

AKSIA LLC

PENNSYLVANIA PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM ABSOLUTE RETURN PROGRAM QUARTERLY UPDATE

AS OF JUNE 30, 2021

PSERS ABSOLUTE RETURN PROGRAM QUARTERLY UPDATE

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I. EXECUTIVE SUMMARY

Investment Policy and Program Objectives

- Reduce the risk and/or enhance the returns of PSERS' overall investment program through investment in a diversified basket of portfolios that incorporate various investment strategies, asset types, and investment vehicles
- Target risk-adjusted returns in excess of the benchmark, net of fees, over a full market cycle
- Target managers which provide idiosyncratic returns and portfolios that exhibit low correlation to equities, fixed income, commodities, and other sources of low-cost beta over a full market cycle

	Target Allocation	Current Allocation as of 06/30/2021
Absolute Return Program	8% ²	8.4%

Sector Constraints	Allocation Range	Current Allocation as of 6/30/2021
Long/Short Equity	0% - 20%	0%
Event Driven	0% - 50%	12%
Relative Value	0% - 65%	54%
Tactical Trading	0% - 65%	34%

Manager/Fund Constraints	Maximum	Note
Allocation to any one manager	20%	
Allocation to any one separate account	15%	
Allocation to any one fund	15%	1 fund currently >15% ¹

¹ The Absolute Return Program is permitted to have one fund or manager that exceeds the maximum allocation guidelines noted above. In no case may the maximum allocation exceed 25%. The Absolute Return Program is currently in compliance with the 25% maximum allocation guideline.

² Effective April 1, 2021, the Target Allocation decreased from 10% to 8%.

Key Observations:

- Over the full market cycle, the AR portfolio return is in line with or exceeds the current benchmark
- The AR portfolio outperformed the current benchmark on a beta-adjusted basis over the 5 year, 10 year, and inception to date period
- The AR portfolio has a higher Sharpe Ratio, lower beta, and lower correlation to the S&P 500 Index than the current benchmark

Performance Objective: Target risk-adjusted returns in excess of the HRFI Fund of Funds Conservative Index +1%, net of fees, over a full market cycle

Time Period	Actual Performance		Beta-Adjusted Performance ("Alpha") ²	
	PSERS ¹	HFRI FOF Conservative + 1%	PSERS ¹	HFRI FOF Conservative + 1%
Current Fiscal YTD (Jul '20 - Jun '21)	12.9%	16.2%	6.1%	7.3%
Last Fiscal Year (Jul '19 - Jun '20)	-0.5%	0.5%	-1.4%	-1.0%
CYTD 2021	4.6%	6.4%	2.0%	2.9%
One Year	12.9%	16.2%	6.1%	7.3%
Three Year	4.8%	6.4%	2.3%	2.6%
Five Year	5.6%	6.1%	3.5%	3.0%
Ten Year	4.3%	4.5%	2.9%	2.0%
Inception to Date (Oct 2005 - Jun 2021)	5.2%	3.9%	4.1%	1.6%
Risk and Return (Oct 2005 - Jun 2021)		(Oct 2008 - Jun 2021)²		
Return (Ann.)	5.2%	3.9%	4.1%	1.6%
Volatility (Ann.)	4.9%	4.3%	3.9%	2.9%
Sharpe Ratio	0.78	0.57	0.94	0.35
Correlation with S&P 500	0.42	0.68	-	-
Beta to S&P 500	0.14	0.20	-	-

¹ Net of hedge fund fees and expenses but gross of Aksia's fee.

² The beta-adjustment calculation requires 36 months of data, therefore the first available date for beta-adjusted performance is October 2008. The referenced index used to calculate Beta-adjusted performance is the S&P 500 TR.

Key Observations:

- The AR portfolio is intended to provide consistent, idiosyncratic returns that provide diversification from the broader equity, fixed income, and commodity markets
- Since inception, the Absolute Return portfolio has had one down year (-8.6% in 2008)
 - During 2008 the S&P 500 Index was down -37.0%, the MSCI ACWI World Index was down over -42.2%, and the current benchmark was down -19.0%
- The AR portfolio achieves these returns without significant beta

Time Period	Actual Performance			Beta-Adjusted Performance ("Alpha") ³	
	PSERS ¹	Policy Index ²	HFRI FOF Conservative + 1%	PSERS ¹	HFRI FOF Conservative + 1%
Current Fiscal YTD (Jul '20 - Jun '21)	12.9%	16.2%	16.2%	6.1%	7.3%
Last Fiscal Year (Jul '19 - Jun '20)	-0.5%	1.7%	0.5%	-1.4%	-1.0%
CYTD 2021	4.6%	6.4%	6.4%	2.0%	2.9%
2020	4.4%	7.5%	7.5%	-0.1%	2.5%
2019	4.0%	6.4%	7.4%	4.4%	3.2%
2018	3.8%	5.8%	0.1%	2.8%	0.8%
2017	4.2%	4.7%	5.2%	2.3%	2.5%
2016	4.0%	4.2%	2.9%	2.7%	1.4%
2015	3.8%	3.8%	1.4%	3.9%	1.2%
2014	3.1%	5.6%	4.2%	2.1%	1.8%
2013	4.8%	7.5%	8.8%	2.2%	3.1%
2012	3.5%	7.5%	5.3%	2.2%	2.9%
2011	7.7%	7.7%	-2.6%	8.7%	-2.4%
2010	17.3%	8.0%	6.1%	14.5%	3.0%
2009	15.3%	-	10.7%	11.4%	5.9%
2008	-8.6%	-	-19.0%	-5.0%	-7.2%
2007	8.2%	-	8.7%		
2006	3.7%	-	10.3%		
2005	0.2%	-	1.7%		

¹ Net of hedge fund fees and expenses but gross of Aksia's fee.

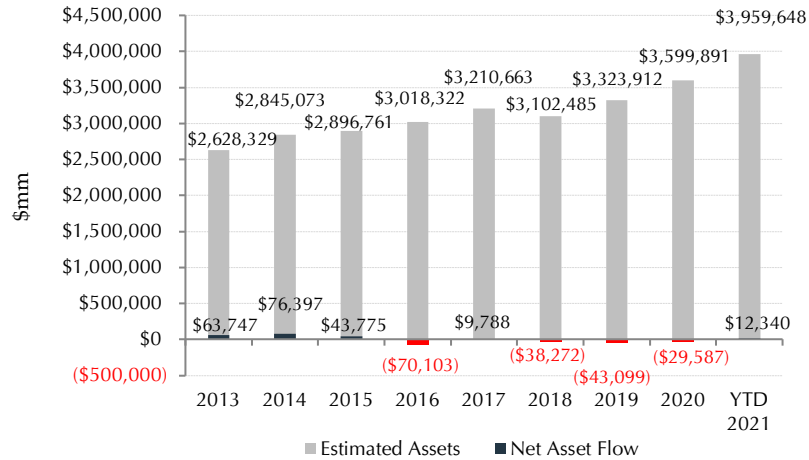
² The Policy Index is comprised of the following: April 2009 (this is when Absolute Return became a separate part of the Asset Allocation) – June 2011: 8% annualized return, July 2011 – June 2014: 7.5% annualized return, July 2014 – September 2019: 3m LIBOR plus 3.5%, October 2019 – Present: HFRI FOF Conservative Index plus 1%.

³ The beta-adjustment calculation requires 36 months of data, therefore the first available date for beta-adjusted performance is October 2008. The referenced index used to calculate Beta-adjusted performance is the S&P 500 TR.

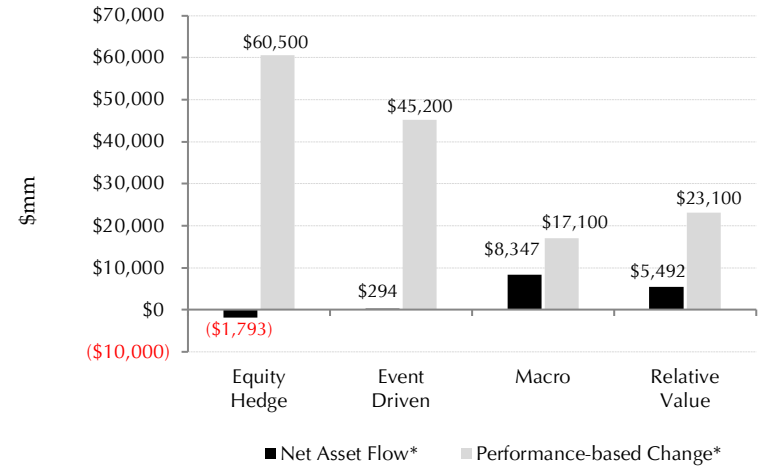
Q2 2021	Fund	Transaction	Amount
Capital Calls and Distributions	Aeolus Property Catastrophe Keystone PF Fund LP	Subscription	+\$59.9mm
	Falko Regional Aircraft Opportunities Fund II LP	Capital Call	+\$2.1mm
Distributions and Redemptions	Aeolus Property Catastrophe Keystone PF Fund LP	Redemption	-\$62.9mm
	Brigade Leveraged Capital Structures Offshore Ltd	Redemption	-\$17.5mm
	Capula Global Relative Value Fund Limited	Redemption	-\$63.2mm
	Falko Regional Aircraft Opportunities Fund II LP	Distribution	-\$1.8mm
	Oceanwood Opportunities Fund	Redemption	-\$64.0mm
	Palmetto Fund Ltd	Redemption	-\$68.0mm
	Perry Partners LP	Distribution	-\$4.0mm
	PIMCO Absolute Return Strategy V Offshore Fund Ltd	Redemption	-\$47.7mm
	RenaissanceRe Upsilon Diversified Fund	Redemption	-\$3.8mm
	SASOF IV LP	Redemption	-\$3.2mm
	Venor Capital Offshore Ltd	Redemption	-\$56.8mm
Total Activity During the Quarter			-\$335.4mm

II. HEDGE FUND INDUSTRY REVIEW

Industry Assets Have Been Modestly Increasing in the Last Several Years (as of Q2 2021)



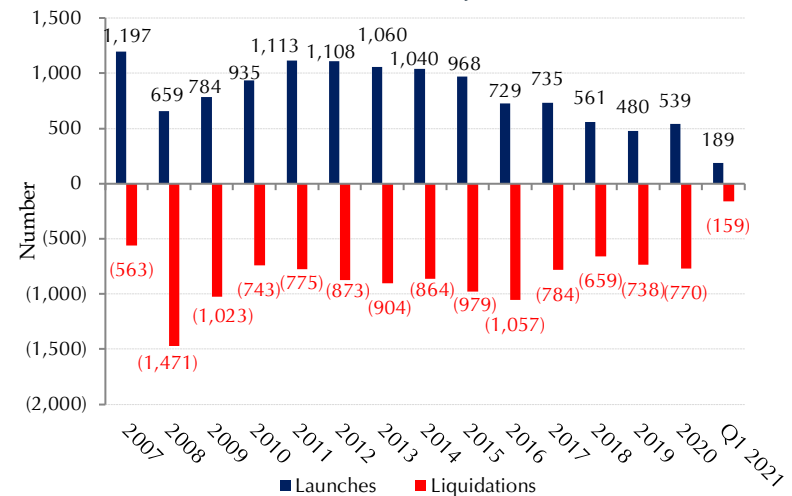
Positive Performance Across All Sectors Accompanied Varied Net Flows in Q2 2021



Q2 2021 Capital Inflows Were Most Notable Among Managers with >\$1B in AUM



New Launches Outpaced Liquidations For The First Time in Several Years (as of Q1 2021**)

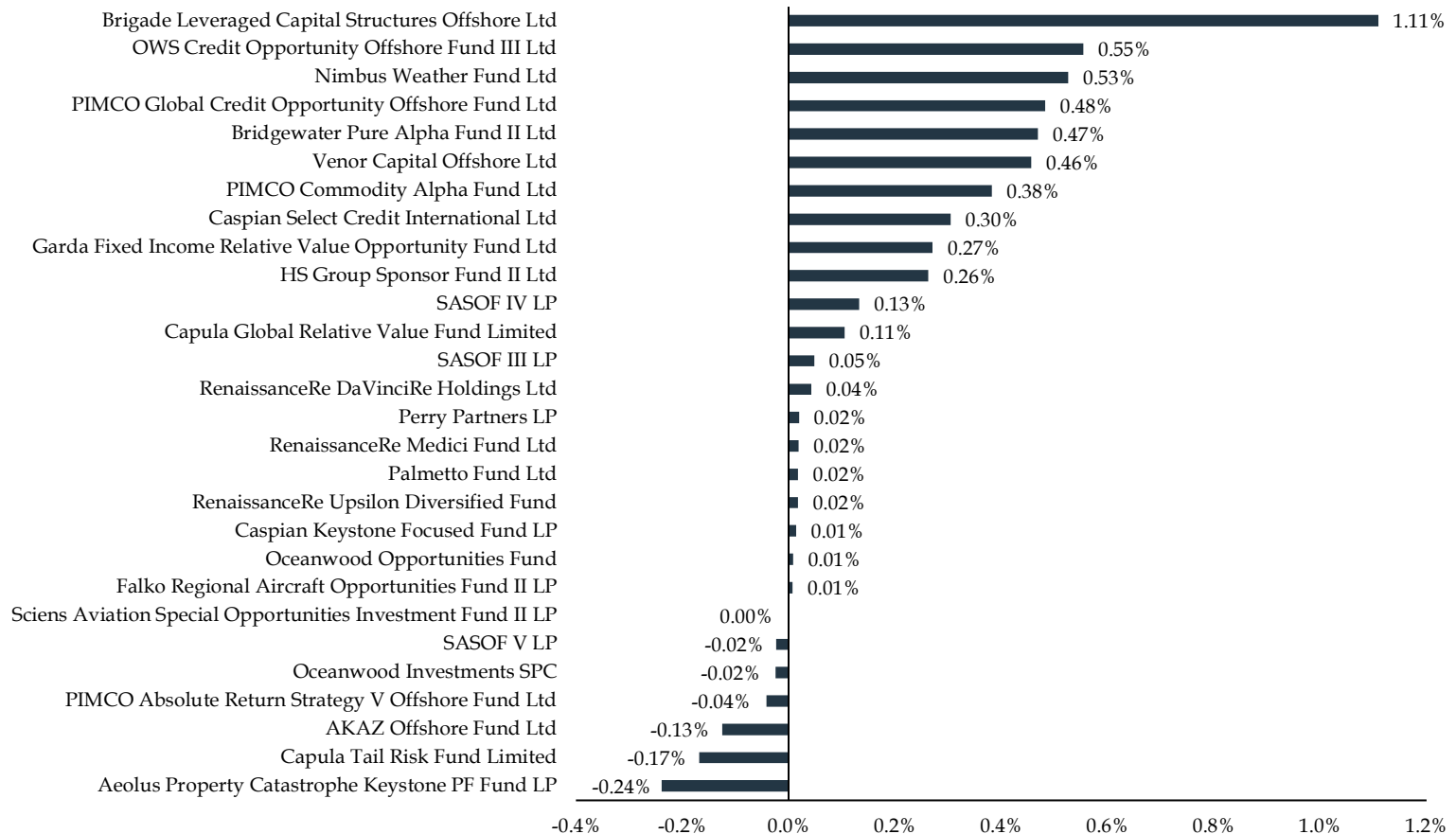


Source: Q2 2021 Global Report
 *Figures are rounded to the nearest \$100M
 **Chart data is one quarter lagged

III. PSERS PORTFOLIO REVIEW

Key Observations:

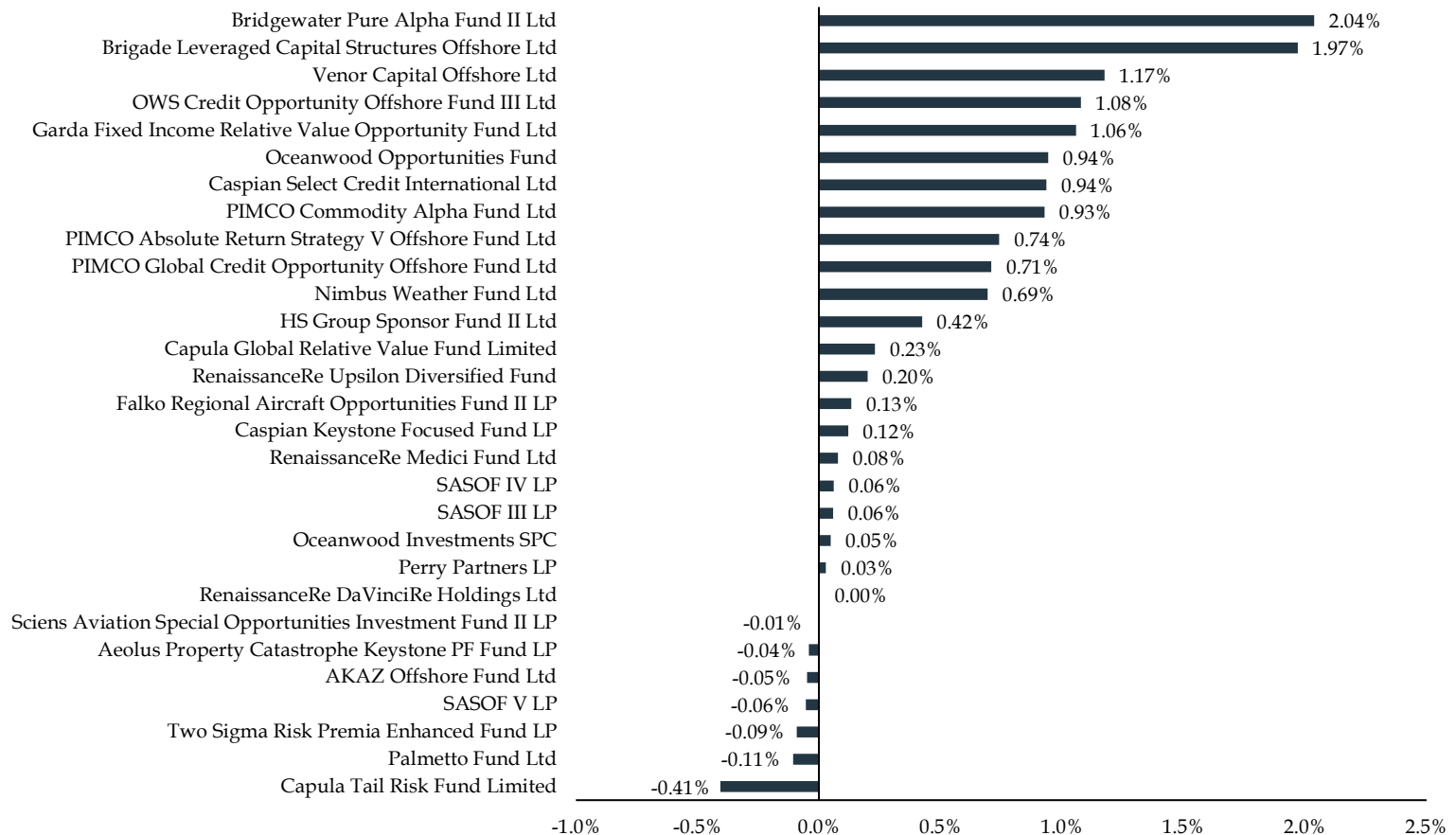
- The return for the period was positive (+4.63%)
- The return for the period is diversified among many sectors and funds
- There were more positive contributors than detractors



YTD through June 30, 2021 Return

Key Observations:

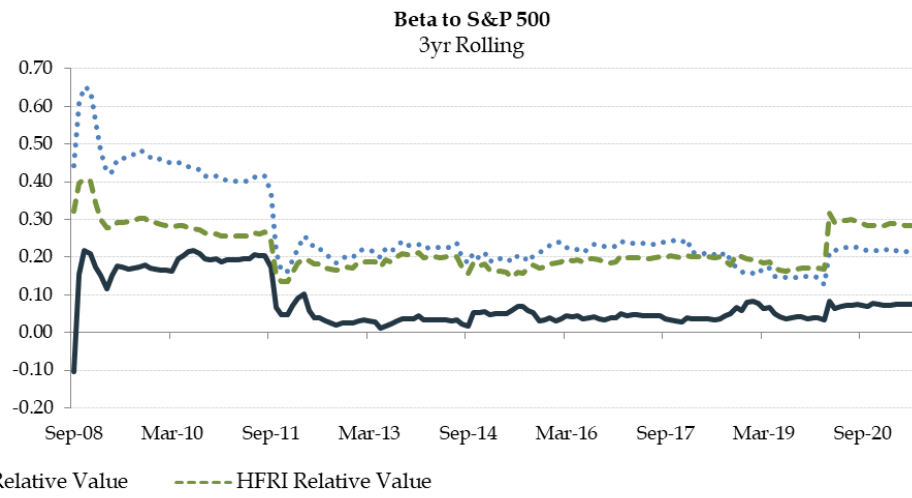
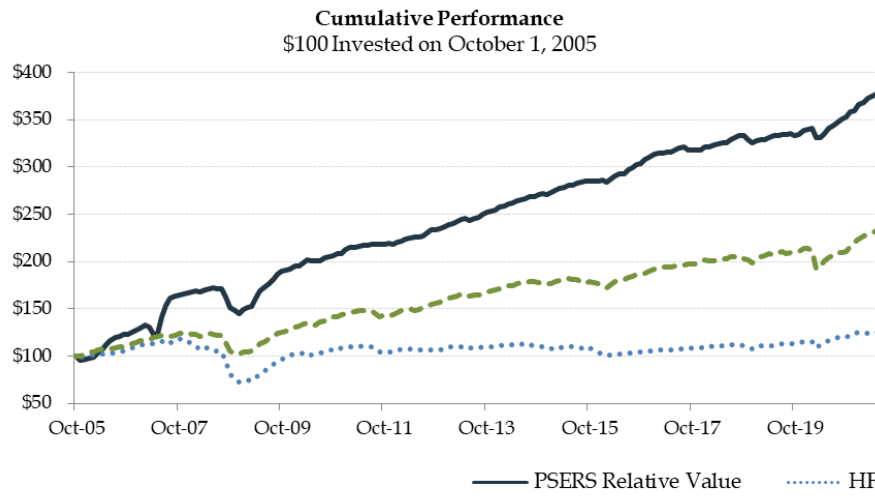
- The return for the period was positive (+12.89%)
- The return for the period is diversified among many sectors and funds
- There were more positive contributors than detractors



L12M through June 30, 2021 Return

Key Observations:

- The AR portfolio's Relative Value allocation performance exceeded the sector indices' performance
- The AR portfolio objective focuses on funds with low equity beta - total Relative Value sector beta achieves this objective and is lower than that of the indices

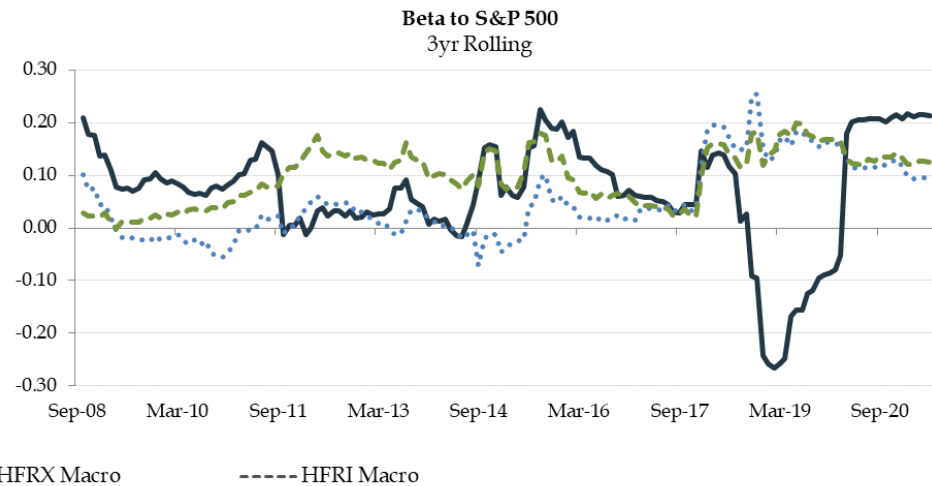
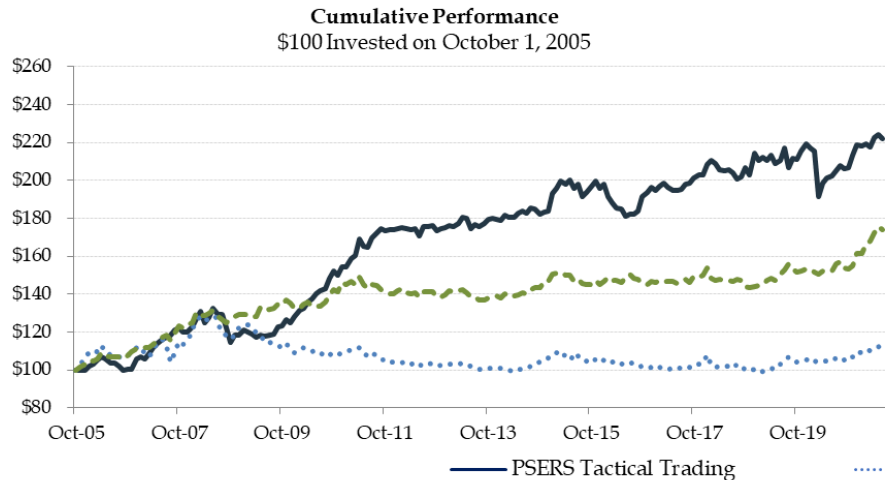


* Analysis for PSERS Relative Value Carve Out is based on realized performance of PSERS' Relative Value hedge funds. The track record includes current funds and funds that have been formerly redeemed.

* Aksia has included both HFRI & HFRX indices as together they provide a decent indicator of hedge fund performance by strategy. HFRX indices are considered 'investable,' whereas HFRI indices are equally weighted across funds in the HFR database. We believe that HFRX indices have a negative selection bias (funds willing to accept new investments may be non-institutional and/or struggling to raise assets), while HFRI has a self-reporting bias (funds who self-report are likely to have recently outperformed, and funds who do poorly may stop reporting). As a result of these biases, we expect HFRX to understate and HFRI to overstate institutional hedge fund performance, over the long run.

Key Observations:

- The AR portfolio's Tactical Trading allocation performance exceeded the sector indices' performance
- The AR portfolio objective focuses on funds with low equity beta - total Tactical Trading sector beta achieves this objective and is slightly higher than that of the indices



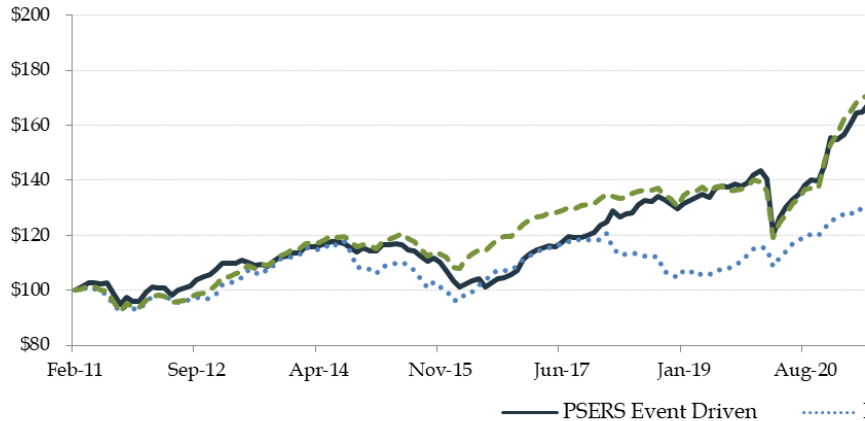
* Analysis for PSERS Tactical Trading Carve Out is based on realized performance of PSERS' Tactical Trading hedge funds. The track record includes current funds and funds that have been formerly redeemed.

* Aksia has included both HFRI & HFRX indices as together they provide a decent indicator of hedge fund performance by strategy. HFRX indices are considered 'investable,' whereas HFRI indices are equally weighted across funds in the HFR database. We believe that HFRX indices have a negative selection bias (funds willing to accept new investments may be non-institutional and/or struggling to raise assets), while HFRI has a self-reporting bias (funds who self-report are likely to have recently outperformed, and funds who do poorly may stop reporting). As a result of these biases, we expect HFRX to understate and HFRI to overstate institutional hedge fund performance, over the long run.

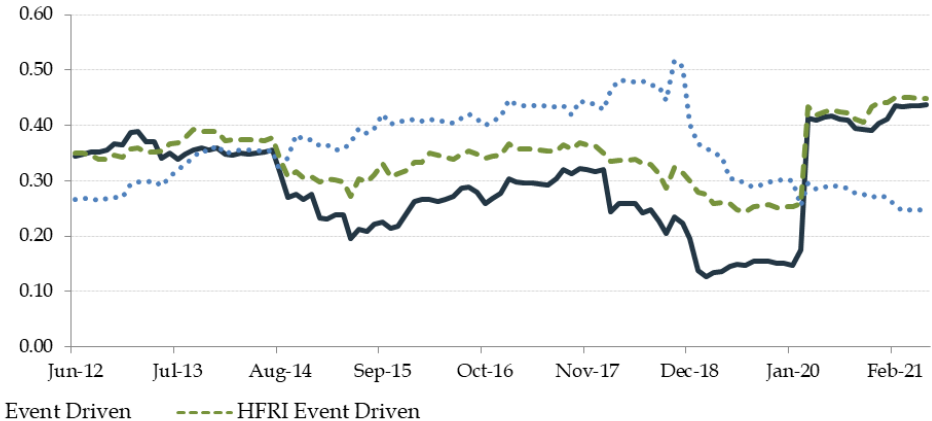
Key Observations:

- The AR portfolio's Event Driven allocation exceeded the investable index sector performance
- The AR portfolio objective focuses on funds with low equity beta – total Event Driven sector beta achieves this objective, although beta did spike during COVID

Cumulative Performance
\$100 Invested on October 5, 2005



Beta to S&P 500
3yr Rolling

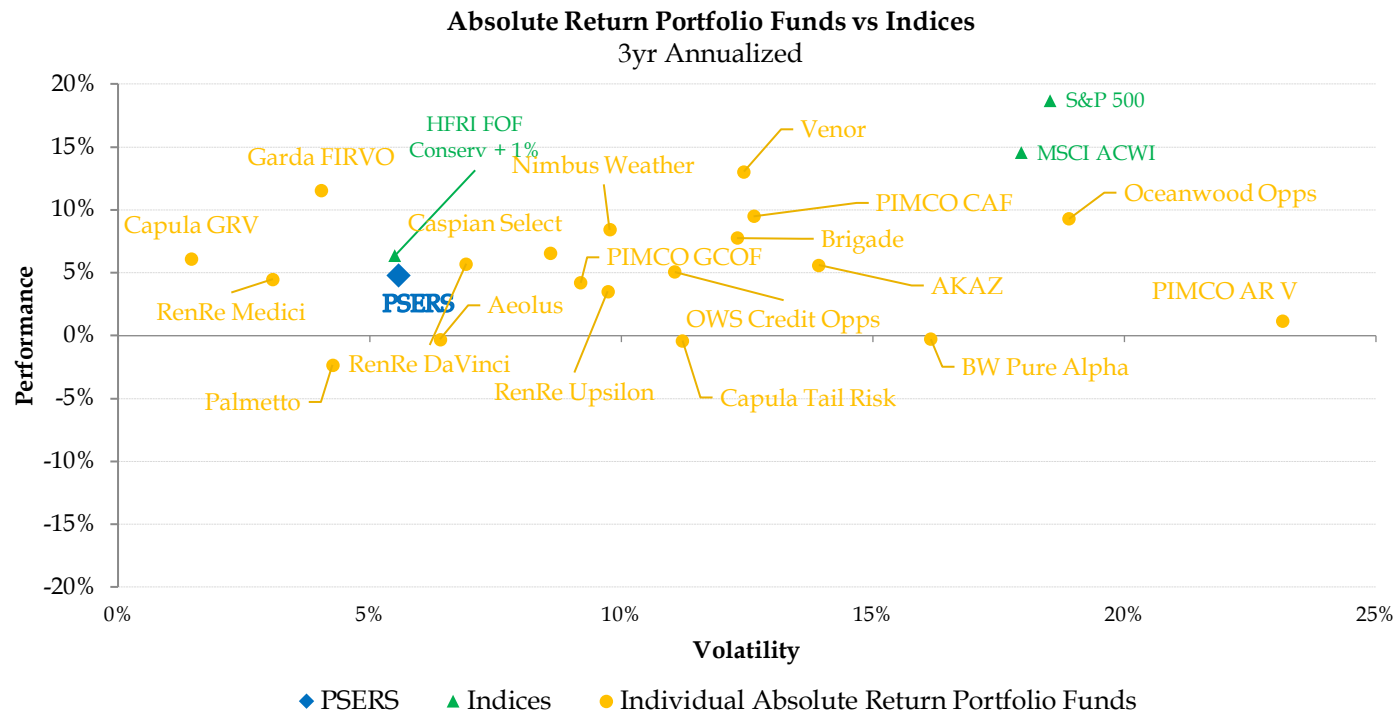


* Analysis for PSERS Event Driven Carve Out is based on realized performance of PSERS' Event Driven hedge funds. The track record includes current funds and funds that have been formerly redeemed.

* Aksia has included both HFRI & HFRX indices as together they provide a decent indicator of hedge fund performance by strategy. HFRX indices are considered 'investable,' whereas HFRI indices are equally weighted across funds in the HFR database. We believe that HFRX indices have a negative selection bias (funds willing to accept new investments may be non-institutional and/or struggling to raise assets), while HFRI has a self-reporting bias (funds who self-report are likely to have recently outperformed, and funds who do poorly may stop reporting). As a result of these biases, we expect HFRX to understate and HFRI to overstate institutional hedge fund performance, over the long run.

Key Observations:

- Diversification of funds dampens volatility
- AR performance and volatility results are similar to the current benchmark
- The AR portfolio has a third of the volatility of the equity markets (S&P 500 and MSCI ACWI)

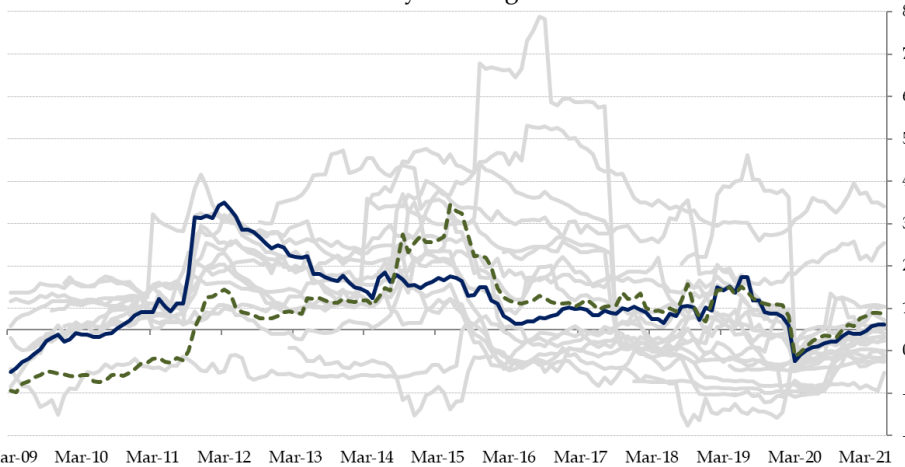


- The return and volatility analysis for the Absolute Return portfolio funds utilizes PSERS' realized performance for the 36-month period prior to and including June 2021. If PSERS has been invested in a fund for less than 36 months, the analysis uses the blended performance of realized returns and fund-level returns prior to PSERS initial investment date. Please see pages 21-23 in this presentation for the inception date of each fund in PSERS portfolio. Analysis for PSERS is performed on realized performance for the Absolute Return portfolio.
- This chart only shows funds that are traditional open-ended fund structures with return methodologies comparable to index returns
- The following private (drawdown structure) funds are not included in this analysis (with inception to date IRRs noted): SASOF fund composite (11.5% net IRR), Falko Regional Aircraft Opportunities Fund II LP (-3.5% net IRR), HS Group Sponsor Fund II Ltd. (16.5% net IRR), Oceanwood Investments SPC (11.0% net IRR), and Caspian Keystone Focused Fund LP (18.2% net IRR)

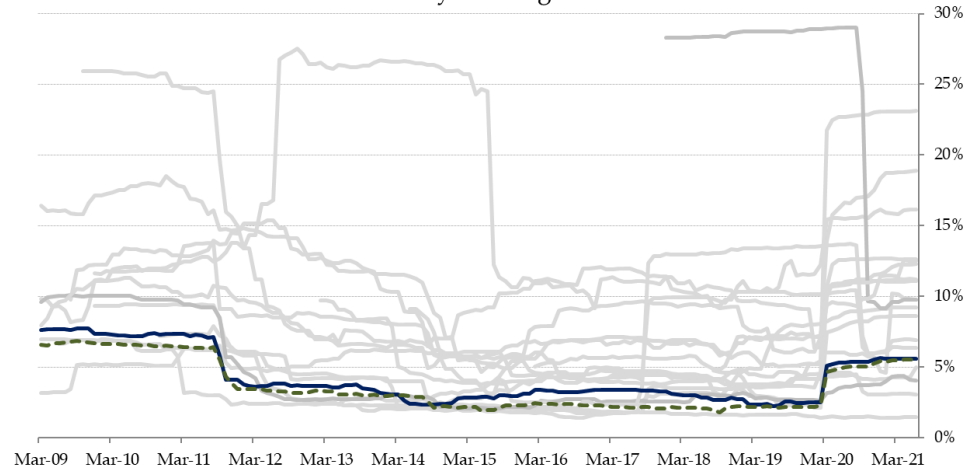
Key Observations:

- Diversification of funds dampens volatility
- AR portfolio Sharpe Ratio and volatility are in-line with the current benchmark

Sharpe Ratio 3yr Rolling



Volatility 3yr Rolling



— PSERS

— Individual Absolute Return Portfolio Funds

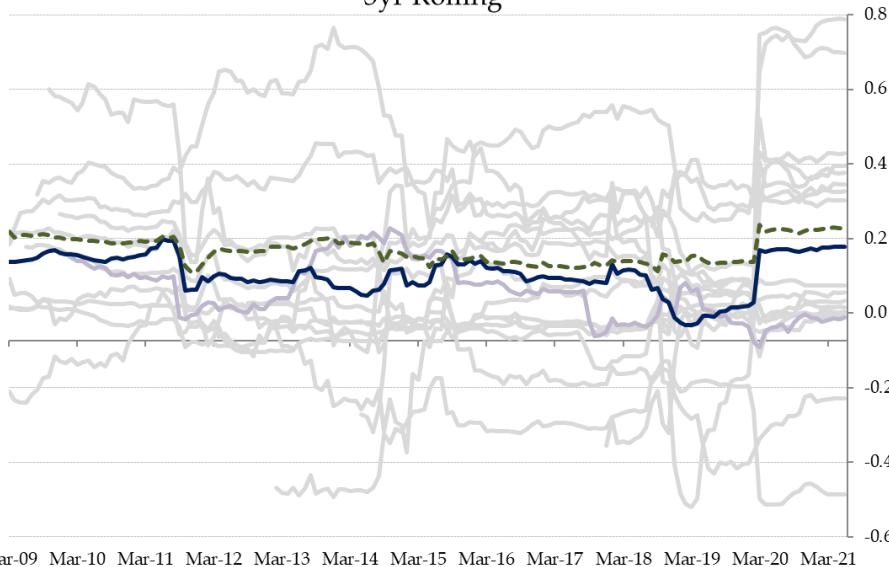
--- HFRI FOF Conservative + 1%

- The Sharpe and volatility analysis for the Absolute Return portfolio funds utilizes PSERS' realized performance for the 36-month period prior to and including June 2021. If PSERS has been invested in a fund for less than 36 months, the analysis uses the blended performance of realized returns and fund-level returns prior to PSERS initial investment date. Please see pages 21-23 in this presentation for the inception date of each fund in PSERS portfolio. Analysis for PSERS is performed on realized performance for the Absolute Return portfolio. Sharpe Ratio uses LIBOR as the risk-free rate.
- For a broad indicator of average 'hedge fund portfolio' performance, Aksia prefers to use the HFRI FOF index group, as there tends to be less self-reporting/dropout bias and losses and side pockets are captured by the FOF vehicle.

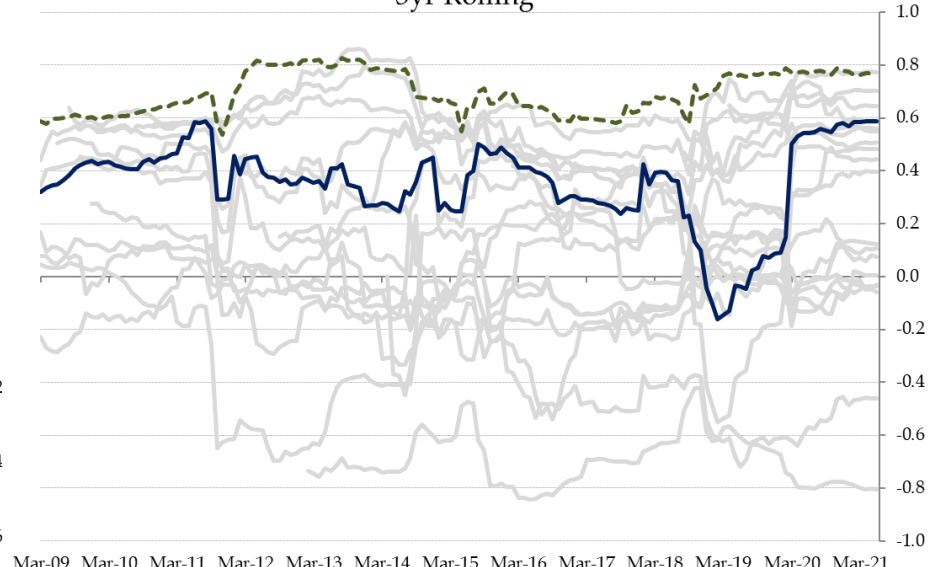
Key Observations:

- The AR portfolio is intended to provide the PSERS overall plan with diversification from the broader equity markets, and the portfolio has relatively low beta and correlation to the S&P 500
- AR portfolio beta and correlation to the S&P 500 are lower than that of the current benchmark

Beta to S&P 500
3yr Rolling



Correlation to S&P 500
3yr Rolling

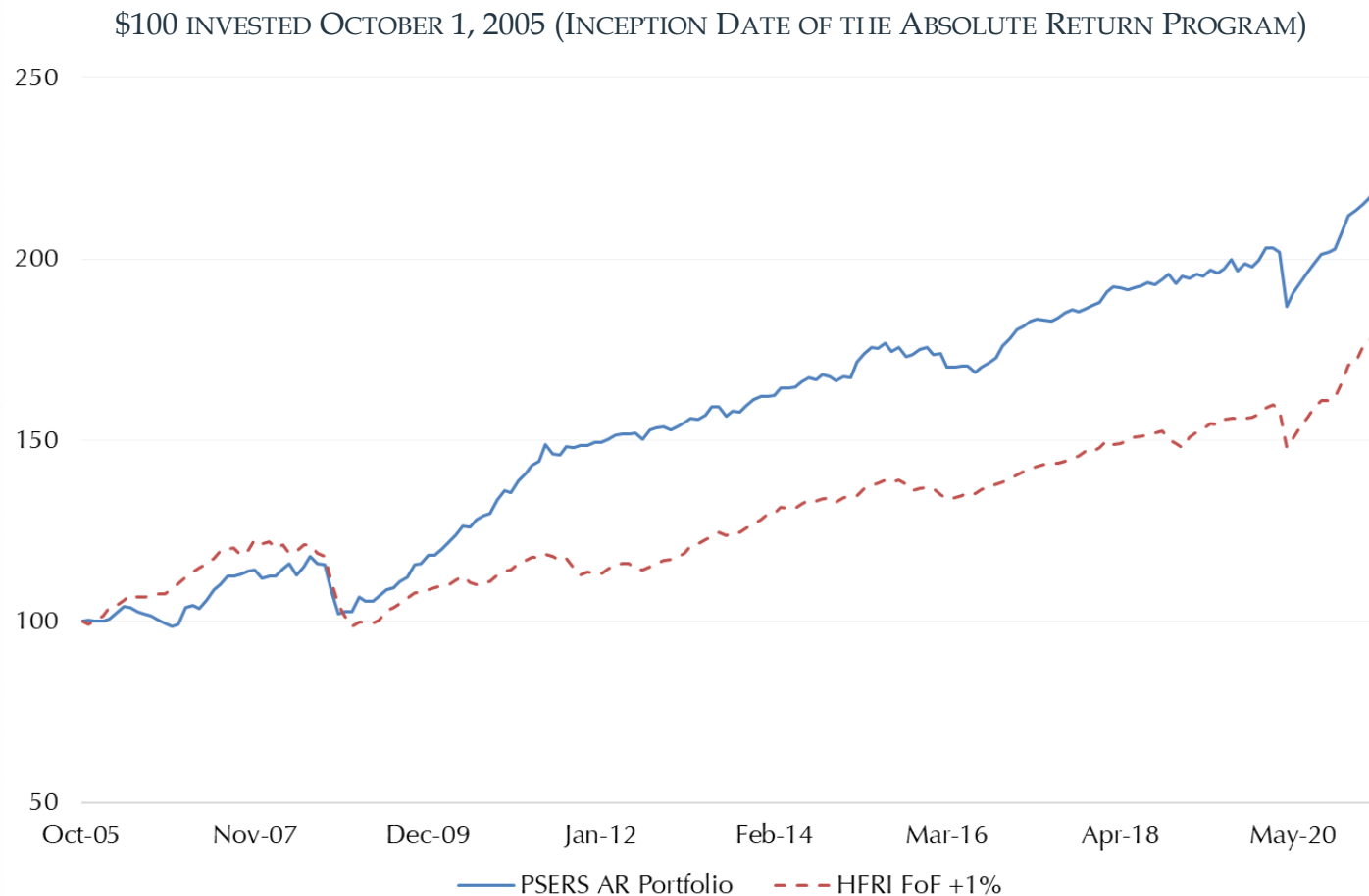


— PSERS — Individual Absolute Return Portfolio Funds - - - HFRI FOF Conservative + 1%

- The beta and correlation analysis for the Absolute Return portfolio funds utilizes PSERS' realized performance for the 36-month period prior to and including June 2021. If PSERS has been invested in a fund for less than 36 months, the analysis uses the blended performance of realized returns and fund-level returns prior to PSERS initial investment date. Please see pages 21-23 in this presentation for the inception date of each fund in PSERS portfolio. Analysis for PSERS is performed on realized performance for the Absolute Return portfolio.
- For a broad indicator of average 'hedge fund portfolio' performance, Aksia prefers to use the HFRI FOF index group, as there tends to be less self-reporting/dropout bias and losses and side pockets are captured by the FOF vehicle.

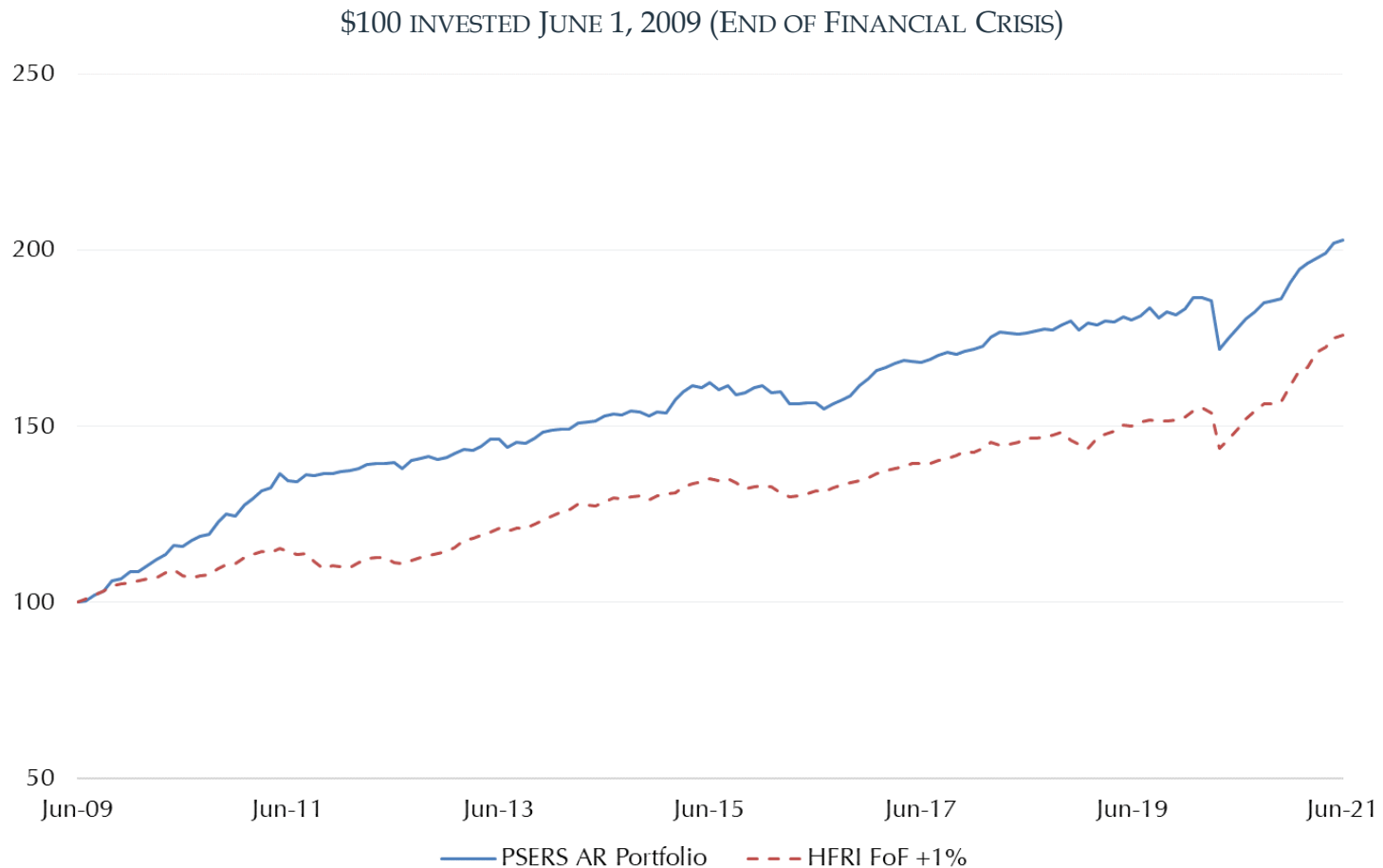
Key Observations:

- The dips in AR performance are generally in line with the current benchmark, and at times are positive during drawdowns in the current benchmark
- The consistent performance of the AR portfolio enables compounding of returns and capital



Key Observations:

- The dips in AR performance are generally in line with the current benchmark, and at times are positive during drawdowns in the current benchmark
- The consistent performance of the AR portfolio enables compounding of returns and capital



VI. APPENDIX

AR PORTFOLIO - AS OF JUNE 30, 2021 (PART 1 OF 3)



Sector	Strategy	Fund Name	NAV (\$MM)	Multiple of Cost	IRR	TWR Since Investment*	Investment as of
Event Driven	Event Credit	Caspian Keystone Focused Fund LP	4.4	1.16	18.2%	N/A	May-16
		Caspian Select Credit International Ltd	307.1	1.54	4.3%	4.3%	Mar-11
		Oceanwood Investments SPC	9.8	1.20	11.0%	N/A	Sep-18
		Venor Capital Offshore Ltd	129.5	1.60	10.6%	12.0%	Sep-16
	Event & Merger	Oceanwood Opportunities Fund	115.2	1.44	6.7%	6.9%	Sep-14
		Perry Partners LP	0.7	0.85	-4.6%	3.5%	Dec-13
	Real Assets	SASOF V LP	3.0	0.44	-89.4%	N/A	May-20
		SASOF IV LP	70.2	0.96	-2.4%	N/A	Mar-18
		SASOF III LP	23.3	1.21	13.8%	N/A	Feb-15
		Sciens Aviation Special Opportunities Investment Fund II LP	0.7	1.37	15.4%	N/A	Mar-13
Falko Regional Aircraft Opportunities Fund II LP	33.1	0.97	-3.5%	N/A	Jul-19		
Total Event Driven			697.0				

*Annualized net performance shown is since inception of the fund in the PSERS portfolio.

AR PORTFOLIO - AS OF JUNE 30, 2021 (PART 2 OF 3)



Sector	Strategy	Fund Name	NAV (\$MM)	Multiple of Cost	IRR	TWR Since Investment*	Investment as of
Relative Value	Fixed Income Arbitrage	Capula Global Relative Value Fund Limited	463.4	1.29	6.4%	6.4%	Feb-11
		Garda Fixed Income Relative Value Opportunity Fund Ltd	628.5	1.80	7.4%	7.3%	Nov-11
	Insurance Linked	Aeolus Property Catastrophe Keystone PF Fund LP - Composite	350.0	1.06	6.9%	5.8%	Jun-12
		Palmetto Fund Ltd	48.1	1.21	3.1%	2.1%	Jul-11
		RenaissanceRe Medici Fund Ltd	69.8	1.21	4.4%	4.5%	Feb-16
		RenaissanceRe Upsilon Diversified Fund	97.0	1.03	1.0%	-14.9%	Jan-17
		DaVinci Reinsurance Ltd	82.3	1.12	4.0%	2.3%	Jan-16
		Nimbus Weather Fund Ltd	188.0	1.25	7.4%	7.1%	Jan-18
		Long/Short Credit	Brigade Leveraged Capital Structures Offshore Ltd	355.4	1.61	7.0%	6.2%
	PIMCO Global Credit Opportunity Offshore Fund Ltd		334.2	2.38	8.6%	8.2%	Feb-08
	Structured Credit	OWS Credit Opportunity Offshore Fund III Ltd	407.5	1.48	9.0%	8.3%	Dec-15
	Multi-Strategy	HS Group Sponsor Fund II Ltd	101.2	1.38	16.5%	10.4%	May-18
	Total Relative Value			3,125.5			

*Annualized net performance shown is since inception of the fund in the PSERS portfolio.

AR PORTFOLIO - AS OF JUNE 30, 2021 (PART 3 OF 3)



Sector	Strategy	Fund Name	NAV (\$MM)	Multiple of Cost	IRR	TWR Since Investment*	Investment as of
Tactical Trading	Global Macro	Bridgewater Pure Alpha Fund II Ltd	953.2	3.17	11.7%	9.2%	Nov-05
		AKAZ Offshore Fund Ltd	246.1	1.23	8.7%	8.7%	Jan-19
		PARS V Offshore Fund Ltd	137.4	2.56	10.7%	8.6%	Feb-08
	Discretionary Commodities	PIMCO Commodity Alpha Fund Ltd**	395.9	2.03	12.4%	12.3%	Apr-15
	Risk Mitigators	Capula Tail Risk Fund Limited	234.8	0.93	-1.2%	-1.2%	Jun-11
Total Tactical Trading			1,967.5				
PSERS Total			5,790.0	1.29	5.38%	5.2%	Oct-05

*Annualized net performance shown is since inception of the fund in the PSERS portfolio.

** PIMCO Commodity Alpha was transferred into the PSERS AR portfolio on Jan 1, 2019. The fund-level statistics shown include its performance prior to the transfer.

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