MEKETA | 45 YEARS
CELEBRATING A MILESTONE

Plymouth County Retirement Association

April 25, 2023

Meeting Materials

Agenda

1. Estimated Retirement Association Performance As of March 31, 2023
2. Performance Update As of February 28, 2023
3. Current Issues
    - Overlay Strategies
4. Appendix
    - Disclaimer, Glossary, and Notes

Estimated Retirement Association Performance
As of March 31, 2023

Estimated Aggregate Performance[1]

	March[2] (%)	QTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Total Retirement Association	-0.6	1.3	-3.4	13.4	6.4	7.0

Benchmark Returns

	March (%)	QTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
Russell 3000	2.7	7.2	-8.6	18.4	10.4	11.7
MSCI EAFE	2.5	8.5	-1.4	13.0	3.5	5.0
MSCI Emerging Markets	3.0	4.0	-10.7	7.8	-0.9	2.0
Bloomberg Aggregate	2.5	3.0	-4.8	-2.8	0.9	1.4
Bloomberg TIPS	2.9	3.3	-6.1	1.8	2.9	1.5
Bloomberg High Yield	1.1	3.6	-3.3	5.9	3.2	4.1
JPM EMBI Global Diversified (Hard Currency)	1.0	1.9	-6.9	0.0	-0.6	2.0
S&P Global Natural Resources	-1.1	0.6	-5.0	27.7	7.8	5.1

Estimated Total Assets

	Estimate
Total Retirement Association	1,304,696,814

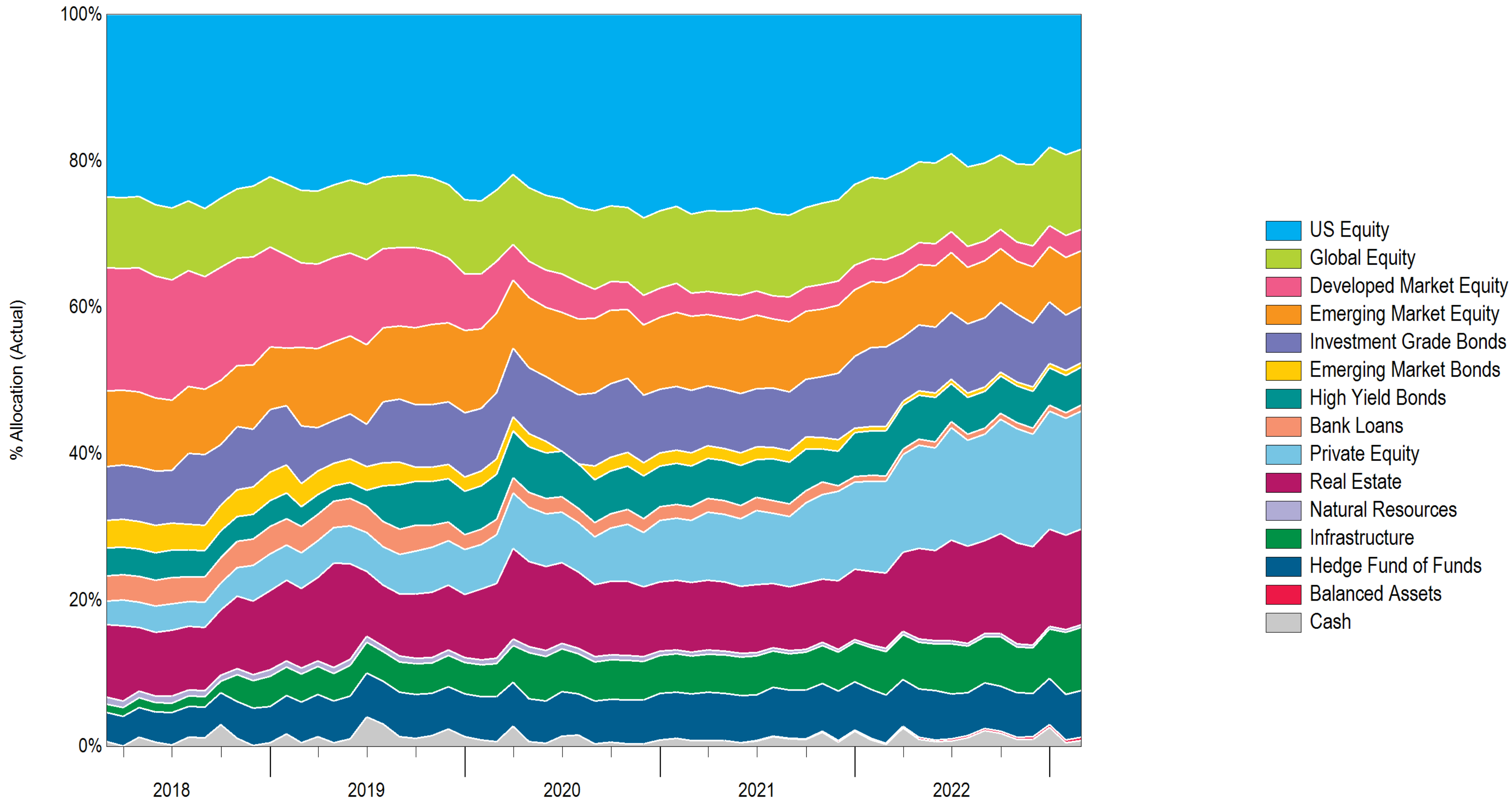
[1] The March performance estimates are calculated using index returns as of March 31, 2023 for each asset class. No performance estimate was included for private equity, real estate, infrastructure, and private natural resources asset classes.
[2] As of March 31, 2023.

Performance Update
As of February 28, 2023

Allocation vs. Target	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Domestic Equity	$241,400,573	18%	26%	21% - 36%	No
International Developed Market Equity	$38,944,123	3%	6%	1% - 16%	Yes
International Emerging Market Equity	$100,387,243	8%	10%	5% - 20%	Yes
Global Equity	$143,628,667	11%	10%	5% - 20%	Yes
Core Bonds	$100,241,747	8%	9%	4% - 14%	Yes
Value-Added Fixed Income	$86,474,915	7%	6%	2% - 12%	Yes
Private Equity	$216,788,423	17%	13%	4% - 18%	Yes
Real Estate	$171,754,235	13%	10%	5% - 15%	Yes
Real Assets	$118,157,481	9%	6%	2% - 10%	Yes
Hedge Fund of Funds	$83,792,568	6%	4%	2% - 8%	Yes
Cash	$11,032,272	1%	0%	0% - 3%	Yes
Total	**$1,312,602,247**	**100%**	**100%**		

	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Total Equity	$800,283,324	61%	69%	60% - 80%	Yes
Total Fixed Income	$186,716,662	14%	15%	5% - 25%	Yes
Total Real Assets and Real Estate	$314,569,988	24%	16%	7% - 25%	Yes
Cash	$11,032,272	1%	0%	0% - 3%	Yes

Asset Allocation History
5 Years Ending February 28, 2023



Asset Class Net Performance Summary

	Market Value ($)	% of Portfolio	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Retirement Association (1)	**1,312,602,247**	**100.0**	**-1.5**	**1.9**	**-0.6**	**9.5**	**6.4**	**7.3**	**7.8**	**Nov-89**
Policy Benchmark (Net) (2)			*-2.0*	*2.2*	*-7.8*	*6.2*	*5.1*	*6.7*	*--*	*Nov-89*
Actual Allocation (Net)			*-1.6*	*1.8*	*-8.3*	*5.8*	*4.3*	*--*	*--*	*Nov-89*
Domestic Equity Assets	**241,400,573**	**18.4**	**-1.8**	**6.8**	**-6.8**	**12.9**	**9.6**	**--**	**11.8**	**Jan-16**
Russell 3000			*-2.3*	*4.4*	*-8.1*	*11.8*	*9.4*	*11.9*	*11.4*	*Jan-16*
International Developed Market Equity Assets	**38,944,123**	**3.0**	**-3.0**	**4.7**	**-7.5**	**1.7**	**-2.0**	**--**	**2.4**	**Jan-16**
MSCI EAFE			*-2.1*	*5.8*	*-3.1*	*6.8*	*2.6*	*4.8*	*5.2*	*Jan-16*
International Emerging Market Equity Assets	**100,387,243**	**7.6**	**-5.3**	**1.5**	**-15.0**	**2.1**	**-1.8**	**--**	**4.7**	**Jan-16**
MSCI Emerging Markets			*-6.5*	*0.9*	*-15.3*	*1.0*	*-1.9*	*1.5*	*5.2*	*Jan-16*
Global Equity Assets	**143,628,667**	**10.9**	**-3.1**	**2.6**	**-3.5**	**9.8**	**6.3**	**--**	**5.3**	**Feb-18**
MSCI ACWI			*-2.9*	*4.1*	*-8.3*	*8.8*	*5.8*	*7.9*	*4.8*	*Feb-18*
Core Fixed Income	**100,241,747**	**7.6**	**-1.5**	**0.8**	**-6.7**	**-1.7**	**1.4**	**--**	**1.8**	**Jan-16**
75% Bbg Aggregate/25% Bbg US TIPs 1-10 year			*-2.2*	*0.3*	*-9.0*	*-2.5*	*1.1*	*1.2*	*1.3*	*Jan-16*
Value Added Fixed Income	**86,474,915**	**6.6**	**-1.1**	**2.0**	**-4.0**	**0.9**	**2.1**	**--**	**4.2**	**Jan-16**
Custom Benchmark - Global Fixed Income (3)			*-1.5*	*1.6*	*-6.3*	*-0.8*	*1.5*	*2.4*	*3.4*	*Jan-16*
Hedge Funds	**83,792,568**	**6.4**	**-0.6**	**1.0**	**-12.8**	**-1.1**	**0.4**	**3.2**	**3.4**	**Feb-10**
Custom Benchmark			*-0.3*	*0.7*	*-3.1*	*4.2*	*3.1*	*3.5*	*3.1*	*Feb-10*
Real Estate (4)	**171,754,235**	**13.1**	**-0.3**	**-0.4**	**13.0**	**15.2**	**12.9**	**--**	**9.8**	**Jan-16**
Custom Benchmark			*0.0*	*0.0*	*7.5*	*9.9*	*8.9*	*--*	*7.5*	*Jan-16*
Private Equity (5)	**216,788,423**	**16.5**	**0.0**	**0.0**	**18.9**	**25.7**	**17.4**	**--**	**13.4**	**Jan-16**
MSCI ACWI IMI (1Q Lagged)+2%			*0.0*	*0.0*	*-19.6*	*5.7*	*6.2*	*9.4*	*9.2*	*Jan-16*
Real Assets (6)	**118,157,481**	**9.0**	**-0.1**	**0.3**	**12.6**	**11.0**	**7.6**	**--**	**4.2**	**Jan-16**
CPI + 3%			*0.8*	*1.9*	*9.2*	*8.3*	*7.0*	*5.7*	*6.5*	*Jan-16*
Cash and Cash Equivalent	**11,032,272**	**0.8**								

(1) Effective January 1, 2023, asset class and total plan performance is rolled up using a weighted average calculation.

(2) The custom benchmark is comprised of 26% Russell 3000/ 6% MSCI EAFE/ 10% MSCI Emerging Markets/ 13% MSCI ACWI IMI (Lagged) + 2%/ 10% MSCI ACWI/ 4% Hedge Funds Custom Benchmark/ 9% (75/25 Barclays Aggregate and Barclays Tips 1-10yr)/ 6% Value Added FI Custom Benchmark/ 10% (80/20 NCREIF ODCE and Wilshire REIT)/ 6% CPI+3%

(3) The Custom Benchmark - Global Fixed Income is comprised of 25% BBgBarc/ US High Yield, 25% / Credit Suisse Leveraged Loans / 25% JP Morgan EMBI Global diversified / and 25% BBgBarc Multiverse TR

(4) The market value and performance is one quarter lagged.

(5) The market value and performance is one quarter lagged.

(6) The market value and performance is one quarter lagged.

Trailing Net Performance

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Retirement Association	**1,312,602,247**	**100.0**	**--**	**-1.5**	**1.9**	**-0.6**	**9.5**	**6.4**	**7.3**	**7.8**	**Nov-89**
Policy Benchmark (Net)				*-2.0*	*2.2*	*-7.8*	*6.2*	*5.1*	*6.7*	*--*	*Nov-89*
Actual Allocation (Net)				*-1.6*	*1.8*	*-8.3*	*5.8*	*4.3*	*--*	*--*	*Nov-89*
Domestic Equity Assets	**241,400,573**	**18.4**	**18.4**	**-1.8**	**6.8**	**-6.8**	**12.9**	**9.6**	**--**	**11.8**	**Jan-16**
Russell 3000				*-2.3*	*4.4*	*-8.1*	*11.8*	*9.4*	*11.9*	*11.4*	*Jan-16*
Rhumbline Russell 1000 Value	47,906,316	3.6	19.8	-3.5	1.5	-2.8	10.9	7.2	--	9.1	Apr-13
Russell 1000 Value				*-3.5*	*1.5*	*-2.8*	*11.0*	*7.2*	*9.6*	*9.2*	*Apr-13*
Rhumbline Russell 1000 Growth	39,780,187	3.0	16.5	-1.2	7.0	-13.3	12.1	11.5	14.2	14.5	Jul-09
Russell 1000 Growth				*-1.2*	*7.0*	*-13.3*	*12.1*	*11.5*	*14.3*	*14.6*	*Jul-09*
Fisher Midcap Value	61,054,041	4.7	25.3	-1.9	9.3	-2.2	18.4	12.0	11.9	9.2	Apr-07
Russell MidCap Value				*-3.2*	*4.6*	*-3.4*	*12.0*	*7.3*	*9.6*	*7.2*	*Apr-07*
Russell MidCap				*-2.4*	*5.7*	*-5.0*	*11.5*	*8.4*	*10.7*	*8.2*	*Apr-07*
Newton Small Cap Growth	46,734,566	3.6	19.4	-2.1	7.9	-9.1	9.1	11.2	13.3	13.6	Aug-09
Russell 2000 Growth				*-1.1*	*8.8*	*-7.9*	*6.5*	*5.1*	*9.3*	*11.2*	*Aug-09*
Vulcan Partners Small Cap Value	15,843,002	1.2	6.6	1.3	13.7	--	--	--	--	-18.6	Apr-22
Russell 2000 Value				*-2.3*	*7.0*	*-4.4*	*12.9*	*6.4*	*8.5*	*-6.2*	*Apr-22*
Systematic Small Cap Free Cash Flow	30,082,460	2.3	12.5	-0.6	6.7	--	--	--	--	4.0	Apr-22
Russell 2000 Value				*-2.3*	*7.0*	*-4.4*	*12.9*	*6.4*	*8.5*	*-6.2*	*Apr-22*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
International Developed Market Equity Assets	**38,944,123**	**3.0**	**3.0**	**-3.0**	**4.7**	**-7.5**	**1.7**	**-2.0**	**--**	**2.4**	**Jan-16**
MSCI EAFE				*-2.1*	*5.8*	*-3.1*	*6.8*	*2.6*	*4.8*	*5.2*	*Jan-16*
Aristotle International Equity	20,667,180	1.6	53.1	-3.0	4.2	-8.1	--	--	--	-2.3	Mar-21
MSCI EAFE				*-2.1*	*5.8*	*-3.1*	*6.8*	*2.6*	*4.8*	*-0.2*	*Mar-21*
Walter Scott International Equity	18,276,942	1.4	46.9	-3.1	5.3	-6.8	--	--	--	-3.3	Mar-21
MSCI EAFE				*-2.1*	*5.8*	*-3.1*	*6.8*	*2.6*	*4.8*	*-0.2*	*Mar-21*
International Emerging Market Equity Assets	**100,387,243**	**7.6**	**7.6**	**-5.3**	**1.5**	**-15.0**	**2.1**	**-1.8**	**--**	**4.7**	**Jan-16**
MSCI Emerging Markets				*-6.5*	*0.9*	*-15.3*	*1.0*	*-1.9*	*1.5*	*5.2*	*Jan-16*
ABS Emerging Markets	53,744,876	4.1	53.5	-4.5	2.0	-14.9	3.3	--	--	4.9	Dec-18
MSCI Emerging Markets				*-6.5*	*0.9*	*-15.3*	*1.0*	*-1.9*	*1.5*	*1.6*	*Dec-18*
Driehaus Emerging Markets Growth	46,642,368	3.6	46.5	-6.2	0.9	-15.2	2.6	--	--	3.3	Mar-19
MSCI Emerging Markets				*-6.5*	*0.9*	*-15.3*	*1.0*	*-1.9*	*1.5*	*0.2*	*Mar-19*
Global Equity Assets	**143,628,667**	**10.9**	**10.9**	**-3.1**	**2.6**	**-3.5**	**9.8**	**6.3**	**--**	**5.3**	**Feb-18**
MSCI ACWI				*-2.9*	*4.1*	*-8.3*	*8.8*	*5.8*	*7.9*	*4.8*	*Feb-18*
First Eagle Global Value Fund	24,581,262	1.9	17.1	-3.4	3.0	-2.7	8.4	5.0	--	4.1	Feb-18
MSCI ACWI Value NR USD				*-3.2*	*1.6*	*-3.4*	*8.5*	*3.9*	*6.1*	*2.8*	*Feb-18*
Kopernik Global All Cap Fund	34,350,136	2.6	23.9	-4.9	0.8	-3.5	17.8	7.8	--	6.9	Feb-18
MSCI ACWI Value NR USD				*-3.2*	*1.6*	*-3.4*	*8.5*	*3.9*	*6.1*	*2.8*	*Feb-18*
Lee Munder Global Multi-Cap Strategy	40,467,163	3.1	28.2	-2.7	4.4	-9.0	7.9	4.4	--	4.4	Mar-18
MSCI ACWI				*-2.9*	*4.1*	*-8.3*	*8.8*	*5.8*	*7.9*	*5.8*	*Mar-18*
Wellington Durable Enterprises, L.P.	44,230,107	3.4	30.8	-2.0	2.1	2.0	7.9	8.1	--	8.1	Mar-18
MSCI ACWI				*-2.9*	*4.1*	*-8.3*	*8.8*	*5.8*	*7.9*	*5.8*	*Mar-18*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Core Fixed Income	**100,241,747**	**7.6**	**7.6**	**-1.5**	**0.8**	**-6.7**	**-1.7**	**1.4**	**--**	**1.8**	**Jan-16**
75% Bbg Aggregate/25% Bbg US TIPs 1-10 year				*-2.2*	*0.3*	*-9.0*	*-2.5*	*1.1*	*1.2*	*1.3*	*Jan-16*
Lord Abbett Short Duration Credit Trust II	43,127,262	3.3	43.0	-0.6	0.8	-2.3	-0.2	--	--	0.5	Aug-19
Bloomberg US Credit 1-3 Yr TR				*-0.7*	*0.3*	*-1.9*	*-0.3*	*1.4*	*1.4*	*0.5*	*Aug-19*
Lord Abbett Core Fixed Income Trust II	40,205,021	3.1	40.1	-2.4	0.9	-10.1	--	--	--	-10.2	Dec-21
Bloomberg US Aggregate TR				*-2.6*	*0.4*	*-9.7*	*-3.8*	*0.5*	*1.1*	*-10.4*	*Dec-21*
Rhumbline TIPS Trust	16,909,465	1.3	16.9	-1.4	0.5	-10.4	--	--	--	-2.0	Sep-20
Bloomberg US TIPS TR				*-1.4*	*0.4*	*-10.4*	*0.2*	*2.6*	*1.2*	*-2.0*	*Sep-20*
Value Added Fixed Income	**86,474,915**	**6.6**	**6.6**	**-1.1**	**2.0**	**-4.0**	**0.9**	**2.1**	**--**	**4.2**	**Jan-16**
Custom Benchmark - Global Fixed Income				*-1.5*	*1.6*	*-6.3*	*-0.8*	*1.5*	*2.4*	*3.4*	*Jan-16*
Eaton Vance High Yield	11,859,565	0.9	13.7	-1.5	2.0	-4.6	1.5	2.8	4.0	5.8	Apr-06
ICE BofA US High Yield TR				*-1.3*	*2.6*	*-5.5*	*1.1*	*2.7*	*4.0*	*6.0*	*Apr-06*
First Eagle Bank Loan Select Fund	10,875,798	0.8	12.6	1.1	3.2	0.1	3.1	3.2	4.1	4.7	Sep-10
Credit Suisse Leveraged Loans				*0.6*	*3.2*	*2.3*	*3.7*	*3.6*	*4.0*	*4.5*	*Sep-10*
Manulife Strategic Fixed Income	40,692,108	3.1	47.1	-2.3	0.8	-5.8	-0.2	--	--	0.6	Jul-19
Bloomberg Multiverse TR				*-3.3*	*-0.1*	*-13.2*	*-4.9*	*-1.6*	*-0.1*	*-3.3*	*Jul-19*
Mesirow High Yield	14,754,569	1.1	17.1	0.4	3.9	-4.4	5.1	--	--	4.9	Aug-19
Bloomberg US Corporate High Yield TR				*-1.3*	*2.5*	*-5.5*	*1.3*	*2.9*	*4.1*	*1.7*	*Aug-19*
Eaton Vance EMD Opportunities Fund	8,292,875	0.6	9.6	0.0	2.6	1.3	--	--	--	1.2	Aug-20
JP Morgan EMBI Global Diversified				*-2.2*	*0.9*	*-8.6*	*-5.2*	*-0.7*	*1.8*	*-6.1*	*Aug-20*

Eaton Vance EMD Opportunities Fund market value and performance is lagged as of 1/31/2023.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Hedge Funds	**83,792,568**	**6.4**	**6.4**	**-0.6**	**1.0**	**-12.8**	**-1.1**	**0.4**	**3.2**	**3.4**	**Feb-10**
Custom Benchmark				*-0.3*	*0.7*	*-3.1*	*4.2*	*3.1*	*3.5*	*3.1*	*Feb-10*
ABS Offshore SPC - Global Segregated Portfolio	35,272,218	2.7	42.1	-1.1	1.6	-2.7	3.8	3.1	4.8	4.9	Aug-10
HFRI Equity Hedge (Total) Index				*-1.3*	*2.5*	*-3.4*	*8.1*	*4.9*	*5.4*	*5.4*	*Aug-10*
HFRI FOF: Strategic Index				*-1.6*	*1.7*	*-4.5*	*3.9*	*2.2*	*3.3*	*3.3*	*Aug-10*
Entrust Special Opportunities Fund III, Ltd.	13,663,481	1.0	16.3	0.0	0.0	-24.4	-6.7	-3.3	--	2.5	Oct-16
HFRI Fund of Funds Composite Index (QTR)				*0.0*	*0.0*	*-5.3*	*3.7*	*3.0*	*3.5*	*3.7*	*Oct-16*
Old Farm Partners Master Fund, L.P.	15,620,463	1.2	18.6	-0.6	1.9	-4.9	6.2	--	--	4.1	Oct-18
HFRI Fund of Funds Composite Index				*-0.6*	*1.4*	*-0.9*	*4.6*	*3.1*	*3.4*	*3.5*	*Oct-18*
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	19,236,406	1.5	23.0	0.0	0.0	-22.1	-5.3	--	--	1.9	Jan-19
HFRI Fund of Funds Composite Index (QTR)				*0.0*	*0.0*	*-5.3*	*3.7*	*3.0*	*3.5*	*4.6*	*Jan-19*
Real Estate	**171,754,235**	**13.1**	**13.1**	**-0.3**	**-0.4**	**13.0**	**15.2**	**12.9**	**--**	**9.8**	**Jan-16**
Custom Benchmark				*0.0*	*0.0*	*7.5*	*9.9*	*8.9*	*--*	*7.5*	*Jan-16*
Core Real Estate	**110,552,113**	**8.4**	**64.4**	**-0.5**	**-0.6**	**4.8**	**11.3**	**10.7**	**--**	**9.1**	**Jan-16**
NCREIF-ODCE				*0.0*	*0.0*	*7.5*	*9.9*	*8.7*	*10.1*	*8.3*	*Jan-16*
TA Realty Core Property Fund, L.P.	76,740,891	5.8	69.4	0.0	0.0	8.9	14.2	--	--	12.5	Apr-18
NCREIF ODCE Equal Weighted (Net)				*0.0*	*0.0*	*7.6*	*9.7*	*8.3*	*9.5*	*8.0*	*Apr-18*
JPMorgan Strategic Property	33,811,222	2.6	30.6	-1.5	-1.8	-2.1	6.7	--	--	6.0	Apr-19
Non-Core Real Estate	**61,202,122**	**4.7**	**35.6**	**0.0**	**0.0**	**31.0**	**22.7**	**16.4**	**--**	**9.5**	**Jan-16**

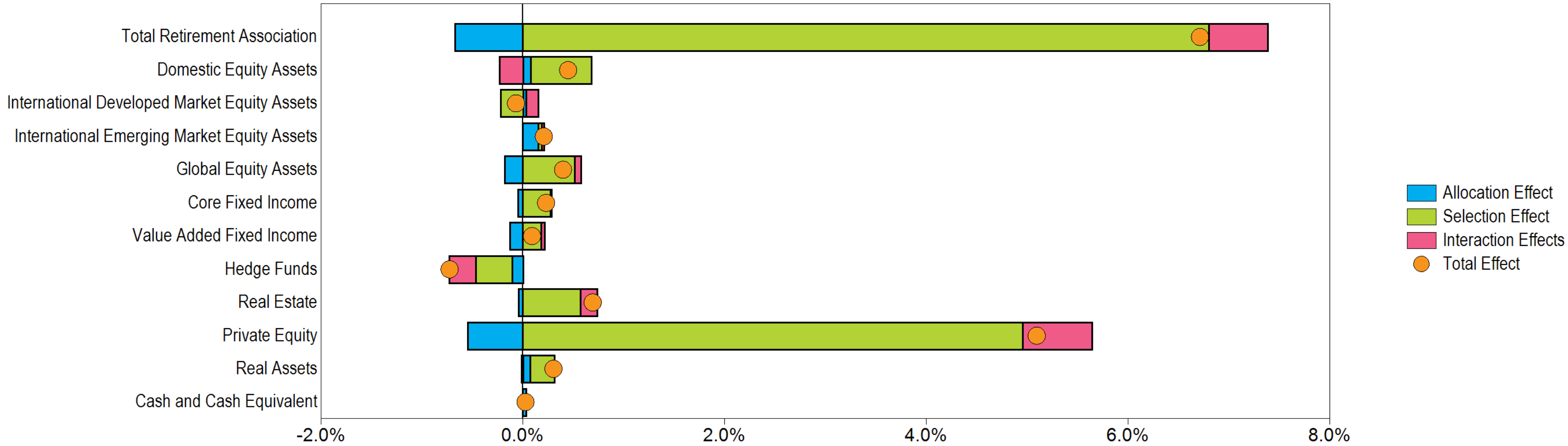
Entrust Special Opportunities Fund III and EntrustPermal Special Opportunities Evergreen Fund: Data is based on December 31, 2023 fair market value, adjusted for subsequent cash flows.
Note: The data for JPMorgan Strategic Property is as of February 28, 2023.
Note: The data for Real Estate is based on September 30, 2022 fair market value, adjusted for subsequent cash flows.
Note: TA Realty Core Property Fund is reported in real time.

Summary | As of February 28, 2023

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Private Equity	**216,788,423**	**16.5**	**16.5**	**0.0**	**0.0**	**18.9**	**25.7**	**17.4**	**--**	**13.4**	**Jan-16**
MSCI ACWI IMI (1Q Lagged)+2%				*0.0*	*0.0*	*-19.6*	*5.7*	*6.2*	*9.4*	*9.2*	*Jan-16*
Private Equity	**202,205,872**	**15.4**	**93.3**	**0.0**	**0.0**	**20.4**	**26.8**	**18.0**	**--**	**13.1**	**Jan-16**
Venture Capital	**14,582,552**	**1.1**	**6.7**	**0.0**	**0.0**	**1.6**	**14.7**	**10.5**	**--**	**11.3**	**Jan-16**
Real Assets	**118,157,481**	**9.0**	**9.0**	**-0.1**	**0.3**	**12.6**	**11.0**	**7.6**	**--**	**4.2**	**Jan-16**
CPI + 3%				*0.8*	*1.9*	*9.2*	*8.3*	*7.0*	*5.7*	*6.5*	*Jan-16*
Core Real Assets	**72,115,890**	**5.5**	**61.0**	**-0.2**	**0.6**	**10.7**	**10.4**	**--**	**--**	**10.9**	**Oct-18**
CPI + 3%				*0.8*	*1.9*	*9.2*	*8.3*	*7.0*	*5.7*	*7.2*	*Oct-18*
IFM Global Infrastructure	72,115,890	5.5	100.0	-0.2	0.6	10.7	10.4	--	--	10.9	Oct-18
CPI + 3%				*0.8*	*1.9*	*9.2*	*8.3*	*7.0*	*5.7*	*7.2*	*Oct-18*
Non-Core Real Assets	**46,041,590**	**3.5**	**39.0**	**0.0**	**0.0**	**14.3**	**10.9**	**5.8**	**--**	**4.0**	**Jan-16**
CPI + 3%				*0.8*	*1.9*	*9.2*	*8.3*	*7.0*	*5.7*	*6.5*	*Jan-16*
Cash and Cash Equivalent	**11,032,272**	**0.8**	**0.8**								
Cash	11,032,272	0.8	100.0								

Note: The data for Real Estate, Private Equity, and Real Assets is based on September 30, 2022 fair market value, adjusted for subsequent cash flows.
Note: The data for IFM Global Infrastructure is as of February 28, 2023.

Attribution Effects
1 Year Ending February 28, 2023



Attribution Summary
1 Year Ending February 28, 2023

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Domestic Equity Assets	-6.8%	-8.7%	1.9%	0.6%	0.1%	-0.2%	0.5%
International Developed Market Equity Assets	-7.5%	-3.8%	-3.6%	-0.2%	0.0%	0.1%	-0.1%
International Emerging Market Equity Assets	-15.0%	-15.9%	0.9%	0.0%	0.2%	0.0%	0.2%
Global Equity Assets	-3.5%	-8.9%	5.4%	0.5%	-0.2%	0.1%	0.4%
Core Fixed Income	-6.7%	-9.7%	2.9%	0.3%	0.0%	0.0%	0.2%
Value Added Fixed Income	-4.0%	-7.0%	3.0%	0.2%	-0.1%	0.0%	0.1%
Hedge Funds	-12.8%	-3.8%	-9.0%	-0.4%	-0.1%	-0.3%	-0.7%
Real Estate	13.0%	6.7%	6.3%	0.6%	0.0%	0.2%	0.7%
Private Equity	18.9%	-19.6%	38.4%	5.0%	-0.5%	0.7%	5.1%
Real Assets	12.6%	8.4%	4.2%	0.2%	0.1%	0.0%	0.3%
Cash and Cash Equivalent	2.1%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	**-0.7%**	**-7.5%**	**6.7%**	**6.8%**	**-0.7%**	**0.6%**	**6.7%**

Annual Investment Expense Analysis
As Of February 28, 2023

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Domestic Equity Assets		**$241,400,573**		
Rhumbline Russell 1000 Value	0.05% of First 25.0 Mil, 0.04% of Next 25.0 Mil, 0.03% Thereafter	$47,906,316	$21,663	0.05%
Rhumbline Russell 1000 Growth	0.05% of First 25.0 Mil, 0.04% of Next 25.0 Mil, 0.03% Thereafter	$39,780,187	$18,412	0.05%
Fisher Midcap Value	0.65% of Assets	$61,054,041	$396,851	0.65%
Newton Small Cap Growth	0.45% of Assets	$46,734,566	$210,306	0.45%
Vulcan Partners Small Cap Value	0.83% of Assets	$15,843,002	$131,497	0.83%
Systematic Small Cap Free Cash Flow	0.76% of Assets	$30,082,460	$228,627	0.76%
International Developed Market Equity Assets		**$38,944,123**		
Aristotle International Equity	0.49% of Assets	$20,667,180	$101,269	0.49%
Walter Scott International Equity	0.75% of Assets	$18,276,942	$137,077	0.75%
International Emerging Market Equity Assets		**$100,387,243**		
ABS Emerging Markets	Performance-based 0.35 and 0.10	$53,744,876	$188,107	0.35%
Driehaus Emerging Markets Growth	0.55% of Assets	$46,642,368	$256,533	0.55%
Global Equity Assets		**$143,628,667**		
First Eagle Global Value Fund	0.75% of Assets	$24,581,262	$184,359	0.75%
Kopernik Global All Cap Fund	0.80% of First 50.0 Mil, 0.75% of Next 150.0 Mil, 0.70% of Next 250.0 Mil, 0.65% of Next 350.0 Mil	$34,350,136	$274,801	0.80%
Lee Munder Global Multi-Cap Strategy	0.45% of Assets	$40,467,163	$182,102	0.45%
Wellington Durable Enterprises, L.P.	0.60% of Assets	$44,230,107	$265,381	0.60%

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Core Fixed Income		**$100,241,747**		
Lord Abbett Short Duration Credit Trust II	0.17% of Assets	$43,127,262	$73,316	0.17%
Lord Abbett Core Fixed Income Trust II	0.15% of Assets	$40,205,021	$60,308	0.15%
Rhumbline TIPS Trust	0.04% of First 5.0 Mil, 0.03% Thereafter	$16,909,465	$5,573	0.03%
Value Added Fixed Income		**$86,474,915**		
Eaton Vance High Yield	0.42% of Assets	$11,859,565	$49,810	0.42%
First Eagle Bank Loan Select Fund	0.40% of Assets	$10,875,798	$43,503	0.40%
Manulife Strategic Fixed Income	0.35% of Assets	$40,692,108	$142,422	0.35%
Mesirow High Yield	0.40% of Assets	$14,754,569	$59,018	0.40%
Eaton Vance EMD Opportunities Fund	0.30% of Assets	$8,292,875	$24,879	0.30%
Ridgemont Equity Partners IV, L.P.		$1,008,678		
Core Real Assets		**$72,115,890**		
Non-Core Real Assets		**$46,041,590**		

Eaton Vance EMD Opportunities Fund: Stated fee of 0.30% with other operating expenses capped at 0.15%.

Note: The value is based on September 30, 2022 FMV.

Private Equity	Commitment	Total Contributions	Total Distributions	Value
Ascend Ventures II, L.P.	2,500,000	2,327,488	995,193	4,793
Ascent Venture Partners IV, L.P.	2,500,000	2,502,219	424,010	0
Ascent Venture Partners V, L.P.	5,000,000	5,004,731	4,054,562	3,564,498
Audax Mezzanine Fund IV, L.P.	10,000,000	8,665,022	7,526,720	2,937,829
Charles River Partnership XI, L.P.	1,839,000	1,820,323	2,532,884	0
Charlesbank Technology Opportunities Fund, L.P.	12,000,000	7,398,711	1,078,536	13,783,468
Ironsides Opportunities Fund II	20,000,000	0	0	0
Ironsides Co-Investment Fund VI, L.P.	13,000,000	13,150,994	288,017	14,786,052
DN Partners II, L.P.	5,000,000	2,375,841	23,571	2,426,338
Euro Choice V, L.P.	6,060,975	5,919,759	5,591,301	3,053,063
FS Equity Partners VIII, L.P.	12,000,000	7,581,269	324,324	13,122,732
Globespan Capital Partners V, L.P.	5,000,000	4,852,500	8,895,488	4,087,430
HarbourVest Partners Co-Investment Fund V, L.P.	12,000,000	9,300,000	1,440,447	14,105,038
HarbourVest Partners Co-Investment Fund VI, L.P.	13,000,000	1,950,000	0	1,701,949
Ironsides Direct Investment Fund V, L.P.	12,000,000	11,870,897	3,152,053	18,327,411
Kohlberg Investors IX	10,000,000	5,510,578	294,108	6,989,158
Landmark Equity Partners XIV, L.P.	6,000,000	5,841,745	7,356,228	500,373
Leeds Equity Partners IV, L.P.	5,000,000	5,093,100	9,709,704	13,385
Leeds Equity Partners V, L.P.	2,500,000	3,525,207	5,594,639	238,203
Lexington Capital Partners VII, L.P.	10,000,000	8,945,670	13,146,414	1,461,845
LLR Equity Partners V, L.P.	12,000,000	11,640,000	3,790,818	16,200,112
Mesirow Financial Capital Partners IX, L.P.	4,000,000	3,840,731	2,021,056	78,637
Ridgemont Equity Partners III, L.P.	12,000,000	11,201,957	4,813,137	17,471,222
Ridgemont Equity Partners IV, L.P.	13,000,000	0	0	0
Rimco Production Company, Inc	2,000,000	2,000,000	7,651,066	1
Searchlight Capital III, L.P.	12,000,000	7,940,428	3,583,186	9,317,120
Siguler Guff Distressed Opportunities Fund III, L.P.	6,000,000	5,820,000	9,151,887	537,317
Summit Partners Growth Equity Fund IX, L.P.	10,000,000	11,620,000	12,558,753	15,001,855
Summit Partners Venture Capital Fund V	10,000,000	4,104,913	0	3,942,112
Summit Partners Growth Equity Fund XI, L.P.	13,000,000	844,860	0	739,765
TRG Growth Partnership II, L.P.	7,500,000	7,366,152	7,957,800	1,313,508

Note: The value is based on September 30, 2022 FMV.

Note: The value for IFM Global Infrastructure and JPMorgan Strategic Property is as of February 28, 2023. The Value for TA Realty Core Property Fund is based on 12/31/2022 FMV as this fund is reported in real time.

Private Equity	Commitment	Total Contributions	Total Distributions	Value
Trilantic Capital Partners VI (North America), L.P.	12,000,000	10,218,707	1,142,305	13,204,434
Waud Capital Partners V, L.P.	10,000,000	8,859,640	0	13,477,134
Wellspring Capital Partners VI, L.P.	12,000,000	11,494,621	2,497,169	15,459,773
Total Plymouth County - PE	**300,899,975**	**210,588,064**	**127,595,373**	**207,846,556**

Real Assets	Commitment	Total Contributions	Total Distributions	Value
Basalt Infrastructure Partners II	10,000,000	9,416,866	2,439,089	9,932,120
BlackRock Global Renewable Power Infrastructure Fund III, L.P.	10,000,000	2,946,235	258,108	2,682,368
BTG Pactual Global Timberland Resources Fund, LLC	5,043,536	5,043,536	1,869,240	1,377,651
Climate Adaptive Infrastructure Fund I	10,000,000	0	0	0
Global Infrastructure Partners III, L.P.	10,000,000	9,969,173	3,393,156	10,961,558
Global Infrastructure Partners IV, L.P.	10,000,000	6,552,307	4,747	6,721,619
IFM Global Infrastructure (U.S.), L.P.	60,000,000	60,000,000	3,832,424	72,115,890
ISQ Global Infrastructure Fund III (USTE), L.P.	10,000,000	1,085,165	1,223	971,137
JPMorgan Global Maritime Investment	10,000,000	10,034,375	2,578,840	9,731,561
Domain Timbervest Partners III, L.P.	5,000,000	5,000,000	3,646,126	3,961,063
Total Plymouth County - RA	**140,043,536**	**110,047,656**	**18,022,952**	**118,454,967**

Real Estate	Commitment	Total Contributions	Total Distributions	Value
1921 Realty, Inc.	5,000,000	5,378,294	0	556,339
AEW Partners IX, L.P.	10,000,000	5,761,317	111	5,949,861
AEW Partners Real Estate Fund VIII, L.P.	25,000,000	23,989,589	27,792,735	7,512,349
Berkshire Value Fund V, L.P.	9,000,000	5,134,454	1,058,371	5,953,020
Carlyle Realty Partners VIII, L.P.	18,000,000	13,029,418	9,073,505	11,424,070
DSF Capital Partners IV, L.P.	5,000,000	5,000,000	7,406,550	0
DSF Multi-Family Real Estate Fund III, L.P.	15,000,000	15,079,717	22,005,735	5,111,996
JPMorgan Strategic Property Fund	27,000,000	27,000,000	1,057,812	33,811,222
PCCP Equity IX, L.P.	10,000,000	4,369,943	0	4,576,020
Real Estate International Partnership Fund I, L.P.	15,000,000	12,677,141	11,372,161	699,983
Rockpoint Real Estate Fund VI, L.P.	9,000,000	6,858,010	1,091,059	7,463,360
TA Realty Core Property Fund, L.P.	60,000,000	60,885,358	6,837,390	76,740,891
TerraCap Partners V, L.P.	5,000,000	4,992,904	85,609	5,559,651
Total Plymouth County - RE	**213,000,000**	**190,156,146**	**87,781,038**	**165,358,762**

Cash Flow Summary

Month Ending February 28, 2023

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
1921 Realty, Inc	$556,339	$0	$0	$0	$556,339
ABS Emerging Markets	$56,271,870	$0	$0	$0	$53,744,876
ABS Offshore SPC - Global Segregated Portfolio	$35,650,741	$0	$0	$0	$35,272,218
AEW Partners Real Estate Fund IX, L.P.	$6,567,145	$0	$0	$0	$6,567,145
AEW Partners Real Estate VIII	$6,278,348	$0	$0	$0	$6,278,348
Aristotle International Equity	$21,300,346	$0	$0	$0	$20,667,180
Ascend Ventures II	$0	$0	$0	$0	$0
Ascent Ventures IV	$0	$0	$0	$0	$0
Ascent Ventures V	$3,124,944	$0	$0	$0	$3,124,944
Audax Mezzanine Debt IV	$2,907,650	$0	$0	$0	$2,907,650
Basalt Infrastructure Partners II	$6,525,463	$0	$0	$0	$6,525,463
Berkshire Value Fund V	$7,101,747	$0	$0	$0	$7,101,747
BlackRock Global Renewable Power Infrastructure Fund III, L.P.	$5,152,128	$0	$0	$0	$5,152,128
BTG Pactual Global Timberland Resources	$1,377,651	$0	$0	$0	$1,377,651
Carlyle Realty Partners VIII	$11,664,172	$0	$0	$0	$11,664,172
Cash	$6,588,098	$17,998,771	-$13,553,851	$4,444,921	$11,032,272
Charles River Partnership XI	$0	$0	$0	$0	$0
Charlesbank Technology Opportunities Fund	$14,960,556	$79,746	$0	$79,746	$15,040,302
Climate Adaptive Infrastructure Fund	$3,187,514	$0	$0	$0	$3,187,514
DN Partners II, LP	$2,426,338	$0	$0	$0	$2,426,338
Driehaus Emerging Markets Growth	$49,679,069	$0	$0	$0	$46,642,368
DSF Multi-Family Real Estate Fund III	$5,017,299	$0	-$868,056	-$868,056	$4,149,243

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
Eaton Vance EMD Opportunities Fund	$8,292,875	$0	$0	$0	$8,292,875
Eaton Vance High Yield	$12,038,877	$0	$0	$0	$11,859,565
Entrust Special Opportunities Fund III, Ltd.	$13,663,481	$0	$0	$0	$13,663,481
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	$19,236,406	$0	$0	$0	$19,236,406
Euro Choice V Programme	$2,986,491	$0	-$148,353	-$148,353	$2,838,139
First Eagle Bank Loan Select Fund	$10,761,911	$0	$0	$0	$10,875,798
First Eagle Global Value Fund	$25,458,826	$0	$0	$0	$24,581,262
Fisher Midcap Value	$62,193,281	$0	$0	$0	$61,054,041
FS Equity Partners VIII, L.P.	$14,534,757	$0	$0	$0	$14,534,757
Global Infrastructure Partners III	$9,922,547	$58,267	-$166,898	-$108,631	$9,813,916
Global Infrastructure Partners IV, L.P.	$7,987,674	$13,355	-$29,209	-$15,854	$7,971,821
Globespan Capital V	$3,557,979	$0	$0	$0	$3,557,979
HarbourVest Partners Co-Investment Fund VI, L.P.	$3,001,949	$0	$0	$0	$3,001,949
HarbourVest Partners Co-Investment V	$13,632,677	$0	$0	$0	$13,632,677
IFM Global Infrastructure	$72,277,944	$0	$0	$0	$72,115,890
Ironsides Co-Investment Fund VI, L.P.	$14,255,911	$0	$0	$0	$14,255,911
Ironsides Direct Investment Fund V, L.P.	$18,327,411	$0	$0	$0	$18,327,411
Ironsides Opportunities Fund II, L.P.	$3,105,350	$0	$0	$0	$3,105,350
ISQ Global Infrastructure Fund III (USTE), L.P.	$971,137	$1,194,463	$0	$1,194,463	$2,165,600
JP Morgan Global Maritime Investment	$7,222,785	$0	-$986,350	-$986,350	$6,236,435
JPMorgan Strategic Property	$34,287,013	$0	$0	$0	$33,811,222
Kohlberg Investors IX	$7,899,628	$0	$0	$0	$7,899,628
Kopernik Global All Cap Fund	$36,107,087	$0	$0	$0	$34,350,136
Landmark Equity Partners XIV	$460,357	$0	-$23,686	-$23,686	$436,672
Lee Munder Global Multi-Cap Strategy	$41,560,878	$0	$0	$0	$40,467,163

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
Leeds Equity Partners IV	$9,031	$0	$0	$0	$9,031
Leeds Equity Partners V	$238,203	$0	$0	$0	$238,203
Lexington Capital Partners VII	$1,341,701	$0	-$16,396	-$16,396	$1,325,305
LLR Equity Partners V, LP.	$16,200,112	$0	-$195,962	-$195,962	$16,004,150
Lord Abbett Core Fixed Income Trust II	$41,186,589	$0	$0	$0	$40,205,021
Lord Abbett Short Duration Credit Trust II	$43,376,073	$0	$0	$0	$43,127,262
Manulife Strategic Fixed Income	$41,635,693	$0	$0	$0	$40,692,108
Mesirow Financial Capital Partners IX, LP	$78,637	$0	$0	$0	$78,637
Mesirow Financial International Real Estate Fund I	$699,983	$0	$0	$0	$699,983
Mesirow High Yield	$14,692,471	$0	$0	$0	$14,754,569
Newton Small Cap Growth	$47,698,362	$0	$0	$0	$46,734,566
Old Farm Partners Master Fund, L.P.	$15,711,343	$0	-$6,388	-$6,388	$15,620,463
PCCP Equity IX, L.P.	$5,326,020	$1,000,000	$0	$1,000,000	$6,326,020
Rhumbline Russell 1000 Growth	$40,259,139	$0	$0	$0	$39,780,187
Rhumbline Russell 1000 Value	$61,147,837	$0	-$11,500,000	-$11,500,000	$47,906,316
Rhumbline TIPS Trust	$17,142,856	$0	$0	$0	$16,909,465
Ridgemont Equity Partners III, L.P.	$18,961,907	$0	-$1,990,280	-$1,990,280	$16,971,626
RIMCO Royalty Partners, LP	$1	$0	$0	$0	$1
Rockpoint Real Estate Fund VI, L.P.	$7,854,027	$0	$0	$0	$7,854,027
Searchlight Capital III, L.P.	$9,617,971	$0	$0	$0	$9,617,971
Siguler Guff Distressed Opportunities Fund III, LP	$496,843	$0	$0	$0	$496,843
Summit Partners Growth Equity Fund IX	$15,085,855	$0	$0	$0	$15,085,855
Summit Partners Growth Equity Fund XI	$1,367,501	$0	$0	$0	$1,367,501
Summit Partners Venture Capital Fund V	$5,029,001	$171,144	$0	$171,144	$5,200,145
Systematic Small Cap Free Cash Flow	$30,258,964	$0	$0	$0	$30,082,460

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
TA Realty Core Property Fund, L.P.	$77,516,051	$135,653	-$910,814	-$775,161	$76,740,891
TerraCap Partners V, L.P	$10,005,097	$0	$0	$0	$10,005,097
Timbervest Partners III, LP	$3,611,063	$0	$0	$0	$3,611,063
TRG Growth Partnership II	$1,313,508	-$1,032,045	$0	-$1,032,045	$281,463
Trilantic Capital Partners VI, L.P.	$13,480,292	$513,604	$0	$513,604	$13,993,896
Vulcan Partners Small Cap Value	$15,623,578	$0	$0	$0	$15,843,002
Walter Scott International Equity	$18,855,453	$0	$0	$0	$18,276,942
Waud Capital Partners V	$14,428,940	$0	$0	$0	$14,428,940
Wellington Durable Enterprises, L.P.	$45,110,612	$0	$0	$0	$44,230,107
Wellspring Capital Partners VI	$15,590,471	$0	$0	$0	$15,590,471
Total	**$1,341,033,838**	**$20,132,958**	**-$30,396,241**	**-$10,263,283**	**$1,311,593,569**

Cash Flow Summary

From October 01, 2022 through February 28, 2023

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
1921 Realty, Inc	$555,888	$0	$0	$0	$556,339
ABS Emerging Markets	$49,205,469	$0	$0	$0	$53,744,876
ABS Offshore SPC - Global Segregated Portfolio	$33,160,237	$0	$0	$0	$35,272,218
AEW Partners Real Estate Fund IX, L.P.	$5,832,696	$617,284	$0	$617,284	$6,567,145
AEW Partners Real Estate VIII	$7,322,850	$0	-$1,234,001	-$1,234,001	$6,278,348
Aristotle International Equity	$17,436,411	$0	$0	$0	$20,667,180
Ascend Ventures II	$0	$0	-$2,142	-$2,142	$0
Ascent Ventures IV	$0	$0	$0	$0	$0
Ascent Ventures V	$3,847,278	$0	-$439,554	-$439,554	$3,124,944
Audax Mezzanine Debt IV	$2,813,303	$0	-$30,179	-$30,179	$2,907,650
Basalt Infrastructure Partners II	$10,007,139	$0	-$3,406,657	-$3,406,657	$6,525,463
Berkshire Value Fund V	$5,897,532	$1,148,727	$0	$1,148,727	$7,101,747
BlackRock Global Renewable Power Infrastructure Fund III, L.P.	$2,646,026	$2,469,760	$0	$2,469,760	$5,152,128
BTG Pactual Global Timberland Resources	$1,323,589	$0	$0	$0	$1,377,651
Carlyle Realty Partners VIII	$10,654,952	$1,018,265	-$778,163	$240,102	$11,664,172
Cash	$22,910,328	$74,241,068	-$86,117,589	-$11,876,521	$11,032,272
Charles River Partnership XI	$0	$0	$0	$0	$0
Charlesbank Technology Opportunities Fund	$12,393,450	$1,256,834	$0	$1,256,834	$15,040,302
Climate Adaptive Infrastructure Fund	--	$3,187,514	$0	$3,187,514	$3,187,514
DN Partners II, LP	$2,426,338	$0	$0	$0	$2,426,338
Driehaus Emerging Markets Growth	$44,458,672	$0	$0	$0	$46,642,368
DSF Multi-Family Real Estate Fund III	$4,756,949	$0	-$962,753	-$962,753	$4,149,243
Eaton Vance EMD Opportunities Fund	$7,409,337	$0	$0	$0	$8,292,875

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
Eaton Vance High Yield	$11,165,577	$0	$0	$0	$11,859,565
Entrust Special Opportunities Fund III, Ltd.	$11,925,266	$0	-$41,008	-$41,008	$13,663,481
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	$17,457,309	$0	-$46,616	-$46,616	$19,236,406
Euro Choice V Programme	$3,378,010	$0	-$214,925	-$214,925	$2,838,139
First Eagle Bank Loan Select Fund	$10,474,387	$0	$0	$0	$10,875,798
First Eagle Global Value Fund	$21,089,580	$0	$0	$0	$24,581,262
Fisher Midcap Value	$53,512,435	$0	-$5,000,000	-$5,000,000	$61,054,041
FS Equity Partners VIII, L.P.	$12,261,304	$1,412,025	$0	$1,412,025	$14,534,757
Global Infrastructure Partners III	$11,069,355	$303,226	-$1,450,868	-$1,147,642	$9,813,916
Global Infrastructure Partners IV, L.P.	$6,589,836	$1,318,005	-$67,804	$1,250,202	$7,971,821
Globespan Capital V	$4,394,697	$0	-$529,451	-$529,451	$3,557,979
HarbourVest Partners Co-Investment Fund VI, L.P.	$1,893,372	$1,300,000	$0	$1,300,000	$3,001,949
HarbourVest Partners Co-Investment V	$14,252,426	$2,761	-$475,122	-$472,361	$13,632,677
IFM Global Infrastructure	$45,308,531	$25,000,000	-$410,208	$24,589,792	$72,115,890
Ironsides Co-Investment Fund VI, L.P.	$14,907,981	$253,526	-$783,667	-$530,141	$14,255,911
Ironsides Direct Investment Fund V, L.P.	$18,702,764	$0	$0	$0	$18,327,411
Ironsides Opportunities Fund II, L.P.	$0	$3,105,350	$0	$3,105,350	$3,105,350
ISQ Global Infrastructure Fund III (USTE), L.P.	$947,215	$1,194,463	$0	$1,194,463	$2,165,600
JP Morgan Global Maritime Investment	$9,838,102	$0	-$3,495,126	-$3,495,126	$6,236,435
JPMorgan Strategic Property	$36,810,038	$576	-$594,855	-$594,278	$33,811,222
Kohlberg Investors IX	$6,746,547	$910,470	$0	$910,470	$7,899,628
Kopernik Global All Cap Fund	$30,354,475	$0	$0	$0	$34,350,136
Landmark Equity Partners XIV	$514,906	$0	-$63,701	-$63,701	$436,672
Lee Munder Global Multi-Cap Strategy	$40,382,952	-$5,000,000	$0	-$5,000,000	$40,467,163
Leeds Equity Partners IV	$13,487	$0	-$4,354	-$4,354	$9,031
Leeds Equity Partners V	$247,496	$0	$0	$0	$238,203

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
Lexington Capital Partners VII	$1,517,650	$13,117	-$149,657	-$136,540	$1,325,305
LLR Equity Partners V, LP.	$15,361,187	$0	-$195,962	-$195,962	$16,004,150
Lord Abbett Core Fixed Income Trust II	$39,184,190	$0	$0	$0	$40,205,021
Lord Abbett Short Duration Credit Trust II	$58,950,218	$0	-$17,000,000	-$17,000,000	$43,127,262
Manulife Strategic Fixed Income	$39,070,189	$0	-$70,906	-$70,906	$40,692,108
Mesirow Financial Capital Partners IX, LP	$78,038	$0	$0	$0	$78,637
Mesirow Financial International Real Estate Fund I	$740,455	$0	$0	$0	$699,983
Mesirow High Yield	$13,847,933	$0	$0	$0	$14,754,569
Newton Small Cap Growth	$42,528,161	$0	$0	$0	$46,734,566
Old Farm Partners Master Fund, L.P.	$14,942,858	$0	-$31,454	-$31,454	$15,620,463
PCCP Equity IX, L.P.	$4,533,181	$1,750,000	$0	$1,750,000	$6,326,020
Rhumbline Russell 1000 Growth	$44,544,578	$0	-$8,500,000	-$8,500,000	$39,780,187
Rhumbline Russell 1000 Value	$64,871,001	$0	-$26,000,000	-$26,000,000	$47,906,316
Rhumbline TIPS Trust	$22,472,711	$0	-$6,000,000	-$6,000,000	$16,909,465
Ridgemont Equity Partners III, L.P.	$16,209,848	$1,708,782	-$2,208,378	-$499,596	$16,971,626
RIMCO Royalty Partners, LP	$1	$0	$0	$0	$1
Rockpoint Real Estate Fund VI, L.P.	$7,658,586	$390,667	$0	$390,667	$7,854,027
Searchlight Capital III, L.P.	$9,429,692	$300,851	$0	$300,851	$9,617,971
Siguler Guff Distressed Opportunities Fund III, LP	$575,077	$0	-$40,474	-$40,474	$496,843
Summit Partners Growth Equity Fund IX	$15,180,935	$84,000	$0	$84,000	$15,085,855
Summit Partners Growth Equity Fund XI	$844,860	$627,736	$0	$627,736	$1,367,501
Summit Partners Venture Capital Fund V	$4,020,426	$1,258,033	$0	$1,258,033	$5,200,145
Systematic Small Cap Free Cash Flow	$25,214,146	$0	$0	$0	$30,082,460

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Ending Market Value
TA Realty Core Property Fund, L.P.	$82,934,487	$280,788	-$1,885,294	-$1,604,505	$76,740,891
TerraCap Partners V, L.P	$5,477,120	$5,486,176	-$1,040,729	$4,445,446	$10,005,097
Timbervest Partners III, LP	$3,922,884	$0	-$350,000	-$350,000	$3,611,063
TRG Growth Partnership II	$968,735	-$1,032,045	$0	-$1,032,045	$281,463
Trilantic Capital Partners VI, L.P.	$12,662,318	$789,462	$0	$789,462	$13,993,896
Vulcan Partners Small Cap Value	$12,516,377	$28,497	-$28,497	$0	$15,843,002
Walter Scott International Equity	$15,226,891	$0	-$63,555	-$63,555	$18,276,942
Waud Capital Partners V	$12,011,980	$1,002,120	-$50,314	$951,806	$14,428,940
Wellington Durable Enterprises, L.P.	$38,163,531	$0	$0	$0	$44,230,107
Wellspring Capital Partners VI	$14,969,077	$235,931	-$105,233	$130,698	$15,590,471
Total	**$1,269,925,815**	**$126,663,969**	**-$169,869,195**	**-$43,205,226**	**$1,311,593,569**

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Overlay Strategies

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Overlay strategies represent another tool in the toolkit for institutional investors that may allow them to more efficiently meet their objectives. In broad terms, overlay strategies are carried out separately from the underlying portfolio assets and are constructed to target asset allocation exposures or risk characteristics, or to express tactical views. Whereas most investment managers are measured against their alpha generation, overlay managers are primarily measured against their ability to mitigate risks and efficiently execute their mandate.

Introduction

Overlay managers ("OM") are engaged to provide a variety of derivatives-based investment strategies. Overlays are implemented through purchasing futures or other derivative instruments so that the net characteristics of the underlying assets and the overlays deliver the desired level of risk mitigation and optimization. When an overlay is added to an investment portfolio, the overlay may effectively represent the addition of economic leverage and, in most cases, the total notional portfolio market value will be larger than the underlying portfolio.

Over the past decade there has been a proliferation of overlay products, and overlay managers are increasingly adept at crafting custom overlay strategies to meet client needs. Our research note offers a brief overview of some of the most common overlay strategies, their benefits, and considerations.

#1. Cash securitization

Cash securitization is an attractive option for institutional investors that prefer to keep capital invested at all times. Most investors keep some level of cash in the portfolio for operational purposes, such as paying benefits and expenses, or meeting private market capital calls. However, in a low rate environment, cash acts as a drag on performance due to the low return nature of the asset class. Cash securitization is the process by which an overlay manager utilizes the cash exposure to stay invested in financial markets through the use of derivatives. For example, an investor may purchase S&P 500 futures to "equitize" the cash portion of their portfolio.

A cash securitization overlay program can be focused on an individual asset class (e.g., equities) or broadly implemented across the entire portfolio. The latter approach requires the OM to have visibility across the investor's cash holdings and cash flow needs. The OM can then use this cash as collateral to purchase futures contracts on liquid indices while being mindful of the timing of plan operation needs. The contracts used are typically long positions in equity and Treasury futures. This eliminates the "cash drag" on performance and keeps the investor fully invested, reducing tracking error versus a policy benchmark.

A risk to the cash securitization strategy occurs when the synthetic asset performs poorly. The cash earmarked as collateral will be used to settle the derivatives contracts, thus creating a need for additional cash. This may result in the need to liquidate physical assets (e.g., stocks or bonds) at adverse prices in order to meet short-term operational obligations.

#2. Exposure maintenance and policy rebalancing

An institutional investor may implement an exposure maintenance overlay to ensure asset classes remain within predetermined ranges. This type of strategy is appealing for the following reasons:

A. **Delegation of asset allocation maintenance** – Ensuring every asset allocation remains within target ranges can be a time consuming and unpredictable exercise. A portfolio can go years without requiring a rebalance trade or, during periods of volatility, can require several trades in a matter of days. Putting an exposure maintenance overlay in place will delegate the monitoring and trade execution to the OM and thereby ensure that the portfolio will maintain its desired target asset allocation exposures.

B. **Efficient transactions** – Effective rebalancing often comes down to timing. Executing rebalancing in physical markets may not always be the most efficient approach. The time it takes between recognizing a market dislocation and settling the physical assets can stretch over days or weeks, depending on notification and settlement schedules, potentially missing a window of opportunity. In most cases, the OM will recognize the dislocation at the market close and have the corresponding synthetic investment in place immediately.

C. **Cost effective transactions** – During periods of extreme market stress (e.g., March 2020), bid-ask spreads for normally liquid assets can widen substantially. An overlay manager can execute the transaction to achieve the desired market exposure using derivatives at a much lower transaction cost, including market impact costs for larger investors. In these instances, it can be beneficial to have a second option for accessing markets and achieving liquidity.

Investors will want to weigh the advantages of an exposure maintenance strategy against the costs of implementation and maintenance of the program. During periods of low volatility, transacting in the physical markets are typically more effective than absorbing the cost of a derivative exposure maintenance program. In addition, while certain responsibilities are delegated to the OM, the investor and their service providers will continue to be responsible for communicating operations with the OM (e.g., when to replace synthetic exposure with physical assets). Derivatives provide exposure with pledged collateral that are marked to market on a daily basis, where losses entail greater administrative complexities that may prove unpalatable. As such, communication of these risks – before and ongoing – are extremely important to a successful program.

#3. Transition management

Transition management is the process by which one portfolio (with a specified mandate) transitions to another portfolio (with the same or different mandate). Even where the mandate remains the same, the investment manager responsible for the new portfolio's mandate may not want to inherit or be responsible for adjusting the securities in the legacy portfolio. Depending on the timing, liquidity, and depth of the asset market, transitioning assets from one manager to another can incur additional trading costs and delays.

The outmoded model for handling this type of transition was to instruct the legacy manager to sell all the securities and give the new manager the resulting cash to invest. The main shortcomings of this method are that costs (commissions, opportunity costs, trade execution) may be high, as a firm with no incentive to maximize receipts is responsible for executing the trades, and the investor may be left underexposed to the market during the transition period.

Using a third-party transition manager ("TM") can reduce or eliminate these costs. For example, the TM typically transfers as many assets "in-kind" as possible. Assets in the legacy portfolio, which are needed by the new manager, can be transferred directly to the new portfolio. Because they are not traded on the open market, commission costs are eliminated. Further, the TM seeks to maintain market exposure throughout the transition, often via the use of derivatives, thus ensuring that opportunity costs are minimized. Finally, a TM is measured on their performance and, therefore, is more likely to search for the best execution. Given that the TM usually has substantial capabilities in a wide array of derivatives markets, achieving the desired market exposure(s) during a transition should prove highly feasible and cost effective.

Any institutional investor should consider utilizing transition management expertise. The benefit of this engagement will depend on the size of the transaction and the type of assets being transitioned. For example, a transition of $50m in highly liquid assets will not benefit from using a TM nearly as much as transitions of larger, less liquid portfolios.

#4. Currency exposure

Investing in foreign assets can improve the diversification profile of US investors, but this comes at the expense of introducing currency risk to a portfolio. Given that currency returns are volatile and difficult to predict, many investors consider implementing currency-hedging programs to reduce or eliminate the volatility that results from foreign currency exposures.

A currency overlay program is meant to synthetically offset the currency risk present with a globally diversified portfolio. An OM can build a currency overlay program for a particular investment, an asset class, or the entire portfolio's currency exposure. Within the program, the OM will use currency futures or forwards to hedge currency risk so that losses in terms of the home currency (e.g., US Dollar) are minimized. A currency overlay program can be active or passive (i.e., rules-based).

While the promise of reducing currency volatility may sound attractive, currency overlays have several disadvantages. The most obvious disadvantage is that some currencies, particularly those for many emerging markets, are typically quite expensive to hedge (the interest rate differential between the US and the country in question is the key determinant of hedging costs). Hence investors may have to be selective in choosing which currencies they wish to hedge.

There are also administrative and governance challenges that deserve mention. Since currency hedging programs may incur losses beyond the investment losses of the portfolio, the decision to hedge currencies could prove difficult to justify in periods of underperformance. The additional administrative burden of maintaining a currency overlay may also be a consideration as frequent rebalancing and data sharing with the OM is required.

#5. Portable alpha

Portable alpha is an investment strategy where investors combine an independent source of manager skill ("alpha") with an underlying asset class investment ("beta"). By combining two uncorrelated return streams and utilizing a wider opportunity set for alpha generation, portable alpha represents an efficient approach to adding excess return. Practically speaking, investors may also view it as a way to add leverage to their portfolio.

Investors access the beta though derivatives, most often futures contracts, but potentially also via swaps. Hence, portable alpha can be implemented within any asset class with an established derivatives market, such as high quality bonds or public equities.

To gain beta exposure greater than the cash invested, investors pay a financing cost which is typically tied to a short-term interest rate. The excess funds can then be invested in an independent alpha strategy, resulting in a combined exposure greater than the initial investment. The combined portfolio should generate returns in excess of the beta component as long as the alpha source produces returns which are greater than the cost of financing the beta exposure (and any other fees incurred).

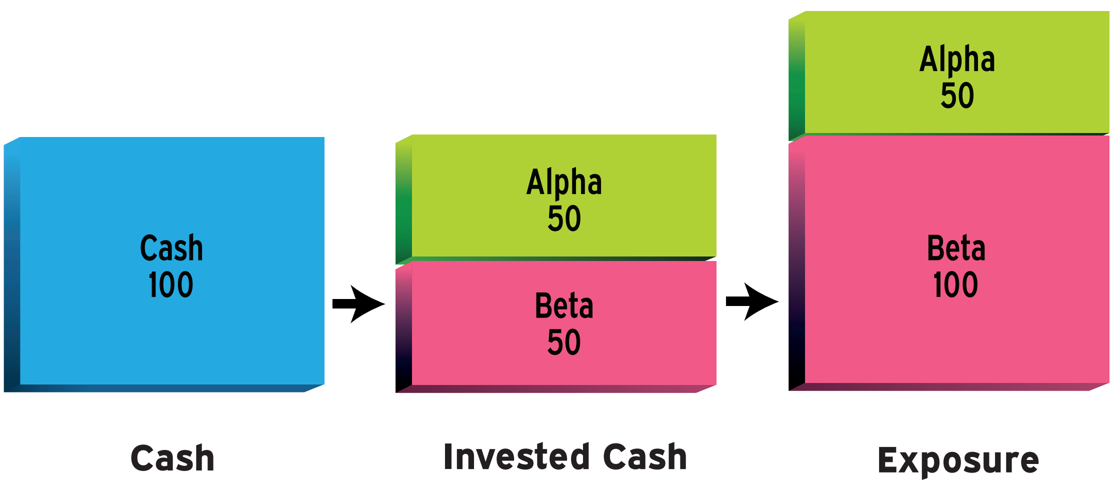

FIGURE 1

Implementation Example

The operational aspect of managing the market exposure (beta) is complex. The process of "rolling" futures contracts or executing a swap requires sophisticated investment and legal review. Investors may employ the services of an OM to manage all of the complexities that are inherent in the strategy.

The strategy, however, does not come without its challenges. These include increased risk, costs and complexity, the potential misuse of leverage, and understanding the nature of the strategy. In addition, sourcing positive and durable alpha is often expensive, difficult to acquire, and challenging to identify.

#6. LDI interest rate hedge management

Beyond the scope of portfolio construction, overlays can also be used to harmonize a portfolio's liability-driven investment strategy with the variable discounted liabilities of corporate retirement plans. When the interest rate Hedge Ratio ("HR")[1] is 100%, assets and liabilities will move in tandem, in theory, with interest rate changes. Alternatively, when the HR is 0%, liabilities and assets move independently. An investor's desired HR is heavily dependent on their approach to interest rate risk management.

[1] In general terms, the HR equals the funded ratio multiplied by the duration of assets divided by the duration of liabilities.

In many cases, a pension plan can achieve a specific HR target by using physical fixed income instruments. However, there are benefits to using an overlay manager. Specifically, 1) a portfolio may not be able to achieve its long-term return objectives with a large allocation to (long-duration) fixed income; and 2) the physical fixed income duration profile might be significantly different than the duration profile of the liability.

The figure below illustrates, the potential mismatch of assets and liabilities in a hypothetical 60/40 portfolio with an expected long-term return assumption ("EROA") of 6.0%.

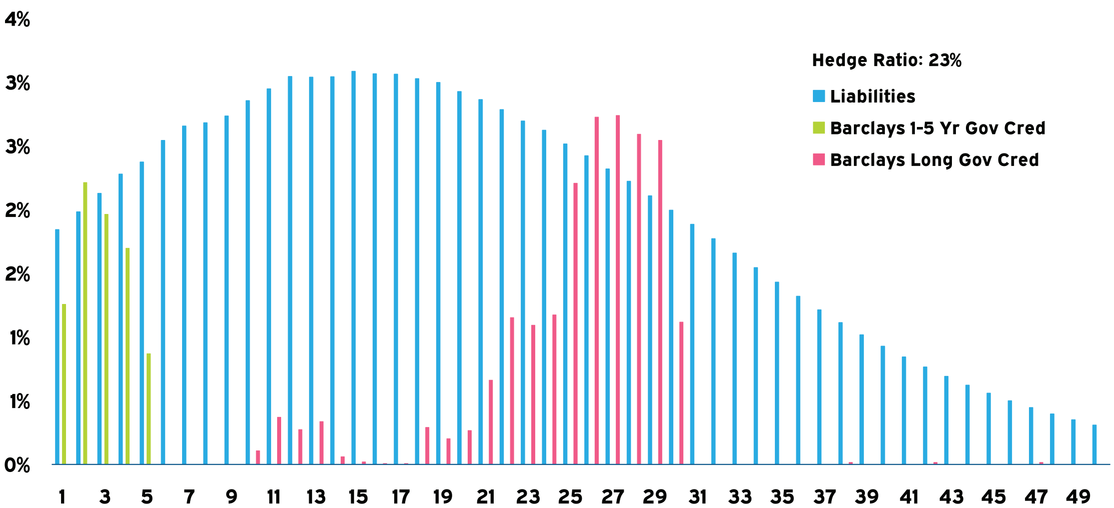

FIGURE 2

Comparison of Benefit Profile to Asset Allocation

Source: Meketa Sample Benefit Profile, Bloomberg.

If the investor would like to hedge 100% of the interest rate risk, they could transition all of their assets to a long-duration fixed income portfolio. Unfortunately, there are two drawbacks of this move: the EROA would drop from 6.0% to 2.5%, and the shape of the expected cash flows from the assets are not the same as the liabilities and, in fact, are even worse.

By implementing an interest-rate overlay, the investor can achieve their interest rate hedging goal, improve the potential to meet their return goal, and better align the interest rate exposure along the yield curve by purchasing futures at specific maturities.

Considerations for implementing an overlay strategy

Each investor has a unique administrative and asset allocation structure. Therefore, the decision to implement an overlay strategy will also have unique considerations.

There are variety of considerations that warrant additional attention in the cost-benefit analysis of desirability of overlays. For example, there are implementation costs of carry, which may incur losses in normal markets. The introduction of leverage can also exacerbate losses or transpose cross-asset characteristics (e.g., equitizing cash will impart equity-like volatility to a cash allocation). There are also implicit costs, such as time. An overlay strategy may increase the required frequency and scope of communication between portfolio fiduciaries, portfolio service providers, and overlay managers.

Overlay strategies typically charge a management fee based on the notional exposure. In some cases, a minimum fee may apply. Careful consideration of all costs should be evaluated prior to any OM engagement. In addition to financing costs, there are two primary trading costs investors should consider:

- → **Implicit trading costs:** This includes bid/offer spreads that differ by strategy. For example, broad-based exposures, such as S&P500 futures or Treasury futures, have very narrow spreads.
- → **Explicit trading costs:** These include commissions for futures contracts and typically cover exchange, execution and clearing fees. Standardized pre-negotiated futures agreements by the OM keep these costs de-minimus (less than one basis point).

Summary

Investors may find that some portfolio inefficiencies are best addressed through overlay managers. Overlay strategies can be constructed to target asset allocation exposures or risk characteristics, to express tactical views, or to achieve specific interest rate exposures. Overlay managers are increasingly willing and able to customize overlay solutions to meet specific investors' needs.

While overlays can offer portfolio solutions, they are administratively and operationally complex. Their introduction of leverage (in some cases) amplifies the risk of portfolios and hence the need for greater oversight and risk controls.

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Appendix

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EFFECTIVE JANUARY 1, 2023, ASSET CLASS AND TOTAL PLAN PEFORMANCE IS ROLLED UP USING A WEIGHTED AVERAGE CALCULATION.

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. Portfolio Return- [Risk Free Rate+Beta*(market return-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 is 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.

SI: Since Inception

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%.

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

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.