

# AKSIA LLC

PENNSYLVANIA PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM  
QUARTERLY UPDATE

AS OF JUNE 30, 2017

# PSERS BOARD MEETING

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# I. EXECUTIVE SUMMARY

## ABSOLUTE RETURN PROGRAM REVIEW

### Investment Policy and Program Objectives

- Reduce risk and/or enhance returns of PSERS overall investment program
- Annual return of LIBOR + 3.5% or greater, with a 9.0% or lower volatility target
- Focus on funds with low equity beta risk

	Target Allocation	Current Allocation as of 06/30/2017
Absolute Return Program	10%	9.6%

Sector Constraints	Allocation Range	Current Allocation as of 06/30/2017
Long/Short Equity	0% - 20%	0%
Event Driven	0% - 50%	16%
Relative Value	0% - 65%	49%
Tactical Trading	0% - 65%	35%

Manager/Fund Constraints	Maximum	Note
Allocation to any one manager	20%	
Allocation to any one separate account	12%	
Allocation to any one fund	10%	1 fund currently >10%

<sup>1</sup> 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.

## ABSOLUTE RETURN PROGRAM REVIEW – PERFORMANCE

**Performance Objective:** Annual return of 3M LIBOR + 3.5% or greater, with a 9.0% or lower volatility target

Time Period	Actual Performance			Beta-Adjusted Performance ("Alpha")	
	PSERS <sup>1</sup>	HFRI FOF Composite <sup>2</sup>	LIBOR + 3.5%	PSERS <sup>1</sup>	HFRI FOF Composite <sup>2</sup>
Current Fiscal YTD (Jul '16 - Jun '17)	9.0%	6.5%	4.5%	7.3%	2.2%
Last Fiscal Year (Jul '15 - Jun '16)	-3.4%	-5.4%	4.0%	-4.1%	-6.9%
CYTD 2017	1.8%	3.2%	2.3%	0.9%	1.0%
2016	4.0%	0.5%	4.2%	2.7%	-2.5%
2015	3.8%	-0.3%	3.8%	3.7%	-1.0%
2014	3.1%	3.4%	3.7%	2.1%	-0.2%
2013	4.8%	9.0%	3.8%	2.0%	1.1%
2012	3.5%	4.8%	4.0%	2.2%	1.6%
2011	7.7%	-5.7%	3.8%	8.0%	-6.1%
2010	17.3%	5.7%	3.9%	14.7%	1.8%
2009	15.3%	11.5%	4.3%	11.8%	5.6%
<b>Risk and Return (Oct 2005 - Jun 2017)</b>				<b>(Oct 2008 - Jun 2017)<sup>3</sup></b>	
Return (Ann.)	5.3%	2.4%	5.2%	5.2%	-0.01%
Volatility (Ann.)	4.9%	5.2%	0.6%	4.0%	3.1%
Sharpe Ratio	0.78	0.18	-	1.21	-0.12
Correlation with S&P 500	0.36	0.70	-	-	-
Beta to S&P 500	0.12	0.26	-	-	-

<sup>1</sup> Net of hedge fund fees and expenses but before Aksia's fees.

<sup>2</sup> This is a well-known index which is included merely to show the general trends in the larger universe of hedge fund strategies in the periods indicated and is not intended to imply that the PSERS portfolio is comparable to the funds providing their returns to the index either in composition or elements of risk.

<sup>3</sup> 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.

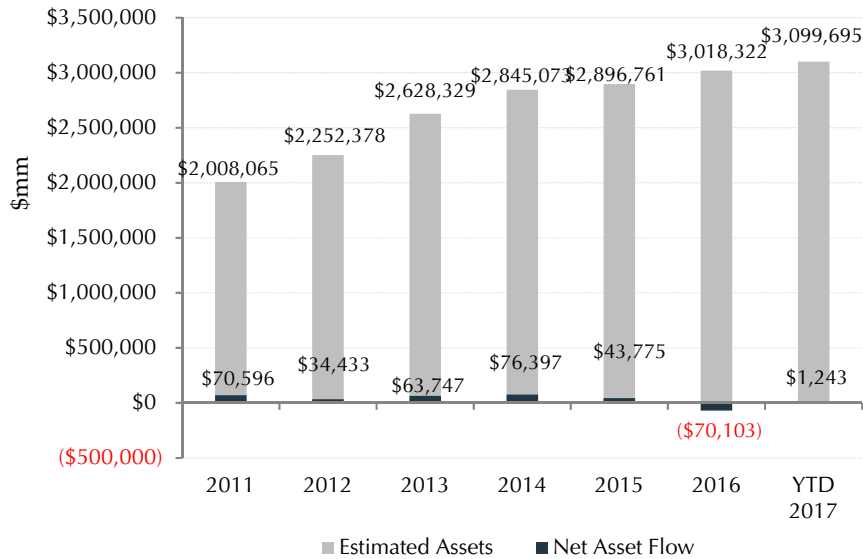
## PORTFOLIO ACTIVITY – ABSOLUTE RETURN PORTFOLIO

Q2 2017	Fund	Transaction	Amount
April	Perry Partners LP	Return of Capital	-\$14.8mm
	Aeolus Property Catastrophe Keystone PF Fund LP - J16	Distribution	-\$15.0mm
	Aeolus Property Catastrophe Keystone PF Fund LP - MY16	Distribution	-\$1.7mm
	Caspian Keystone Focused Fund LP	Distribution	-\$0.8mm
	Sciens Aviation Special Opportunities Investment Fund II, LP	Distribution	-\$0.8mm
May	Two Sigma Risk Premia Enhanced Fund LP	Initial Subscription	+\$150.0mm
	SASOF III LP	Capital Call	+\$9.0mm
	Sciens Aviation Special Opportunities Investment Fund II, LP	Distribution	-\$0.5mm
June	RenaissanceRe Medici Fund Ltd.	Additional Subscription	+\$20.0mm
	Aeolus Property Catastrophe Keystone PF Fund LP - MY16	Transfer to MY17 Sub Account	-\$35.4mm
	Aeolus Property Catastrophe Keystone PF Fund LP - MY17	Transfer from MY16 Sub Account	+\$35.4mm
	Aeolus Property Catastrophe Keystone PF Fund LP - MY17	Additional Subscription	+\$25.0mm
	SASOF III LP	Capital Call	+\$10.8mm
	Sciens Aviation Special Opportunities Investment Fund II, LP	Capital Call	+\$2.5mm
	SASOF III LP	Capital Call	+\$9.6mm
Palmetto Fund Ltd.	Partial Redemption	-\$75.0mm	

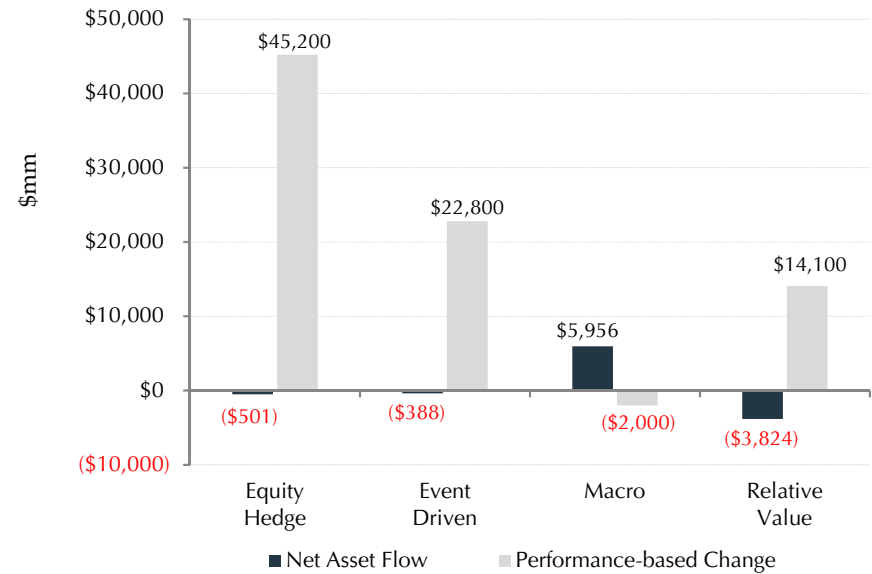
## II. HEDGE FUND INDUSTRY REVIEW

# HEDGE FUND INDUSTRY REVIEW

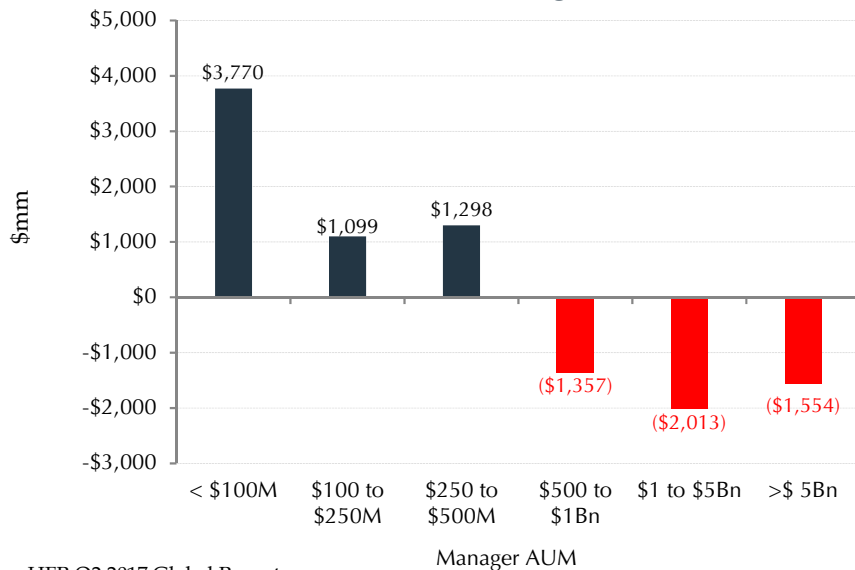
**Net Asset Flows Positive Following Outflows of 2016**



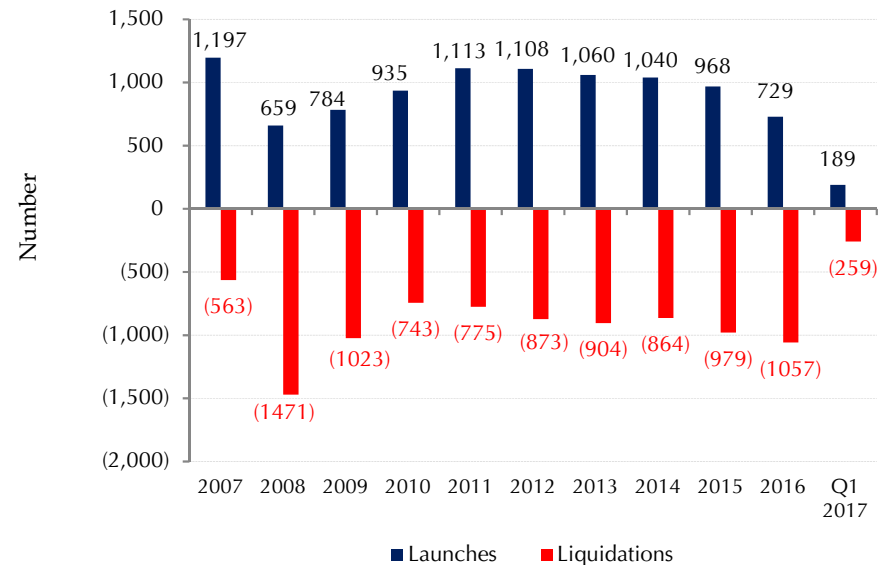
**YTD Net Asset Flows Favor Macro Despite Recent Performance**



**Capital Flows Strongly Favor Smaller Fund & New Launches Through First Half 2017**



**Liquidations Continue to Outweigh Launches in Q1 2017**





## III. PSERS PORTFOLIO REVIEW

## PSERS PORTFOLIO AS OF JUNE 30, 2017 – ABSOLUTE RETURN PORTFOLIO

Sector	Strategy	Fund Name	NAV (mm)	Multiple of Cost	YTD Return	Annualized Return in PSERS Portfolio*	Manager Inception in PSERS Portfolio
Event Driven	Event Credit	Caspian Keystone Focused Fund LP	\$15.3	1.12	5.6%	17.6%	May-16
		Caspian Select Credit International Ltd	\$243.3	1.22	3.5%	3.2%	Mar-11
		Ellis Lake Domestic Fund LP	\$2.3	0.91	-1.7%	-17.3% <sup>1</sup>	Apr-13
		Venor Capital Offshore Ltd	\$152.4	1.02	-3.8%	1.6%	Sep-16
	Event & Merger	Oceanwood Opportunities Fund	\$229.3	1.15	11.0%	4.9%	Sep-14
		Perry Partners LP	\$39.6	0.85	-8.1%	-4.8%	Dec-13
	Real Assets	SASOF III LP	\$102.1	1.07	11.5%	11.6% <sup>2</sup>	Feb-15
		Sciens Aviation Special Opportunities Investment Fund II LP	\$8.9	1.12	NA <sup>3</sup>	6.6% <sup>2</sup>	Mar-13
<b>Total Event Driven</b>			<b>\$793.2</b>				
Relative Value	Fixed Income Arbitrage	Capula Global Relative Value Fund Limited	\$420.4	1.40	2.6%	6.8%	Feb-11
		Garda Fixed Income Relative Value Opportunity Fund Ltd	\$395.9	1.32	4.0%	5.6%	Nov-11
	Insurance Linked	Aeolus Property Catastrophe Keystone PF Fund LP - Composite	\$169.1	1.13	1.4%	15.5%	Jun-12
		Palmetto Catastrophe Fund Ltd	\$174.6	1.36	0.8%	6.0%	Jul-11
		RenaissanceRe Medici Fund Ltd	\$45.7	1.04	1.5%	5.3%	Feb-16
		RenaissanceRe Upsilon Diversified Fund	\$20.7	1.03	3.3%	3.3%	Jan-17
		DaVinci Reinsurance Ltd	\$22.5	1.19	6.6%	12.5%	Jan-16
	Long/Short Credit	Brigade Leveraged Capital Structures Offshore Ltd	\$294.0	1.49	4.6%	5.7%	Sep-07
		PIMCO Global Credit Opportunity Offshore Fund Ltd	\$278.8	2.08	-0.5%	9.8%	Feb-08
	Structured Credit	OWS Credit Opportunity Offshore Fund III Ltd	\$237.1	1.19	8.5%	11.4%	Dec-15
	Volatility	PIMCO Multi-Asset Volatility Offshore Fund Ltd	\$235.5	1.11	0.1%	2.2%	Oct-12
	Multi Risk Premia	Two Sigma Risk Premia Enhanced Fund LP	\$147.2	0.98	-1.9%	-1.9%	May-17
<b>Total Relative Value</b>			<b>\$2,441.5</b>				
Tactical Trading	Global Macro	Bridgewater Pure Alpha Fund II Ltd	\$865.2	3.00	-2.2%	11.6%	Nov-05
		PARS V Offshore Fund I Ltd	\$266.2	2.48	2.8%	12.1%	Feb-08
	Risk Mitigators	BlackRock Capital Structure Investments Offshore Fund Ltd	\$286.8	1.43	7.7%	4.4%	Apr-09
		Capula Tail Risk Fund Limited	\$326.2	0.89	-5.9%	-1.6%	Jun-11
<b>Total Tactical Trading</b>			<b>\$1,744.4</b>				
<b>PSERS Total</b>			<b>\$4,979.1</b>	<b>1.45</b>	<b>1.8%</b>	<b>5.3%</b>	<b>Oct-05</b>

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

<sup>1</sup> Performance is due to illiquid holding return.

<sup>2</sup> Annualized return number is Internal Rate of Return (IRR) since inception of the investment.

<sup>3</sup> As these funds enter the wind down stage of their lifecycles, YTD values are not representative of performance.

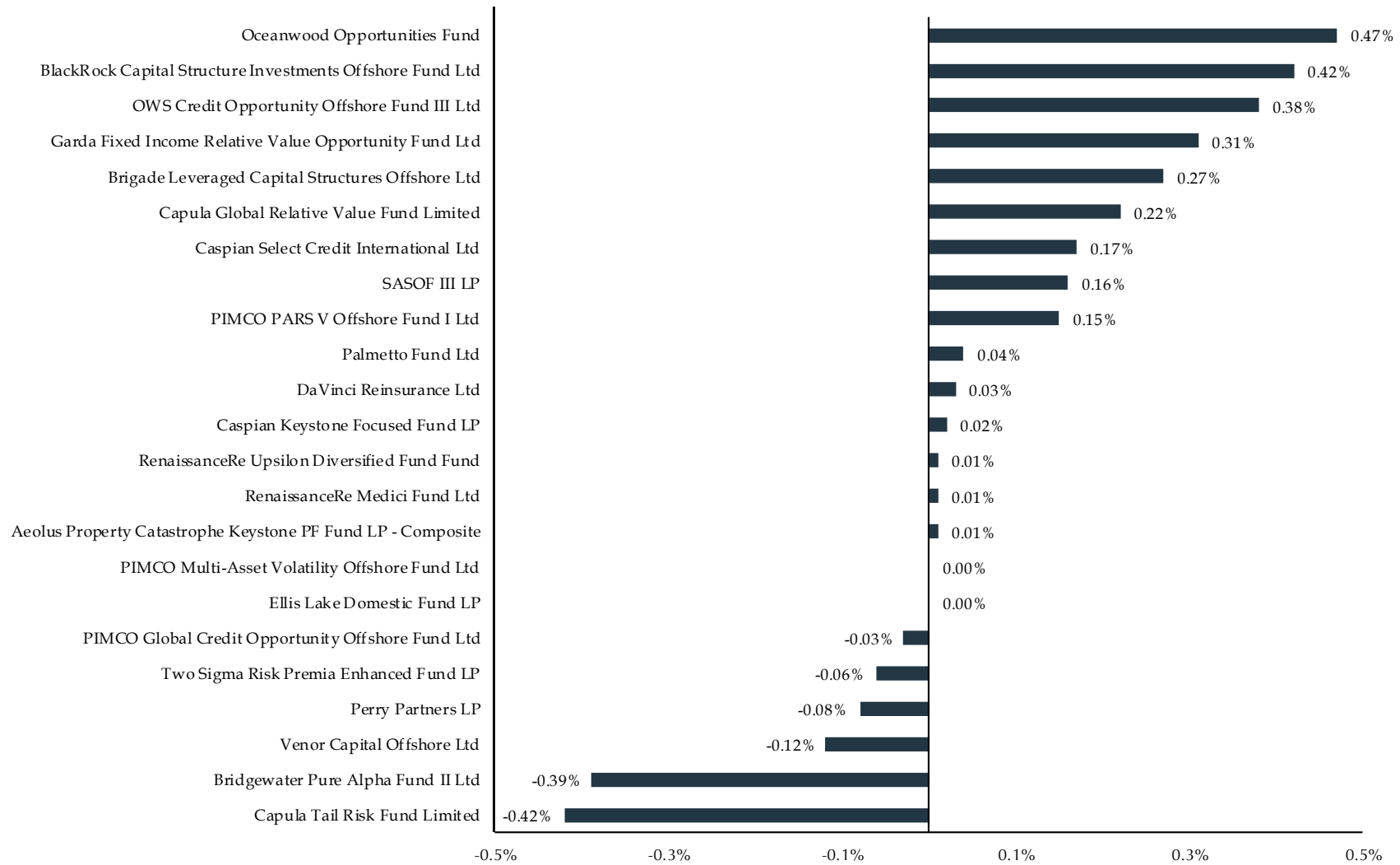
## PSERS PORTFOLIO AS OF JUNE 30, 2017 – OTHER ASSET CLASSES

### Hedge Funds in Other Asset Classes

Asset Class	Sector	Strategy	Fund Name	NAV (mm)	Multiple of Cost	YTD Return	Annualized Return in PSERS Portfolio*	Manager Inception in PSERS Portfolio
Commodities	Tactical Trading	Discretionary Commodities	PIMCO Commodity Alpha Fund Ltd	\$269.6	1.40	5.4%	16.4%	Apr-15
Global Equity	Relative Value	Quantitative Strategies	BlackRock Emerging Markets Alpha Advantage Fund Ltd	\$136.8	2.67	19.8%	16.6%	Jan-09
			The 32 Capital Fund Ltd	\$178.2	1.64	3.8%	8.0%	Jan-09
High Yield Fixed Income	Event Driven	Credit	Brigade Distressed Value Fund Ltd	\$151.6	1.52	5.9%	7.5%	Oct-11
	Relative Value	Structured Credit	Brigade Structured Credit Offshore Fund Ltd	\$249.5	1.25	4.3%	8.6%	Nov-14
	Private Credit	Real Estate	Galton Onshore Mortgage Recovery Fund III LP	\$136.2	1.09	10.8%	2.0%	Nov-13
Risk Parity	Multi-Strategy	Multi-Strategy	Bridgewater All Weather Portfolio Limited 15%	\$627.4	1.03	5.6%	3.6%	Sep-12
	Tactical Trading	Global Macro	DE Shaw Orienteer HV Fund LLC	\$614.5	1.08	5.6%	12.0%	Feb-16
TIPS	Tactical Trading	Global Macro	Bridgewater Pure Alpha Fund II Ltd	\$573.9	1.70	-2.9%	13.9%	Jun-07
	Relative Value	Fixed Income Arbitrage	Garda Fixed Income Relative Value Opportunity Fund Ltd	\$144.3	1.09	4.0%	4.5%	Aug-14
US Core Plus Fixed Income	Multi-Strategy	Multi-Strategy	BlackRock US Extended Core Global Alpha Bond (Non-ERISA) Fund Ltd	\$930.1	1.38	4.2%	7.2%	Jun-07
LIBOR Composite	Tactical Trading	Risk Mitigator	Capula Tail Risk Fund Limited	\$46.8	0.94	-5.9%	-3.8%	Nov-15

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

# 2017 YTD ABSOLUTE RETURN PORTFOLIO MANAGER ATTRIBUTION



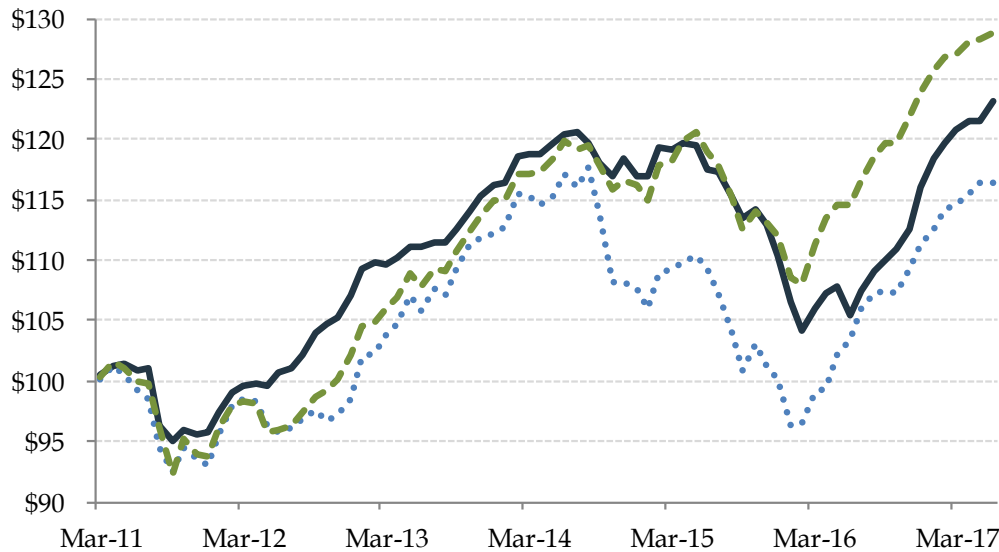
YTD through June 30, 2017 Return

PSERS Absolute Return Portfolio

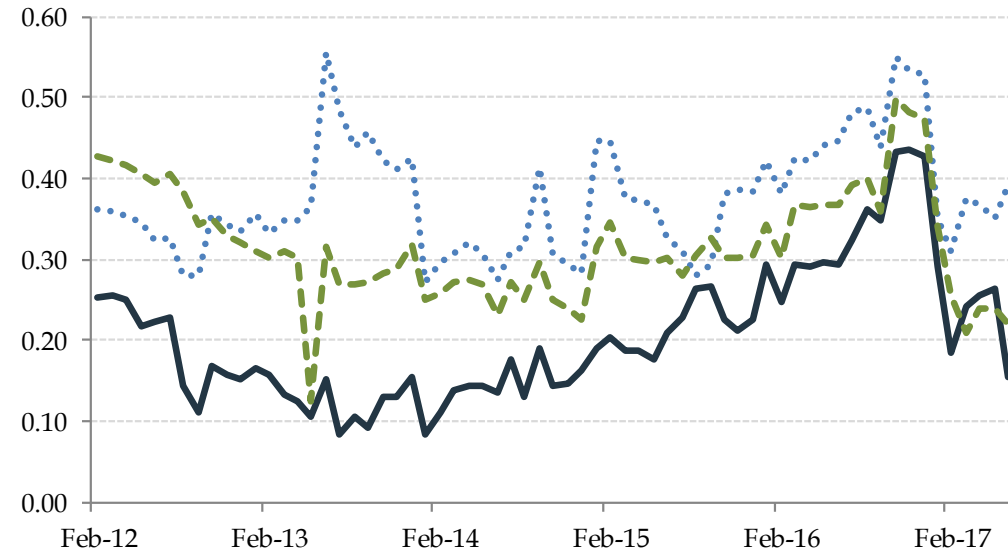
1.8%

# PSERS EVENT DRIVEN CARVE OUT

**Cumulative Performance**  
\$100 Invested on March 1, 2011



**Beta to S&P 500**  
1yr Rolling, As of June 30, 2017



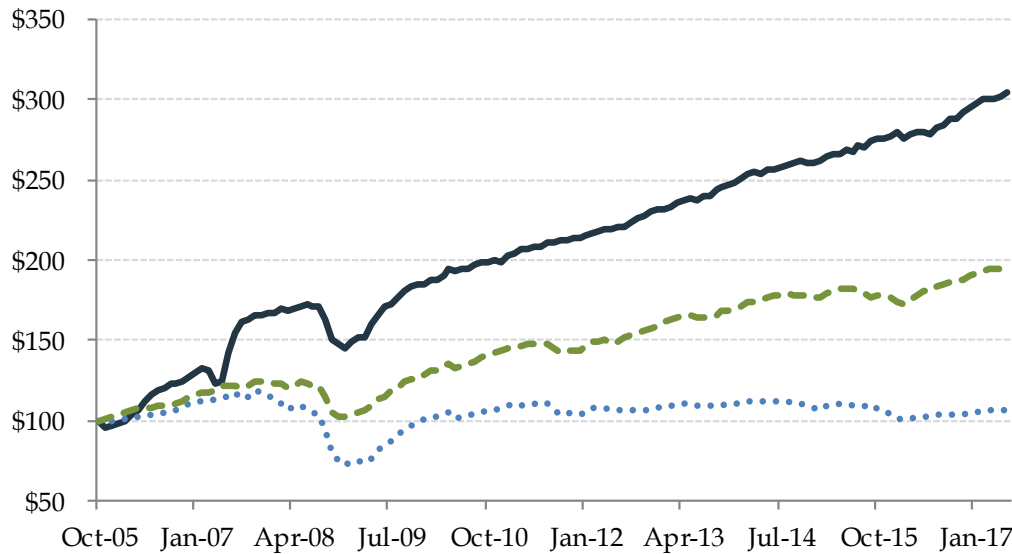
— PSERS Event Driven    ..... HFRX Event Driven    - - - HFRI Event Driven

\* 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.

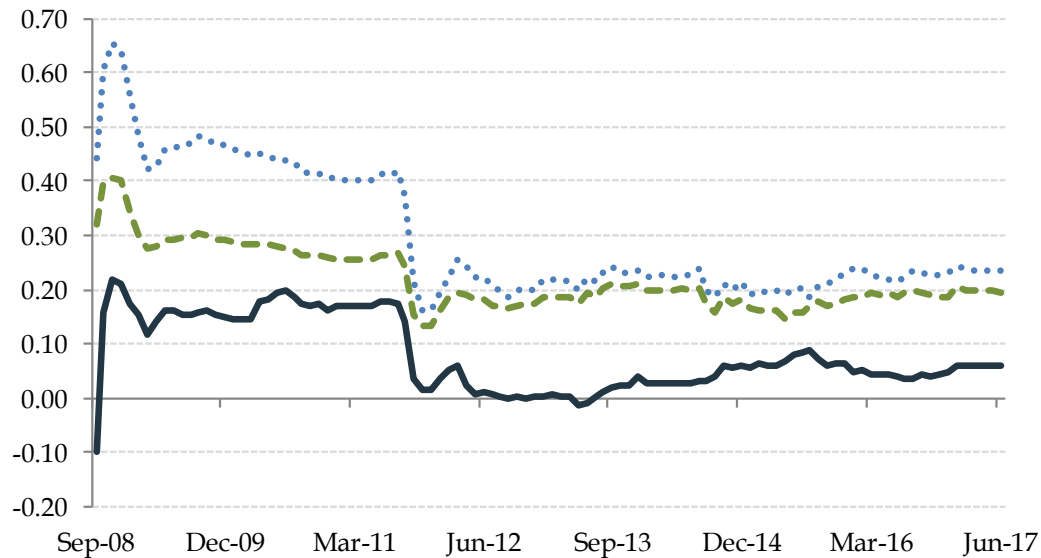
\* Aksia has included both HFRI & HFRX indices as together they provide a decent indicator of hedge fund performance by strategy. HFRX indices are considered 'investable,' whereas HFRI indices are equally weighted across funds in the HFR database. We believe that HFRX indices have a negative selection 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.

# PSERS RELATIVE VALUE CARVE OUT

**Cumulative Performance**  
\$100 Invested on October 1, 2005



**Beta to S&P 500**  
3yr Rolling, As of June 30, 2017



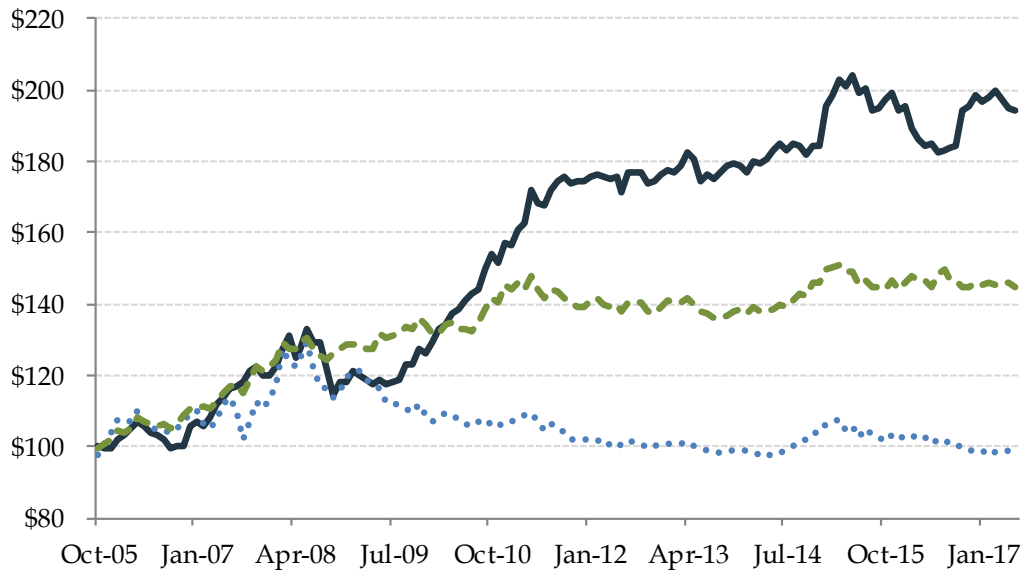
— PSERS Relative Value    ..... HFRX Relative Value    - - - HFRI Relative Value

\* 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.

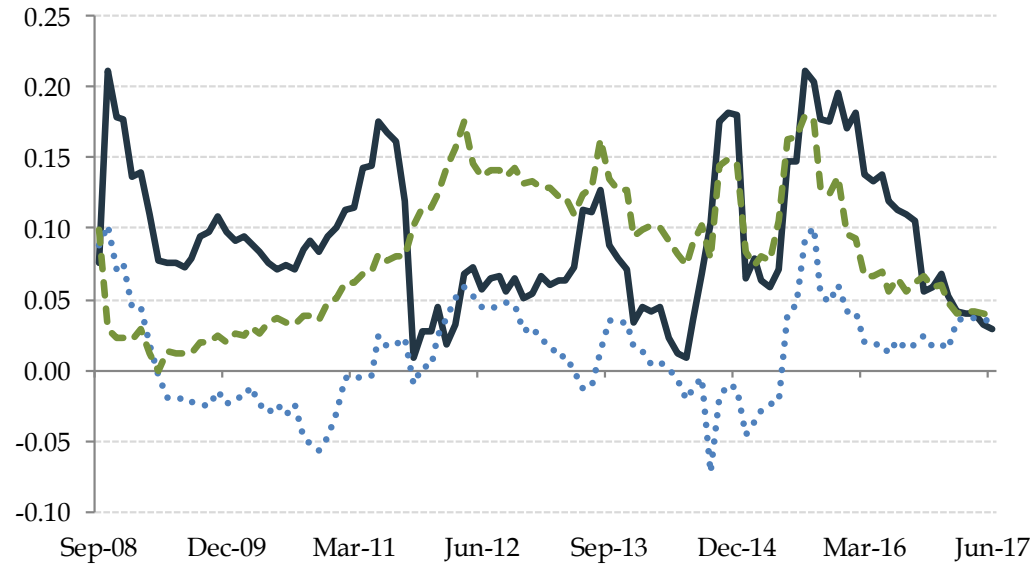
\* Aksia has included both HFRI & HFRX indices as together they provide a decent indicator of hedge fund performance by strategy. HFRX indices are considered 'investable,' whereas HFRI indices are equally weighted across funds in the HFR database. We believe that HFRX indices have a negative selection 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.

# PSERS TACTICAL TRADING CARVE OUT

**Cumulative Performance**  
\$100 Invested on October 1, 2005



**Beta to S&P 500**  
3yr Rolling, As of June 30, 2017



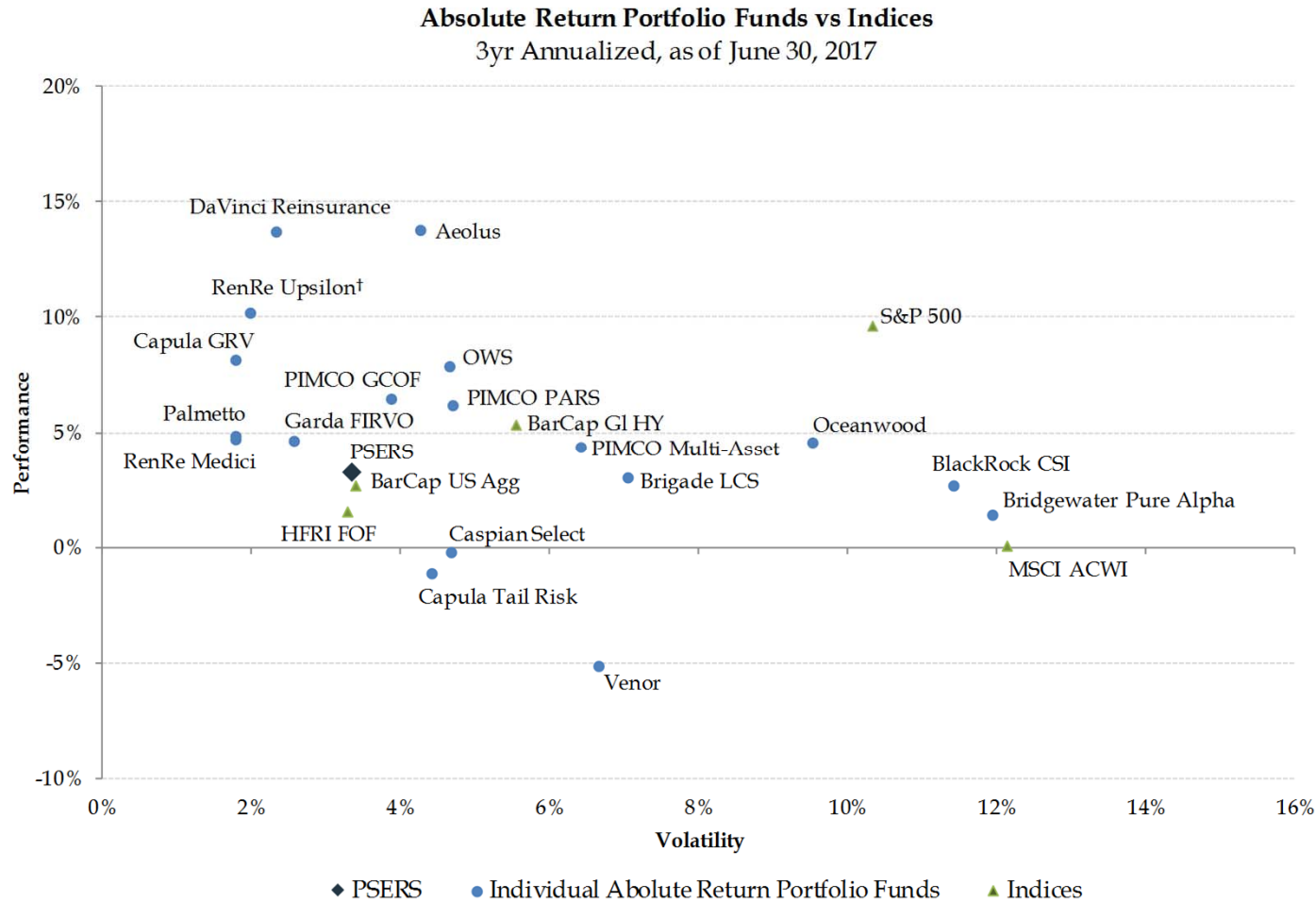
— PSERS Tactical Trading      ..... HFRX Macro      - - - HFRI Macro

\* 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.

# PERFORMANCE & VOLATILITY

PSERS Absolute Return Portfolio has exhibited performance and volatility in line with program objectives



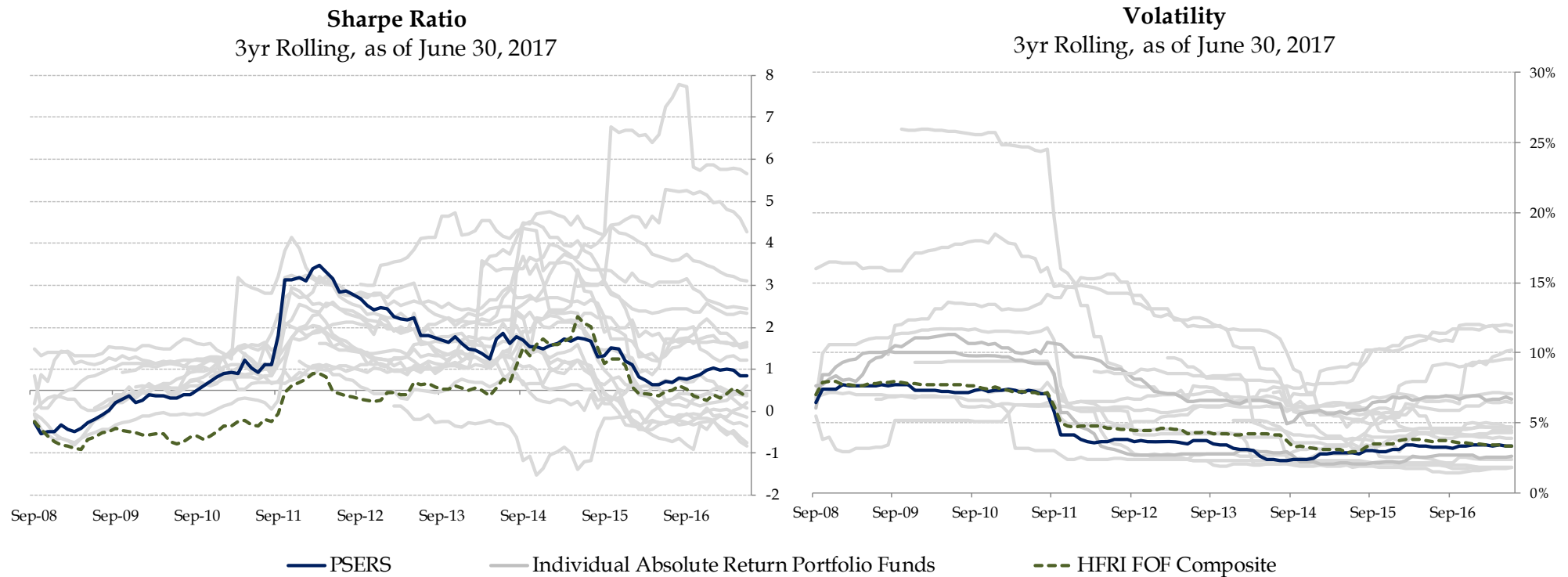
† Track record is less than 36 months

\* 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 2017. 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 page 9 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.



## RISK-ADJUSTED PERFORMANCE & VOLATILITY

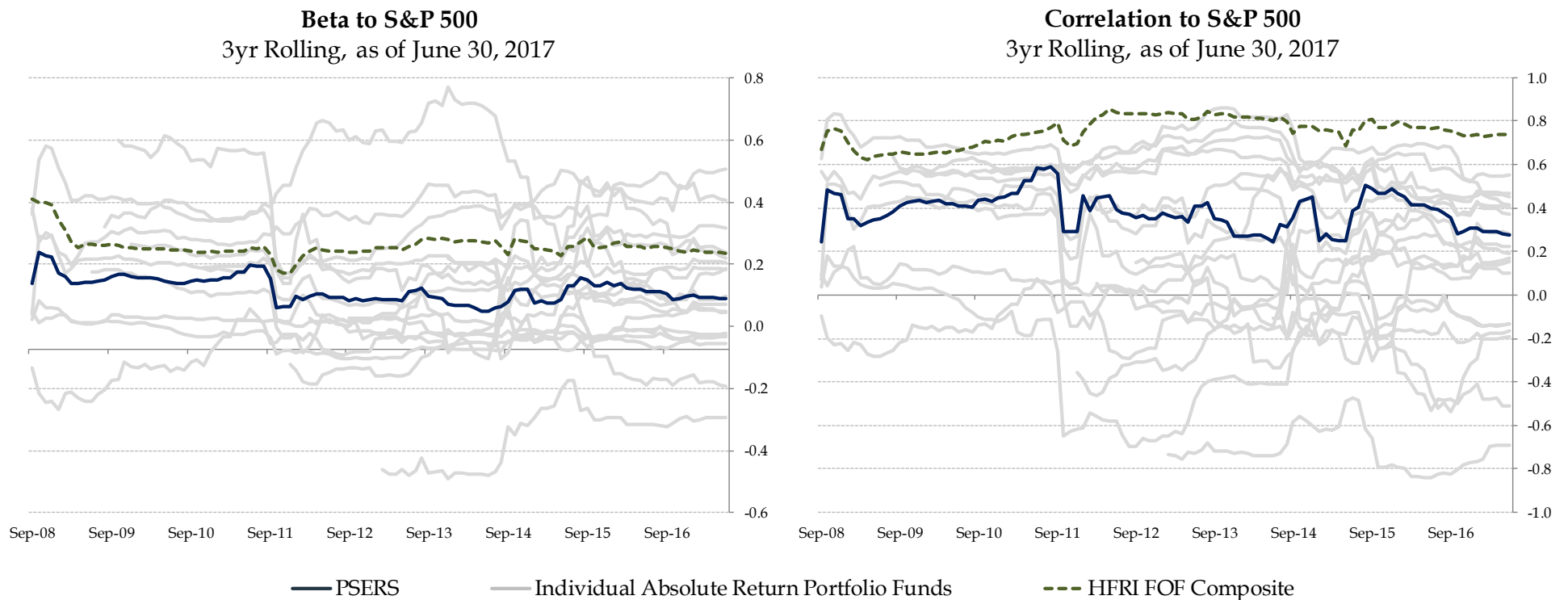
PSERS Absolute Return Portfolio has generally exhibited greater risk-adjusted returns than the broad FOF universe



- 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 2017. 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 page 9 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 Composite Index, as there tends to be less self-reporting/dropout bias and losses and side pockets are captured by the FOF vehicle.

## BETA & CORRELATION

PSERS Absolute Return Portfolio has exhibited consistently low beta and correlation to U.S. equities



- 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 2017. 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 page 9 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.
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