

City of Marlborough Contributory Retirement System

Meeting Materials
February 22, 2022

Fund Evaluation Report

Agenda

1. Economic and Market Update Data As of December 31, 2021
2. Fourth Quarter 2021 Investment Review
 - Retirement System Summary
 - Retirement System Detail
 - Portfolio Reviews
3. Asset Allocation Update
4. Driehaus Fee Reduction
5. Request for Proposal
6. Appendices
 - Meketa Investment Group Corporate Update
 - Disclaimer, Glossary, and Notes

Economic and Market Update

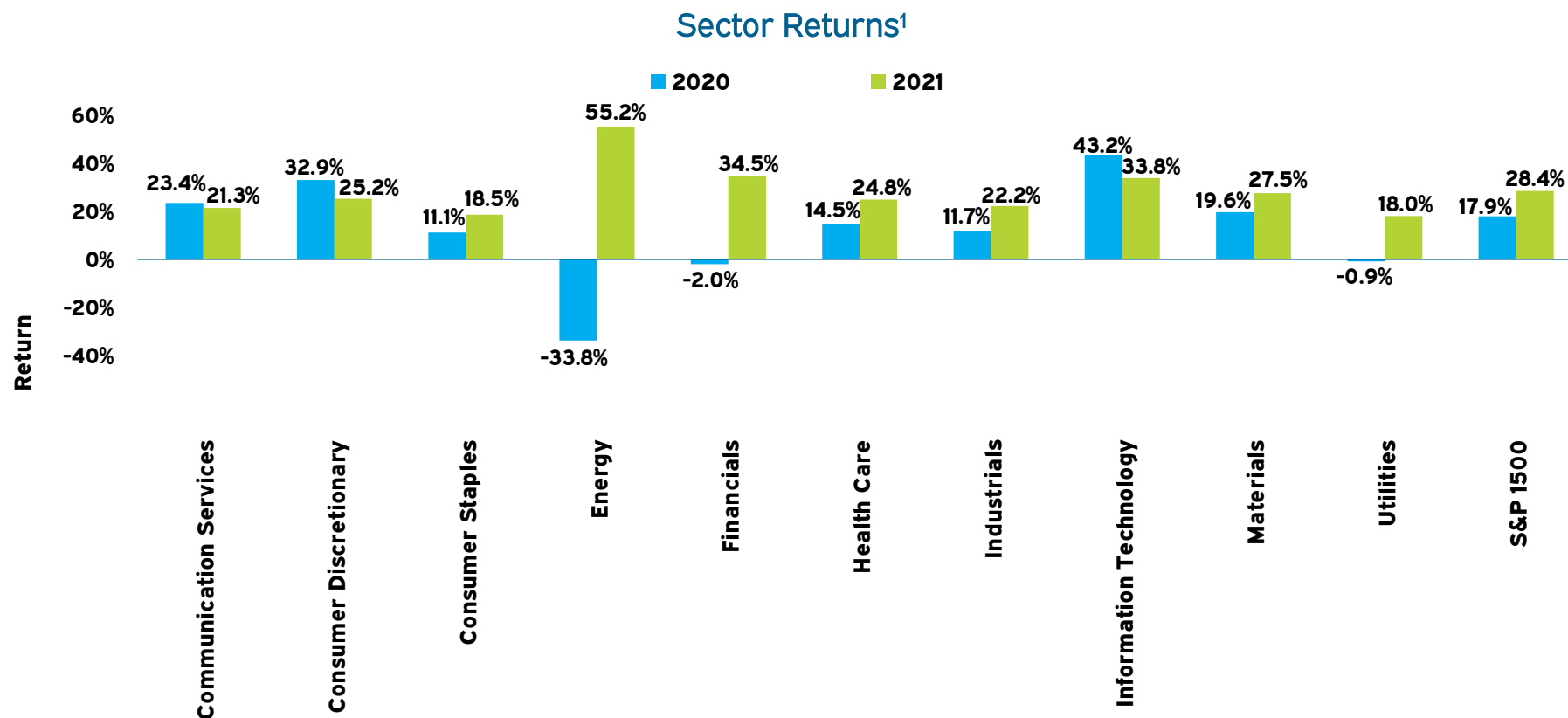
Data as of December 31, 2021

Market Returns¹

Indices	December	1 Year	3 Year	5 Year	10 Year
S&P 500	4.5%	28.7%	26.1%	18.5%	16.6%
MSCI EAFE	5.1%	11.3%	13.5%	9.6%	8.0%
MSCI Emerging Markets	1.9%	-2.5%	10.9%	9.9%	5.5%
MSCI China	-3.2%	-21.7%	7.8%	9.4%	7.2%
Bloomberg Barclays Aggregate	-0.3%	-1.5%	4.8%	3.6%	2.9%
Bloomberg Barclays TIPS	0.3%	6.0%	8.4%	5.3%	3.1%
Bloomberg Barclays High Yield	1.9%	5.3%	8.8%	6.3%	6.8%
10-year US Treasury	-0.4%	-3.6%	5.1%	3.5%	2.4%
30-year US Treasury	-2.1%	-4.6%	9.7%	7.0%	4.4%

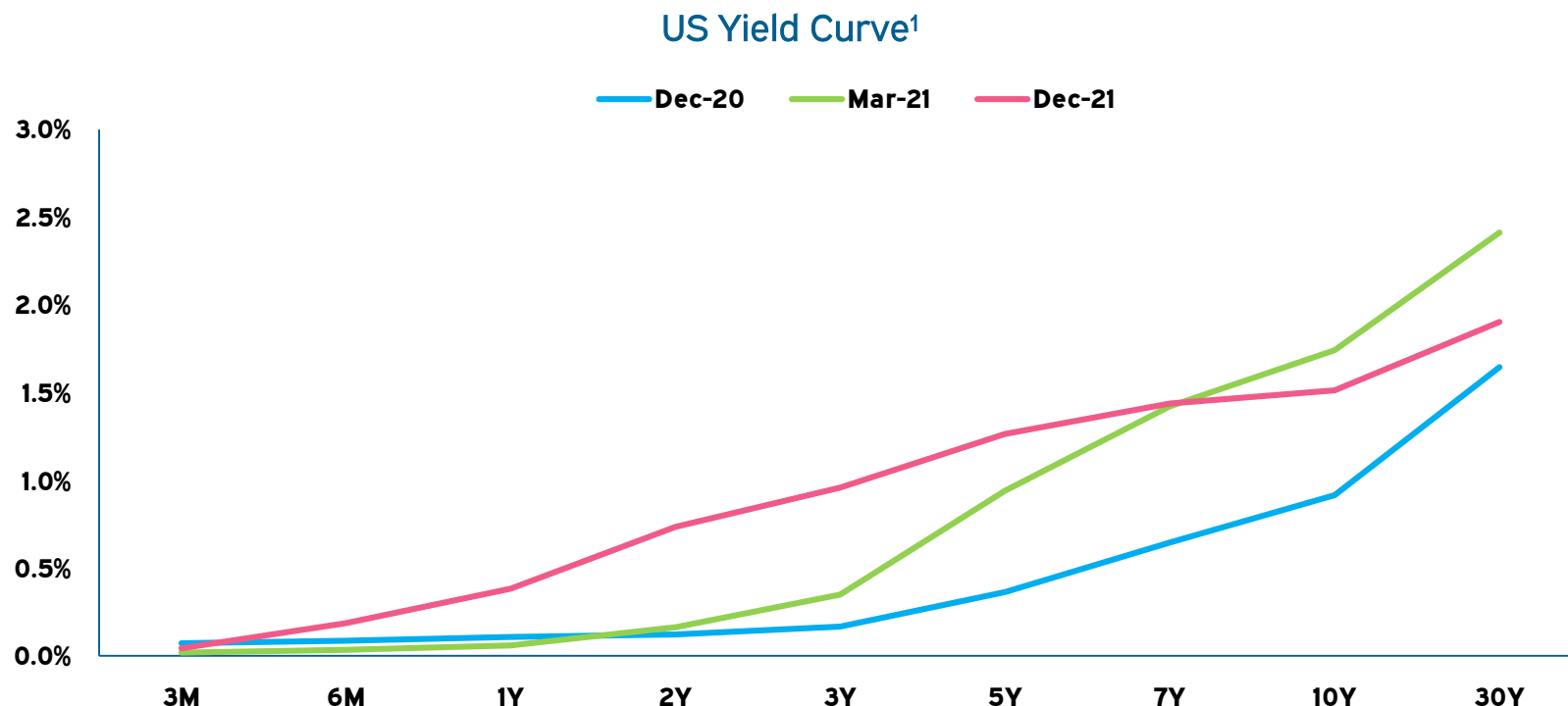
- Declining fears over the Omicron variant and expectations for continued corporate strength contributed to global equity markets posting positive returns for December. Developed markets led the way with international equities (MSCI EAFE) outpacing US equities (S&P 500). Emerging markets lagged mainly due to continued concerns related to China. Overall in 2021, US equities had the best results given continued policy support, relative success in reopening the economy, and strong corporate fundamentals.
- In December, rising inflation and expectations for less accommodative policy led to the US bond market (Bloomberg Barclays Aggregate) declining slightly, while high yield bonds increased in the risk-on environment. For the year, TIPS led the way in bonds, up 6%, followed by high yield with the broad bond market index declining by 1.5%.

¹ Source: Investment Metrics and Bloomberg. Data is as of December 31, 2021.



- All sectors advanced in 2021 with energy leading the way followed by financials, a reversal of the 2020 trend.
- The technology sector also produced strong results last year building on the 40%+ returns in the prior year.

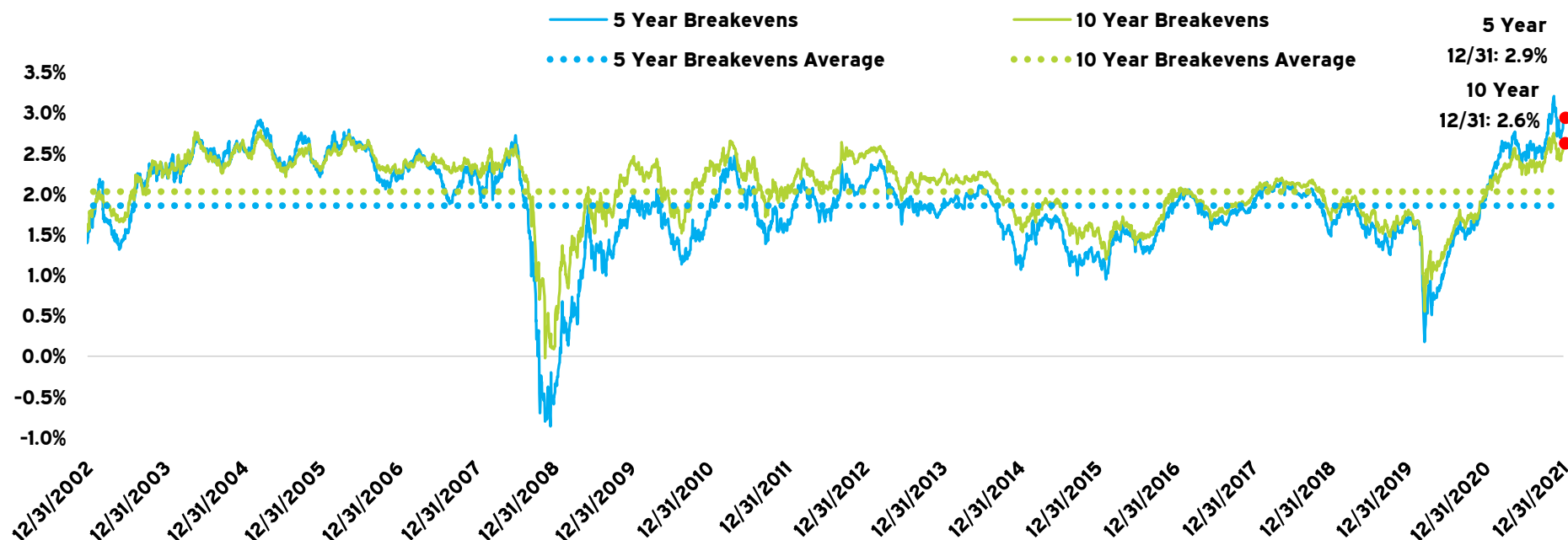
¹ Source: Bloomberg. Data is as of December 31, 2021.



- 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, while monetary policy anchored short-dated rates near 0%.
- Over the latter-half of the year, however, shorter-dated yields from 1- to 5-years rose sharply as the FOMC signaled that policy rates may be tightened more aggressively than previously anticipated.

¹ Source: Bloomberg. Data is as of December 31, 2021.

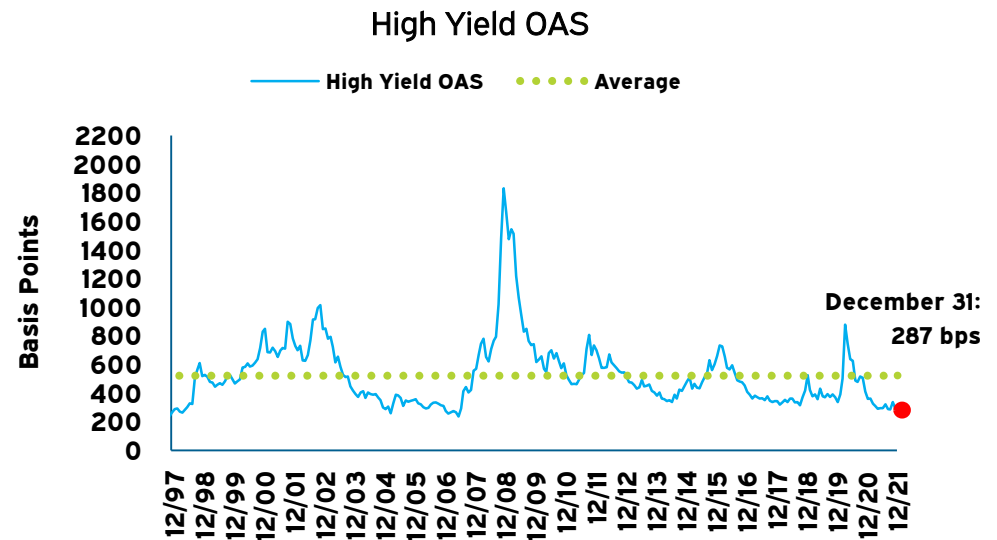
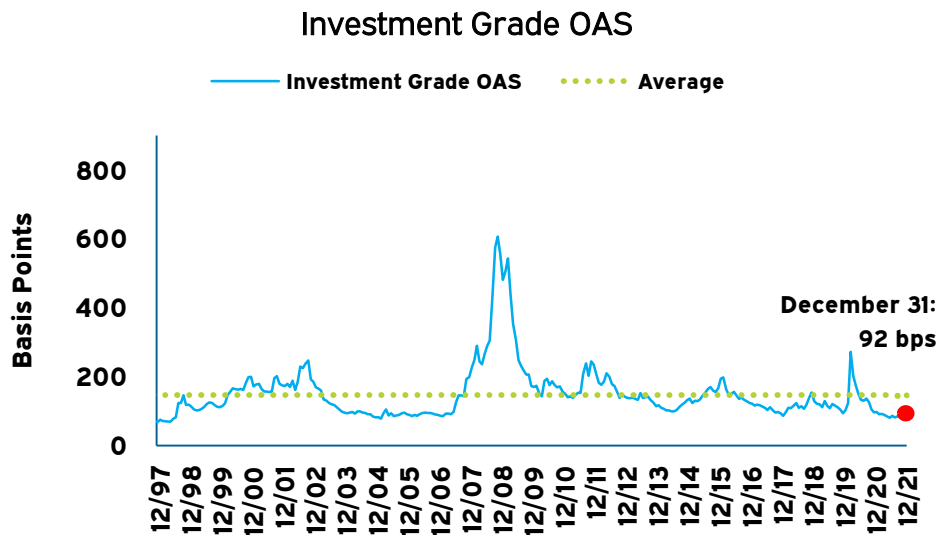
Breakeven Inflation¹



- Inflation expectations finished the year higher than they started, ending at a level well above the Fed's 2% target.
- 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 December 31, 2021.

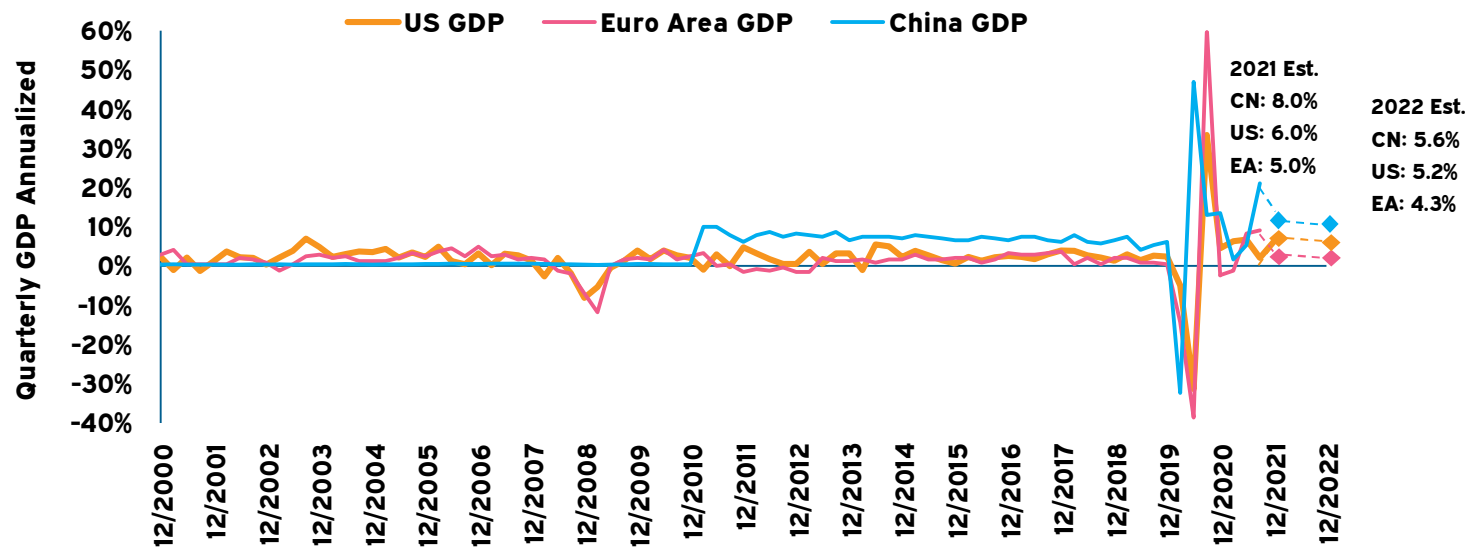
Credit Spreads (High Yield & Investment Grade)¹



- Credit spreads (the yield spread above a comparable maturity Treasury) narrowed in December after the modest widening in November on the discovery of the new virus variant (Omicron).
- Policy support, strong corporate fundamentals, and the search for yield in a low-rate environment have been key drivers in the decline in US credit spreads to well below long-term averages, particularly for high yield issuers.

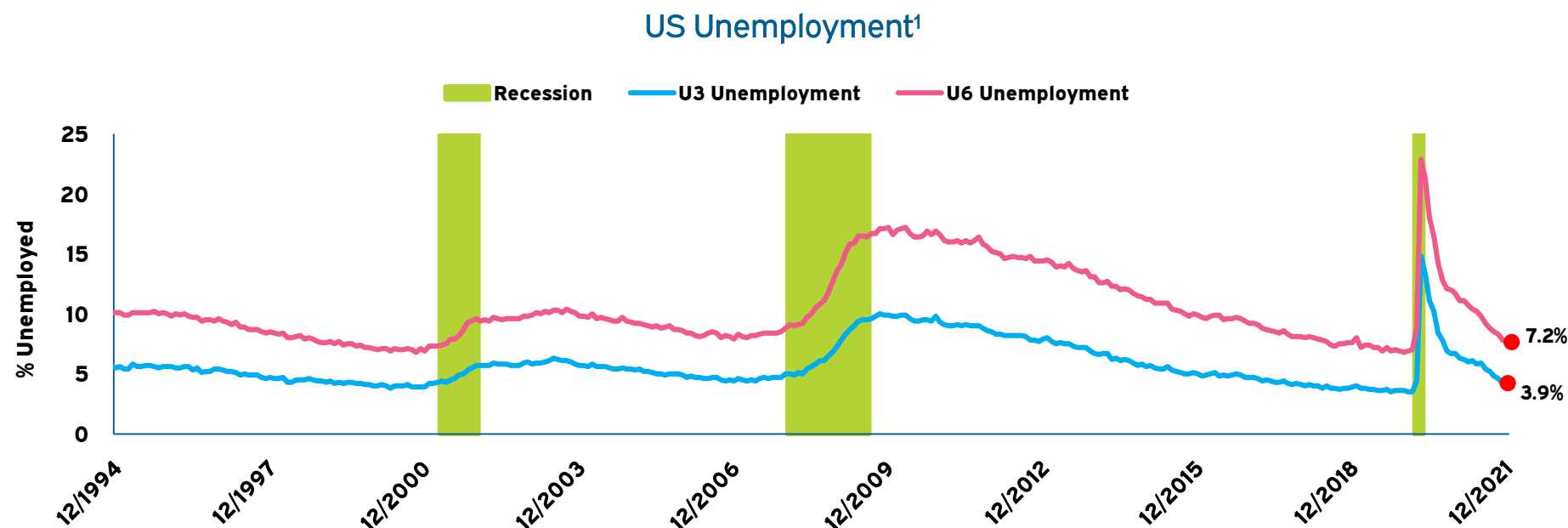
¹ Source: Barclays Live. Data represents OAS and is as of December 31, 2021.

GDP Data Shows Slowing Growth in 2022¹



- In late 2020 and early 2021, major economies grew at rates far above potential. These high rates of growth are expected to decline slightly, 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 again in 2022, 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 increased 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 4.2% to 3.9% in December. It still remains slightly 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 is much higher at 7.2%. Also, the labor force participation rate remains quite low at 61.9% and is below the 63.4% level of January 2020.
- Continued improvements in the labor market have contributed to recent expectations that the Federal Reserve will increase its pace of policy removal in 2022.

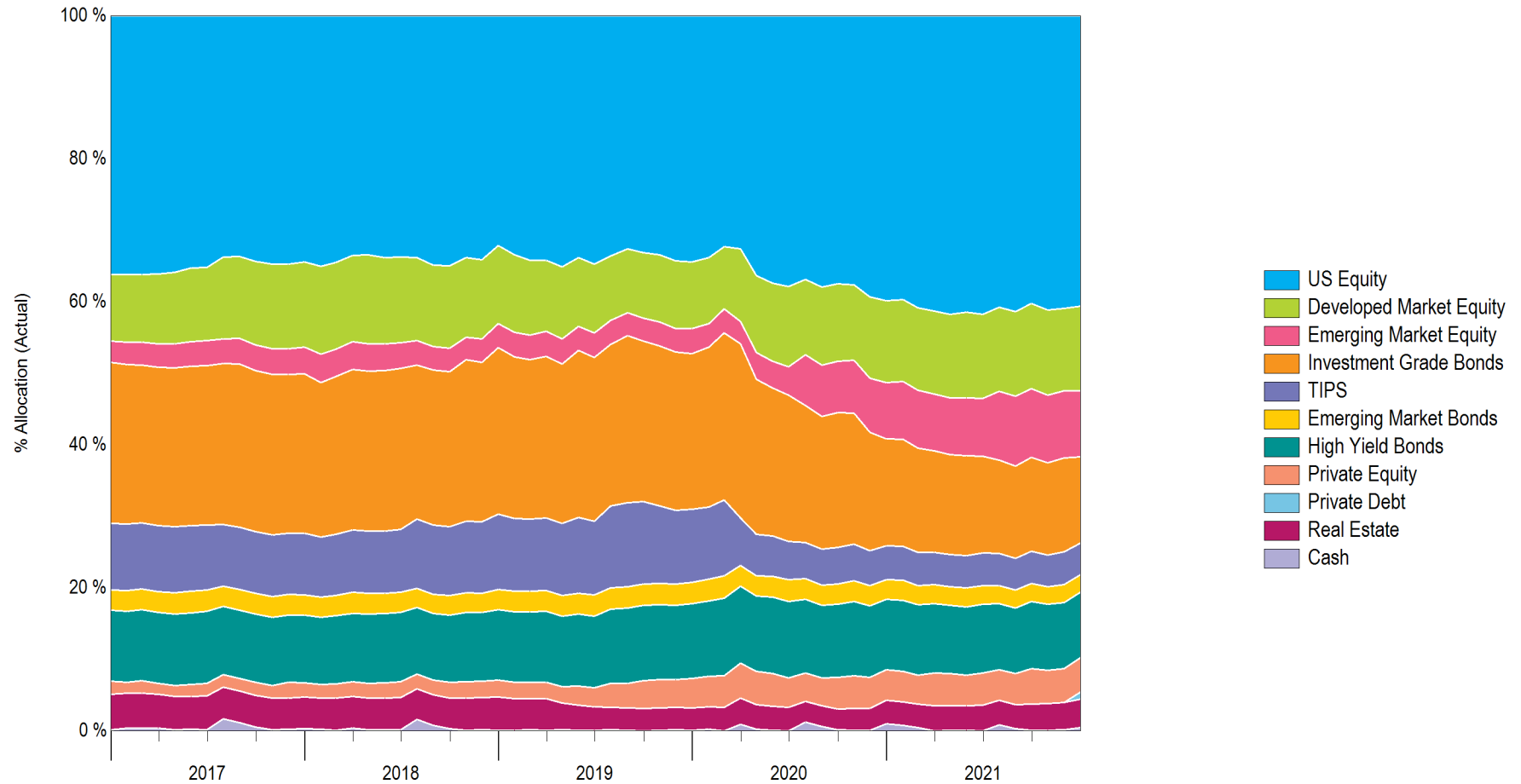
¹ Source: Bloomberg. Data is as of December 31, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

Fourth Quarter 2021 Investment Review

Retirement System Summary

Allocation vs. Targets and Policy				
	Current Balance	Current Allocation	Policy	Policy Range
US Equity	\$96,445,367	41%	38%	28% - 42%
Developed Market Equity	\$28,025,890	12%	12%	5% - 15%
Emerging Market Equity	\$22,088,720	9%	10%	1% - 12%
Investment Grade Bonds	\$28,531,031	12%	12%	10% - 25%
TIPS	\$10,585,750	4%	0%	0% - 10%
Emerging Market Bonds	\$5,788,196	2%	2%	1% - 5%
High Yield Bonds	\$21,700,647	9%	5%	5% - 12%
Private Equity	\$11,373,642	5%	5%	3% - 7%
Private Debt	\$2,500,000	1%	4%	0% - 5%
Real Estate	\$9,452,199	4%	7%	2% - 10%
Infrastructure	--	--	5%	0% - 5%
Cash	\$1,063,700	0%	0%	0% - 5%
Total	\$237,555,143	100%	100%	

Asset Allocation History 5 Years Ending December 31, 2021



Asset Class Performance Summary										
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (net)	237,555,143	100.0	4.8	13.8	15.2	10.5	9.2	7.4	8.1	Jul-88
55% MSCI World & 45% Barclays Aggregate			4.3	10.9	14.2	10.0	8.4	6.7	7.4	Jul-88
65% MSCI World / 35% Barclays Aggregate			5.1	13.2	15.9	11.2	9.4	7.0	7.6	Jul-88
InvMetrics Public DB \$50mm-\$250mm Net Median			4.4	13.4	15.6	11.1	9.6	7.1	9.0	Jul-88
Domestic Equity Assets (net)	96,445,367	40.6	10.0	24.8	21.8	15.1	14.7	8.7	9.8	Oct-06
Russell 3000			9.3	25.7	25.8	18.0	16.3	9.7	10.9	Oct-06
PRIT Domestic Equity			9.9	27.8	25.7	17.8	16.1	9.1	9.9	Oct-06
International Developed Markets Equity Assets (net)	28,025,890	11.8	2.7	11.5	13.8	9.7	7.4	--	3.9	Oct-06
MSCI EAFE			2.7	11.3	13.5	9.5	8.0	6.3	4.2	Oct-06
International Emerging Markets Equity Assets (net)	22,088,720	9.3	0.0	2.3	14.3	12.1	--	--	7.8	Jan-15
MSCI Emerging Markets			-1.3	-2.5	10.9	9.9	5.5	9.6	6.1	Jan-15
Investment Grade Bonds Assets (net)	28,531,031	12.0	0.0	-1.6	4.7	3.5	2.9	4.3	5.9	Jul-88
Bloomberg US Aggregate TR			0.0	-1.5	4.8	3.6	2.9	4.3	6.0	Jul-88
PRIT Core Fixed Income			1.6	0.1	7.6	5.4	4.6	5.2	6.8	Jul-88
High Yield Bond Assets (net)	21,700,647	9.1	0.4	4.0	8.0	5.7	6.0	--	6.6	Sep-03
Bloomberg US High Yield TR			0.7	5.3	8.8	6.3	6.8	7.8	7.7	Sep-03
PRIT Public Value-Added Fixed Income			-0.1	3.5	6.1	4.8	4.0	6.5	6.1	Sep-03
TIPS Assets (net)	10,585,750	4.5	2.3	5.8	8.3	5.3	3.0	--	4.3	Oct-05
Bloomberg US TIPS TR			2.4	6.0	8.4	5.3	3.1	5.3	4.4	Oct-05
Emerging Market Debt Assets (net)	5,788,196	2.4	-1.5	-2.4	6.5	4.7	--	--	4.8	Jan-15
JP Morgan EMBI Global Diversified			-0.4	-1.8	5.9	4.7	5.3	7.9	4.9	Jan-15
Open-Ended Real Estate (net)	6,800,996	2.9	7.8	23.4	10.6	9.7	11.0	7.9	8.5	Oct-95
NCREIF ODCE			8.0	22.2	9.2	8.7	10.5	8.3	9.2	Oct-95
Total Closed End Real Estate (net)	2,651,203	1.1	5.6	14.0	-12.6	-5.5	--	--	3.6	Jan-13
Private Equity Assets (net)	11,373,642	4.8	3.1	39.5	26.4	16.1	11.1	--	8.5	Oct-06
Private Debt Assets (net)	2,500,000	1.1								
Cash (net)	1,063,700	0.4								

	Trailing Performance										Inception (%)	Inception Date
	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)			
Total Retirement System	237,555,143	100.0	--	4.8	13.8	15.2	10.5	9.2	7.4	8.1	Jul-88	
55% MSCI World & 45% Barclays Aggregate				4.3	10.9	14.2	10.0	8.4	6.7	7.4	Jul-88	
65% MSCI World / 35% Barclays Aggregate				5.1	13.2	15.9	11.2	9.4	7.0	7.6	Jul-88	
InvMetrics Public DB \$50mm-\$250mm Net Median				4.4	13.4	15.6	11.1	9.6	7.1	9.0	Jul-88	
Domestic Equity Assets	96,445,367	40.6	40.6	10.0	24.8	21.8	15.1	14.7	8.7	9.8	Oct-06	
Russell 3000				9.3	25.7	25.8	18.0	16.3	9.7	10.9	Oct-06	
PRIT Domestic Equity				9.9	27.8	25.7	17.8	16.1	9.1	9.9	Oct-06	
RhumbLine S&P 500 Index	35,051,165	14.8	36.3	11.0	28.6	26.0	18.4	16.5	9.5	8.2	Mar-99	
S&P 500				11.0	28.7	26.1	18.5	16.6	9.5	8.1	Mar-99	
eV US Passive S&P 500 Equity Net Median				11.0	28.6	26.0	18.4	16.5	9.4	8.0	Mar-99	
Frontier Capital Appreciation	26,466,879	11.1	27.4	5.8	18.2	21.6	13.0	--	--	13.4	Feb-13	
Russell 2500 Growth				0.2	5.0	25.1	17.7	15.7	10.4	15.0	Feb-13	
eV US Small-Mid Cap Growth Equity Net Median				2.5	12.7	27.8	20.6	16.0	10.9	15.7	Feb-13	
RhumbLine HEDI	34,927,323	14.7	36.2	11.9	25.5	--	--	--	--	35.1	Nov-20	
Russell 1000 HEDI Moderate GR USD				11.8	25.5	25.4	19.3	17.1	11.2	35.2	Nov-20	
eV US Large Cap Core Equity Gross Median				10.5	27.9	25.0	17.9	16.2	10.1	39.2	Nov-20	

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
International Developed Markets Equity Assets	28,025,890	11.8	11.8	2.7	11.5	13.8	9.7	7.4	--	3.9	Oct-06
MSCI EAFE				2.7	11.3	13.5	9.5	8.0	6.3	4.2	Oct-06
RhumbLine MSCI EAFE Index	28,025,890	11.8	100.0	2.7	11.5	13.8	9.7	--	--	5.4	Aug-14
MSCI EAFE				2.7	11.3	13.5	9.5	8.0	6.3	5.3	Aug-14
eV EAFE All Cap Equity Net Median				2.5	10.5	13.9	9.8	8.9	7.6	5.9	Aug-14
International Emerging Markets Equity Assets	22,088,720	9.3	9.3	0.0	2.3	14.3	12.1	--	--	7.8	Jan-15
MSCI Emerging Markets				-1.3	-2.5	10.9	9.9	5.5	9.6	6.1	Jan-15
DFA Emerging Markets	11,233,716	4.7	50.9	0.9	5.8	11.8	10.1	--	--	6.4	Jan-15
MSCI Emerging Markets				-1.3	-2.5	10.9	9.9	5.5	9.6	6.1	Jan-15
eV Emg Mkts All Cap Equity Net Median				-1.2	-1.6	12.6	10.3	6.1	9.8	6.5	Jan-15
Driehaus Emerging Market Equity	10,855,003	4.6	49.1	-0.9	-1.5	16.4	13.8	--	--	8.9	Jan-15
MSCI Emerging Markets				-1.3	-2.5	10.9	9.9	5.5	9.6	6.1	Jan-15
eV Emg Mkts All Cap Equity Net Median				-1.2	-1.6	12.6	10.3	6.1	9.8	6.5	Jan-15
Investment Grade Bonds Assets	28,531,031	12.0	12.0	0.0	-1.6	4.7	3.5	2.9	4.3	5.9	Jul-88
Bloomberg US Aggregate TR				0.0	-1.5	4.8	3.6	2.9	4.3	6.0	Jul-88
PRIT Core Fixed Income				1.6	0.1	7.6	5.4	4.6	5.2	6.8	Jul-88
SSgA U.S. Aggregate Bond Index	28,531,031	12.0	100.0	0.0	-1.6	4.7	3.5	2.9	4.3	4.5	May-01
Bloomberg US Aggregate TR				0.0	-1.5	4.8	3.6	2.9	4.3	4.5	May-01
eV US Core Fixed Inc Net Median				-0.1	-1.5	5.2	3.8	3.2	4.6	4.7	May-01

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
High Yield Bond Assets	21,700,647	9.1	9.1	0.4	4.0	8.0	5.7	6.0	--	6.6	Sep-03
Bloomberg US High Yield TR				0.7	5.3	8.8	6.3	6.8	7.8	7.7	Sep-03
PRIT Public Value-Added Fixed Income				-0.1	3.5	6.1	4.8	4.0	6.5	6.1	Sep-03
Shenkman Capital	21,700,647	9.1	100.0	0.4	4.0	8.0	5.7	6.0	--	6.6	Apr-06
Bloomberg US High Yield TR				0.7	5.3	8.8	6.3	6.8	7.8	7.3	Apr-06
eV US High Yield Fixed Inc Net Median				0.6	5.0	8.2	5.8	6.4	7.2	6.7	Apr-06
TIPS Assets	10,585,750	4.5	4.5	2.3	5.8	8.3	5.3	3.0	--	4.3	Oct-05
Bloomberg US TIPS TR				2.4	6.0	8.4	5.3	3.1	5.3	4.4	Oct-05
SSgA TIPS Index-NL	10,585,750	4.5	100.0	2.3	5.8	8.3	5.3	3.0	--	4.3	Oct-05
Bloomberg US TIPS TR				2.4	6.0	8.4	5.3	3.1	5.3	4.4	Oct-05
eV US TIPS / Inflation Fixed Inc Net Median				2.2	5.7	8.3	5.4	3.1	5.4	4.4	Oct-05
Emerging Market Debt Assets	5,788,196	2.4	2.4	-1.5	-2.4	6.5	4.7	--	--	4.8	Jan-15
JP Morgan EMBI Global Diversified				-0.4	-1.8	5.9	4.7	5.3	7.9	4.9	Jan-15
Payden Emerging Market Bond	5,788,196	2.4	100.0	-1.5	-2.4	6.5	4.7	--	--	4.8	Jan-15
JP Morgan EMBI Global Diversified				-0.4	-1.8	5.9	4.7	5.3	7.9	4.9	Jan-15
Open-Ended Real Estate	6,800,996	2.9	2.9	7.8	23.4	10.6	9.7	11.0	7.9	8.5	Oct-95
NCREIF ODCE				8.0	22.2	9.2	8.7	10.5	8.3	9.2	Oct-95
Clarion Partners	6,800,996	2.9	100.0	7.8	23.4	10.6	9.7	11.0	--	7.9	Oct-02
NCREIF ODCE				8.0	22.2	9.2	8.7	10.5	8.3	8.4	Oct-02

Total Retirement System | As of December 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Closed End Real Estate	2,651,203	1.1	1.1	5.6	14.0	-12.6	-5.5	--	--	3.6	Jan-13
Rockwood Capital Real Estate Partners Fund XI, L.P. NCREIF-ODCE	2,651,203	1.1	100.0	5.6 8.0	14.0 22.2	-- 9.2	-- 8.7	-- 10.4	-- 8.3	6.5 11.5	Dec-19 Dec-19
Private Equity Assets	11,373,642	4.8	4.8	3.1	39.5	26.4	16.1	11.1	--	8.5	Oct-06
North American Strategic Partners 2006	27,121	0.0	0.2								
Ironsides Partnership Fund IV	2,524,347	1.1	22.2								
Ironsides Direct Investment Fund IV	2,293,059	1.0	20.2								
Ironsides Partnership Fund V, L.P.	887,209	0.4	7.8								
Ironsides Direct Investment Fund V, L.P.	3,024,167	1.3	26.6								
HarbourVest 2019 Global Fund	2,617,738	1.1	23.0								
Private Debt Assets	2,500,000	1.1	1.1								
NB Private Debt Fund IV	2,500,000	1.1	100.0								
Cash	1,063,700	0.4	0.4								

Private Equity market values are as of September 30, 2021 and adjusted for subsequent flows.

North American Strategic Partners market value is cash adjusted as of June 30, 2021. The fund is currently in the liquidation process and will only be reported on annually (as of December 31).

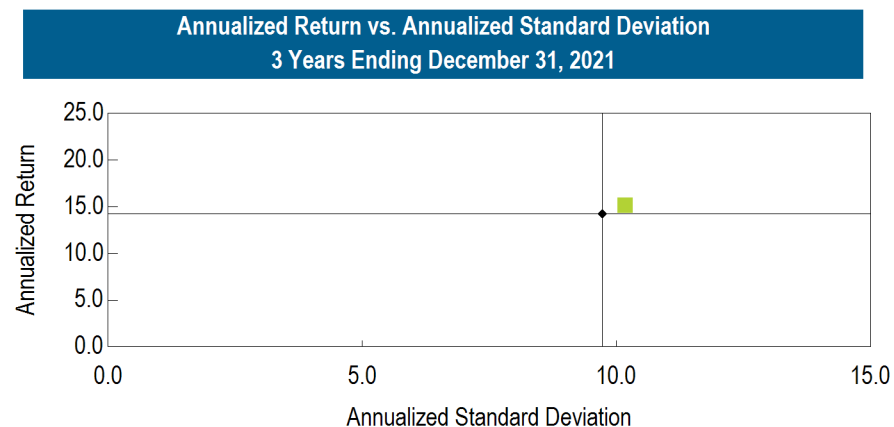
	Calendar Year Performance									
	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
Total Retirement System	13.8	14.2	17.5	-4.5	13.0	8.7	-0.2	6.3	14.0	10.9
55% MSCI World & 45% Barclays Aggregate	10.9	12.9	19.1	-4.6	13.6	5.5	0.0	5.5	13.0	10.7
65% MSCI World / 35% Barclays Aggregate	13.2	13.7	21.0	-5.5	15.5	5.9	-0.2	5.4	15.9	11.9
Domestic Equity Assets	24.8	13.4	27.6	-6.9	20.1	14.6	-1.6	13.1	33.1	15.3
Russell 3000	25.7	20.9	31.0	-5.2	21.1	12.7	0.5	12.6	33.6	16.4
PRIT Domestic Equity	27.8	18.9	30.5	-5.1	20.7	12.8	0.1	11.6	33.6	16.8
RhumbLine S&P 500 Index	28.6	18.3	31.4	-4.4	21.8	11.9	1.4	13.6	32.2	16.0
S&P 500	28.7	18.4	31.5	-4.4	21.8	12.0	1.4	13.7	32.4	16.0
Frontier Capital Appreciation	18.2	18.1	28.9	-13.9	19.1	20.5	-6.5	12.4	--	--
Russell 2500 Growth	5.0	40.5	32.7	-7.5	24.5	9.7	-0.2	7.1	40.6	16.1
RhumbLine HEDI	25.5	--	--	--	--	--	--	--	--	--
Russell 1000 HEDI Moderate GR USD	25.5	18.5	32.7	-0.9	23.4	11.4	4.8	15.4	30.9	13.9
International Developed Markets Equity Assets	11.5	7.9	22.3	-13.5	24.9	1.4	-0.8	-8.7	21.2	15.0
MSCI EAFE	11.3	7.8	22.0	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3
RhumbLine MSCI EAFE Index	11.5	7.9	22.3	-13.5	24.9	1.4	-0.8	--	--	--
MSCI EAFE	11.3	7.8	22.0	-13.8	25.0	1.0	-0.8	-4.9	22.8	17.3

Total Retirement System | As of December 31, 2021

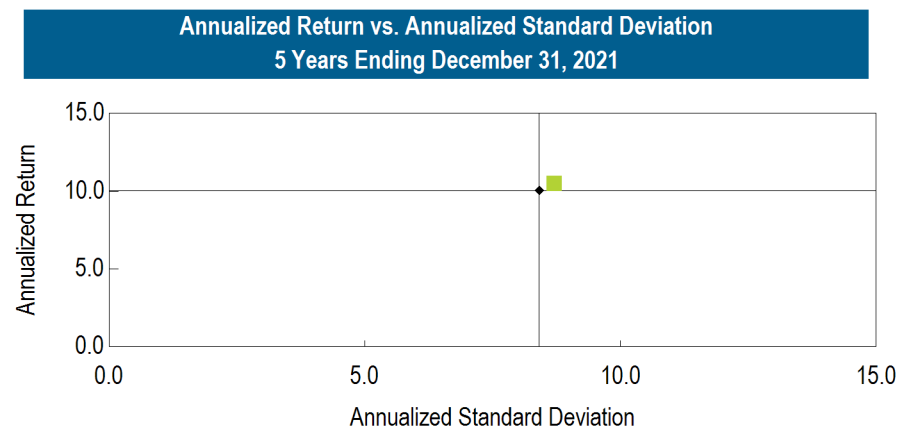
	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
International Emerging Markets Equity Assets	2.3	21.1	20.7	-15.4	39.7	9.4	-12.7	--	--	--
<i>MSCI Emerging Markets</i>	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2
DFA Emerging Markets	5.8	13.9	16.0	-15.2	36.6	12.4	-14.9	--	--	--
<i>MSCI Emerging Markets</i>	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2
Driehaus Emerging Market Equity	-1.5	28.0	25.3	-15.6	43.0	6.5	-10.6	--	--	--
<i>MSCI Emerging Markets</i>	-2.5	18.3	18.4	-14.6	37.3	11.2	-14.9	-2.2	-2.6	18.2
Investment Grade Bonds Assets	-1.6	7.5	8.7	0.0	3.6	2.6	0.6	6.0	-2.0	4.3
<i>Bloomberg US Aggregate TR</i>	-1.5	7.5	8.7	0.0	3.5	2.6	0.5	6.0	-2.0	4.2
<i>PRIT Core Fixed Income</i>	0.1	12.0	11.2	-0.9	5.3	3.9	-2.0	15.1	-2.9	6.2
SSgA U.S. Aggregate Bond Index	-1.6	7.5	8.7	0.0	3.6	2.6	0.6	6.0	-2.0	4.3
<i>Bloomberg US Aggregate TR</i>	-1.5	7.5	8.7	0.0	3.5	2.6	0.5	6.0	-2.0	4.2
High Yield Bond Assets	4.0	6.3	14.0	-1.8	6.5	12.6	-2.3	2.9	6.4	12.4
<i>Bloomberg US High Yield TR</i>	5.3	7.1	14.3	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8
<i>PRIT Public Value-Added Fixed Income</i>	3.5	4.3	10.7	-2.5	8.5	11.2	-5.2	-0.7	-2.0	14.2
Shenkman Capital	4.0	6.3	14.0	-1.8	6.5	12.6	-2.3	2.9	6.4	12.4
<i>Bloomberg US High Yield TR</i>	5.3	7.1	14.3	-2.1	7.5	17.1	-4.5	2.5	7.4	15.8
TIPS Assets	5.8	10.9	8.4	-1.4	3.0	4.7	-1.4	3.6	-8.6	6.9
<i>Bloomberg US TIPS TR</i>	6.0	11.0	8.4	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0
SSgA TIPS Index-NL	5.8	10.9	8.4	-1.4	3.0	4.7	-1.4	3.6	-8.6	6.9
<i>Bloomberg US TIPS TR</i>	6.0	11.0	8.4	-1.3	3.0	4.7	-1.4	3.6	-8.6	7.0

Total Retirement System | As of December 31, 2021

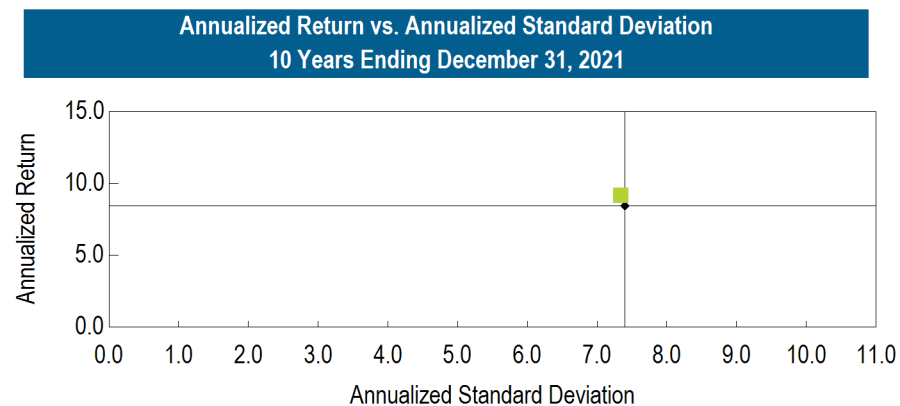
	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
Emerging Market Debt Assets	-2.4	6.2	16.5	-7.0	12.0	11.5	-0.8	--	--	--
<i>JP Morgan EMBI Global Diversified</i>	<i>-1.8</i>	<i>5.3</i>	<i>15.0</i>	<i>-4.3</i>	<i>10.3</i>	<i>10.2</i>	<i>1.2</i>	<i>7.4</i>	<i>-5.3</i>	<i>17.4</i>
Payden Emerging Market Bond	-2.4	6.2	16.5	-7.0	12.0	11.5	-0.8	--	--	--
<i>JP Morgan EMBI Global Diversified</i>	<i>-1.8</i>	<i>5.3</i>	<i>15.0</i>	<i>-4.3</i>	<i>10.3</i>	<i>10.2</i>	<i>1.2</i>	<i>7.4</i>	<i>-5.3</i>	<i>17.4</i>
Open-Ended Real Estate	23.4	2.2	7.3	8.6	7.9	9.1	15.7	13.2	12.8	10.9
<i>NCREIF ODCE</i>	<i>22.2</i>	<i>1.2</i>	<i>5.3</i>	<i>8.3</i>	<i>7.6</i>	<i>8.8</i>	<i>15.1</i>	<i>12.5</i>	<i>13.9</i>	<i>10.9</i>
Clarion Partners	23.4	2.2	7.3	8.6	7.9	9.1	15.7	13.2	12.8	10.9
<i>NCREIF ODCE</i>	<i>22.2</i>	<i>1.2</i>	<i>5.3</i>	<i>8.3</i>	<i>7.6</i>	<i>8.8</i>	<i>15.1</i>	<i>12.5</i>	<i>13.9</i>	<i>10.9</i>
Total Closed End Real Estate	14.0	-5.3	-38.2	-1.8	15.1	9.5	23.8	13.3	18.8	--
Rockwood Capital Real Estate Partners Fund XI, L.P.	14.0	0.0	--	--	--	--	--	--	--	--
<i>NCREIF-ODCE</i>	<i>22.2</i>	<i>1.2</i>	<i>5.3</i>	<i>8.3</i>	<i>7.6</i>	<i>8.8</i>	<i>15.0</i>	<i>12.5</i>	<i>13.9</i>	<i>10.9</i>
Private Equity Assets	39.5	22.9	17.7	10.2	-5.3	-2.8	8.6	5.5	9.1	12.2
North American Strategic Partners 2006										
Ironsides Partnership Fund IV										
Ironsides Direct Investment Fund IV										
Ironsides Partnership Fund V, L.P.										
Ironsides Direct Investment Fund V, L.P.										
HarbourVest 2019 Global Fund										
Private Debt Assets										
NB Private Debt Fund IV										



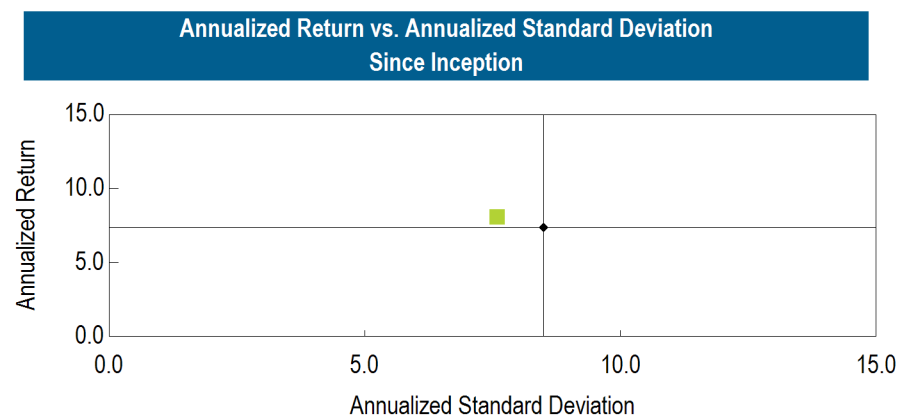
- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate



- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

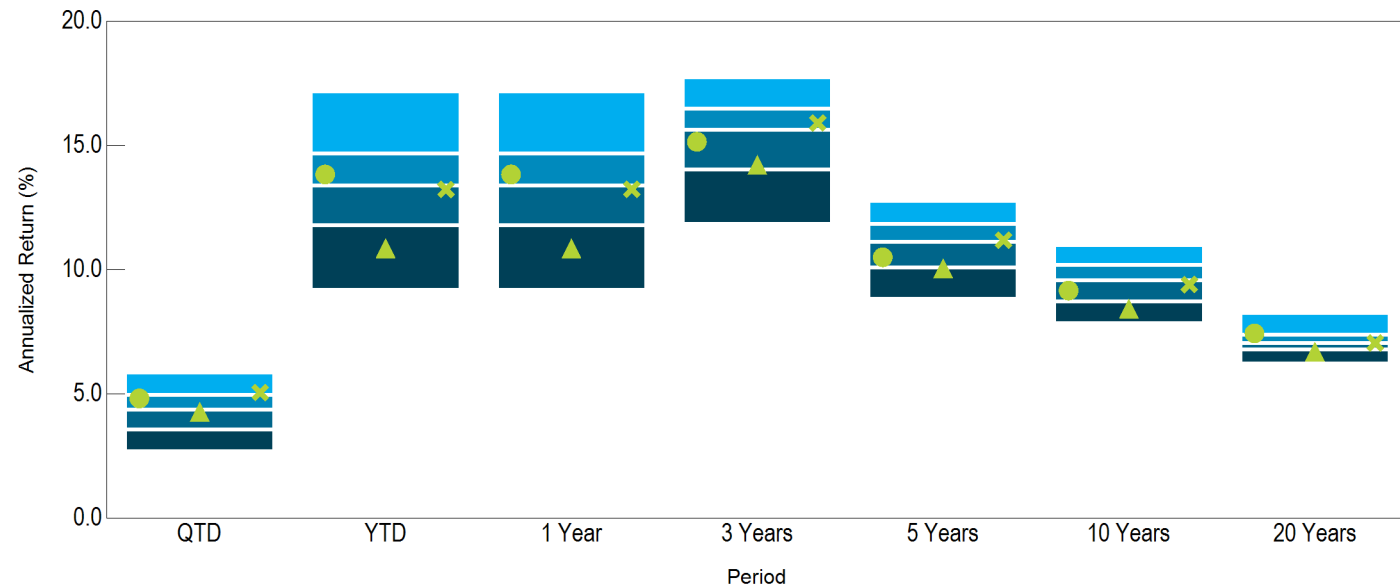


- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate



- Total Retirement System
- ◆ 55% MSCI World & 45% Barclays Aggregate

InvMetrics Public DB \$50mm-\$250mm Net Return Comparison
Ending December 31, 2021



	Return (Rank)											
5th Percentile	5.8		17.2		17.2		17.7		12.8		11.0	
25th Percentile	5.0		14.7		14.7		16.5		11.9		10.2	
Median	4.4		13.4		13.4		15.6		11.1		9.6	
75th Percentile	3.6		11.8		11.8		14.0		10.1		8.7	
95th Percentile	2.7		9.2		9.2		11.9		8.8		7.8	
# of Portfolios	168		166		166		164		156		128	
● Total Retirement System	4.8	(34)	13.8	(43)	13.8	(43)	15.2	(57)	10.5	(68)	9.2	(61)
▲ 55% MSCI World & 45% Barclays Aggregate	4.3	(56)	10.9	(87)	10.9	(87)	14.2	(74)	10.0	(78)	8.4	(85)
✕ 65% MSCI World / 35% Barclays Aggregate	5.1	(21)	13.2	(55)	13.2	(55)	15.9	(40)	11.2	(50)	9.4	(56)
											7.4	(24)
											6.7	(79)
											7.0	(53)

Statistics Summary						
5 Years Ending December 31, 2021						
	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Retirement System	10.5%	8.7%	0.2	1.0	1.1	1.8%
55% MSCI World & 45% Barclays Aggregate	10.0%	8.4%	--	1.0	1.1	0.0%
Equity Assets	13.4%	15.6%	-1.4	1.0	0.8	3.2%
Russell 3000	18.0%	16.0%	--	1.0	1.1	0.0%
Domestic Equity Assets	15.1%	16.5%	-1.1	1.0	0.8	2.7%
Russell 3000	18.0%	16.0%	--	1.0	1.1	0.0%
RhumbLine S&P 500 Index	18.4%	15.4%	-1.6	1.0	1.1	0.0%
S&P 500	18.5%	15.4%	--	1.0	1.1	0.0%
Frontier Capital Appreciation	13.0%	22.7%	-0.6	1.1	0.5	7.8%
Russell 2500 Growth	17.7%	19.7%	--	1.0	0.8	0.0%
RhumbLine HEDI	--	--	--	--	--	--
Russell 1000 HEDI Moderate GR USD	19.3%	14.4%	--	1.0	1.3	0.0%
International Developed Markets Equity Assets	9.7%	14.8%	0.5	1.0	0.6	0.3%
MSCI EAFE	9.5%	14.8%	--	1.0	0.6	0.0%
RhumbLine MSCI EAFE Index	9.7%	14.8%	0.5	1.0	0.6	0.3%
MSCI EAFE	9.5%	14.8%	--	1.0	0.6	0.0%
International Emerging Markets Equity Assets	12.1%	16.3%	0.9	1.0	0.7	2.5%
MSCI Emerging Markets	9.9%	16.6%	--	1.0	0.5	0.0%

RhumbLine HEDI funded on 10/5/2020. Statistics will be reflected after first full five calendar years.

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
DFA Emerging Markets	10.1%	17.4%	0.1	1.0	0.5	3.9%
MSCI Emerging Markets	9.9%	16.6%	--	1.0	0.5	0.0%
Driehaus Emerging Market Equity	13.8%	15.8%	1.0	0.9	0.8	3.9%
MSCI Emerging Markets	9.9%	16.6%	--	1.0	0.5	0.0%
Investment Grade Bonds Assets	3.5%	3.1%	-0.3	1.0	0.8	0.1%
Bloomberg US Aggregate TR	3.6%	3.1%	--	1.0	0.8	0.0%
SSgA U.S. Aggregate Bond Index	3.5%	3.1%	-0.3	1.0	0.8	0.1%
Bloomberg US Aggregate TR	3.6%	3.1%	--	1.0	0.8	0.0%
High Yield Bond Assets	5.7%	6.6%	-0.7	0.9	0.7	0.9%
Bloomberg US High Yield TR	6.3%	7.4%	--	1.0	0.7	0.0%
Shenkman Capital	5.7%	6.6%	-0.7	0.9	0.7	0.9%
Bloomberg US High Yield TR	6.3%	7.4%	--	1.0	0.7	0.0%
TIPS Assets	5.3%	3.6%	-1.3	1.0	1.2	0.1%
Bloomberg US TIPS TR	5.3%	3.5%	--	1.0	1.2	0.0%
SSgA TIPS Index-NL	5.3%	3.6%	-1.4	1.0	1.2	0.1%
Bloomberg US TIPS TR	5.3%	3.5%	--	1.0	1.2	0.0%
Emerging Market Debt Assets	4.7%	10.2%	0.0	1.1	0.4	2.1%
JP Morgan EMBI Global Diversified	4.7%	8.8%	--	1.0	0.4	0.0%
Payden Emerging Market Bond	4.7%	10.2%	0.0	1.1	0.4	2.1%
JP Morgan EMBI Global Diversified	4.7%	8.8%	--	1.0	0.4	0.0%

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Open-Ended Real Estate	9.7%	5.6%	0.9	1.0	1.5	1.1%
NCREIF ODCE	8.7%	5.3%	--	1.0	1.4	0.0%
Clarion Partners	9.7%	5.6%	0.9	1.0	1.5	1.1%
NCREIF ODCE	8.7%	5.3%	--	1.0	1.4	0.0%
Total Closed End Real Estate	-5.5%	22.2%	-0.7	0.8	-0.3	21.8%
NCREIF ODCE	8.7%	5.3%	--	1.0	1.4	0.0%
Rockwood Capital Real Estate Partners Fund XI, L.P.	--	--	--	--	--	--
NCREIF-ODCE	8.7%	5.3%	--	1.0	1.4	0.0%
Comerica Short Term Fund	0.4%	0.2%	-1.9	-0.1	-3.0	0.3%
91 Day T-Bills	1.1%	0.3%	--	1.0	0.0	0.0%

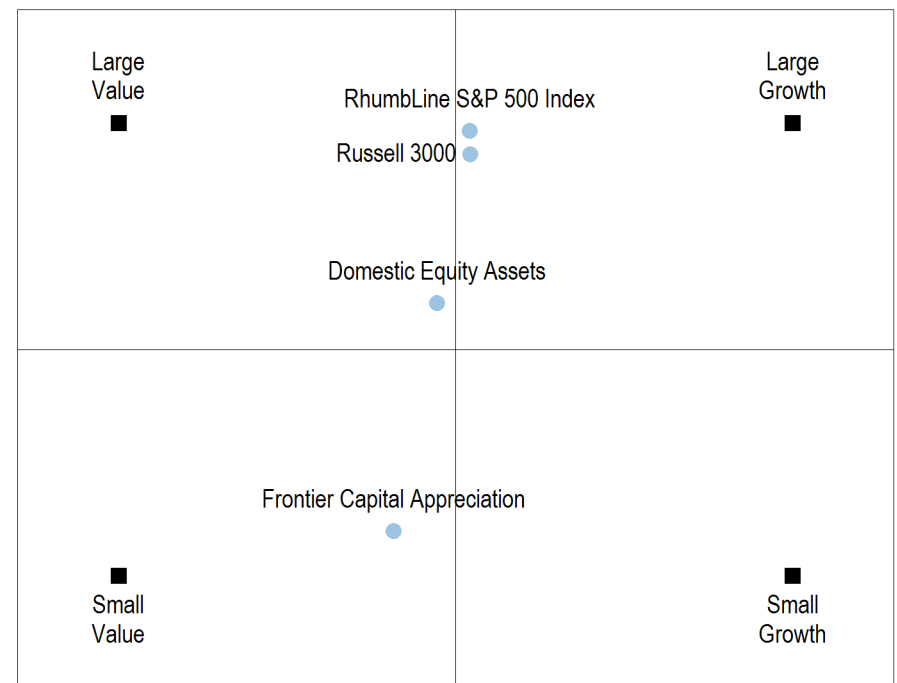
Rockwood Capital XI statistics will be reflected after first full five calendar years.

Retirement System Detail

Asset Allocation on December 31, 2021

	Actual	Actual
Frontier Capital Appreciation	\$26,466,879	27.4%
RhumbLine HEDI	\$34,927,323	36.2%
RhumbLine S&P 500 Index	\$35,051,165	36.3%
Total	\$96,445,367	100.0%

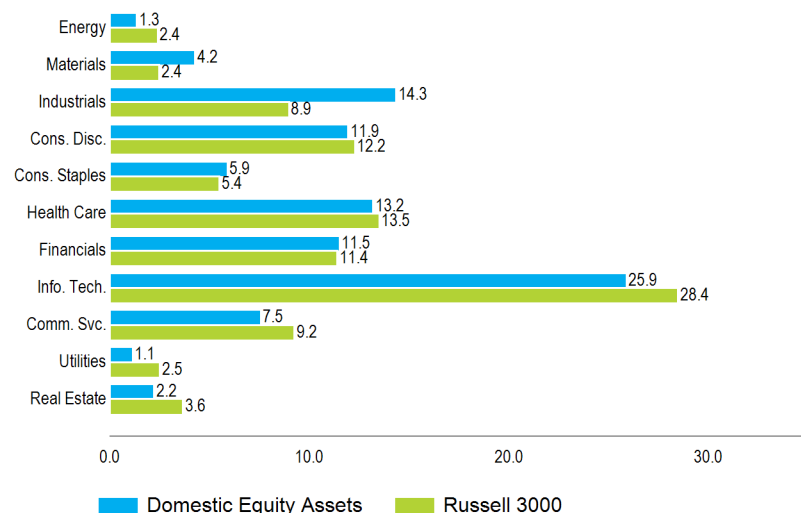
Domestic Equity Assets Style Map 3 Years Ending December 31, 2021



Domestic Equity Assets | As of December 31, 2021

Domestic Equity Assets Characteristics			
	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	96.4	--	92.5
Number Of Holdings	677	3065	676
Characteristics			
Weighted Avg. Market Cap. (\$B)	467.0	568.6	400.5
Median Market Cap (\$B)	28.2	2.8	27.2
P/E Ratio	25.0	24.9	24.1
Yield	1.0	1.3	1.1
EPS Growth - 5 Yrs.	18.7	20.4	18.0
Price to Book	4.5	4.5	4.3

Sector Allocation (%) vs Russell 3000



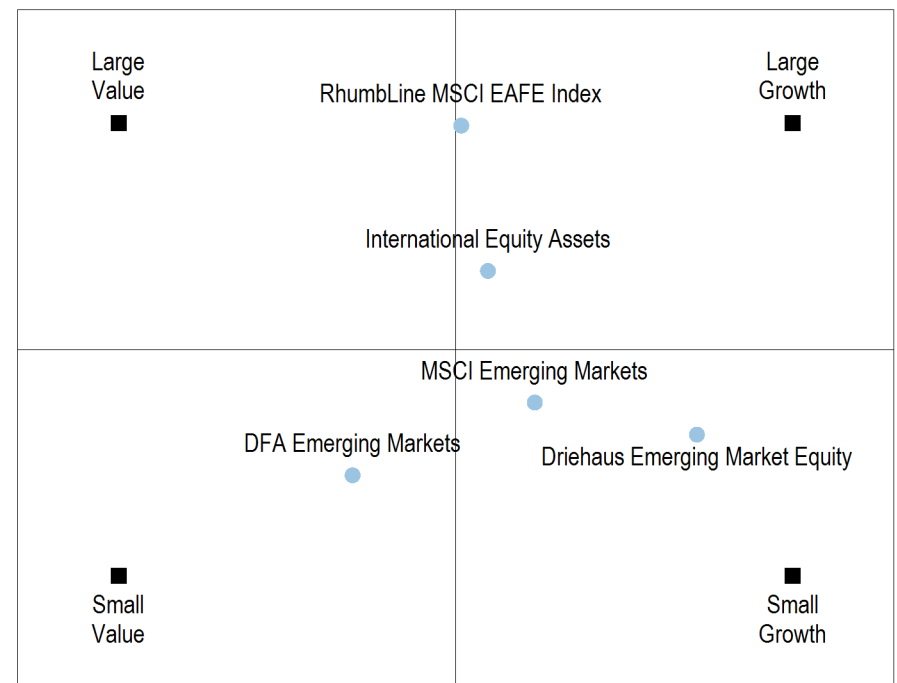
Top 10 Holdings

APPLE INC	4.7%
MICROSOFT CORP	4.4%
AMAZON.COM INC	2.5%
ALPHABET INC	1.6%
ALPHABET INC	1.5%
META PLATFORMS INC	1.4%
BERKSHIRE HATHAWAY INC	1.0%
NVIDIA CORPORATION	1.0%
JOHNSON & JOHNSON	0.9%
UNITEDHEALTH GROUP INC	0.8%
Total	19.9%

Asset Allocation on December 31, 2021

	Actual	Actual
DFA Emerging Markets	\$11,233,716	22.4%
DrieHaus Emerging Market Equity	\$10,855,003	21.7%
RhumbLine MSCI EAFE Index	\$28,025,890	55.9%
Total	\$50,114,610	100.0%

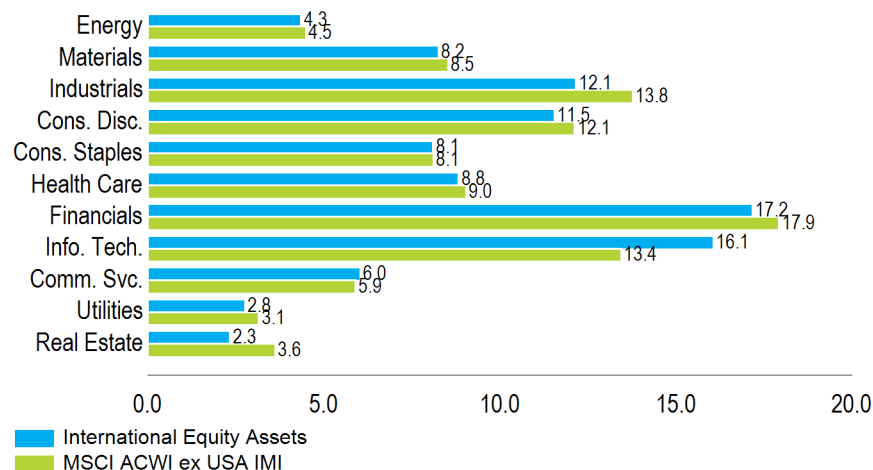
International Equity Assets Style Map 3 Years Ending December 31, 2021



International Equity Assets | As of December 31, 2021

International Equity Characteristics			
	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	50.1	--	49.4
Number Of Holdings	7069	6706	6980
Characteristics			
Weighted Avg. Market Cap. (\$B)	106.7	85.0	102.2
Median Market Cap (\$B)	0.8	2.0	0.9
P/E Ratio	15.6	15.3	16.7
Yield	2.5	2.6	2.5
EPS Growth - 5 Yrs.	14.8	12.9	13.6
Price to Book	2.9	2.7	2.9

Sector Allocation (%) vs MSCI ACWI ex USA IMI



Top 10 Holdings

SAMSUNG ELECTRONICS CO LTD	2.0%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	2.0%
TENCENT HOLDINGS LTD	1.5%
NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	1.3%
NESTLE SA, CHAM UND VEVEY	1.3%
ASML HOLDING NV	1.2%
ROCHE HOLDING AG	0.9%
LVMH MOET HENNESSY LOUIS VUITTON SE	0.7%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	0.7%
ICICI BANK LTD	0.7%
Total	12.4%

Country Allocation Report

As of 12/31/2021

Region	% of Total	% of Bench	% Diff
North America ex U.S.	0.4%	7.4%	-7.0%
United States	2.4%	0.0%	2.4%
Europe Ex U.K.	31.2%	31.6%	-0.4%
United Kingdom	7.0%	9.7%	-2.8%
Pacific Basin Ex Japan	7.9%	7.5%	0.4%
Japan	12.7%	14.9%	-2.2%
Emerging Markets	37.3%	28.0%	9.3%
Other	1.1%	0.9%	0.2%
Total	100.0%	100.0%	0.0%

International Equity Country Allocation			
vs MSCI ACWI ex USA IMI			
Country	% of Total	% of Bench	% Diff
ARGENTINA	0.2%	0.0%	0.2%
AUSTRALIA	3.9%	4.7%	-0.8%
AUSTRIA	0.1%	0.2%	-0.1%
BAHRAIN	0.0%	0.0%	0.0%
BANGLADESH	0.0%	0.0%	0.0%
BELGIUM	0.4%	0.7%	-0.2%
BRAZIL	1.6%	1.2%	0.5%
CANADA	0.4%	7.4%	-7.0%
CHILE	0.1%	0.1%	0.0%
CHINA	9.3%	8.3%	1.0%
COLOMBIA	0.0%	0.0%	0.0%
CROATIA	0.0%	0.0%	0.0%
CZECH REPUBLIC	0.0%	0.0%	0.0%
DENMARK	1.5%	1.6%	-0.1%
EGYPT	0.0%	0.0%	0.0%
ESTONIA	0.0%	0.0%	0.0%
FINLAND	0.7%	0.7%	0.0%
FRANCE	6.4%	6.7%	-0.3%
GERMANY	5.1%	5.4%	-0.3%
GREECE	0.1%	0.1%	0.0%
HONG KONG	2.9%	1.7%	1.3%
HUNGARY	0.1%	0.1%	0.0%
INDIA	6.9%	3.9%	3.1%
INDONESIA	0.8%	0.4%	0.3%

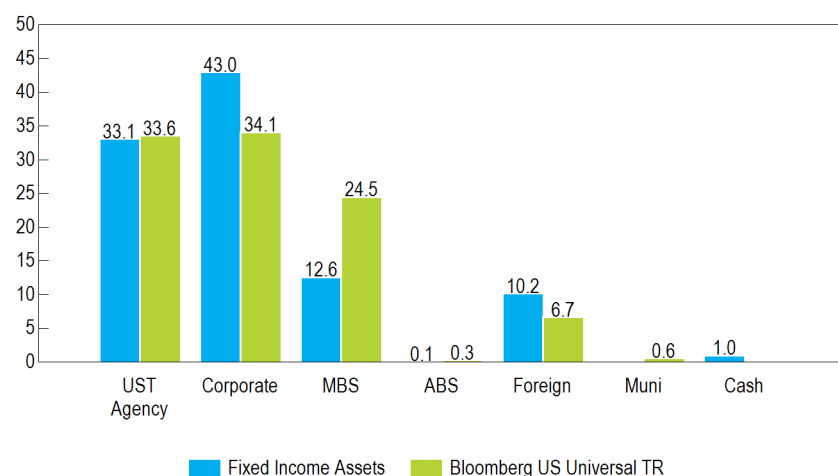
Country	% of Total	% of Bench	% Diff
IRELAND	0.7%	0.4%	0.2%
ISRAEL	0.5%	0.7%	-0.2%
ITALY	1.2%	1.6%	-0.5%
JAPAN	12.7%	14.9%	-2.2%
JORDAN	0.0%	0.0%	0.0%
KAZAKHSTAN	0.0%	0.0%	0.0%
KENYA	0.0%	0.0%	0.0%
KOREA	5.0%	3.7%	1.2%
KUWAIT	0.0%	0.2%	-0.2%
LEBANON	0.0%	0.0%	0.0%
LITHUANIA	0.0%	0.0%	0.0%
LUXEMBOURG	0.3%	0.0%	0.3%
MALAYSIA	0.5%	0.4%	0.0%
MAURITIUS	0.0%	0.0%	0.0%
MEXICO	1.1%	0.6%	0.6%
MOROCCO	0.0%	0.0%	0.0%
NETHERLANDS	4.5%	2.9%	1.7%
NEW ZEALAND	0.2%	0.2%	-0.1%
NIGERIA	0.0%	0.0%	0.0%
NORWAY	0.4%	0.6%	-0.2%
OMAN	0.0%	0.0%	0.0%
OTHER	0.5%	0.0%	0.5%
PAKISTAN	0.0%	0.0%	0.0%
PERU	0.0%	0.1%	0.0%
PHILIPPINES	0.2%	0.2%	0.0%
POLAND	0.2%	0.2%	0.0%
PORTUGAL	0.1%	0.1%	0.0%

Country	% of Total	% of Bench	% Diff
QATAR	0.2%	0.2%	0.0%
ROMANIA	0.0%	0.0%	0.0%
RUSSIA	0.9%	0.9%	0.0%
SAUDI ARABIA	0.9%	0.9%	0.0%
SERBIA	0.0%	0.0%	0.0%
SINGAPORE	0.9%	0.8%	0.0%
SLOVENIA	0.0%	0.0%	0.0%
SOUTH AFRICA	1.2%	0.9%	0.3%
SPAIN	1.3%	1.4%	-0.1%
SRI LANKA	0.0%	0.0%	0.0%
SWEDEN	2.1%	2.9%	-0.8%
SWITZERLAND	6.3%	6.2%	0.1%
TAIWAN	7.1%	4.8%	2.3%
THAILAND	0.7%	0.5%	0.2%
TUNISIA	0.0%	0.0%	0.0%
TURKEY	0.1%	0.1%	0.0%
UKRAINE	0.0%	0.0%	0.0%
UNITED ARAB EMIRATES	0.2%	0.3%	-0.2%
UNITED KINGDOM	7.0%	9.7%	-2.8%
UNITED STATES	2.4%	0.0%	2.4%
VIETNAM	0.1%	0.0%	0.1%
Total	100.0%	100.0%	0.0%

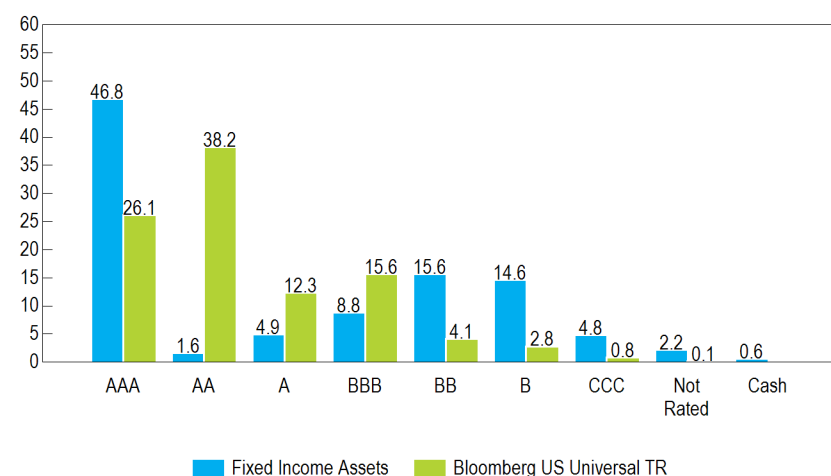
Asset Allocation on December 31, 2021		
	Actual	Actual
Payden Emerging Market Bond	\$5,788,196	8.7%
Shenkman Capital	\$21,700,647	32.6%
SSgA TIPS Index-NL	\$10,585,750	15.9%
SSgA U.S. Aggregate Bond Index	\$28,531,031	42.8%
Total	\$66,605,623	100.0%

Fixed Income Characteristics vs. Bloomberg US Universal TR			
	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Fixed Income Characteristics			
Yield to Maturity	3.2	2.1	3.0
Average Duration	5.4	6.7	5.6
Average Quality	A	AA	A
Weighted Average Maturity	8.1	12.8	8.1

Sector Allocation



Credit Quality Allocation



Portfolio Reviews

Account Information

Account Name	RhumbLine S&P 500 Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	3/01/99
Account Type	US Equity
Benchmark	S&P 500
Universe	eV US Passive S&P 500 Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine S&P 500 Index	11.0	28.6	26.0	18.4	16.5	8.2	Mar-99
S&P 500	11.0	28.7	26.1	18.5	16.6	8.1	Mar-99

Top 10 Holdings

APPLE INC	6.8%
MICROSOFT CORP	6.2%
AMAZON.COM INC	3.6%
ALPHABET INC	2.2%
TESLA INC	2.1%
ALPHABET INC	2.0%
META PLATFORMS INC	2.0%
NVIDIA CORPORATION	1.8%
BERKSHIRE HATHAWAY INC	1.4%
UNITEDHEALTH GROUP INC	1.2%
Total	29.2%

RhumbLine S&P 500 Index Equity Characteristics vs S&P 500

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	35.1	--	36.3
Number Of Holdings	507	504	506
Characteristics			
Weighted Avg. Market Cap. (\$B)	664.8	670.5	554.0
Median Market Cap (\$B)	34.6	34.6	30.7
P/E Ratio	26.2	26.2	25.5
Yield	1.3	1.3	1.4
EPS Growth - 5 Yrs.	19.9	19.8	18.5
Price to Book	4.9	4.9	4.5
Sector Distribution			
Energy	2.7	2.6	2.7
Materials	2.6	2.5	2.5
Industrials	7.8	7.7	8.0
Consumer Discretionary	12.5	13.1	12.3
Consumer Staples	5.9	6.3	5.7
Health Care	13.2	13.0	13.1
Financials	10.9	10.9	12.0
Information Technology	29.1	28.6	27.5
Communication Services	10.1	10.2	11.2
Utilities	2.5	2.4	2.4
Real Estate	2.8	2.7	2.6

RhumbLine HEDI | As of December 31, 2021

Account Information	
Account Name	RhumbLine HEDI
Account Structure	Separate Account
Investment Style	Passive
Inception Date	11/01/20
Account Type	US Equity
Benchmark	Russell 1000 HEDI Moderate GR USD
Universe	eV US Large Cap Core Equity Gross

Portfolio Performance Summary							
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine HEDI	11.9	25.5	--	--	--	35.1	Nov-20
Russell 1000 HEDI Moderate GR USD	11.8	25.5	25.4	19.3	17.1	35.2	Nov-20

Top 10 Holdings	
APPLE INC	6.1%
MICROSOFT CORP	5.9%
AMAZON.COM INC	3.4%
ALPHABET INC	2.4%
ALPHABET INC	2.1%
META PLATFORMS INC	1.8%
BERKSHIRE HATHAWAY INC	1.5%
JOHNSON & JOHNSON	1.3%
HOME DEPOT INC. (THE)	1.2%
UNITEDHEALTH GROUP INC	1.2%
Total	26.8%

Rhumbline HEDI Characteristics		
	Portfolio Q4-21	Portfolio Q3-21
Market Value		
Market Value (\$M)	34.9	31.2
Number Of Holdings	241	239
Characteristics		
Weighted Avg. Market Cap. (\$B)	591.0	498.5
Median Market Cap (\$B)	39.7	36.2
P/E Ratio	27.8	26.0
Yield	1.1	1.2
EPS Growth - 5 Yrs.	17.7	17.4
Price to Book	6.1	5.7
Sector Distribution		
Energy	0.0	0.0
Materials	2.3	2.5
Industrials	14.4	14.8
Consumer Discretionary	10.5	10.8
Consumer Staples	10.3	9.6
Health Care	13.1	13.1
Financials	10.9	11.2
Information Technology	27.2	26.2
Communication Services	8.8	9.7
Utilities	0.6	0.6
Real Estate	1.7	1.4

Russell 1000 HEDI benchmark characteristic data is unavailable.

Frontier Capital Appreciation | As of December 31, 2021

Account Information	
Account Name	Frontier Capital Appreciation
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	2/01/13
Account Type	US Equity
Benchmark	Russell 2500 Growth
Universe	eV US Small-Mid Cap Growth Equity Net

Portfolio Performance Summary							
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Frontier Capital Appreciation	5.8	18.2	21.6	13.0	--	13.4	Feb-13
Russell 2500 Growth	0.2	5.0	25.1	17.7	15.7	15.0	Feb-13

Top 10 Holdings	
BUILDERS FIRSTSOURCE INC	3.0%
MACOM TECHNOLOGY SOLUTIONS HOLDINGS INC	2.2%
KBR INC	1.8%
WOLFSPEED INC	1.8%
CASH - USD	1.7%
DANA INC	1.7%
CAESARS ENTERTAINMENT INC	1.6%
LPL FINANCIAL HOLDINGS INC	1.5%
INSULET CORP	1.5%
COOPER COS INC (THE)	1.4%
Total	18.2%

Frontier Capital Appreciation Characteristics			
	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	26.5	--	25.0
Number Of Holdings	142	1471	135
Characteristics			
Weighted Avg. Market Cap. (\$B)	8.3	8.4	7.9
Median Market Cap (\$B)	5.3	1.9	4.0
P/E Ratio	19.0	28.4	18.1
Yield	0.5	0.5	0.5
EPS Growth - 5 Yrs.	17.9	22.4	18.7
Price to Book	2.9	6.0	3.0
Sector Distribution			
Energy	1.3	2.0	1.3
Materials	9.0	3.2	6.9
Industrials	22.9	15.0	21.5
Consumer Discretionary	13.0	15.4	14.2
Consumer Staples	0.0	2.7	0.0
Health Care	13.1	22.3	14.1
Financials	13.0	5.7	12.9
Information Technology	19.8	28.3	21.1
Communication Services	2.4	2.2	2.4
Utilities	0.0	0.4	0.0
Real Estate	2.1	2.8	2.2

Account Information

Account Name	RhumbLine MSCI EAFE Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	8/01/14
Account Type	Non-US Stock Developed
Benchmark	MSCI EAFE
Universe	eV EAFE All Cap Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
RhumbLine MSCI EAFE Index	2.7	11.5	13.8	9.7	--	5.4	Aug-14
MSCI EAFE	2.7	11.3	13.5	9.5	8.0	5.3	Aug-14

Top 10 Holdings

NESTLE SA, CHAM UND VEVEY	2.3%
ASML HOLDING NV	1.9%
ROCHE HOLDING AG	1.7%
LVMH MOET HENNESSY LOUIS VUITTON SE	1.3%
TOYOTA MOTOR CORP	1.1%
NOVARTIS AG	1.1%
NOVO NORDISK 'B'	1.1%
ASTRAZENECA PLC	1.0%
SONY GROUP CORPORATION	0.9%
SAP SE	0.9%
Total	13.3%

Rhumbline MSCI EAFE Index Characteristics

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	28.0	--	27.3
Number Of Holdings	829	828	843
Characteristics			
Weighted Avg. Market Cap. (\$B)	86.3	85.5	81.1
Median Market Cap (\$B)	14.6	14.7	14.1
P/E Ratio	17.2	17.1	18.0
Yield	2.7	2.7	2.7
EPS Growth - 5 Yrs.	12.1	11.8	10.3
Price to Book	2.9	2.8	2.8
Sector Distribution			
Energy	3.4	3.4	3.4
Materials	7.4	7.6	7.2
Industrials	15.9	16.2	15.6
Consumer Discretionary	12.4	12.5	12.6
Consumer Staples	10.2	10.3	10.1
Health Care	12.6	12.8	12.5
Financials	16.7	16.9	17.0
Information Technology	9.5	9.7	9.6
Communication Services	4.4	4.5	4.6
Utilities	3.3	3.4	3.2
Real Estate	2.7	2.8	2.8

DFA Emerging Markets | As of December 31, 2021

Account Information

Account Name	DFA Emerging Markets
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	Non-US Stock Emerging
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkts All Cap Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
DFA Emerging Markets	0.9	5.8	11.8	10.1	--	6.4	Jan-15
MSCI Emerging Markets	-1.3	-2.5	10.9	9.9	5.5	6.1	Jan-15

Top 10 Holdings

SAMSUNG ELECTRONICS CO LTD	3.8%
TENCENT HOLDINGS LTD	3.2%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	3.1%
TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	1.6%
CASH - USD	1.3%
ALIBABA GROUP HOLDING LTD	1.0%
CHINA CONSTRUCTION BANK CORP	0.9%
RELIANCE INDUSTRIES LTD	0.9%
PING AN INSURANCE GROUP	0.7%
SK HYNIX INC	0.7%
Total	17.3%

DFA Emerging Markets Characteristics

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	11.2	--	11.1
Number Of Holdings	6222	1413	6118
Characteristics			
Weighted Avg. Market Cap. (\$B)	93.3	139.7	90.8
Median Market Cap (\$B)	0.6	7.2	0.6
P/E Ratio	11.1	12.3	11.9
Yield	2.8	2.4	2.9
EPS Growth - 5 Yrs.	16.9	15.8	16.1
Price to Book	2.5	2.8	2.5
Sector Distribution			
Energy	4.7	5.6	5.0
Materials	11.3	8.6	11.6
Industrials	8.6	5.1	8.4
Consumer Discretionary	11.0	13.5	12.0
Consumer Staples	5.9	5.9	6.1
Health Care	4.0	4.2	4.2
Financials	15.8	19.4	16.1
Information Technology	22.5	22.7	20.3
Communication Services	8.0	10.7	7.9
Utilities	3.2	2.4	3.3
Real Estate	3.5	2.0	3.8

Account Information

Account Name	Driehaus Emerging Market Equity
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	Non-US Stock Emerging
Benchmark	MSCI Emerging Markets
Universe	eV Emg Mkts All Cap Equity Net

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Driehaus Emerging Market Equity	-0.9	-1.5	16.4	13.8	--	8.9	Jan-15
MSCI Emerging Markets	-1.3	-2.5	10.9	9.9	5.5	6.1	Jan-15

Top 10 Holdings

TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	7.7%
NORTHERN INSTITUTIONAL U.S. GOVERNMENT SELECT PORTFOLIO	6.2%
SAMSUNG ELECTRONICS CO LTD	5.6%
TENCENT HOLDINGS LTD	3.8%
ICICI BANK LTD	2.9%
HOUSING DEVELOPMENT FINANCE CORP LTD	1.9%
RELIANCE INDUSTRIES LTD	1.9%
PT BANK CENTRAL ASIA TBK	1.7%
H D F C BANK LTD	1.7%
ZHANGZHOU PIEN TZE HUANG PHARMACEUTICAL CO LTD	1.6%
Total	34.9%

Driehaus Emerging Market Equity Characteristics

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Market Value			
Market Value (\$M)	10.9	--	11.0
Number Of Holdings	88	1413	94
Characteristics			
Weighted Avg. Market Cap. (\$B)	175.5	139.7	167.9
Median Market Cap (\$B)	34.9	7.2	29.1
P/E Ratio	21.3	12.3	26.7
Yield	1.7	2.4	1.4
EPS Growth - 5 Yrs.	18.6	15.8	18.5
Price to Book	4.1	2.8	4.0
Sector Distribution			
Energy	6.6	5.6	4.8
Materials	7.2	8.6	7.1
Industrials	6.2	5.1	6.8
Consumer Discretionary	9.8	13.5	10.1
Consumer Staples	4.8	5.9	4.8
Health Care	3.9	4.2	4.1
Financials	19.7	19.4	21.2
Information Technology	26.6	22.7	25.8
Communication Services	8.3	10.7	11.1
Utilities	0.8	2.4	1.3
Real Estate	0.0	2.0	0.0

Account Information

Account Name	SSgA U.S. Aggregate Bond Index
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	5/01/01
Account Type	US Fixed Income Investment Grade
Benchmark	Bloomberg US Aggregate TR
Universe	eV US Core Fixed Inc Net

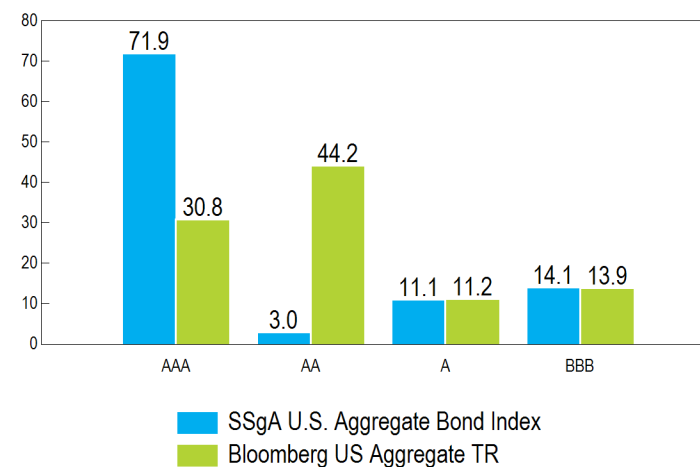
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA U.S. Aggregate Bond Index	0.0	-1.6	4.7	3.5	2.9	4.5	May-01
Bloomberg US Aggregate TR	0.0	-1.5	4.8	3.6	2.9	4.5	May-01

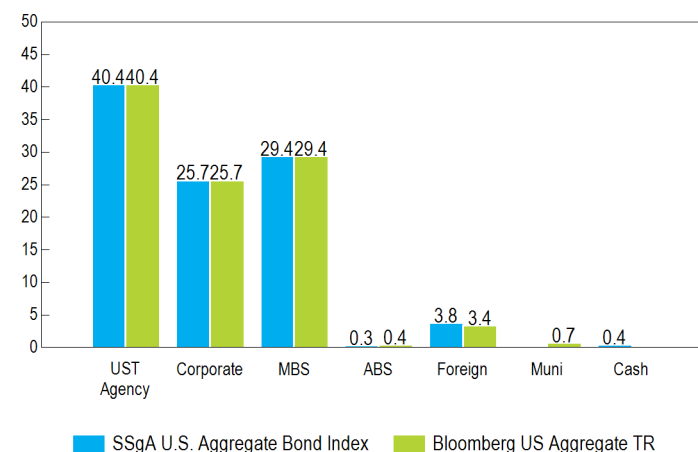
SSgA U.S. Aggregate Bond Index Characteristics vs. Bloomberg US Aggregate TR

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Fixed Income Characteristics			
Yield to Maturity	1.8	1.7	1.6
Average Duration	6.8	6.8	6.7
Average Quality	AA	AA	AA
Weighted Average Maturity	8.6	8.7	8.4

Credit Quality Allocation



Sector Allocation



Shenkman Capital | As of December 31, 2021

Account Information

Account Name	Shenkman Capital
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	4/01/06
Account Type	US Fixed Income High Yield
Benchmark	Bloomberg US High Yield TR
Universe	eV US High Yield Fixed Inc Net

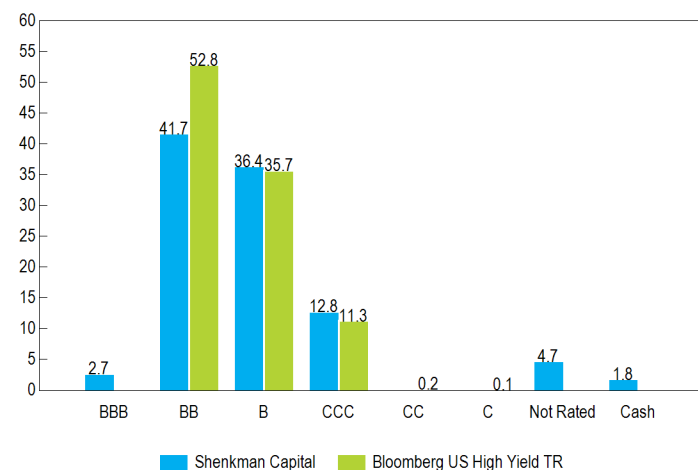
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Shenkman Capital	0.4	4.0	8.0	5.7	6.0	6.6	Apr-06
Bloomberg US High Yield TR	0.7	5.3	8.8	6.3	6.8	7.3	Apr-06

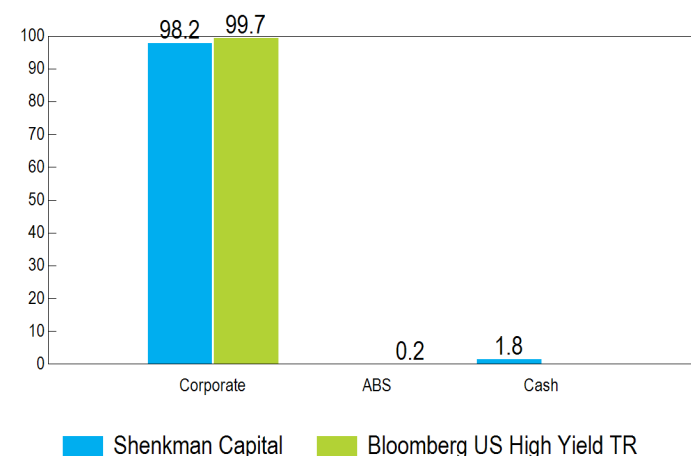
Shenkman Capital Characteristics vs. Bloomberg US High Yield TR

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Fixed Income Characteristics			
Yield to Maturity	4.9	4.8	4.9
Average Duration	3.6	5.2	3.7
Average Quality	BB	B	BB
Weighted Average Maturity	6.3	6.5	6.4

Credit Quality Allocation



Sector Allocation



SSgA TIPS Index-NL | As of December 31, 2021

Account Information

Account Name	SSgA TIPS Index-NL
Account Structure	Commingled Fund
Investment Style	Passive
Inception Date	10/01/05
Account Type	US Inflation Protected Fixed
Benchmark	Bloomberg US TIPS TR
Universe	eV US TIPS / Inflation Fixed Inc Net

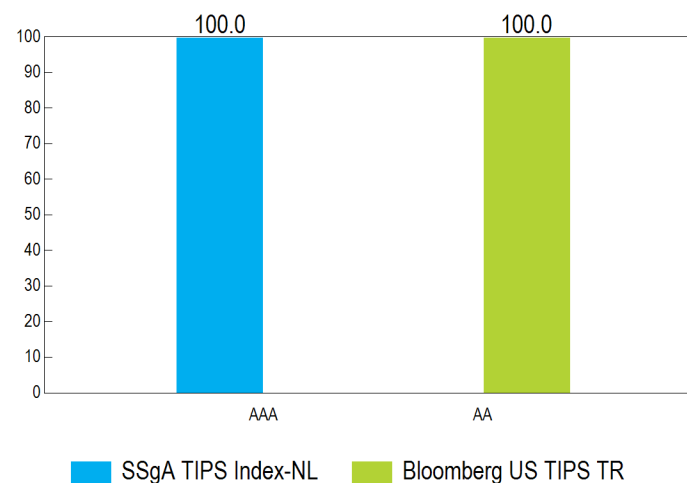
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
SSgA TIPS Index-NL	2.3	5.8	8.3	5.3	3.0	4.3	Oct-05
Bloomberg US TIPS TR	2.4	6.0	8.4	5.3	3.1	4.4	Oct-05

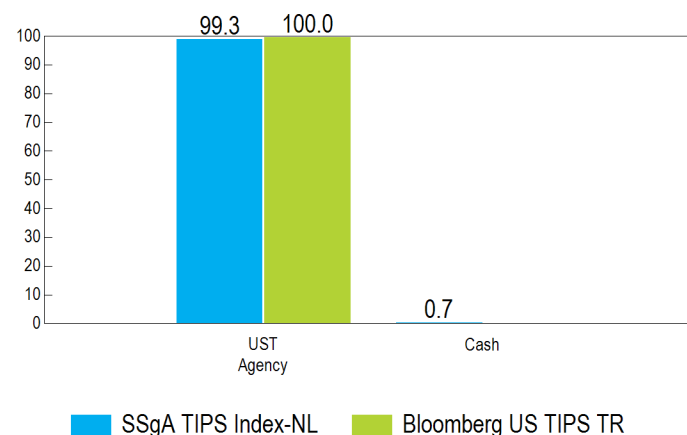
SSgA TIPS Index-NL Characteristics vs. Bloomberg US TIPS TR

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Fixed Income Characteristics			
Yield to Maturity	1.3	1.2	1.2
Average Duration	4.4	7.5	5.5
Average Quality	AAA	AA	AAA
Weighted Average Maturity	8.0	8.0	8.2

Credit Quality Allocation



Sector Allocation



Account Information

Account Name	Payden Emerging Market Bond
Account Structure	Mutual Fund
Investment Style	Active
Inception Date	1/01/15
Account Type	International Emerging Market Debt
Benchmark	JP Morgan EMBI Global Diversified
Universe	

Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Payden Emerging Market Bond	-1.5	-2.4	6.5	4.7	--	4.8	Jan-15
JP Morgan EMBI Global Diversified	-0.4	-1.8	5.9	4.7	5.3	4.9	Jan-15

Fund Characteristics as of December 31, 2021

Versus JP Morgan EMBI Global Diversified

Sharpe Ratio (3 Year)	0.5
Average Duration	7.7
Average Coupon	5.9%
Average Effective Maturity	12.6
R-Squared (3 Year)	1.0
Alpha (3 Year)	0.0%
Beta (3 Year)	1.1

Payden Emerging Market Bond Characteristics vs. JP Morgan EMBI Global Diversified

	Portfolio Q4-21	Index Q4-21	Portfolio Q3-21
Fixed Income Characteristics			
Yield to Maturity	7.1	4.8	6.3
Average Duration	7.7	7.9	7.6
Average Quality	BB	BB	BB
Weighted Average Maturity	12.6	12.6	12.4

Fixed Income Sectors as of December 31, 2021

GOVERNMENT	58.8%
MUNICIPAL	0.0%
CORPORATE	15.8%
SECURITIZED	0.0%
CASH & EQUIVALENTS	3.7%
DERIVATIVE	21.7%

Credit Quality as of December 31, 2021

AAA	1.0%
AA	4.0%
A	3.0%
BBB	28.0%
BB	26.0%
B	30.0%
Below B	5.0%
Not Rated	3.0%

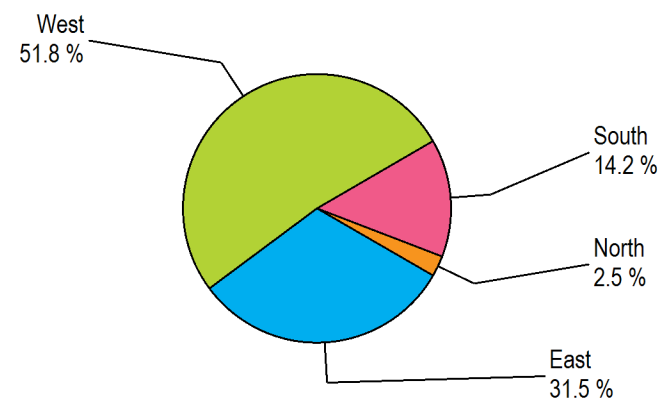
Account Information

Account Name	Clarion Partners
Account Structure	Commingled Fund
Investment Style	Active
Inception Date	10/01/02
Account Type	Real Estate
Benchmark	NCREIF ODCE
Universe	

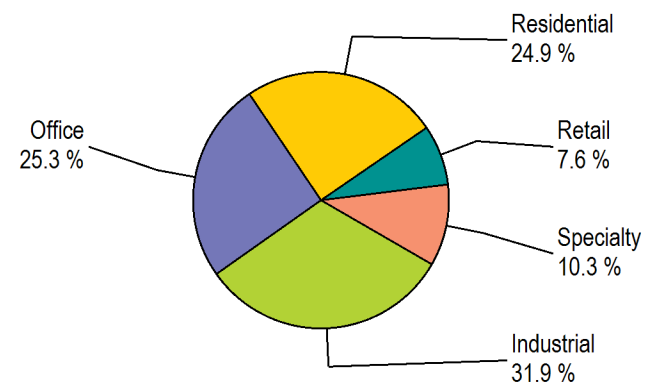
Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Clarion Partners	7.8	23.4	10.6	9.7	11.0	7.9	Oct-02
NCREIF ODCE	8.0	22.2	9.2	8.7	10.5	8.4	Oct-02

Geographic Diversification



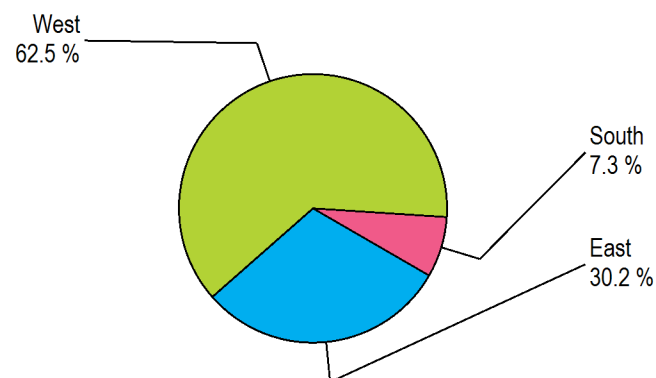
Property Type Allocation



Account Information

Account Name	Rockwood Capital Real Estate Partners Fund XI, L.P.
Account Structure	Other
Investment Style	Passive
Inception Date	12/01/19
Account Type	Real Estate
Benchmark	NCREIF-ODCE
Universe	

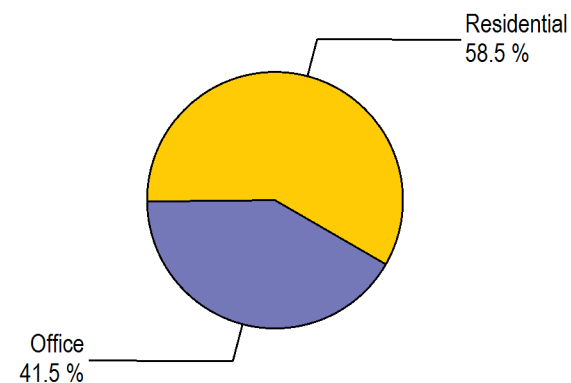
Geographic Diversification



Portfolio Performance Summary

	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Rockwood Capital Real Estate Partners Fund XI, L.P.	5.6	14.0	--	--	--	6.5	Dec-19
NCREIF-ODCE	8.0	22.2	9.2	8.7	10.4	11.5	Dec-19

Property Type Allocation



Rockwood Real Estate characteristics are as of 9/30/21.

Non-Marketable Securities Overview						
As of December 31, 2021						
Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	IRR (%)
North American Strategic Partners 2006	2006	\$4,539,998	\$4,411,659	\$2,094,251	\$27,121	7.1
Ironsides Partnership Fund IV	2015	\$2,500,000	\$1,343,006	\$989,308	\$2,524,347	36.7
Ironsides Direct Investment Fund IV	2015	\$2,500,000	\$2,419,534	\$2,368,492	\$2,293,059	20.1
Ironsides Partnership Fund V, L.P.	2019	\$2,000,000	\$656,851	\$0	\$887,209	--
Ironsides Direct Investment Fund V, L.P.	2019	\$2,000,000	\$2,425,558	\$242,967	\$3,024,167	28.4
HarbourVest 2019 Global Fund	2019	\$4,000,000	\$1,840,000	\$308,688	\$2,617,738	62.7
Total Account		\$17,539,998	\$13,096,608	\$1,815,203	\$11,373,642	

IRRs for investments less than 2 years are not shown.

IRRs are as of 9/30/2021.

Non-Marketable Securities Overview							
As of December 31, 2021							
Account Type	Account	Vintage Year	Commitment	Cumulative Takedown	Cumulative Distributions	Value (RV)	IRR (%)
Private Debt	NB Private Debt Fund IV	2021	\$5,000,000	\$2,500,000	\$0	\$2,500,000	--
	Total Account		\$5,000,000	\$2,500,000	\$0	\$2,500,000	

IRRs for investments less than 2 years are not shown.

Annual Investment Expense Analysis As Of December 31, 2021				
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Equity Assets		\$146,559,977		
Domestic Equity Assets		\$96,445,367		
RhumbLine S&P 500 Index	0.07% of First 25.0 Mil, 0.05% of Next 25.0 Mil, 0.04% Thereafter	\$35,051,165	\$22,526	0.06%
Frontier Capital Appreciation	0.79% of Assets	\$26,466,879	\$209,088	0.79%
RhumbLine HEDI	0.05% of Assets	\$34,927,323	\$17,464	0.05%
International Equity Assets		\$50,114,610		
International Developed Markets Equity Assets		\$28,025,890		
RhumbLine MSCI EAFE Index	0.08% of First 25.0 Mil, 0.07% of Next 25.0 Mil, 0.05% Thereafter	\$28,025,890	\$22,118	0.08%
International Emerging Markets Equity Assets		\$22,088,720		
DFA Emerging Markets	0.33% of Assets	\$11,233,716	\$37,071	0.33%
Driehaus Emerging Market Equity	0.90% of Assets	\$10,855,003	\$97,695	0.90%
Fixed Income Assets		\$66,605,623		
Investment Grade Bonds Assets		\$28,531,031		
SSgA U.S. Aggregate Bond Index	0.04% of Assets	\$28,531,031	\$11,412	0.04%
High Yield Bond Assets		\$21,700,647		
Shenkman Capital	0.45% of Assets	\$21,700,647	\$97,653	0.45%
TIPS Assets		\$10,585,750		
SSgA TIPS Index-NL	0.04% of Assets	\$10,585,750	\$4,234	0.04%
Emerging Market Debt Assets		\$5,788,196		
Payden Emerging Market Bond	0.69% of Assets	\$5,788,196	\$39,939	0.69%

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Real Estate Assets		\$9,452,199		
Open-Ended Real Estate		\$6,800,996		
Clarion Partners	1.10% of Assets	\$6,800,996	\$74,811	1.10%
Total Closed End Real Estate		\$2,651,203		
Rockwood Capital Real Estate Partners Fund XI, L.P.		\$2,651,203		
Private Equity Assets		\$11,373,642		
North American Strategic Partners 2006	0.8% on drawn and undrawn capital less investments sold or written off 5% carried interest, 8% preferred return	\$27,121		
Ironsides Partnership Fund IV	0% Management fee, 8% Preferred Return, 5% Carried Interest	\$2,524,347		
Ironsides Direct Investment Fund IV	0.5% Management fee, 8% Preferred Return, 15% Carried Interest	\$2,293,059		
Ironsides Partnership Fund V, L.P.		\$887,209		
Ironsides Direct Investment Fund V, L.P.	0.5% Management fee, 8% preferred return, 15% carried interest	\$3,024,167		
HarbourVest 2019 Global Fund	0.69% average annual management fee; 8.0% preferred return on secondary and direct investments and with corresponding carried interest of 12.5% on secondary and direct investments	\$2,617,738		
Private Debt Assets		\$2,500,000		
NB Private Debt Fund IV		\$2,500,000		
Cash		\$1,063,700		
Comerica Short Term Fund		\$1,063,700		
Total		\$237,555,143	\$634,011	0.27%

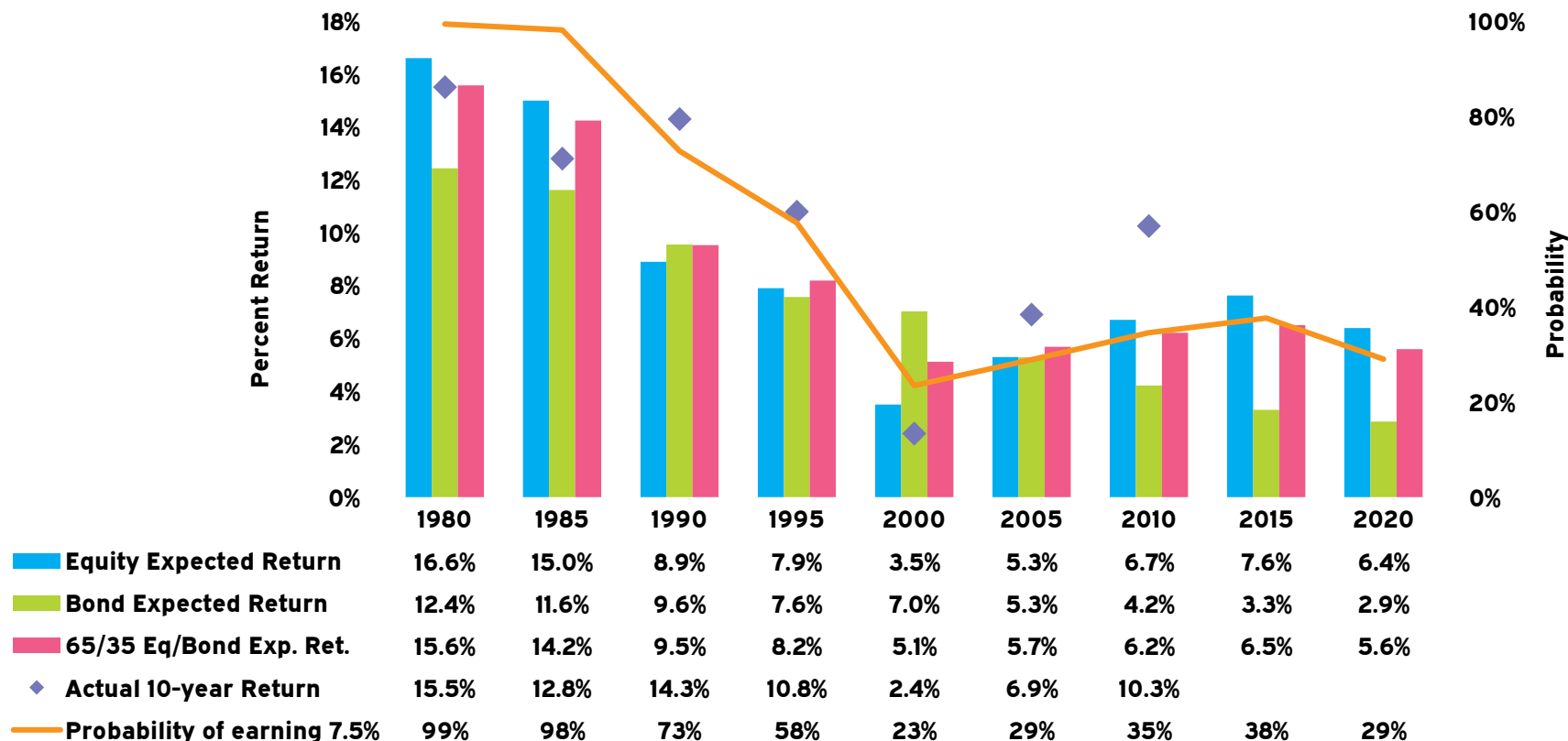
Asset Allocation Update

Overview

Introduction

- This document reviews recent changes in expected long-term return assumptions for the System.
- Over long periods of time, riskier assets, such as equities, are likely to produce relatively high rates of return. Consequently, higher allocations to risky assets increase the likelihood of the System achieving its long-term return expectations. However, riskier assets increase volatility in the short-term.
- The asset allocation review process highlights the natural tension between long-term goals and short-term risks and should allow the Fund to make more informed decisions regarding portfolio positioning.

The Secular Decline in Investment Returns¹



- The chart above illustrates that a portfolio comprising of 65% domestic stocks and 35% investment grade bonds has produced diminishing expected returns as well as actual returns over the past 30 years.

¹ Expected return assumptions for 1) Bonds equals the yield of the ten-year Treasury plus 100 basis points, and 2) Equities equals the dividend yield plus the earnings yield of the S&P 500 index (using the inflation-adjusted trailing 10-year earnings). Probability calculation is for the subsequent ten years.

What is Risk? Definition and Timeframe Matter

Time Frame	Asset Class	Risk Of:			
		Losing Money	Return Volatility	Failing to Achieve 7% Return Target	Failing to Pay Obligations
1 Year	Cash	Low	Low	High	Low
	Equities	High	High	Moderate	Low
20 Years	Cash	Low	Low	High	High
	Equities	Low	Moderate	Low	Low

- Mitigating short-term risk most often favors “conservative” investments, like cash.
- Mitigating long-term risk most often favors “aggressive” investments, like equities.
- The timeframe largely determines which types of strategies/assets best mitigate risk.

2022 Capital Markets Expectations

Updating our Capital Market Expectations

- Capital Markets Expectations are the inputs needed to conduct MVO.
 - MVO is the traditional starting point for determining asset allocation.
- Consultants (including Meketa) generally set them once a year.
 - Our results are normally published in January, based on December 31 data.
- Our process relies on both quantitative and qualitative methodologies.
 - There are numerous inputs, but interest rates and relative valuation levels are two of the most influential.
 - Our Investment Policy Committee vets the models' outputs and make judgment calls to make some changes, as they deemed prudent.

Rate Sensitive

	2022 E(R) (%)	2021 E(R) (%)	Δ From 2021 (%)
Cash Equivalents	1.7	1.1	0.6
Short-term Investment Grade Bonds	1.9	1.3	0.6
Investment Grade Bonds	2.4	1.8	0.6
Intermediate Government Bonds	1.9	1.4	0.5
Long-term Government Bonds	2.8	2.5	0.3
Mortgage Backed Securities	2.5	1.8	0.7
Investment Grade Corporate Bonds	3.0	2.3	0.7
Long-term Corporate Bonds	3.7	3.2	0.5
Short-term TIPS	1.9	1.4	0.5
TIPS	2.4	1.8	0.6
Foreign Bonds	2.3	1.7	0.6
<i>US Inflation</i>	<i>2.2</i>	<i>2.1</i>	<i>0.1</i>

- Investment grade fixed income credit strategies generally rose due to higher yields on both nominal and real bases.

Spread Fixed Income

	2022 E(R) (%)	2021 E(R) (%)	Δ From 2021 (%)
High Yield Bonds	4.4	4.2	0.2
Higher Quality High Yield	4.2	3.8	0.4
Bank Loans	4.0	4.0	0.0
Collateralized Loan Obligations(CLOs)	4.2	4.2	0.0
Emerging Market Bonds (major)	4.2	3.7	0.5
Emerging Market Bonds (local)	4.6	3.9	0.7
Private Debt	7.3	6.8	0.5

- Most fixed income credit strategies rose due to higher yields despite some spread tightening among high yield bonds.

Equities

	2022 E(R) (%)	2021 E(R) (%)	Δ From 2021 (%)
US Equity	6.8	6.8	0.0
US Small Cap	7.4	7.1	0.3
Developed Non-US Equity	7.5	7.1	0.4
Dev. Non-US Small Cap	7.4	7.0	0.4
Emerging Market Equity	8.4	8.1	0.3
Emerging Market Small Cap	8.2	8.2	0.0
Frontier Market Equity	8.7	8.9	-0.2
Global Equity	7.2	7.1	0.1
Low Volatility Equity	6.5	6.4	0.1
Private Equity	10.0	9.1	0.9

- In the US, gains in expected return from higher earnings rates was offset by increases of valuation levels.
 - The situation was generally reversed outside the US, with lower valuations boosting expected returns slightly more than lower earnings depressed them.

Real Assets

	2022 E(R) (%)	2021 E(R) (%)	Δ From 2021 (%)
Real Estate	7.4	6.9	0.5
REITs	7.1	7.2	-0.1
Core Private Real Estate	6.1	5.5	0.6
Value-Added Real Estate	8.1	7.7	0.4
Opportunistic Real Estate	9.6	9.2	0.4
Infrastructure	7.7	NA	NA
Infrastructure (Public)	7.4	7.4	0.0
Infrastructure (Core Private)	7.3	7.0	0.3
Infrastructure (Non-Core Private)	9.3	9.0	0.3

- For private real estate, the impact of flat or lowered capitalization rates and yields is offset by projected future interest rate increases.

Horizon 2021 Peer Survey

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.¹
- 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	1.2	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

¹ The 2021 survey included 39 respondents. The 10-year horizon included all 39 respondents, and the 20-year horizon included 24 respondents. Figures based on Meketa's 2021 CMEs.

Expected System Returns Over Time

Asset Allocation Policy Options

	Current Policy (2021 CME) (%)	Current Policy (2022 CME) (%)	Actual Allocation (2021 CME) (%)	Actual Allocation (2022 CME) (%)
Growth / Equity	65	65	67	67
US Equity	38	38	41	41
Developed Market Equity	12	12	12	12
Emerging Market Equity	10	10	9	9
Private Equity	5	5	5	5
Core Fixed Income (IG/TIPS)	12	12	17	17
Value-Add Fixed Income	11	11	12	12
Real Assets	12	12	4	4
Real Estate	7	7	4	4
Infrastructure	5	5	0	0
Cash	0	0	<1	<1
<i>Expected Return (20 years)</i>	7.0	7.0	6.6	6.6
<i>Sharpe Ratio</i>	0.41	0.37	0.39	0.35
<i>Standard Deviation</i>	14.4	14.4	14.1	14.1

- The System's expected return and risk has remained stable (the Sharpe ratio declined due to an increase in the risk-free rate).
 - These projections only include expected asset class returns with no allowance for excess manager performance.

MVO Risk Analysis

MVO-Based Risk Analysis

	Current Policy (2022 CME) (%)	Actual Allocation (2022 CME) (%)
Worst Case Returns		
One Year	-21.5	-21.3
Three Years (annualized)	-10.5	-10.6
Five Years (annualized)	-6.9	-7.0
Ten Years (annualized)	-3.0	-3.2
Twenty Years (annualized)	-0.2	-0.4
Probability of Experiencing Negative Returns		
One Year	30.6	31.3
Three Years	19.0	20.0
Five Years	12.9	13.8
Ten Years	5.5	6.2
Twenty Years	1.2	1.5

Next Steps

- The policy target expected return exceeds that of the current allocation.
 - This indicates that the asset allocation is moving in the right direction (ie, expected return is rising).
- The long-term expected return for the System is under the actuarial assumed rate.
 - This dynamic is not unusual for the System; historically it has maintained a lower expected rate of return but realized higher than anticipated performance through a combination of manager outperformance and outperformance of asset classes in the short term versus the long-term expectation (eg, U.S. equity).
 - Raising the expected return beyond 7% can be difficult given the relatively low number of asset classes with expected returns at or above that level.
- Two potential paths forward:
 - Maintain current targets and continue to implement portfolio, check next year to see if rising interest rates and changes in equity valuation close expected return gap.
 - Conduct new asset study this year.
 - Likely outcome is more exposure to high-return asset classes: private equity, non-US equity.

Appendices

Notes and Disclaimers

- 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.
- 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.

Driehaus Fee Reduction

Driehaus Fee Change

- Driehaus Capital Management manages a portion of the System's emerging market equity exposure.
 - The strategy makes up 49% of the EM equity portfolio and approximately 5% of the overall System's portfolio.
 - Driehaus has managed the assets since January 2015, returning 8.9% on average per year during the period versus a benchmark return of 6.1% during the same period.
- The System currently benefits from a relationship fee arrangement for Meketa clients, setting the management fee at 80 basis point with a 10 basis point expense cap.
 - After further discussion, Driehaus is offering to further reduce the management fee to 55 basis points.
- We recommend the System accept the fee change.
 - No other aspect of the investment will change aside from the System's share class holding of Driehaus's fund. The vehicle, assets, and strategy will remain the same.
 - The expense cap will remain 10 basis points.

SEARCH DESCRIPTION

The Board Members of the Marlborough Retirement System (hereinafter "Board") are seeking proposals from providers of master trust and custodial services. The Board seeks a provider of customary custody, accounting and recordkeeping services including but not limited to: standard reporting of holdings and transfers; providing required custody and accounting services for externally held investment accounts; reconciling assets and transfers with external parties including the System's auditors, investment managers, and the Public Employee Retirement Administration Commission ("PERAC").

This search will be conducted and any contract will be awarded in accordance with M.G.L. Ch. 32 and all applicable investment guidelines administered by the Public Employee Retirement Administration Commission ("PERAC"). The Board reserves the right to reject any and all proposals at its discretion.

Please see below for a listing of the System's current investment organization for your reference while preparing proposals.

Investment Style (# of portfolios)	Account Type(s)	Market Value
(\$mm)		
Cash	STIF	< 1
U.S. Equity (3)	Commingled (3)	60
International Developed Market Equity (1)	Commingled (1)	20
International Emerging Market Equity (2)	Commingled (2)	5
Investment Grade Bonds	Commingled (1)	40
U.S. TIPS (1)	Commingled (1)	20
High Yield Bonds (1)	Commingled (1)	15
Emerging Market Debt (1)	Commingled (1)	5
Real Estate (5)	Commingled (1)	5
	Limited Partnership (1)	2
Private Equity (3)	Limited Partnership (3)	5



Request for Proposal

Master Trust/Custody Services

Instructions

Please read instructions before completing this questionnaire.

1. Proposals must be received at the Board prior to 3:00 PM Eastern Standard Time on October 2, 2019 at the Board's offices.

Proposals or unsolicited amendments will not be accepted after the closing date and time.

2. Bidders mailing materials should allow adequate time to assure timely arrival. Bidders may correct, modify, or withdraw their proposals prior to the deadline only. Correction or modification must be in writing and must be admitted and received in the same manner as the original proposal. Requests to withdraw proposals must be in writing.
3. All questions and all blank space must be completed in precise detail. Blank or incomplete responses to applicable questions may preclude the proposal from consideration.
4. Please answer as N/A, should any question not be applicable.
5. Please forward one electronic copy (no physical copy is required) of your firm's Proposal to:

Margaret Shea
Director
Marlborough Retirement System
mshea@marlborough-ma.gov

Proposals must be directed solely to the Administrator.

6. Additionally, please send via e-mail an electronic copy to Meketa Investment Group at rfpresponse@meketa.com.

E-mail: rfpresponse@meketa.com
E-mail Subject: "2019 Marlborough RS Custody Search"

7. If deemed necessary by the Board, bidders may be selected for interview. Each bidder selected for an interview will be allotted sufficient time to orally present its proposal and to answer any questions that may be posed by the person(s) appointed by the Board to interview bidders. The bidders would be evaluated on the basis of the criteria set forth in this request for proposal.

Instructions (continued)

8. The Board reserves the right to make an award without interviews of the bidders. Therefore, the proposals should be submitted initially on the most favorable terms of both price and technical approach that the bidder can propose to the Board. The Board also reserves the right to reject at its sole discretion any and all proposals received, whether prior to or after the bidders' interviews. The Board shall have sole discretion in deciding which bidders, if any, will be considered and/or interviewed.
9. All bidders are hereby advised that any proposal selected shall be subject to (1) approval of the Board, (2) a written contract and (3) approval of the engagement by the Massachusetts Public Employee Retirement Administration Commission (PERAC). Failure to agree on mutually acceptable contract language will void the award of the proposed engagement to the selected bidder.
10. The Board shall have sole discretion in determining whether the parties are unable to reach agreement on the language of the written contract. Note that the Board may require that the contract contain mandatory contractual terms and language.
11. The proposal shall be signed by an official with the power to bind the bidder.
12. The Board reserves the right to waive certain requirements or other protections in the event that the Board deems it to be in its best interest.
13. The proposal shall contain a certification that the proposal has been submitted in good faith and without collusion or fraud with any other person; additionally, it shall contain a statement disclosing any outside marketing or other relationships that the firm may have. Additionally, four PERAC documents are required, the New Vendor Disclosures, New Vendor Contact Information form, Vendor Certification form, and the Placement Agent Statement. These may be obtained from the PERAC website: <http://www.mass.gov/perac/compliance-investments/compliance-forms/>. Bidders must submit three copies of the PERAC forms.
14. The Board reserves the right to waive any minor informalities.
15. With respect to the RFP, all answers should be in specific reference to the subject product/service.
16. All questions **and** all blank space must be completed in precise detail. Blank or incomplete responses to applicable questions may preclude the proposal from consideration. Please answer as N/A, should any question not be applicable.



Request for Proposal

Master Trust/Custody Services

Minimum Criteria Certification

If you do not satisfy all of the minimum criteria, please do not respond to this RFP

Bidders must meet all of the following minimum criteria. Failure to satisfy any of the minimum criteria will result in the disqualification of the bidder. Please respond to each of the following by initialing the "YES" response to certify that you do meet the minimum criteria.

1. The proposed contract will not have a total term to exceed seven (7) years and the contract may be terminable by the Board prior to expiration given a reasonable notice period. _____ Yes
2. The firm has filled out and attached the four required PERAC forms.
(See <http://www.mass.gov/perac/compliance-investments/compliance-forms/>) _____ Yes
3. If selected, the Firm is willing and able to include the mandatory contractual terms and conditions into the contract, as required under Massachusetts General Laws Chapter 32, as amended by Chapter 176 of the Acts of 2011. _____ Yes

Certified and Initialized by:

Name Title Date

Organization background

1. Please list the name of the firm, headquarters address, address of servicing office as well as contact information for an individual responsible for responding to inquiries regarding this Proposal.
2. Provide a brief history of your Master Trust/Custody organization including the year the firm was founded and how it has evolved over time.
3. Please disclose the ownership structure of the firm, providing details on the number of owners and distribution of ownership among them if applicable (i.e., not publicly traded). Do you anticipate any changes to the ownership structure?
4. Please summarize your Master Trust/Custody Department's long-term strategy for business development.
5. Please describe any organizational changes (mergers, acquisitions, alliances) of the past two years that have affected your Master Trust/Custody operations. Specifically, what adjustments have or are occurring because of these organizational changes?
6. Please list your current credit rating by Moody's or S&P. In addition please list the percentage of Tier 1 capital.
7. Briefly summarize your firm's competitive advantages within the Master Trust/Custody industry.
8. What percentage of total corporate earnings did your Master Trust/Custody Department contribute to your organization each year over the last five years?
9. Please indicate your organization's quantity of relationships (total number of clients) and assets (market value) in each of the Master Trust/Custody areas. Of these combined assets, what proportion and asset base are represented by Public Fund clients?
10. Please indicate how your firm maintains its independence.
11. Does any foreign entity have any control or financial interest in your organization? If so, please identify and describe the relationship.

12. What was the custodial client turnover (gains and losses) of your firm over the last three years?
13. How many clients do you serve that have asset sizes similar to those of the Fund described?
14. How many clients do you serve are Massachusetts public retirement systems? What is the total of their assets under custody? When did you first begin servicing accounts for Massachusetts public retirement systems
15. Does your firm consider itself to be a fiduciary with respect to the services provided? Is this stated in writing within your contract, and if so, how is it stated specifically?
16. Do you provide reporting for ASC 820 (previously FAS 157) disclosure requirements?
17. Describe what limitation of liability, if any, your company imposes through its contract.
18. Are there any potential conflicts of interest that may be created by awarding the contract to your firm? If yes, please explain.
19. Please describe any relationships your organization has with other business organizations, including major subsidiaries belonging to the same parent company or joint ventures with other firms. Is your firm related by ownership or formal business agreement to any provider of brokerage, consulting and/or research services? If yes, please explain.
20. Please provide a brief description of any past (last 10 years) or pending regulatory action, litigation or other legal proceedings involving your Master Trust/Custody Department or any registered employees and/or principals.
21. Please provide a brief description of any past (last 5 years) or pending regulatory action, litigation or other legal proceedings involving your parent organization, other subsidiaries and affiliates or their registered employees and/or principals.
22. Please attach a sample client contract, with all addenda and attachments.

23. Please state the face amount and provide copies of all insurance policies (E&O, Fiduciary Insurance, Fidelity Bonding, and other insurance policies).

24. Please provide a copy of your firm's most recent SOC1 report

IV. Diversity and Inclusion

1. Do you provide annual reporting of diversity statistics to the following recipients: (Y/N)

Clients	
Prospects	
Regulators	
Consultants	

2. Does the Firm have a formal Diversity and Inclusion policy or initiative?

Please provide details of the relevant policies and initiatives. If there is no formal D&I policy, please provide details of active D&I practices.

- a) Yes ☐
- b) No ☐
- c) Due to be implemented within the next 12 months ☐

If yes, please enter the policy below:

3. Does the Firm have a Diversity and Inclusion Committee or Group within the organization, empowered to effect best practices?

- a) Yes ☐
- b) No ☐
- c) Due to be implemented within the next 12 months ☐

Comment:

4. Does the Firm have policies or practices in place to ensure that equal pay is provided for equal performance in equivalent roles regardless of gender and minority categorization?

Please provide details of the relevant policies, practices and available pay equity analyses.

- a) Yes ☐
- b) No ☐
- c) Due to be implemented within the next 12 months ☐

Comment:

5. Does the Firm engage with organizations or programs that promote the recruitment and retention of women and/or minorities?

Please provide a list of relevant organizations and programs.

6. Does the Firm have a formal mentorship, sponsorship or employer affinity program for women and/or minorities?

Please provide details of the Firm's relevant programs.

7. Does the Firm define goals and measure diversity outcomes at all levels of the organization, across all departments, and is compensation tied to the achievement of these goals?

Please provide details of the relevant goals.

8. What are you doing today to expand inclusion among firm owners over the next five years? How do you measure that and how do you keep yourselves accountable?

9. Does your senior leadership advocate for D&I initiatives within the investment industry?

Please provide details of D&I advocacy.

10. What if any actions has your firm taken over the last year, or do you plan to take, to combat racism and sexism in the investment management industry?

11. When selecting service providers, does the Firm assess each provider's D&I policies or practices?

Please provide details of D&I assessment of service providers.

- a) Yes ☐
- b) No ☐

12. Do you utilize MWDBE investment banks for capital markets services, mergers and acquisitions services and/or other advisory services?

If yes, please provide a list of MWDBE owned providers utilized.

- c) Yes ☐
- d) No ☐

13. Does the Firm have a Code of Conduct that addresses harassment, discrimination and/or workplace violence in and/or outside of the workplace?

Please provide a summary or a copy of the relevant Code of Conduct.

- a) Yes ☐
- b) No ☐
- c) Due to be implemented within the next 12 months ☐

Comment:

14. Does the Firm have procedures in place for the anonymous reporting and investigation of harassment, discrimination and/or workplace violence?

Please provide details of the relevant procedures, including how regularly they are reviewed.

- a) Yes ☐
b) No ☐
c) Due to be implemented within the next 12 months ☐

Comment:

15. Does the Firm provide mandatory anti-harassment and non-discrimination training to all employees or managers only?

Please provide details of the relevant training, including how regularly training is provided.

- a) Yes - all employees ☐
b) Yes - managers only ☐
c) No ☐
d) Due to be implemented within the next 12 months ☐

Comment:

Client Servicing Capabilities

1. Describe your approach to client service. Include a discussion of the procedures relative to client interaction. Does each client have a primary contact to whom all inquiries are directed? What coverage is provided if those responsible for an account are unavailable?

2. Describe the organizational structure of your Master Trust/Custody Department, including an organizational chart and the total number of employees in each area. Discuss how different teams/departments within the Master Trust/Custody Department work with each other. If your organization uses multiple office locations please include a description of how the different locations interact with each other.

3. Discuss the minimum level of education or experience required of employees in your Master Trust/Custody Department. Describe on-going and new-employee training program(s). What has the level of turnover in the Master Trust/Custody Department been over the last 5 years?

4. Describe the roles and number of people who would be assigned to this account, their total years in the industry, their total years with your organization and their total number of years in custody if different from organization. Where would they be located? To how many client accounts would this team be assigned? Does the proposed team have experience with Massachusetts public retirement systems?

5. Do you have programs in place designed to retain key personnel? If so, describe.

6. Will you be subcontracting any of the work described in these specifications? If so, explain.

7. Describe quality control/internal audit programs you have within your Master Trust/Custody Department. How are clients reports audited and how often prior to finalization/dissemination? How often is the Department audited by outside organizations.

8. How do you monitor client satisfaction?
9. In what ways do you distinguish yourself from other Master Trust/Custody providers in the area of client relations?
10. Do you have a dedicated Master Trust/Custody legal staff?
11. Do you provide any training or other educational media to your clients?
12. How often will the client service officer meet with the client at the Board's offices or meetings?
13. Will specific members of your staff be assigned to this account? If so, please provide their names, educational and experience backgrounds as well as their current number of clients serviced and maximum number of clients serviced.
14. Do you have a disaster recovery program in place? If so, describe in detail.
15. Describe the time requirement and termination charges (if any) required by your firm if your services are terminated.

Systems and Data-Processing

1. Discuss the hardware and software systems that support your Master Trust/Custody Department.
2. How long has the current software been in place? When was the most recent major change/enhancement to the systems that support your Master Trust/Custody capabilities? Are the systems batch-oriented or real-time?
3. Was the software developed in-house? Do you have a data-processing staff in-house? How many persons actually support your system?

4. What major enhancements are planned at this time?
5. What are your annual budgets for the last three years for systems enhancements/upgrades in the Master Trust/Custody areas?
6. Is your data-processing equipment shared with other departments? If so, what is the priority level for Master Trust/Custody?
7. Describe the data-processing cycle for creating monthly and annual reports and provide sample copies of these reports. Indicate the frequency with which each report is generated and the number of business days following the end of a reporting period upon which it is distributed.
8. Do you have the ability to generate reports that reflect PERAC accounting? What is your experience with PERAC reporting? Please provide samples of such reporting.
9. What system security measures do you have in place?
10. How do you handle reporting or software programming needs specific to one client? Include a discussion of any cost implications. What is the approximate time frame within which client-specific needs are met?

On-Line Services

1. Do you offer an on-line reporting service for clients and their advisors (investment managers, consultants, auditors, etc.)? If yes, how current is the information? What are system support availability hours?
2. In what formats is data available? With which commercial software programs is your data compatible?
3. Can users access your system through Microsoft Windows?
4. What are your e-mail/internet capabilities with respect to client data retrieval?
5. What E-mail/internet security measures do you have in place?

6. Can non-standard reports be created by users with your on-line software? Does your system have a user-friendly report writer?
7. What client training do you provide for utilizing your on-line system?
8. Does your system provide on-line help?
9. Please provide sample copies of user manuals and documentation.

Accounting and Reporting

1. Provide a complete description of your accounting system.
2. Are your reports on a trade date, settlement date, or cash basis? Are all versions available?
3. Do asset valuations include accrued income and dividends, as well as all pending transactions?
4. How do you report interest and dividend income? How are interest and paydowns for pass-through securities reflected?
5. Can you capture and report brokerage commissions generated by a money manager?
6. How do you report on illiquid investments (i.e. real estate, private equity)?
7. How long is your data retention period?
8. Describe the daily, weekly, monthly, quarterly, and annual reporting timetables to which your organization would commit.
9. Do you provide book and market value reconciliations? How often?

10. Describe your procedures for notifying investment managers of transactions and cash balances available for investment.
11. What procedures are used to verify the accuracy and completeness of dividend and income receipts?
12. Where is your accounting group located?

Asset Safekeeping

1. Describe your system for registration and custody of assets, including depositories used.
2. Describe your procedures for securities settlement and clearance. How and where are physical settlements transacted?
3. How do you track the accuracy in your custody and clearing area?
4. Describe your safekeeping facilities.
5. If securities are lost or damaged, do you obtain replacement securities?
6. Please provide the following information concerning pricing:
 - a. What is the source of your pricing data for equity and fixed income securities? Include pricing sources for foreign assets and currencies.
 - b. What procedures do you have in effect, if any, to identify and investigate unusual or significant pricing changes?
7. How do you handle information on corporate activities (i.e., tender offers, exchange offers, splits, etc.)?
8. Describe how you monitor and distribute proxy information. Also, please note whether proxy voting services are included in your cost proposal.

9. Briefly describe your global custody capabilities, highlighting those items which set you apart from your competition.
10. For each country where you provide custody services, list your custodial agent bank and the year the current relationship began.
11. What selection criteria do you use to select your global sub-custodians? Please describe how you ensure that sub custodians provide the highest level of reporting and service to your clients. Also, discuss whether clients have transparency into the sub custodian relationships and underlying reporting.
12. Please discuss whether your firm is willing to take on the burden/liability of filing on behalf of clients for either sub-custodial documentation or foreign taxes. If not, please describe the process for ensuring this documentation takes place.
13. Outside of the United States, do you use any central depository facilities? Are they used for international clearing?
14. How are trade settlements communicated?
15. Describe your ability to handle foreign exchange transactions. Please discuss transparency with respect to FX and trade data, especially in light of recent issues surrounding this topic.
16. Do you execute foreign exchange transactions pursuant to best execution standards for the client's benefit or do you derive profit from foreign exchange transactions you execute above your stated fixed fee for consummating the transactions and, if so, in what amount or percentage per transactions?
17. Do you provide real time reporting on FX trades, with spreads and costs clearly articulated? Do you provide "time-stamped" data?
18. Do you have an accrual accounting system for global custody?
19. How do you handle tax reclaim processing?

20. Are accounting and reporting capabilities available in both local currency and in U.S. dollars? Please describe.
21. Do your standard reports include a report of trades pending settlement? Is there a standard report of all pending transactions? Is there a standard report of pending tax reclaims?
22. How long have you used your current global accounting software? What major enhancements have you made in the last three years?
23. Describe your global cash management services.

Foreign Exchange Transactions

1. Within international separate account portfolios, what is your pricing policy and procedures for competitive and auto-repatriated foreign-exchange trades (i.e. dividends, interest, etc.)?
2. How does your firm monitor and evaluate the execution of the local "sub-custodian" foreign-exchange executions. Please elaborate on how these sub-custodians are held to the same standards as your firm with respect to execution. Do you assume the liability, and indemnify the client, for sub-custodians?
3. What area handles foreign exchange contracts within your organization? Have there been any recent personnel changes with regards to senior management?
4. Are investment managers given a choice to as to whether or not they want use the custodian for foreign contracts?
5. Are any penalties in place for executing trades outside of the custodian bank?
6. When a foreign contract request is initiated by the manager do you execute the contract right away or will the request become part of a batch process to be executed at a later time?
7. How are the rates which foreign contracts are executed, arrived at?

8. Do you track your execution relative to the daily average for each currency? Is this information available to clients and consultants?
9. What is the cost associated with a foreign exchange contract? Is there a flat fee or is the cost embedded in the spread?
10. Are there any countries with which you will not process a foreign currency exchange contract with?
11. Can you confirm compliance with the foreign laws, including the Foreign Corrupt Practices Act?

Transition Plan

1. Describe a proposed custodian transition process and timetable.
2. Describe the factors that could change the proposed transition process and timetable.
3. What specific technical and human resources would you provide during the conversion?
4. Please discuss the transition notification period required for terminating a current securities lending program, and implementing a new program.

Cash Management

1. What short-term investment vehicles do you offer for tax-exempt use? What are the respective fees?
2. Describe, in detail, your buy/sell fail procedures. Are dollar amounts "netted" together?
3. If your client is in a net buy fail position, how are the related cash monies handled?
4. How are overdrafts handled? Do client-level "daylight" overdrafts occur? What are the charges if any for an overdrawn position?

5. Do you have the ability to forecast available cash? If yes, how far out into the future?
6. Did any of your organization's short-term investment vehicles "break the buck" in the past five years? If so, what was your firm's response to clients who may have suffered losses (realized or unrealized) and were any capital support programs offered by your organizations?

Securities Lending (if applicable)

1. In what year did you first offer securities lending?
2. How many clients currently participate in securities lending? What is the dollar size of your securities lending pool?
3. How do you protect against excess risk and loss? Describe with specific details any indemnification provisions related to borrower default and/or collateral impairment.
4. Describe your policy for screening borrowing counterparties.
5. Please provide a current list of the borrowing counterparties approved for lending.
6. How many borrowing counterparties on your approved list are actually used (i.e., does 75% of your lending actually go to a small number of counterparties)?
7. What is the maximum loan made to a single borrowing counterparty?
8. What percentage of collateral do you require? Please list requirements for various types of securities if applicable. Do you require collateral to cover both market value and accrued income?
9. What forms of collateral do you accept? If you accept non-cash collateral, please describe how it is managed.
10. What is the credit quality of your collateralized pool? Please provide liquidity (e.g., WAM/WAL) and yield characteristics as well

11. Describe the procedures and the frequency of marking collateral to market.
12. How is the collateral invested? Please describe general investment approach as well as risk mitigation strategies.
13. For direct lending services do clients have a choice of collateral pools? If yes, please provide a factsheet or prospectus for each pool.
14. Have you ever experienced any impairments to your collateral pools? If so, how was this handled?
15. Describe the allocation system used in determining which clients' securities are loaned.
16. What lending reports are made available to clients?
17. Do you offer international lending? If yes, please describe.
18. What percentage of the income generated from securities lending is shared with your clients?
19. Given the summary of the investment program enclosed with this Request for Proposal, what would be the approximate annual income generated by your securities lending program?

Performance Measurement and Analytical Services

1. Describe the performance evaluation services you presently offer, including attribution analysis reports.
2. Describe the internal infrastructure used to provide these services (i.e., organizational hierarchy, resources, etc.).
3. Describe the methodology used to calculate performance measurement.
4. Can you compare managers' rates of return to a substantial universe of similar portfolios?

5. Do you adjust market values used in performance calculations for accruals?
6. Describe any reports you have which analyze equity or fixed income portfolio holdings. Are these reports available for aggregates of portfolios?
7. What are the sources of your performance measurement and manager analytic information?
8. List all market indices available.
9. How often and how soon are performance measurement reports available?
10. Do you provide broker trade analysis? Can you provide information identifying commission and implicit execution costs by broker, and by portfolio? Please describe your capability in this area in detail.
11. Provide a sample of the performance measurement information that you normally send to your clients.
12. Can you backload prior years' monthly performance data? If yes, please describe and give the number of years of data that can be backloaded.
13. Describe your procedures for auditing rates of return calculated.
14. What is your procedure for calculating performance for periods that contain large cash flows? (>10% of market value)
15. How do you process private market investments (i.e. private equity, private real estate & infrastructure) that are reported on a lagged basis?
16. Do you have any other significant performance measurement or analytic services not addressed in the above questions?

Benefit Disbursements and Payments

1. Do you provide benefit payment services? How long have you provided such services?
2. What system and software is used for benefit payments?
3. Please describe methods available to make disbursements (e.g., ACH, wire, paper check, etc.).
4. Do you provide lump-sum payments as well as monthly payments? What are the frequencies of check disbursements? When is the Fund charged for payments?
5. How quickly can you respond to time-sensitive disbursement requests (e.g., hardship withdrawals)?
6. Describe your procedures for controlling outstanding checks.
7. Do you provide federal and state income tax withholding?
8. Do you offer a direct deposit option?
9. Can your system provide a monthly benefit check register which lists the amounts paid to each participant and the various withholding taxes (state, federal, etc.)? Please describe your ability to provide check registers via electronic media (e.g., CD ROM, diskette).
10. Please describe in detail the tax reporting you provide to sponsors and to benefit payment recipients.
11. Do you have an on-line system for direct input of benefit data by the client? Is the system capable of interfacing directly with client pension administration and recordkeeping systems?

Asset Transitions/Management

1. Describe your capabilities with respect to assisting clients in implementing significant asset transitions/restructurings.
2. Do you offer internal trade crossing/swapping opportunities to help clients achieve low-cost transitions between managers? If so, what was the volume of internal crosses/swaps executed during 2018, 2017, 2016, 2015, 2014?
3. Please provide an overview of investment products offered by your organization to qualified plans. What advantages, if any, are associated with client utilization of these products relative to other vehicles?

Class Action Filing Services

1. Describe your capabilities with respect to assisting clients in filing claims on behalf of the class actions.
2. Please explain how fees are charges with regards to filing claims on the client's behalf as well as an estimated fee range.
3. Please outline the 3rd party audit services on class action filings. Are these costs borne by the custodian bank, or the client? If there is a choice, please detail how many clients utilize each option currently.

Bankruptcy Filings

1. How do you handle bankruptcy filings and the subsequent monitoring of the filings?

References

1. Please provide a list of clients that have converted to your organization in the past twelve months, including the dates of conversion.
2. Indicate the numbers of Public Funds and their assets under custody you organization currently services.
3. Please list the five investment managers who have the largest market values under your custody.

4. Please list clients that have departed your organization in the past twelve months, including dates of leaving.
-
5. Please list five references for clients with similar structures and sizes to this Fund, and that utilize any services you provide that support this structure (i.e., multiple sponsors/plans with a commingled investment pool) with at least three of these references utilizing the same client service team you are proposing for this mandate. For how long has each been a client of your organization?
-
- a. Please list three references specifically who are Massachusetts public plans (if applicable)
-
6. Please list estimated fees for compliance monitoring.
-

Estimated Fees

(Please Send Under Separate Cover)

Estimated Fees

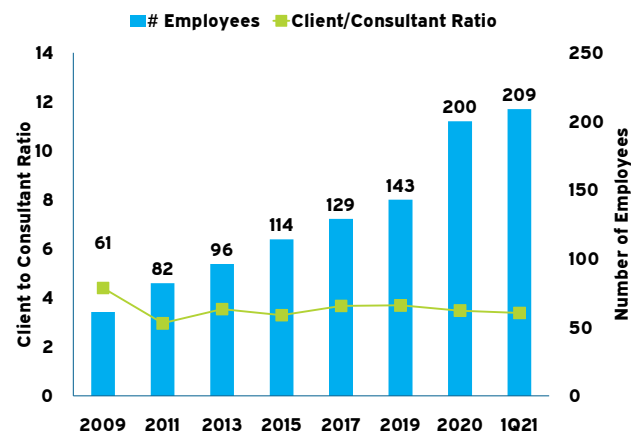
1. Every Master Trust/Master Custody provider has a different fee structure. To help us evaluate your response please quote **unbundled** fees for the services referenced, and fees for any service packages that may be appropriate. Please fill out the attached fee spreadsheet and be as specific as possible with regards to *all* services covered by this Request for Proposal, including your fees for:
 - a. Separate account portfolios (domestic equity, foreign equity, fixed income);
 - b. Commingled accounts;
 - c. Line item accounts;
 - d. Limited Partnership accounts;
 - e. Third Party Mutual Fund Transactions;
 - f. Minimum Annual Fee (if applicable);
 - g. Check Distributions, including lump sums;
 - h. Wire outs, ACH;
 - i. Options/Futures;
 - j. Assets under custody;
 - k. Transactions/settlements for domestic, foreign (DTC, FED, Physicals, Mortgage Paydowns, etc);
 - l. On-line data access;
 - m. Analytic and performance reports and services;
 - n. Expense ratio for short-term investment vehicle;
 - o. Securities lending: collateral pool fee; revenue split
 - p. All other services and fees (please provide specific details of each)
2. Are you willing to offer a flat fee structure? If so, what fee would you propose?
3. Are you willing to guarantee your fees for a fixed number of years?
4. Do the fees stated above include all services required to be performed as described in this Proposal?
5. Please describe your billing policy.

Appendices

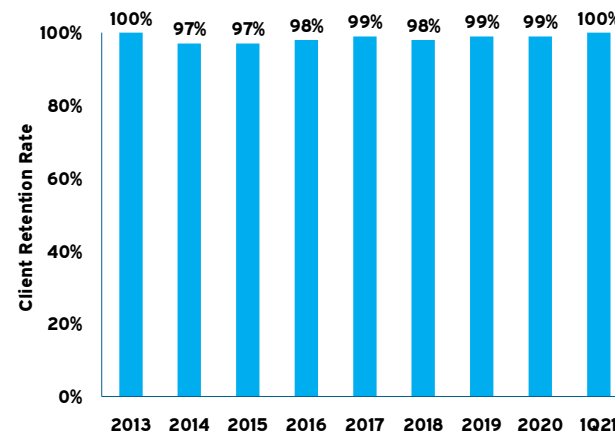
Meketa Investment Group Corporate Update

- Staff of 215, including 142 investment professionals and 43 CFA Charterholders
- 220 clients, with over 350 funds throughout the United States
- Significant investment in staff and resources
- Offices in Boston, Chicago, Miami, New York, Portland (OR), San Diego, and London
- We advise on \$1.6 trillion in client assets
 - Over \$125 billion in assets committed to alternative investments
 - Private Equity ■ Infrastructure ■ Natural Resources
 - Real Estate ■ Hedge Funds ■ Commodities

Client to Consultant Ratio¹



Client Retention Rate²



Meketa Investment Group is proud to work for over 5 million American families everyday.

¹ On March 15, 2019, 31 employees joined the firm as part of the merger of Meketa Investment Group and Pension Consulting Alliance.

² Client Retention Rate is one minus the number of clients lost divided by the number of clients at prior year-end.

Asset Classes Followed Intensively by Meketa Investment Group

Domestic Equities	International Equities	Private Equity	Real Assets	Fixed Income	Hedge Funds
- Passive - Enhanced Index - Large Cap - Midcap - Small Cap - Microcap - 130/30	- Large Cap Developed - Small Cap Developed - Emerging Markets - Frontier Markets	- Buyouts - Venture Capital - Private Debt - Special Situations - Secondaries - Fund of Funds	- Public REITs - Core Real Estate - Value Added Real Estate - Opportunistic Real Estate - Infrastructure - Timber - Natural Resources - Commodities	- Short-Term - Core - Core Plus - TIPS - High Yield - Bank Loans - Distressed - Global - Emerging Markets	- Long/Short Equity - Event Driven - Relative Value - Fixed Income Arbitrage - Multi Strategy - Market Neutral - Global Macro - Fund of Funds - Portable Alpha

Disclaimer, Glossary, and Notes

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CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM," "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

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. $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} \times (\text{market return} - \text{Risk Free Rate})]$.

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.