6%	5%	2% - 8%
Long-Term Government Bonds	\$25,317,792	5%	7%	2% - 12%
TIPS	\$17,667,197	4%	4%	1% - 7%
Emerging Market Bonds	\$0	0%	2%	0% - 4%
High Yield Bonds	\$22,572,324	5%	6%	3% - 9%
Bank Loans	\$8,070,199	2%	2%	0% - 4%
Private Equity	\$56,377,106	12%	10%	5% - 15%
Real Estate	\$40,603,122	9%	10%	5% - 15%
Natural Resources	\$5,356,357	1%	3%	0% - 6%
Infrastructure	\$8,613,837	2%	2%	0% - 5%
Opportunistic	\$9,776,835	2%	0%	0% - 5%
Balanced Assets	\$7,084,714	2%	--	--
Cash	\$15,101,696	3%	0%	0% - 5%
Total	\$467,648,779	100%	100%	

Asset Class Performance Summary											
	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (gross)	467,648,779	100.0	4.1	5.1	16.8	15.9	11.7	9.6	7.3	8.7	Jan-89
Total Retirement System			4.1	5.1	16.5	15.6	11.4	9.3	7.0	8.4	
Domestic Equity Assets	109,237,692	23.4	4.9	10.6	27.6	24.0	16.6	15.7	9.4	10.7	Jul-93
<i>Russell 3000</i>			<i>3.9</i>	<i>9.3</i>	<i>25.7</i>	<i>25.8</i>	<i>18.0</i>	<i>16.3</i>	<i>9.7</i>	<i>10.7</i>	<i>Jul-93</i>
International Developed Market Equity Assets	58,912,294	12.6	4.2	2.2	11.1	13.9	9.3	7.7	6.2	5.5	Feb-98
<i>MSCI EAFE</i>			<i>5.1</i>	<i>2.7</i>	<i>11.3</i>	<i>13.5</i>	<i>9.5</i>	<i>8.0</i>	<i>6.3</i>	<i>5.2</i>	<i>Feb-98</i>
International Emerging Market Equity Assets	54,343,666	11.6	1.6	-0.2	3.3	17.6	12.9	7.4	--	7.7	Sep-08
<i>MSCI Emerging Markets</i>			<i>1.9</i>	<i>-1.3</i>	<i>-2.5</i>	<i>10.9</i>	<i>9.9</i>	<i>5.5</i>	<i>9.6</i>	<i>4.4</i>	<i>Sep-08</i>
Investment Grade Bond Assets	28,613,948	6.1	-0.2	0.1	-1.5	4.8	3.6	2.9	4.4	4.9	Jul-93
<i>Bloomberg US Aggregate TR</i>			<i>-0.3</i>	<i>0.0</i>	<i>-1.5</i>	<i>4.8</i>	<i>3.6</i>	<i>2.9</i>	<i>4.3</i>	<i>5.1</i>	<i>Jul-93</i>
Long-Term Government Bond Assets	25,317,792	5.4	-0.8	1.6	0.1	7.6	5.4	--	--	5.0	Dec-15
<i>PRIT Core Fixed Income</i>			<i>-0.7</i>	<i>1.6</i>	<i>0.1</i>	<i>7.6</i>	<i>5.4</i>	<i>4.6</i>	<i>5.2</i>	<i>5.0</i>	<i>Dec-15</i>
TIPS Assets	17,667,197	3.8	0.3	2.3	5.9	8.4	5.3	3.1	--	4.6	Mar-07
<i>Bloomberg US TIPS TR</i>			<i>0.3</i>	<i>2.4</i>	<i>6.0</i>	<i>8.4</i>	<i>5.3</i>	<i>3.1</i>	<i>5.3</i>	<i>4.6</i>	<i>Mar-07</i>
High Yield Bond Assets	22,572,324	4.8	2.2	0.5	4.6	8.8	6.1	6.4	--	6.3	Apr-07
<i>Bloomberg US High Yield TR</i>			<i>1.9</i>	<i>0.7</i>	<i>5.3</i>	<i>8.8</i>	<i>6.3</i>	<i>6.8</i>	<i>7.8</i>	<i>7.0</i>	<i>Apr-07</i>
Bank Loan Assets	8,070,199	1.7	0.6	0.6	4.4	5.1	3.5	--	--	3.6	Aug-14
<i>Credit Suisse Leveraged Loans</i>			<i>0.6</i>	<i>0.7</i>	<i>5.4</i>	<i>5.4</i>	<i>4.3</i>	<i>4.8</i>	<i>4.8</i>	<i>4.1</i>	<i>Aug-14</i>

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Real Estate Assets	40,603,122	8.7	5.5	5.5	15.6	6.4	6.5	9.0	7.5	7.7	Jan-89
<i>NCREIF-ODCE</i>			<i>8.0</i>	<i>8.0</i>	<i>22.2</i>	<i>9.2</i>	<i>8.7</i>	<i>10.4</i>	<i>8.3</i>	<i>7.5</i>	<i>Jan-89</i>
Private Equity Assets	56,377,106	12.1									
Natural Resources Assets	5,356,357	1.1									
Infrastructure Assets	8,613,837	1.8									
Opportunistic Assets	9,776,835	2.1									
Balanced Assets	7,084,714	1.5	3.0	5.4	19.9	16.2	12.4	10.6	8.2	8.9	Apr-90
<i>60% Wilshire 5000 & 40% Barclays Aggregate</i>			<i>2.2</i>	<i>5.7</i>	<i>14.7</i>	<i>17.6</i>	<i>12.4</i>	<i>11.1</i>	<i>8.0</i>	<i>9.2</i>	<i>Apr-90</i>
Cash	15,101,696	3.2									

	Trailing Net Performance											Inception (%)	Inception Date
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)			
Total Retirement System (gross)	467,648,779	100.0	--	4.1	5.1	16.8	15.9	11.7	9.6	7.3	8.7	Jan-89	
Total Retirement System				4.1	5.1	16.5	15.6	11.4	9.3	7.0	8.4		
Domestic Equity Assets	109,237,692	23.4	23.4	4.9	10.6	27.6	24.0	16.6	15.7	9.4	10.7	Jul-93	
<i>Russell 3000</i>				3.9	9.3	25.7	25.8	18.0	16.3	9.7	10.7	Jul-93	
RhumbLine Russell 1000 Growth Index	28,491,703	6.1	26.1	2.1	11.7	27.6	34.1	25.3	19.7	--	13.3	Jun-05	
<i>Russell 1000 Growth</i>				2.1	11.6	27.6	34.1	25.3	19.8	10.9	13.4	Jun-05	
<i>Large Growth MStar MF Median</i>				1.5	7.7	22.3	30.4	23.0	18.2	10.2	12.2	Jun-05	
<i>Large Growth MStar MF Rank</i>				36	11	18	12	22	14	--	22	Jun-05	
RhumbLine Russell 1000 Value Index	28,426,770	6.1	26.0	6.3	7.8	25.1	17.6	11.1	12.9	--	8.4	Jun-05	
<i>Russell 1000 Value</i>				6.3	7.8	25.2	17.6	11.2	13.0	8.3	8.5	Jun-05	
<i>Large Value MStar MF Median</i>				6.4	8.4	26.5	18.0	11.8	12.9	8.1	8.8	Jun-05	
<i>Large Value MStar MF Rank</i>				56	59	70	58	66	50	--	61	Jun-05	
Rhumblin QSI Index	34,558,536	7.4	31.6	5.7	12.3	28.3	23.0	16.6	--	--	14.4	Aug-13	
<i>QSI Index</i>				5.7	12.3	28.4	23.1	16.7	15.5	10.3	14.5	Aug-13	
<i>Russell 3000</i>				3.9	9.3	25.7	25.8	18.0	16.3	9.7	15.0	Aug-13	
<i>Large Cap MStar MF Median</i>				4.6	8.9	25.8	24.6	17.3	15.4	9.3	14.0	Aug-13	
<i>Large Cap MStar MF Rank</i>				32	6	26	58	55	--	--	48	Aug-13	
Brown Small Cap Fundamental Value	17,760,683	3.8	16.3	5.8	9.6	31.7	16.0	8.7	--	--	10.7	Jul-16	
<i>Russell 2000 Value</i>				4.1	4.4	28.3	18.0	9.1	12.0	9.2	12.6	Jul-16	
<i>Small Value MStar MF Median</i>				5.3	6.4	31.6	18.6	9.3	11.9	9.6	12.2	Jul-16	
<i>Small Value MStar MF Rank</i>				24	3	48	86	61	--	--	73	Jul-16	

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
International Developed Market Equity Assets	58,912,294	12.6	12.6	4.2	2.2	11.1	13.9	9.3	7.7	6.2	5.5	Feb-98
<i>MSCI EAFE</i>				5.1	2.7	11.3	13.5	9.5	8.0	6.3	5.2	Feb-98
SSgA MSCI EAFE Index	43,553,030	9.3	73.9	5.1	2.7	11.5	13.9	9.9	8.3	--	6.5	Oct-09
<i>MSCI EAFE</i>				5.1	2.7	11.3	13.5	9.5	8.0	6.3	6.2	Oct-09
<i>Foreign MStar MF Median</i>				4.4	2.3	10.9	14.5	10.0	8.5	6.9	7.0	Oct-09
<i>Foreign MStar MF Rank</i>				30	43	43	57	53	57	--	61	Oct-09
Axiom International Small Cap Equity	15,359,264	3.3	26.1	1.9	0.6	9.7	--	--	--	--	39.9	May-20
<i>S&P Developed Ex-U.S. SmallCap</i>				4.6	-0.3	8.8	15.6	10.8	10.2	9.8	30.1	May-20
<i>MSCI EAFE Small Cap</i>				4.4	0.1	10.1	15.6	11.0	10.8	9.9	29.9	May-20
International Emerging Market Equity Assets	54,343,666	11.6	11.6	1.6	-0.2	3.3	17.6	12.9	7.4	--	7.7	Sep-08
<i>MSCI Emerging Markets</i>				1.9	-1.3	-2.5	10.9	9.9	5.5	9.6	4.4	Sep-08
Driehaus Emerging Markets Growth	44,239,973	9.5	81.4	0.5	-0.7	-0.8	--	--	--	--	14.8	Mar-19
<i>MSCI Emerging Markets</i>				1.9	-1.3	-2.5	10.9	9.9	5.5	9.6	8.3	Mar-19
<i>Diversified Emerging Mkts MStar MF Median</i>				2.0	-1.1	-1.7	12.0	9.8	6.1	9.7	9.2	Mar-19
<i>Diversified Emerging Mkts MStar MF Rank</i>				77	46	45	--	--	--	--	16	Mar-19
Acadian Emerging Markets Small Cap	10,103,693	2.2	18.6	6.8	2.4	26.6	18.2	14.3	--	--	8.7	Jun-14
<i>MSCI Emerging Markets Small Cap</i>				4.2	1.3	18.8	16.5	11.5	7.4	11.0	5.9	Jun-14
<i>Diversified Emerging Mkts MStar MF Median</i>				2.0	-1.1	-1.7	12.0	9.8	6.1	9.7	4.9	Jun-14
<i>Diversified Emerging Mkts MStar MF Rank</i>				1	6	1	13	13	--	--	7	Jun-14
Investment Grade Bond Assets	28,613,948	6.1	6.1	-0.2	0.1	-1.5	4.8	3.6	2.9	4.4	4.9	Jul-93
<i>Bloomberg US Aggregate TR</i>				-0.3	0.0	-1.5	4.8	3.6	2.9	4.3	5.1	Jul-93
SSgA U.S. Aggregate Bond Index-NL	28,613,948	6.1	100.0	-0.2	0.1	-1.5	4.8	3.6	2.9	--	3.9	Apr-04
<i>Bloomberg US Aggregate TR</i>				-0.3	0.0	-1.5	4.8	3.6	2.9	4.3	3.9	Apr-04
<i>Intermediate Core Bond MStar MF Median</i>				-0.3	-0.2	-1.5	5.1	3.7	3.2	4.4	4.1	Apr-04
<i>Intermediate Core Bond MStar MF Rank</i>				30	8	53	66	64	74	--	64	Apr-04

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Long-Term Government Bond Assets	25,317,792	5.4	5.4	-0.8	1.6	0.1	7.6	5.4	--	--	5.0	Dec-15
<i>PRIT Core Fixed Income</i>				-0.7	1.6	0.1	7.6	5.4	4.6	5.2	5.0	Dec-15
PRIT Core Fixed Income	25,317,792	5.4	100.0	-0.8	1.6	0.1	7.6	5.4	--	--	5.0	Dec-15
<i>PRIT Core Fixed Income</i>				-0.7	1.6	0.1	7.6	5.4	4.6	5.2	5.0	Dec-15
TIPS Assets	17,667,197	3.8	3.8	0.3	2.3	5.9	8.4	5.3	3.1	--	4.6	Mar-07
<i>Bloomberg US TIPS TR</i>				0.3	2.4	6.0	8.4	5.3	3.1	5.3	4.6	Mar-07
SSgA TIPS Index	17,667,197	3.8	100.0	0.3	2.3	5.9	8.4	5.3	3.1	--	4.6	Mar-07
<i>Bloomberg US TIPS TR</i>				0.3	2.4	6.0	8.4	5.3	3.1	5.3	4.6	Mar-07
<i>Inflation-Protected Bond MStar MF Median</i>				0.3	2.0	5.6	8.0	5.0	2.8	5.1	4.2	Mar-07
<i>Inflation-Protected Bond MStar MF Rank</i>				55	20	34	27	25	22	--	23	Mar-07
High Yield Bond Assets	22,572,324	4.8	4.8	2.2	0.5	4.6	8.8	6.1	6.4	--	6.3	Apr-07
<i>Bloomberg US High Yield TR</i>				1.9	0.7	5.3	8.8	6.3	6.8	7.8	7.0	Apr-07
Loomis Sayles High Yield Conservative	11,507,154	2.5	51.0	2.2	-0.1	4.1	8.4	6.0	--	--	6.2	Feb-12
<i>Bloomberg US High Yield TR</i>				1.9	0.7	5.3	8.8	6.3	6.8	7.8	6.6	Feb-12
<i>High Yield Bond MStar MF Median</i>				1.7	0.6	5.1	8.2	5.6	6.2	6.9	6.0	Feb-12
<i>High Yield Bond MStar MF Rank</i>				10	94	77	40	28	--	--	31	Feb-12
Columbia High Yield	11,065,170	2.4	49.0	2.2	1.1	5.2	9.2	6.1	--	--	6.3	Dec-16
<i>Bloomberg US High Yield TR</i>				1.9	0.7	5.3	8.8	6.3	6.8	7.8	6.6	Dec-16
<i>High Yield Bond MStar MF Median</i>				1.7	0.6	5.1	8.2	5.6	6.2	6.9	5.9	Dec-16
<i>High Yield Bond MStar MF Rank</i>				8	8	50	17	27	--	--	30	Dec-16

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Bank Loan Assets	8,070,199	1.7	1.7	0.6	0.6	4.4	5.1	3.5	--	--	3.6	Aug-14
<i>Credit Suisse Leveraged Loans</i>				0.6	0.7	5.4	5.4	4.3	4.8	4.8	4.1	Aug-14
Beach Point Loan Fund	8,070,199	1.7	100.0	0.6	0.6	4.4	5.1	3.5	--	--	3.6	Aug-14
<i>Credit Suisse Leveraged Loans</i>				0.6	0.7	5.4	5.4	4.3	4.8	4.8	4.1	Aug-14
<i>Bank Loan MStar MF Median</i>				0.7	0.6	4.6	4.8	3.7	4.2	4.3	3.5	Aug-14
<i>Bank Loan MStar MF Rank</i>				82	44	58	35	60	--	--	42	Aug-14
Real Estate Assets	40,603,122	8.7	8.7	5.5	5.5	15.6	6.4	6.5	9.0	7.5	7.7	Jan-89
<i>NCREIF-ODCE</i>				8.0	8.0	22.2	9.2	8.7	10.4	8.3	7.5	Jan-89
UBS Trumbull Property Income Fund	10,751,299	2.3	26.5	5.2	5.2	14.6	6.4	6.1	7.7	7.5	7.5	Jan-89
<i>NCREIF ODCE (net)</i>				7.7	7.7	21.1	8.2	7.7	9.4	7.3	6.5	Jan-89
UBS Trumbull Property Fund	3,504,027	0.7	8.6	4.8	4.8	15.7	2.2	3.6	6.3	6.5	6.7	Jan-89
<i>NCREIF ODCE (net)</i>				7.7	7.7	21.1	8.2	7.7	9.4	7.3	6.5	Jan-89
JPMCB Strategic Property Fund	6,269,858	1.3	15.4	7.9	7.9	20.1	8.4	--	--	--	8.4	Jan-19
<i>NCREIF ODCE (net)</i>				7.7	7.7	21.1	8.2	7.7	9.4	7.3	8.2	Jan-19
AEW Partners VII	1,020,238	0.2	2.5									
Rockwood X	6,644,419	1.4	16.4									
Torchlight Debt Opportunity Fund VI	3,967,621	0.8	9.8									
TerraCap Partners IV (Institutional), L.P.	4,200,068	0.9	10.3									
Rockwood Capital Real Estate Partners Fund XI, L.P.	4,245,593	0.9	10.5									

Market Values for all Real Estate, Private Equity, and Natural Resources investments, with the exception of UBS and JP Morgan, are as of 09/30/2021 adjusted for subsequent cash flows.

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Private Equity Assets	56,377,106	12.1	12.1									
Adams Street Partners 2010	8,441,187	1.8	15.0									
Goldman Sachs Private Equity Partners 2005	824,068	0.2	1.5									
North American Strategic Partners 2006	58,769	0.0	0.1									
Brookfield Capital Partners IV	4,024,989	0.9	7.1									
PRIT Vintage Year 2001	80,856	0.0	0.1									
PRIT Vintage Year 2002	15,705	0.0	0.0									
Ridgemont Equity Partners II	4,059,525	0.9	7.2									
TA XII	4,487,395	1.0	8.0									
LLR Equity Partners V	5,211,161	1.1	9.2									
Wellspring Capital Partners VI	5,621,398	1.2	10.0									
Trilantic Capital Partners VI	5,536,688	1.2	9.8									
Brookfield Capital Partners V, L.P.	3,378,308	0.7	6.0									
FS Equity Partners VIII L.P.	3,439,550	0.7	6.1									
Ridgemont Equity Partners III	4,830,815	1.0	8.6									
Searchlight Capital III	1,519,220	0.3	2.7									
Charlesbank Technology Opportunities Fund	3,262,472	0.7	5.8									

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Natural Resources Assets	5,356,357	1.1	1.1									
Hancock Timberland IX	3,130,700	0.7	58.4									
Oppenheimer Natural Resources	2,225,657	0.5	41.6									
Infrastructure Assets	8,613,837	1.8	1.8									
IFM Global Infrastructure (U.S.), L.P. <i>CPI+5%</i>	7,747,871	1.7	89.9	2.2 0.9	2.5 3.4	16.1 12.1	11.1 8.5	-- 7.9	-- 7.1	-- 7.3	11.2 8.4	Oct-18 Oct-18
Global Infrastructure Partners IV	865,966	0.2	10.1									
Opportunistic Assets	9,776,835	2.1	2.1									
HarbourVest Co-Investment Fund V, L.P.	5,164,788	1.1	52.8									
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	4,612,047	1.0	47.2									
Balanced Assets	7,084,714	1.5	1.5	3.0	5.4	19.9	16.2	12.4	10.6	8.2	8.9	Apr-90
<i>60% Wilshire 5000 & 40% Barclays Aggregate</i>				2.2	5.7	14.7	17.6	12.4	11.1	8.0	9.2	Apr-90
PRIT General Allocation	7,084,714	1.5	100.0	3.0	5.4	19.9	16.2	12.4	10.6	8.2	8.9	Apr-90
<i>60% Wilshire 5000 & 40% Barclays Aggregate</i>				2.2	5.7	14.7	17.6	12.4	11.1	8.0	9.2	Apr-90
Cash	15,101,696	3.2	3.2									
Cash Account	15,101,696	3.2	100.0									
<i>91 Day T-Bills</i>				0.0	0.0	0.0	0.8	1.1	0.6	1.2	1.2	Jan-02

Oppenheimer Natural Resources market value is as of 03/31/2021 adjusted for subsequent cash flows.

Total Retirement System | As of December 31, 2021
Cash Flow Summary

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Aberdeen Emerging Markets Bond Fund	\$4,055,087	\$0	-\$4,055,087	\$0	\$0	0.00%
Acadian Emerging Markets Small Cap	\$9,449,126	\$0	-\$10,525	\$665,092	\$10,103,693	6.82%
Adams Street Partners 2010	\$6,535,682	\$0	-\$864,698	\$2,770,203	\$8,441,187	42.57%
AEW Partners VII	\$1,017,216	\$0	\$0	\$3,022	\$1,020,238	0.30%
Axiom International Small Cap Equity	\$15,075,507	\$0	-\$10,240	\$293,997	\$15,359,264	1.88%
Beach Point Loan Fund	\$8,021,897	\$0	-\$3,363	\$51,664	\$8,070,199	0.60%
Brookfield Capital Partners IV	\$4,123,004	\$0	\$0	-\$98,015	\$4,024,989	-2.38%
Brookfield Capital Partners V, L.P.	\$3,267,937	\$26,422	\$0	\$83,949	\$3,378,308	2.57%
Brown Small Cap Fundamental Value	\$16,780,745	\$0	-\$14,801	\$994,739	\$17,760,683	5.84%
Cash Account	\$1,355,779	\$29,245,917	-\$15,500,000	\$0	\$15,101,696	0.00%
Charlesbank Technology Opportunities Fund	\$2,911,277	\$0	\$0	\$351,195	\$3,262,472	12.06%
Columbia High Yield	\$10,823,799	\$0	-\$3,781	\$245,151	\$11,065,170	2.23%
Driehaus Emerging Markets Growth	\$44,009,536	\$0	\$0	\$230,437	\$44,239,973	0.52%
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	\$4,708,857	\$0	\$0	-\$96,810	\$4,612,047	-2.06%
FS Equity Partners VIII L.P.	\$2,370,725	\$0	-\$135,135	\$1,203,960	\$3,439,550	50.88%
Global Infrastructure Partners IV	\$554,090	\$0	\$0	\$311,876	\$865,966	56.29%
Goldman Sachs Private Equity Partners 2005	\$895,099	\$0	-\$187,733	\$116,702	\$824,068	13.13%
Hancock Timberland IX	\$3,137,747	\$0	\$0	-\$7,047	\$3,130,700	-0.22%
HarbourVest Co-Investment Fund V, L.P.	\$5,065,732	\$0	-\$55,888	\$154,944	\$5,164,788	3.06%
IFM Global Infrastructure (U.S.), L.P.	\$7,577,777	\$0	\$0	\$170,094	\$7,747,871	2.24%
JPMCB Strategic Property Fund	\$5,812,319	\$0	\$0	\$457,539	\$6,269,858	7.87%
LLR Equity Partners V	\$4,832,258	\$0	-\$81,650	\$460,553	\$5,211,161	9.54%
LLR Equity Partners VI, L.P.	\$889,300	\$720,000	\$0	-\$24,300	\$1,585,000	-1.93%

Total Retirement System | As of December 31, 2021

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Loomis Sayles High Yield Conservative	\$11,258,741	\$0	-\$4,315	\$252,728	\$11,507,154	2.17%
North American Strategic Partners 2006	\$58,769	\$0	\$0	\$0	\$58,769	0.00%
Oppenheimer Natural Resources	\$2,225,657	\$0	\$0	\$0	\$2,225,657	0.00%
PRIT Core Fixed Income	\$25,509,946	\$0	-\$2,321	-\$189,833	\$25,317,792	-0.75%
PRIT General Allocation	\$2,816,280	\$4,064,542	\$0	\$203,892	\$7,084,714	2.96%
PRIT Vintage Year 2001	\$90,458	\$0	-\$9,455	-\$147	\$80,856	-0.16%
PRIT Vintage Year 2002	\$10,457	\$0	\$0	\$5,248	\$15,705	50.19%
Rhumblin QSI Index	\$32,691,424	\$0	-\$2,016	\$1,869,128	\$34,558,536	5.71%
Rhumblin Russell 1000 Growth Index	\$27,902,695	\$0	-\$1,603	\$590,610	\$28,491,703	2.11%
Rhumblin Russell 1000 Value Index	\$26,741,458	\$0	-\$1,599	\$1,686,911	\$28,426,770	6.30%
Ridgemont Equity Partners II	\$4,146,591	\$0	-\$364,513	\$277,447	\$4,059,525	6.71%
Ridgemont Equity Partners III	\$6,135,592	\$0	-\$1,685,659	\$380,882	\$4,830,815	6.26%
Rockwood Capital Real Estate Partners Fund XI, L.P.	\$4,020,014	\$0	\$0	\$225,579	\$4,245,593	5.61%
Rockwood X	\$7,256,148	\$0	-\$1,087,968	\$476,239	\$6,644,419	6.60%
Searchlight Capital III	\$3,091,721	\$0	\$0	-\$1,572,501	\$1,519,220	-50.86%
SSgA MSCI EAFE Index	\$41,440,025	\$0	-\$3,629	\$2,116,634	\$43,553,030	5.10%
SSgA TIPS Index	\$14,128,856	\$3,500,000	-\$883	\$39,224	\$17,667,197	0.27%
SSgA U.S. Aggregate Bond Index-NL	\$16,648,521	\$12,000,000	-\$1,431	-\$33,142	\$28,613,948	-0.20%
TA XII	\$3,522,145	\$0	-\$195,750	\$1,161,000	\$4,487,395	33.02%
TerraCap Partners IV (Institutional), L.P.	\$4,274,110	\$0	-\$106,109	\$32,067	\$4,200,068	0.76%
Torchlight Debt Opportunity Fund VI	\$4,042,614	\$0	-\$385,001	\$310,008	\$3,967,621	7.69%

Total Retirement System | As of December 31, 2021

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Trilantic Capital Partners VI	\$2,845,739	\$2,590,039	\$0	\$100,910	\$5,536,688	3.44%
UBS Trumbull Property Fund	\$3,343,483	\$0	\$0	\$160,545	\$3,504,027	4.80%
UBS Trumbull Property Income Fund	\$10,223,804	\$0	\$0	\$527,494	\$10,751,299	5.16%
Wellspring Capital Partners VI	\$6,128,387	\$0	-\$1,015,412	\$508,423	\$5,621,398	8.34%
Total	\$423,824,131	\$52,146,920	-\$25,790,563	\$17,468,292	\$467,648,779	4.09%

Private Market Managers' Performance Overview

Managers	Strategy	Vintage Year	Commitment Amount (\$mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
Real Estate Managers								
AEW Partners VII	Opportunistic	2014	5.0	91%	9.9	2	11.1%	1.4x
Rockwood X	Value-Added	2016	10.0	85%	11.9	4	7.6%	1.2x
Torchlight Debt Opportunity Fund VI	Opportunistic	2019	5.0	100%	NM ²	NM	NM	NM
TerraCap Partners IV	Value-Added	2019	5.0	100%	NM	NM	NM	NM
Rockwood XI	Value-Added	2019	8.0	47%	NM	NM	NM	NM
Private Equity Managers								
Adams Street Partners	Fund of Funds	2010	10.0	89%	13.0	3	12.9%	1.8x
Goldman Sachs PE Partners	Fund of Funds	2005	10.0	100%	8.0	3	4.6%	1.4x
North American Strategic Partners ³	Fund of Funds	2006	9.1	88%	7.2	3	6.4%	1.4x
PRIT Vintage Year 2001	Fund of Funds	2001	2.5	NA	8.5	NA	NA	NA
PRIT Vintage Year 2002	Fund of Funds	2002	0.5	NA	8.1	NA	NA	NA
Brookfield Capital Partners IV	Buyout	2015	4.0	80%	21.1	1	46.9%	2.6x
LLR Equity Partners V	Buyout	2017	5.0	80%	29.5	3	19.1%	1.4x
Ridgemont Equity Partners II	Buyout	2015	6.0	70%	21.1	2	16.1%	1.6x

¹ As of 06/30/2021.

² NM² indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. A not meaningful return is generated by funds with less than 24 months of activity.

³ IRR and multiple are as of 12/31/2020.

Private Market Managers' Performance Overview (continued)¹

Managers	Strategy	Vintage Year	Commitment Amount (\$mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
TA XII	Growth Equity	2016	4.0	100%	23.0	1	41.7%	2.8x
Wellspring VI	Buyout	2017	5.0	77%	29.5	3	21.3%	1.3x
Trilantic Capital Partners VI	Buyout	2018	5.0	36%	29.7	4	6.2%	1.1x
Brookfield Capital Partners V	Buyout	2019	4.0	54%	NM ²	NM	NM	NM
FS Equity Partners VIII	Buyout	2019	5.0	52%	NM	NM	NM	NM
Ridgemont Equity Partners III	Buyout	2019	6.0	60%	NM	NM	NM	NM
Searchlight Capital III	Special Situations	2020	5.0	45%	NM	NM	NM	NM
Charlesbank Technology Opportunities	Buyout	2019	5.0	31%	NM	NM	NM	NM
LLR Equity Partners VI	Buyout	2020	4.0	24%	NM	NM	NM	NM
Opportunistic Managers								
HarbourVest Co-Investment Fund IV	Opportunistic	2019	4.0	48%	NM	NM	NM	NM
EnTrustPermal Spec. Opps. Evergreen Fund	Opportunistic	2020	6.0	55%	NM	NM	NM	NM
Infrastructure Managers								
Global Infrastructure Partners IV	Value-Added	2019	5.0	11%	NM	NM	NM	NM
Natural Resources Managers								
Hancock Timberland	Timber	2008	8.0	100%	--	--	-0.3%	1.0x
Oppenheimer Natural Resources	Natural Resources	2010	7.0	100%	--	--	-4.3%	0.7x

¹ As of 06/30/2021.

² NM² indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. A not meaningful return is generated by funds with less than 24 months of activity.

Asset Allocation Review and Risk Analysis

Introduction

- Meketa Investment Group recently completed our 2022 capital markets expectations, which updates each of our asset class assumptions.
- Annually, we review asset allocation with the Board, and periodically we recommend modest changes to the asset allocation policy.
 - We try to avoid tinkering too frequently with the Retirement System’s long-term strategic asset allocation.
- However, when material changes to the Retirement System occur it is important to reassess the System’s asset allocation policy.
 - The recent contribution of the proceeds from the pension obligation bond is a material development for the Retirement System.
 - It warrants revisiting asset allocation to determine if the Board’s risk tolerances or return objectives have changed in light of the contribution on the System’s behalf in PRIM.
- The following document outlines the System’s asset allocation policy, PRIM’s current asset allocation, and the combined impact of the aggregate Retirement System’s assets.

Asset Allocation Policy Options¹

	Quincy (%)	PRIM (%)	Combined Fund (%)
Growth/Equity	59	59	59
US Equity	24	24	24
Developed Market Equity (non-US)	13	13	13
Emerging Market Equity	12	5	8
Private Equity	10	16	13
Credit	10	7	8
High Yield Bonds	6	5	6
Bank Loans	2	0	1
Private Debt	0	1	1
Emerging Market Bonds	2	0	1
Rate Sensitive	16	16	16
Investment Grade Bonds	5	16 ²	11
Long-term Government Bonds	7	0	4
TIPS	4	0	2
Real Assets	15	12	14
Real Estate	10	8	9
Natural Resources/Timber	3	3	3
Infrastructure	2	1	2
Hedge Funds	0	7	4
Expected Return (20 years)	7.23	7.04	7.14
Standard Deviation	14.1	13.8	13.9
Probability of Achieving 7.25% over 20 Years	49.1	46.7	47.9

¹ Expected return and standard deviation are based upon Meketa Investment Group's 2022 Annual Asset Study. Throughout this document, returns for periods longer than one year are annualized. Asset Allocations may not sum due to rounding.

² Includes 1% to cash.

Impact of Pension Obligation Bond (“POB”)

- The POB was invested in PRIM, which has an expected return of 6.0% over the next 10 years and 7.0% over the next 20 years, based on Meketa’s 2022 capital markets assumptions.
 - This is reasonably consistent with the projections from PRIM’s investment consultant of 5.7% for 10 years and 6.9% for 30 years.
- With the influx of assets from the POB, the System’s overall expected return decreased to 7.14% over the next 20 years.
 - The System’s probability of meeting the assumed rate of return likewise declined, from 49.1% to 47.9%.
 - These assumptions do not include alpha from active management. However, alpha expectations for both policies are expected to be approximately 0% in aggregate, if the Fund’s choose slightly above average managers (40th percentile) in all asset classes.

Comparison to Peers - Tracking Error

- The System's current asset allocation policy is different than PRIM.
- The System can expect long-term tracking error (i.e., over a 20-year period) relative to PRIM to be as follows:

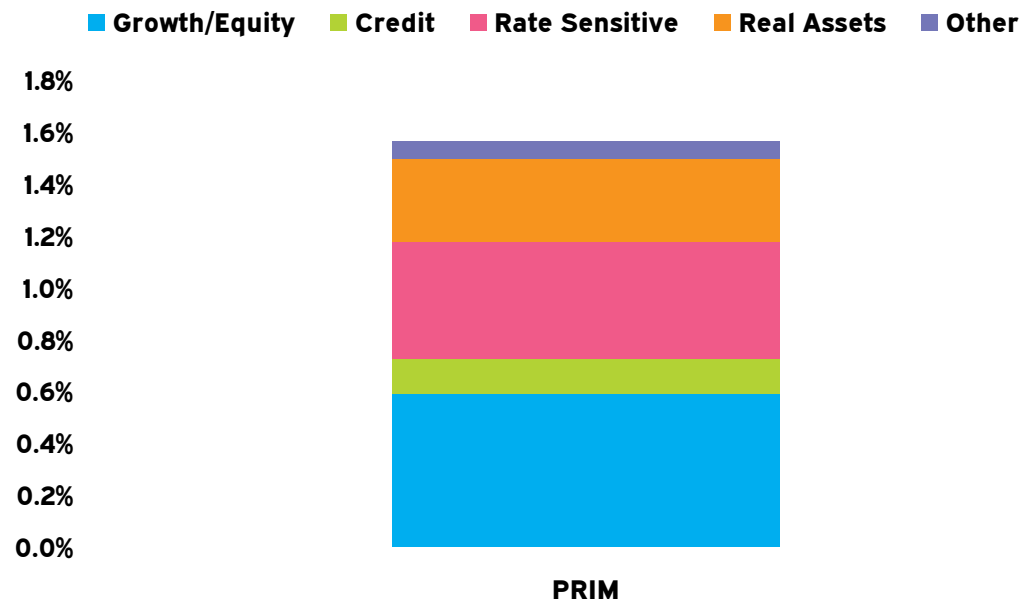
Policy	Tracking Error per Annum (%)
Current Policy	1.6
Combined Allocations	0.8

- While we would expect higher tracking error over shorter periods of time, over the long-term, the System's current policy will display approximately 1.6% tracking error relative to PRIM, per annum.

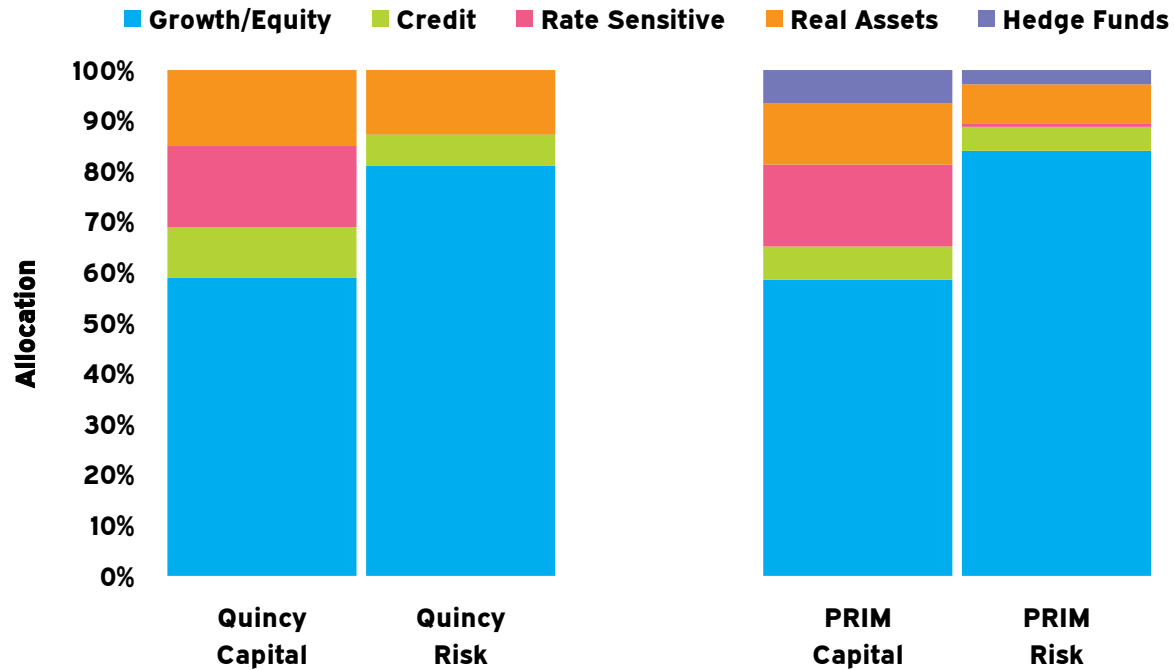
Decomposition of Tracking Error

- The current asset allocation policy's tracking error relative to PRIM comes from many different sources.
- The chart below examines the sources of tracking error due to differences in asset allocation.
- Note that additional tracking error can be expected due to variances resulting from active management.

Sources of Tracking Error



Risk Budgeting Analysis¹ (Capital Allocation vs. Risk Allocation)



- PRIM has more growth/equity risk and hedge fund risk, while Quincy’s asset allocation policy has more risk allocated within the real assets and credit.

¹ Risk allocation is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio and then dividing this by the standard deviation of the total portfolio.

MVO-Based Risk Analysis

Scenario	Quincy (%)	PRIM (%)	Combined Fund (%)
Worst Case Returns (1)			
One Year	-20.7	-20.4	-20.5
Three Years (annualized)	-10.0	-9.8	-9.9
Five Years (annualized)	-6.4	-6.3	-6.3
Ten Years (annualized)	-2.6	-2.6	-2.6
Twenty Years (annualized)	0.2	0.1	0.2
Probability of Experiencing Negative Returns			
One Year	29.6	29.7	29.7
Three Years	17.7	17.9	17.8
Five Years	11.6	11.7	11.6
Ten Years	4.5	4.6	4.6
Twenty Years	0.8	0.9	0.8
Probability of Achieving at least a 7.25% Return			
One Year	49.8	49.3	49.5
Three Years	49.7	48.7	49.2
Five Years	49.6	48.3	49.0
Ten Years	49.4	47.6	48.5
Twenty Years	49.1	46.7	47.9

Value at Risk¹

Scenario	Quincy	PRIM	Combined
VaR (%):			
1 month	-8.8	-8.6	-8.7
3 months	-14.4	-14.1	-14.3
6 months	-19.2	-18.8	-19.0

Conditional Value at Risk¹

Scenario	Quincy	PRIM	Combined
CVaR (%):			
1 month	-10.2	-9.9	-10.0
3 months	-16.7	-16.4	-16.5
6 months	-22.5	-22.0	-22.2

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

Historical Negative Scenario Analysis¹
(Cumulative Return)

Scenario	Quincy (%)	PRIM (%)	Combined (%)
COVID-19 Market Shock (Feb 2020-Mar 2020)	-18.9	-17.2	-18.0
Taper Tantrum (May - Aug 2013)	-1.6	0.4	-0.6
Global Financial Crisis (Oct 2007 - Mar 2009)	-30.0	-27.9	-29.0
Popping of the TMT Bubble (Apr 2000 - Sep 2002)	-15.9	-16.2	-16.1
LTCM (Jul - Aug 1998)	-9.9	-7.7	-8.8
Asian Financial Crisis (Aug 97 - Jan 98)	0.3	4.0	2.1
Rate spike (1994 Calendar Year)	1.4	4.0	2.7
Early 1990s Recession (Jun - Oct 1990)	-7.2	-5.4	-6.3
Crash of 1987 (Sep - Nov 1987)	-12.5	-10.4	-11.4
Strong dollar (Jan 1981 - Sep 1982)	2.0	3.5	2.8
Volcker Recession (Jan - Mar 1980)	-4.7	-4.1	-4.4
Stagflation (Jan 1973 - Sep 1974)	-23.8	-21.7	-22.8

¹ See the Appendix for our scenario inputs. In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.

Historical Positive Scenario Analysis¹
(Cumulative Return)

Scenario	Quincy (%)	PRIM (%)	Combined (%)
Global Financial Crisis Recovery (Mar 2009 - Nov 2009)	40.5	33.2	36.9
Best of Great Moderation (Apr 2003 - Feb 2004)	33.8	29.2	31.5
Peak of the TMT Bubble (Oct 1998 - Mar 2000)	44.5	45.4	44.9
Plummeting Dollar (Jan 1986 - Aug 1987)	60.4	51.8	56.1
Volcker Recovery (Aug 1982 - Apr 1983)	34.4	31.0	32.7
Bretton Wood Recovery (Oct 1974 - Jun 1975)	31.0	28.2	29.6

¹ See the Appendix for our scenario inputs. In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.

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

Scenario	Quincy (%)	PRIM (%)	Combined (%)
10-year Treasury Bond rates rise 100 bps	4.6	4.6	4.6
10-year Treasury Bond rates rise 200 bps	-0.9	-0.3	-0.6
10-year Treasury Bond rates rise 300 bps	-3.3	-3.2	-3.3
Baa Spreads widen by 50 bps, High Yield by 200 bps	0.5	0.5	0.5
Baa Spreads widen by 300 bps, High Yield by 1000 bps	-24.0	-21.6	-22.8
Trade Weighted Dollar gains 10%	-4.6	-3.5	-4.0
Trade Weighted Dollar gains 20%	-2.2	-1.0	-1.6
U.S. Equities decline 10%	-6.5	-6.3	-6.4
U.S. Equities decline 25%	-19.0	-17.5	-18.3
U.S. Equities decline 40%	-29.7	-26.4	-28.0

- Both Fund’s primary risk factors would continue to be an equity market decline and a widening of credit spreads.

¹ Assumes that assets not directly exposed to the factor are affected nonetheless. See the Appendix for further details.

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

Scenario	Quincy (%)	PRIM (%)	Combined (%)
10-year Treasury Bond rates drop 100 bps	2.5	2.3	2.4
10-year Treasury Bond rates drop 200 bps	12.8	10.2	11.5
Baa Spreads narrow by 30bps, High Yield by 100 bps	7.9	7.8	7.8
Baa Spreads narrow by 100bps, High Yield by 300 bps	15.4	12.8	14.1
Trade Weighted Dollar drops 10%	8.6	7.4	8.0
Trade Weighted Dollar drops 20%	24.7	21.1	22.9
U.S. Equities rise 10%	7.2	7.2	7.2
U.S. Equities rise 30%	18.0	16.4	17.2

¹ Assumes that assets not directly exposed to the factor are affected nonetheless. See the Appendix for further details.

Overview and Next Steps

- The Quincy policy's expected return is 7.2%.
- The System recently approved investing the proceeds from the pension obligation bond in PRIM, which is expected to return 6.0% over the next 10 years and 7.0% over the next 20 years.
- The combination of the System's assets in the legacy portfolio and the new investment in PRIM, is expected to return 7.1% over the next 20 years and has a 47.9% probability of meeting the System's assumed rate of return.
 - These assumptions do not include alpha from active management. However, alpha expectations for both policies are expected to be approximately 0% in aggregate, if the Funds' choose slightly above average managers (40th percentile) in all asset classes.
- Overall, PRIMs more conservative policy's return is expected to dilute the System's long-term expected return and give the Retirement System a lower likelihood of reaching its target return.
- Considering the POB's impact to the System's long-term expected return, Meketa is seeking guidance from the Board on the return objective going forward.
 - This will help us determine if we should propose alternative policies, and if so, whether the Board should:
 - take on more risk to increase the likelihood of reaching the target return for the aggregate assets, or
 - or continue to invest the legacy assets in accordance with the Retirement System's target return, not increasing risk to offset PRIM's more conservative profile.

Appendices

Horizon Study

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.
 - In the 2021 survey there were 39 respondents.
- The Horizon survey is a useful tool for Board members to determine whether their consultant’s expectations for returns (and risk) are reasonable.

Asset Class	10-Year Average (%)	Meketa 10-Year (%)	20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	12	0.7	1.9	1.1
TIPS	1.6	1.2	2.4	1.8
US Core Bonds	2.1	1.2	3.2	1.8
US High Yield Bonds	3.8	3.3	5.0	4.2
Emerging Market Debt	4.2	3.9	5.3	3.8
Private Debt	6.5	6.6	6.9	6.8
US Equity (large cap)	5.8	5.2	6.7	6.8
Developed Non-US Equity	6.4	6.7	7.1	7.1
Emerging Non-US Equity	7.2	7.5	7.8	8.1
Private Equity	8.8	8.0	9.6	9.1
Real Estate	5.5	6.5	6.2	6.9
Infrastructure	6.2	7.1	6.8	7.0
Commodities	3.1	3.4	4.0	3.7
Hedge Funds	4.5	3.4	5.3	4.3
Inflation	2.1	2.3	2.2	2.1

Notes and Disclaimers

- ¹ The returns shown in the Policy Options and Risk Analysis sections rely on estimates of expected return, standard deviation, and correlation developed by Meketa Investment Group. To the extent that actual return patterns to the asset classes differ from our expectations, the results in the table will be incorrect. However, our inputs represent our best unbiased estimates of these simple parameters.
- ² The returns shown in the Policy Options and Risk Analysis sections use a lognormal distribution, which may or may not be an accurate representation of each asset classes' future return distribution. To the extent that it is not accurate in whole or in part, the probabilities listed in the table will be incorrect. As an example, if some asset classes' actual distributions are even more right-skewed than the lognormal distribution (i.e., more frequent low returns and less frequent high returns), then the probability of the portfolio hitting a given annual return will be lower than that stated in the table.
- ³ The standard deviation bars in the chart in the Risk Analysis section do not indicate the likelihood of a 1, 2, or 3 standard deviation event—they simply indicate the return we expect if such an event occurs. Since the likelihood of such an event is the same across allocations regardless of the underlying distribution, a relative comparison across policy choices remains valid.

Scenario Return Inputs

Asset Class	Benchmark Used
Investment Grade Bonds	Barclays Aggregate
TIPS	Barclays US TIPS
Intermediate-term Government Bonds	Barclays Treasury Intermediate
Long-term Government Bonds	Barclays Long US Treasury
EM Bonds (local)	JPM GBI-EM Global Diversified Composite
Bank Loans	CSFB Leveraged Loan
High Yield Bonds	Barclays High Yield
Direct Lending	Cliffwater Direct Lending Index
Mezzanine Debt	Preqin Associates Mezzanine
Distressed Debt	Preqin Distressed Debt Index
Core Real Estate	NCREIF Property
Value-Added RE	NCREIF Townsend Value Added
Opportunistic RE	NCREIF Townsend Opportunistic
REITs	NAREIT Equity
Infrastructure (private)	S&P Global Infrastructure
Natural Resources (private)	S&P Global Natural Resources
Timber	NCREIF Timberland
Commodities	Bloomberg Commodity Index
US Equity	Russell 3000
Public Foreign Equity (Developed)	MSCI EAFE
Public Foreign Equity (Emerging)	MSCI Emerging Markets
Private Equity	Preqin Private Equity Composite
Long-short Equity	HFRI Equity Hedge
Global Macro	HFRI Macro
Hedge Funds	HFRI Fund Weighted Composite
Private Debt	Weighted average of Distressed Debt, Mezzanine Debt and Direct Lending (2nd Lien)

Negative Historical Scenario Returns - Sample Inputs

	Covid-19 Market Shock (Feb 2020-Mar 2020)	Taper Tantrum (May - Aug 2013)	Global Financial Crisis (Oct 2007 - Mar 2009)	Popping of the TMT Bubble (Apr 2000 - Sep 2002)	LTCM (Jul - Aug 1998)
Cash Equivalents	0.4	0.0	2.6	9.9	0.8
Short-term Investment Grade Bonds	0.4	-0.1	7.9	21.9	1.6
Investment Grade Bonds	-0.9	-3.7	8.5	28.6	1.8
Long-term Corporate Bonds	-18.4	-9.3	-10.3	26.9	-0.6
Long-term Government Bonds	12.7	-11.6	24.2	35.5	4.1
TIPS	-0.4	-8.5	8.2	37.4	0.7
Global ILBs	-6.5	-7.4	-3.9	39.7	0.7
High Yield Bonds	-20.8	-2.0	-22.8	-6.3	-5.0
Bank Loans	-20.3	0.8	-23.7	6.3	0.7
Direct Lending	-4.8	2.6	-3.3	-2.6	-2.3
Foreign Bonds	-4.5	-3.2	2.1	8.5	3.5
Mezzanine Debt	-4.8	4.6	-26.4	-2.0	-2.6
Distressed Debt	-12.2	4.6	-26.4	-2.0	-2.6
Emerging Market Bonds (major)	-15.3	-11.5	-5.0	6.3	-28.2
Emerging Market Bonds (local)	-13.9	-14.3	-7.9	7.2	-34.1
US Equity	-35.0	3.0	-45.8	-43.8	-15.4
Developed Market Equity (non-US)	-32.7	-2.2	-52.1	-46.7	-11.5
Emerging Market Equity	-31.2	-9.4	-51.2	-43.9	-26.7
Global Equity	-33.6	-0.7	-49.3	-46.7	-14.0
Private Equity/Debt	-7.8	5.7	-27.7	-23.4	-3.2
Private Equity	-7.4	5.8	-28.2	-26.0	-3.3
Private Debt Composite	-10.1	4.6	-22.3	-1.7	-2.3
REITs	-41.0	-13.3	-63.0	45.4	-15.3
Core Private Real Estate	0.7	3.6	-10.6	23.6	2.3
Value-Added Real Estate	-3.5	3.8	-20.2	177.0	1.8
Opportunistic Real Estate	-8.6	4.0	-25.7	21.4	1.5
Natural Resources (Private)	-22.1	2.5	-31.2	-3.9	-16.9
Timberland	0.1	1.3	20.7	-1.5	0.5
Farmland	-0.1	3.3	26.7	11.4	0.8
Commodities (naive)	-18.9	-2.4	-36.9	18.5	-12.0
Core Infrastructure	-1.3	3.7	-0.8	24.8	-0.3
Hedge Funds	-9.1	-0.4	-17.8	-2.1	-9.4
Long-Short	-10.9	1.0	-26.4	-8.8	-8.3
Hedge Fund of Funds	-7.6	-0.5	-19.5	-0.4	-7.7

Negative Historical Scenario Returns - Sample Inputs (Continued)

	Rate spike (1994 Calendar Year)	Crash of 1987 (Sep - Nov 1987)	Strong dollar (Jan 1981 - Sep 1982)	Volcker Recession (Jan - Mar 1980)	Stagflation (Jan 1973 - Sep 1974)
Cash Equivalents	3.9	1.4	24.4	2.9	13.5
Short-term Investment Grade Bonds	0.5	2.3	29.9	-2.6	4.3
Investment Grade Bonds	-2.9	2.2	29.9	-8.7	7.9
Long-term Corporate Bonds	-5.8	1.5	29.6	-14.1	-12.0
Long-term Government Bonds	-7.6	2.6	28.4	-13.6	-1.8
TIPS	-7.5	2.8	15.6	-7.8	4.3
Global ILBs	-7.9	2.9	16.5	-8.3	4.5
High Yield Bonds	-1.0	-3.6	6.9	-2.3	-15.5
Bank Loans	10.3	-1.7	3.3	-1.1	-7.5
Direct Lending	7.6	-2.3	3.2	-1.0	-7.2
Foreign Bonds	5.3	-0.3	34.8	-6.5	-1.4
Mezzanine Debt	7.6	-2.3	3.2	-1.0	-7.2
Distressed Debt	7.6	-2.3	3.2	-1.0	-7.2
Emerging Market Bonds (major)	-18.9	-9.2	-1.6	-2.6	-20.2
Emerging Market Bonds (local)	-22.8	-11.0	-2.0	-3.2	-23.9
US Equity	1.3	-29.5	-2.3	-4.1	-42.6
Developed Market Equity (non-US)	7.8	-14.5	-18.0	-7.0	-36.3
Emerging Market Equity	-7.3	-25.3	-12.1	-6.6	-44.2
Global Equity	5.0	-21.5	-11.2	-5.8	-39.3
Private Equity/Debt	13.2	-0.7	-2.7	-2.5	-18.2
Private Equity	14.2	-0.5	-3.9	-2.7	-20.1
Private Debt Composite	6.2	-1.8	3.0	-1.0	-6.9
REITs	-3.5	-19.5	2.5	-3.6	-33.9
Core Private Real Estate	6.4	2.5	23.9	5.5	-4.4
Value-Added Real Estate	11.2	4.3	44.2	9.6	-7.6
Opportunistic Real Estate	18.8	3.1	30.7	7.0	-5.6
Natural Resources (Private)	12.6	-9.9	-9.5	-9.1	19.3
Timberland	15.4	9.2	23.6	-7.4	5.5
Farmland	9.4	5.3	13.3	-4.2	3.1
Commodities (naïve)	16.6	1.8	-16.0	-9.6	139.5
Core Infrastructure	-11.5	-0.1	-0.2	-0.1	-0.5
Hedge Funds	4.1	-7.8	-3.8	-1.9	-15.7
Long-Short	2.6	-10.0	-4.9	-2.5	-19.8
Hedge Fund of Funds	-3.5	-5.7	-2.7	-1.4	-11.5

Positive Historical Scenario Returns - Sample Inputs

	Global Financial Crisis Recovery (Mar 2009 - Nov 2009)	Best of Great Moderation (Apr 2003 - Feb 2004)	Peak of the TMT Bubble (Oct 1998 - Mar 2000)	Plummeting Dollar (Jan 1986 - Aug 1987)	Volcker Recovery (Aug 1982 - Apr 1983)	Bretton Wood Recovery (Oct 1974 - Jun 1975)
Cash Equivalents	0.1	0.9	6.7	10.0	6.0	4.5
Short-term Investment Grade Bonds	4.3	2.8	5.3	13.2	15.4	5.0
Investment Grade Bonds	9.0	4.6	1.7	14.4	26.4	9.2
Long-term Corporate Bonds	28.8	11.3	-3.1	15.9	42.1	17.5
Long-term Government Bonds	2.0	4.9	-2.3	15.4	33.6	11.8
TIPS	14.3	9.1	6.3	10.2	11.5	4.1
Global ILBs	24.7	9.6	6.6	10.8	12.1	4.3
High Yield Bonds	49.1	21.8	2.1	24.9	23.3	19.3
Bank Loans	32.9	10.1	6.1	11.1	10.4	8.7
Direct Lending	-0.2	26.8	8.2	8.3	23.7	-0.2
Foreign Bonds	23.4	15.2	-7.0	44.5	32.3	17.9
Mezzanine Debt	30.8	23.7	26.8	5.4	8.2	8.3
Distressed Debt	30.8	23.7	26.8	5.4	8.2	8.3
Emerging Market Bonds (major)	27.0	20.6	49.0	38.9	21.6	21.0
Emerging Market Bonds (local)	37.5	25.2	61.0	48.4	26.5	25.7
US Equity	51.6	37.2	50.2	64.8	59.3	55.1
Developed Market Equity (non-US)	60.5	56.7	53.0	140.0	29.6	34.6
Emerging Market Equity	94.6	79.4	101.3	126.5	52.1	53.4
Global Equity	59.9	46.2	54.8	108.4	43.0	44.6
Private Equity/Debt	15.4	23.3	84.6	19.1	13.7	18.4
Private Equity	13.0	23.7	92.1	21.7	14.8	20.2
Private Debt Composite	27.5	20.4	21.4	5.9	7.9	8.0
REITs	82.5	44.6	-5.2	51.8	47.4	42.5
Core Private Real Estate	-16.4	9.0	18.1	13.1	6.8	4.5
Value-Added Real Estate	-32.7	11.4	19.6	23.6	11.9	7.8
Opportunistic Real Estate	-19.0	13.6	27.9	16.7	8.6	5.7
Natural Resources (Private)	57.8	36.1	22.2	78.3	30.2	14.8
Timberland	-3.3	8.5	20.5	28.6	20.0	8.7
Farmland	5.4	9.6	10.4	15.9	11.3	5.0
Commodities (naïve)	28.9	30.6	17.1	27.6	6.2	-20.2
Core Infrastructure	2.1	8.5	33.0	1.4	0.6	0.6
Hedge Funds	20.1	22.4	52.8	30.6	13.8	14.5
Long-Short	25.9	25.3	81.4	40.8	18.0	18.9
Hedge Fund of Funds	10.3	13.3	36.8	21.3	9.7	10.3

'Anti' Stress Test Return Assumptions - Sample Inputs¹

	10-year Treasury Bond rates drop 100 bps	10-year Treasury Bond rates drop 200 bps	Baa Spreads narrow by 30bps, High Yield by 100 bps	Baa Spreads narrow by 100bps, High Yield by 300 bps	Trade Weighted Dollar drops 10%	Trade Weighted Dollar drops 20%	US Equities rise 10%	US Equities rise 30%
Cash Equivalents	1.8	2.1	0.7	0.2	2.1	4.5	2.3	3.5
Short-term Investment Grade Bonds	3.6	5.5	0.5	2.0	1.5	3.3	0.8	1.8
Investment Grade Bonds	8.5	14.6	1.3	3.9	2.6	9.4	1.8	4.2
Long-term Corporate Bonds	18.1	32.8	3.9	14.5	5.5	15.6	3.5	7.8
Long-term Government Bonds	20.2	38.2	0.7	-0.6	1.9	22.2	3.6	6.8
TIPS	9.4	16.9	1.1	5.9	3.7	7.8	1.5	1.8
Global ILBs	3.1	6.4	2.0	7.4	5.8	8.4	1.7	2.8
High Yield Bonds	2.9	8.9	7.0	25.7	7.5	8.6	4.8	10.7
Bank Loans	-0.1	2.1	4.0	16.3	4.0	0.8	2.1	4.0
Direct Lending	-0.3	-0.2	4.8	5.7	1.5	3.0	1.6	2.5
Foreign Bonds	5.8	11.3	1.7	7.4	9.9	21.3	2.3	7.4
Mezzanine Debt	1.4	2.1	8.9	16.7	6.5	5.9	5.9	6.9
Distressed Debt	1.0	2.7	9.1	17.0	6.4	7.5	6.1	8.1
Emerging Market Bonds (major)	3.2	7.3	5.5	15.5	7.1	15.1	5.4	11.3
Emerging Market Bonds (local)	3.8	10.0	5.6	17.6	10.7	19.7	6.2	14.9
US Equity	3.6	15.2	11.0	18.7	7.3	24.4	10.0	30.0
Developed Market Equity (non-US)	-2.3	16.4	9.0	18.3	12.9	47.6	6.4	18.3
Emerging Market Equity	0.6	17.8	9.5	34.3	19.5	47.9	9.3	29.8
Global Equity	0.8	15.1	9.3	19.6	10.7	35.6	8.3	25.0
Private Equity/Debt	2.1	4.3	10.1	9.5	6.9	16.3	10.3	11.9
Private Equity	2.2	4.3	10.1	8.3	6.7	16.9	11.0	12.5
Private Debt Composite	0.8	1.7	7.6	12.8	4.7	5.6	4.5	5.8
REITs	2.8	14.5	9.3	27.1	5.9	25.5	10.0	22.7
Core Private Real Estate	0.9	1.5	4.6	-3.5	1.3	5.2	3.0	3.3
Value-Added Real Estate	2.7	6.3	5.4	-9.3	0.9	12.0	6.0	7.0
Opportunistic Real Estate	0.1	3.8	5.7	-5.4	-0.3	10.8	4.6	5.7
Natural Resources (Private)	-1.0	11.1	9.4	31.0	16.2	26.5	8.5	16.8
Timberland	6.5	9.1	4.9	-0.6	3.9	12.5	6.2	5.9
Farmland	3.2	4.2	6.7	3.8	3.5	7.8	5.2	4.3
Commodities (naïve)	-2.5	-3.2	2.5	9.8	13.1	-2.5	3.1	1.8
Core Infrastructure	0.8	-4.3	7.1	4.8	3.5	-2.3	2.0	2.9
Hedge Funds	3.4	4.8	5.7	11.3	5.6	9.2	5.5	9.2
Long-Short	3.4	5.7	6.6	12.3	7.2	14.7	6.8	12.2
Hedge Fund of Funds	2.5	3.9	4.8	10.2	4.7	8.1	4.7	8.2

¹ Assumptions are based on performance for each asset class during historical periods that resembled these situations.

Stress Test Return Assumptions - Sample Inputs¹

	10-year Treasury Bond rates rise 100 bps	10-year Treasury Bond rates rise 200 bps	10-year Treasury Bond rates rise 300 bps	Baa Spreads widen by 50 bps, High Yield by 200 bps	Baa Spreads widen by 300 bps, High Yield by 1000 bps	Trade Weighted Dollar gains 10%	Trade Weighted Dollar gains 20%	US Equities decline 10%	US Equities decline 25%	US Equities decline 40%
Cash Equivalents	1.3	1.0	0.7	2.8	1.1	4.0	1.3	3.1	2.3	0.4
Short-term Investment Grade Bonds	-0.2	-2.1	-4.0	2.2	1.5	1.2	1.4	1.3	0.7	0.8
Investment Grade Bonds	-3.9	-10.0	-16.2	3.9	-0.4	1.7	4.2	2.4	0.7	-1.0
Long-term Corporate Bonds	-10.8	-25.1	-39.4	2.6	-13.1	1.0	7.8	0.5	-8.0	-11.7
Long-term Government Bonds	-15.5	-33.2	-50.9	7.8	7.3	3.7	12.8	3.0	2.6	2.4
TIPS	-5.4	-12.9	-20.3	2.8	-6.1	-2.1	-0.2	2.6	-2.3	-8.7
Global ILBs	-2.0	-7.9	-11.9	2.4	-11.1	-3.1	-4.8	2.8	-5.4	-16.3
High Yield Bonds	2.2	-3.4	-3.6	-1.8	-23.0	-3.5	-0.6	-4.9	-15.5	-21.2
Bank Loans	1.0	-0.7	-5.2	-2.7	-20.3	-3.1	-0.5	-3.6	-12.8	-16.9
Direct Lending	-0.3	-3.5	-6.2	-1.6	-7.8	-3.9	0.1	-3.8	-6.8	-5.1
Foreign Bonds	-4.6	-9.8	-15.7	6.6	-2.9	-3.3	-8.8	1.8	-4.6	-9.2
Mezzanine Debt	3.2	-0.9	-6.1	-1.9	-19.0	-2.7	-5.9	-4.7	-15.3	-20.1
Distressed Debt	3.0	-1.1	-6.3	-2.2	-21.0	-3.4	-8.5	-5.3	-16.9	-21.5
Emerging Market Bonds (major)	0.8	-4.8	-3.6	-0.1	-14.3	-1.1	-3.8	-3.2	-12.0	-14.7
Emerging Market Bonds (local)	1.6	-5.2	-3.0	0.0	-13.2	-1.7	-12.7	-3.0	-13.8	-21.2
US Equity	5.7	0.9	2.8	-1.1	-31.6	-2.4	1.9	-10.0	-25.0	-40.0
Developed Market Equity (non-US)	8.0	3.1	-5.6	0.3	-35.1	-12.9	-9.0	-8.7	-23.4	-41.4
Emerging Market Equity	9.3	5.5	0.1	-1.1	-42.8	-15.1	-15.7	-11.9	-30.8	-46.9
Global Equity	6.5	2.1	-0.6	-0.6	-33.3	-8.2	-5.7	-9.5	-24.6	-40.3
Private Equity/Debt	4.8	0.9	-5.5	-0.1	-22.1	-4.1	-6.8	-10.0	-22.1	-25.0
Private Equity	5.1	1.1	-5.3	0.0	-22.3	-3.9	-6.0	-10.8	-22.9	-25.3
Private Debt Composite	1.9	-2.0	-6.2	-1.7	-15.4	-3.3	-3.9	-4.5	-12.5	-14.7
REITs	3.1	-3.5	1.2	-3.8	-37.3	-1.0	12.4	-6.5	-32.8	-55.7
Core Private Real Estate	2.4	2.7	4.8	2.0	-6.7	1.3	9.4	-0.1	-8.2	-13.5
Value-Added Real Estate	4.5	7.3	13.7	7.2	-12.8	14.1	6.8	1.5	-13.1	-22.1
Opportunistic Real Estate	3.7	6.5	9.6	1.1	-19.9	1.1	15.1	-1.4	-16.6	-25.5
Natural Resources (Private)	12.2	6.0	-3.7	-0.8	-26.6	-6.0	-19.7	-5.1	-20.0	-34.4
Timberland	1.4	1.6	-9.8	5.0	6.8	2.5	8.3	0.0	2.6	3.9
Farmland	2.4	-0.1	-9.2	3.9	10.1	0.8	8.0	0.6	4.9	10.3
Commodities (naïve)	27.4	13.8	-0.8	-5.7	-57.0	-15.5	-31.2	-4.3	-34.1	-58.0
Core Infrastructure	0.2	-6.4	-6.1	1.2	0.1	-1.8	3.6	-1.1	-5.0	-7.8
Hedge Funds	2.1	-1.4	-5.2	-0.5	-14.2	-1.9	-1.3	-4.2	-11.9	-15.3
Long-Short	4.2	-0.6	-4.2	-0.1	-20.5	-2.8	-3.8	-7.1	-17.2	-22.8
Hedge Fund of Funds	1.3	-2.1	-5.7	-1.3	-14.5	-2.6	-2.0	-4.8	-12.3	-15.6

¹ Assumptions are based on performance for each asset class during historical periods that resembled these situations.

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PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

Credit Risk: Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security.)

Duration: Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

Information Ratio: This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

Jensen's Alpha: A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk. $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} * (\text{market return} - \text{Risk Free Rate})]$.

Market Capitalization: For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

Market Weighted: Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

Maturity: The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

Prepayment Risk: The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

Price-Book Value (P/B) Ratio: The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

Price-Earnings (P/E) Ratio: A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about its future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

Quality Rating: The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

Sharpe Ratio: A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

STIF Account: Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

Standard Deviation: A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

Style: The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

Yield to Maturity: The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a “basis book.” For example, a 5% bond pays \$5 a year interest on each \$100 par value. To figure its current yield, divide \$5 by \$95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay \$100 for the bond that can be bought now for \$95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{5\% \text{ (discount)}}{5 \text{ (yrs. to maturity)}} = 1\% \text{ pro rata, plus } 5.26\% \text{ (current yield)} = 6.26\% \text{ (yield to maturity)}$$

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: *Investment Terminology*, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

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Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.