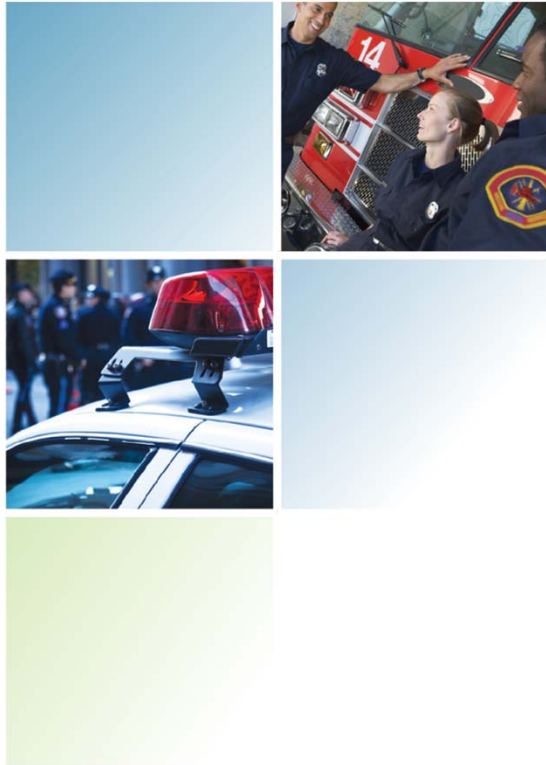


FIRE & POLICE PENSION ASSOCIATION of COLORADO

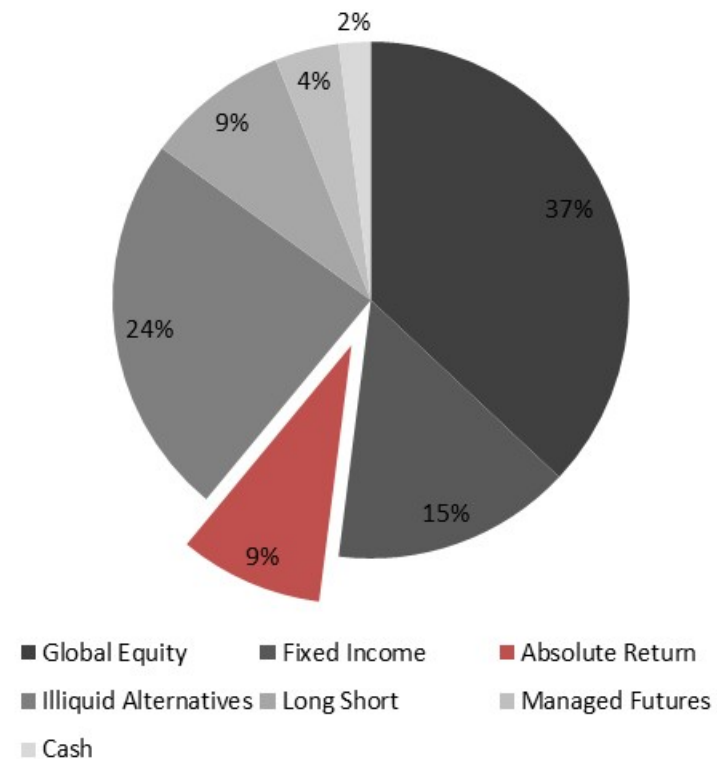


2018 Liquid Strategies Asset Class Review

Absolute Return

Agenda

- Market and hedge fund performance
- Absolute Return background, objectives, and portfolio construction
- Absolute Return results and portfolio composition
- Alternative Beta/AQR
- 2019 planning
- Appendix



Market Performance

October 2018

	YTD	ANNUALIZED RETURN				ANNUALIZED VOLATILITY			
		1 YEAR	3 YEARS	5 YEARS	10 YEARS	1 YEAR	3 YEARS	5 YEARS	10 YEARS
MSCI ACWI IMI	-4.19%	-0.67%	8.11%	6.44%	10.40%	11.80%	9.89%	10.34%	14.80%
S&P 500 Total Return Index	3.01%	7.35%	11.52%	11.34%	13.24%	12.19%	9.39%	10.06%	13.47%
MSCI Europe Index	-9.90%	-8.34%	2.51%	1.21%	6.54%	13.15%	12.05%	12.57%	18.24%
MSCI Emerging Markets Index	-15.45%	-12.19%	6.92%	1.15%	8.20%	15.25%	14.91%	15.08%	19.52%
Bloomberg Barclays U.S. Aggregate Bond Index.	-2.38%	-2.05%	1.04%	1.83%	3.94%	2.35%	2.71%	2.72%	3.14%
HFRI Fund Weighted Composite	-1.86%	-0.36%	3.61%	3.13%	4.96%	4.85%	3.88%	3.84%	5.08%
HFRI FOF Diversified Index	-1.12%	-0.31%	1.93%	2.39%	2.96%	4.27%	3.25%	3.33%	3.72%
HFRI Equity Hedge (Total) Index.	-2.91%	-0.69%	4.65%	3.72%	5.73%	6.44%	5.63%	5.59%	7.29%
HFRI Equity Market Neutral Index	0.52%	1.46%	2.56%	3.22%	2.36%	2.14%	1.95%	1.78%	2.41%
HFRI EH Sector Energy/Basic Materials Index	-3.66%	-0.16%	1.83%	-1.94%	1.45%	10.57%	10.00%	10.41%	12.30%
HFRI EH Sector Technology/Healthcare (Total) Index	8.24%	9.49%	8.85%	9.03%	10.00%	7.74%	7.80%	7.68%	7.30%
HFRI FOF Diversified Index	-1.12%	-0.31%	1.93%	2.39%	2.96%	4.27%	3.25%	3.33%	3.72%
HFRI Macro Total Index	-3.52%	-3.11%	-0.15%	0.96%	1.29%	5.19%	4.23%	4.09%	4.39%
HFRI Relative Value Multi-Strategy Index	1.15%	1.74%	3.67%	3.39%	6.21%	1.87%	2.04%	2.09%	3.44%
HFRI Relative Value Fixed Income-Convertible Arbitrage Index	-0.69%	-0.19%	3.94%	3.43%	8.86%	2.82%	2.96%	2.85%	6.09%

Absolute Return Portfolio Background

2010—2014

2010-11

- Absolute Return (“AR”) approved as part of a “Real Return” asset class
- Designed as a “risk reducer”, seeking actuarial rate of return, inflation protection, and flight-to-quality characteristics
- Implemented via separately managed accounts sub-advised by three fund of funds

2012-13

- Albourne Advisors hired as external hedge fund consultant
- Transition from fund of fund management to direct Staff oversight and implementation
- Staff begins reduction of manager headcount
- Addition of alternative beta (AQR)

2014

- Global macro sub-allocation restructured
- Staff presented revised portfolio construction framework for AR

Absolute Return Portfolio Background

2015—Present

2015

- AR added strategy diversification through multistrategy hedge funds
- Opportunistic framework introduced

2016

- AR portfolio framework and Staff approach affirmed

2017

- Platform multistrategy hired (Citadel)
- Transition of alternative beta coverage

2018

- Cambridge hired to replace Albourne as hedge fund consultant at year-end
- LST added team member (Molly Goodman)

Absolute Return Goals

- Allocation:
 - Target: 9%
 - Current: 8.8%
- Objective – Generate attractive, differentiated rate of return with modest volatility over a market cycle
- Benchmark: HFRI FOF Diversified Index [Effective July 2018]
- Return (market cycle):
 - Capital Market Expectation – 6.25%
 - Aspirational: 4.0-8.0%
- Volatility: 4 - 8%
- Sharpe: 1.0 over a market cycle
- Correlation to MSCI ACWI IMI: 0.50 or lower over a market cycle
- Beta to MSCI ACWI IMI: 0.30 or lower over a market cycle
- Max drawdown not to exceed -15%

Absolute Return Portfolio Construction

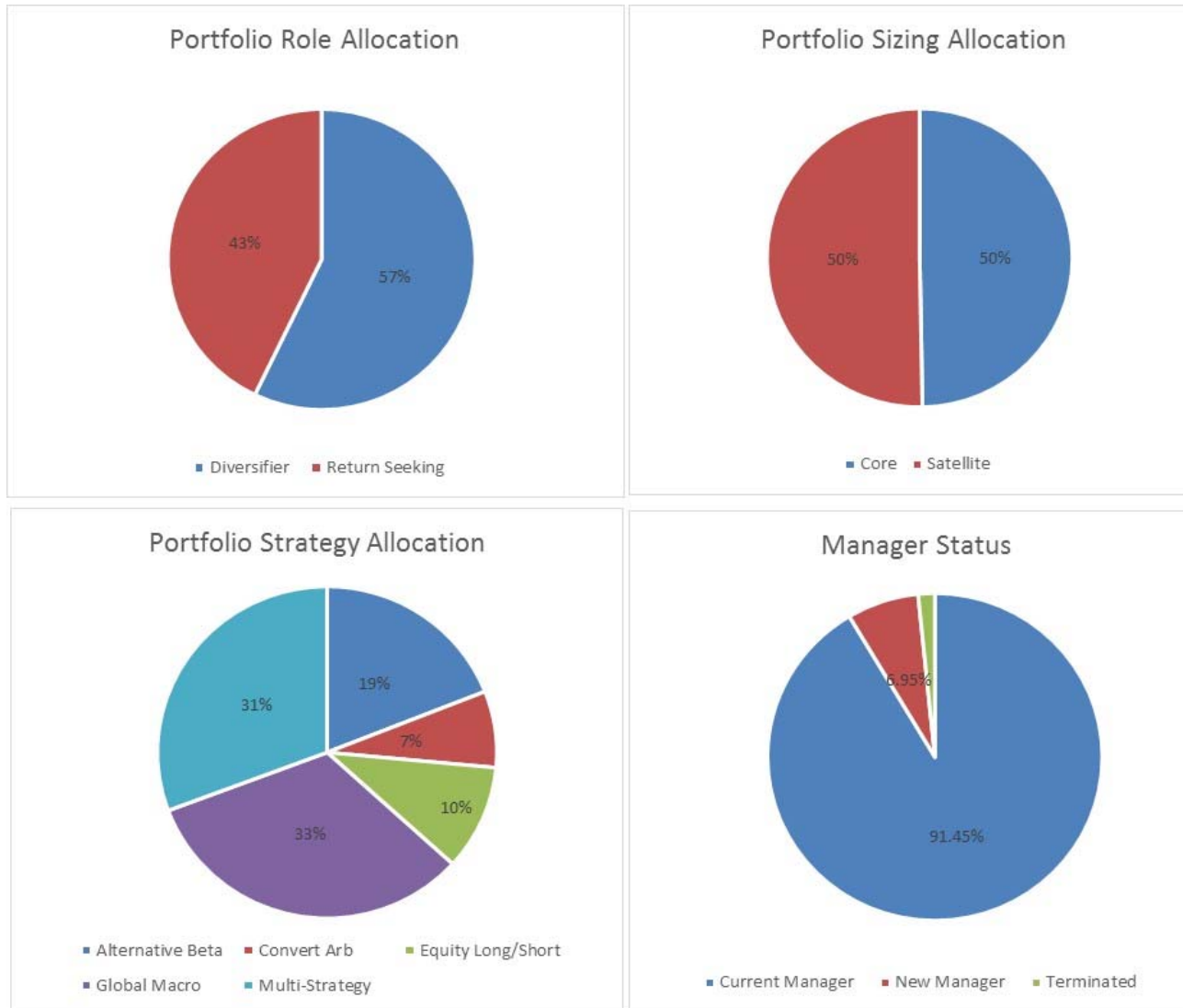
Sizing

- Core
 - 10-12% at cost
 - Min/max: 8/15%
- Satellite
 - 5% +/-2% at cost
 - Min/max: 3/8

“Role”

- Diversifier: 40-70%
- Return: 10-30%
- Alternative beta: 5-15%
- Opportunistic: 0-15%
- Counter correlator: 0-20%

Absolute Return – Current Allocation



Absolute Return Portfolio Construction

Current Portfolio							
	Manager	Status	Strategy	Role	Size	\$	%
1	Alphadyne Global Rates Fund II	Current Manager	Global Macro	Return Seeking	Satellite	\$ 45,500,739	10.5%
2	AQR Delta II	Current Manager	Alternative Beta	Diversifier	Core	\$ 47,631,848	11.0%
3	AQR SPF	Current Manager	Alternative Beta	Diversifier	Core	\$ 34,468,905	8.0%
4	Autonomy Global Macro Fund	Current Manager	Global Macro	Return Seeking	Satellite	\$ 42,816,119	9.9%
5	Citadel Kensington Fund	Current Manager	Multi-Strategy	Diversifier	Core	\$ 46,250,917	10.7%
6	HBK LP	Current Manager	Multi-Strategy	Diversifier	Core	\$ 56,243,219	13.0%
7	Hudson Bay Arbitrage	Current Manager	Convert Arb	Diversifier	Satellite	\$ 32,156,134	7.4%
8	Hudson Bay	New Manager	Multi-Strategy	Diversifier	Core	\$ 30,000,000	6.9%
9	KCL Capital Fund	Current Manager	Equity Long/Short	Return Seeking	Satellite	\$ 37,438,010	8.7%
10	Pharo Macro Fund	Current Manager	Global Macro	Return Seeking	Satellite	\$ 52,238,499	12.1%
11	Soroban Fund LLC	Terminated	Equity Long/Short	Return Seeking	Satellite	\$ 6,917,732	1.6%
						\$ 431,662,122.89	100%

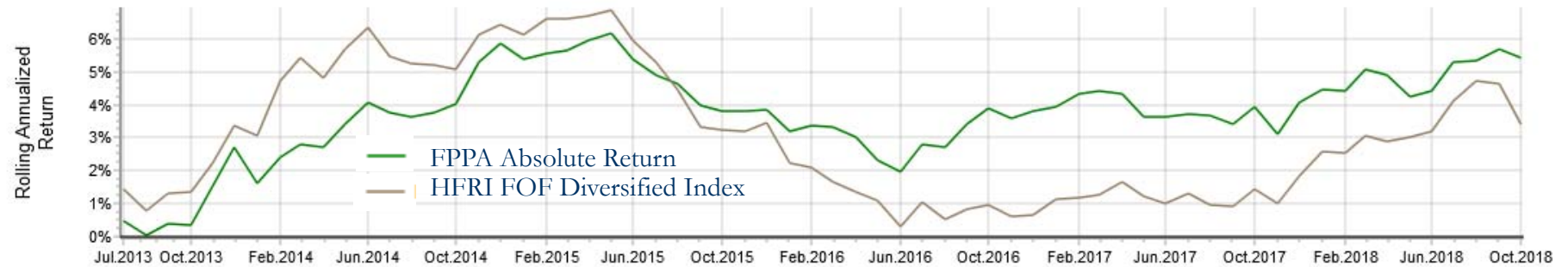
Absolute Return Performance

October 2018

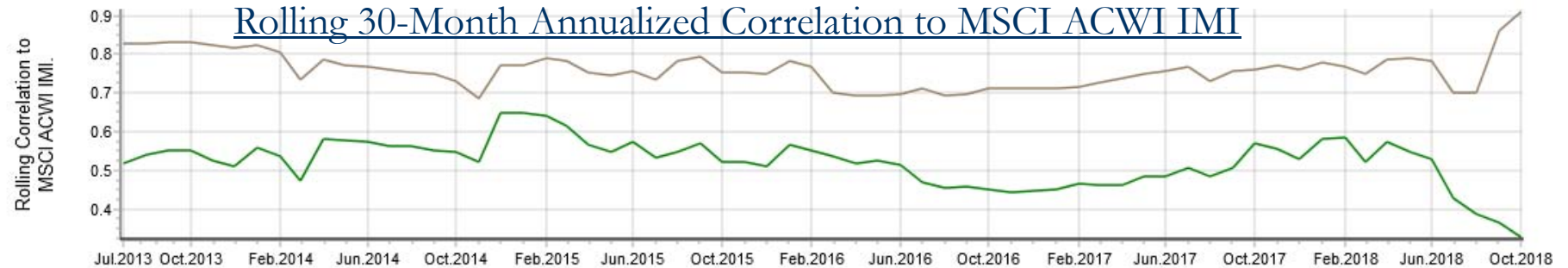
Annualized Return					
	YTD	1 YEAR	3 YEARS	5 YEARS	ITD
Absolute Return (Feb 2011)	1.71%	2.06%	4.00%	4.22%	2.96%
Absolute Return ex Alternative Beta (July 2013)	6.59%	6.75%	5.65%	4.43%	4.39%
Alternative Beta (July 2013)	-14.05%	-13.06%	-1.66%	3.33%	3.35%
Global Macro (Feb 2011)	9.49%	11.06%	8.40%	5.68%	4.00%
Multi-Strategies (Jan 2015)	4.27%	3.47%	3.40%		2.29%
Convert Arb (Oct 2017)	6.05%	6.96%			6.61%
Long Short (April 2011)	2.82%	3.78%	4.65%	5.64%	5.08%
HFRI FOF Diversified Index	-1.12%	-0.31%	1.93%	2.39%	2.23%
Bloomberg Barclays U.S. Aggregate Bond Index.	-2.38%	-2.05%	1.04%	1.83%	2.55%
FPPA Annualized Volatility					
		1 YEAR	3 YEARS	5 YEARS	10 YEARS
Absolute Return		3.67%	2.81%	3.07%	3.28%
Absolute Return ex Alternative Beta		3.68%	3.19%	3.48%	3.42%
Alternative Beta		7.23%	5.74%	6.31%	6.49%
Global Macro		7.58%	5.15%	4.92%	5.37%
Multi-Strategy		2.97%	2.76%		2.89%
Convert Arb		2.21%			2.15%
Long Short		8.43%	8.26%	7.72%	6.51%
HFRI FOF Diversified Index		4.27%	3.25%	3.33%	3.47%
Bloomberg Barclays U.S. Aggregate Bond Index.		2.35%	2.71%	2.72%	2.74%

Absolute Return Performance

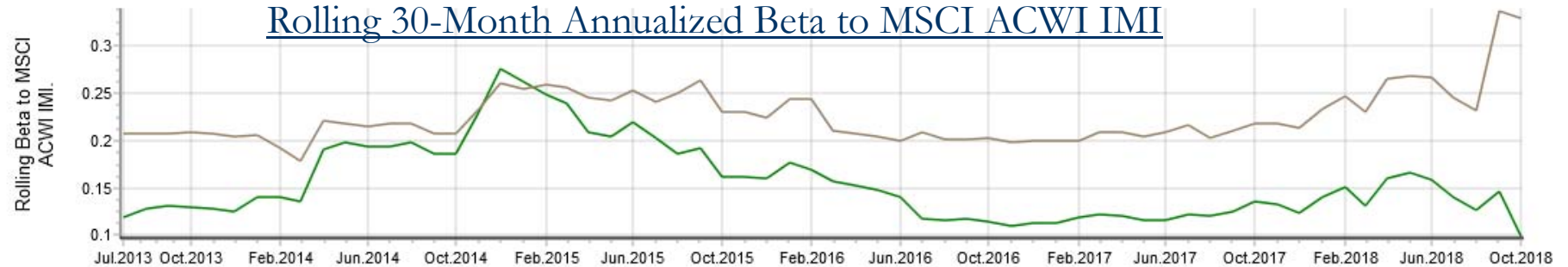
Rolling 30-Month Annualized Return



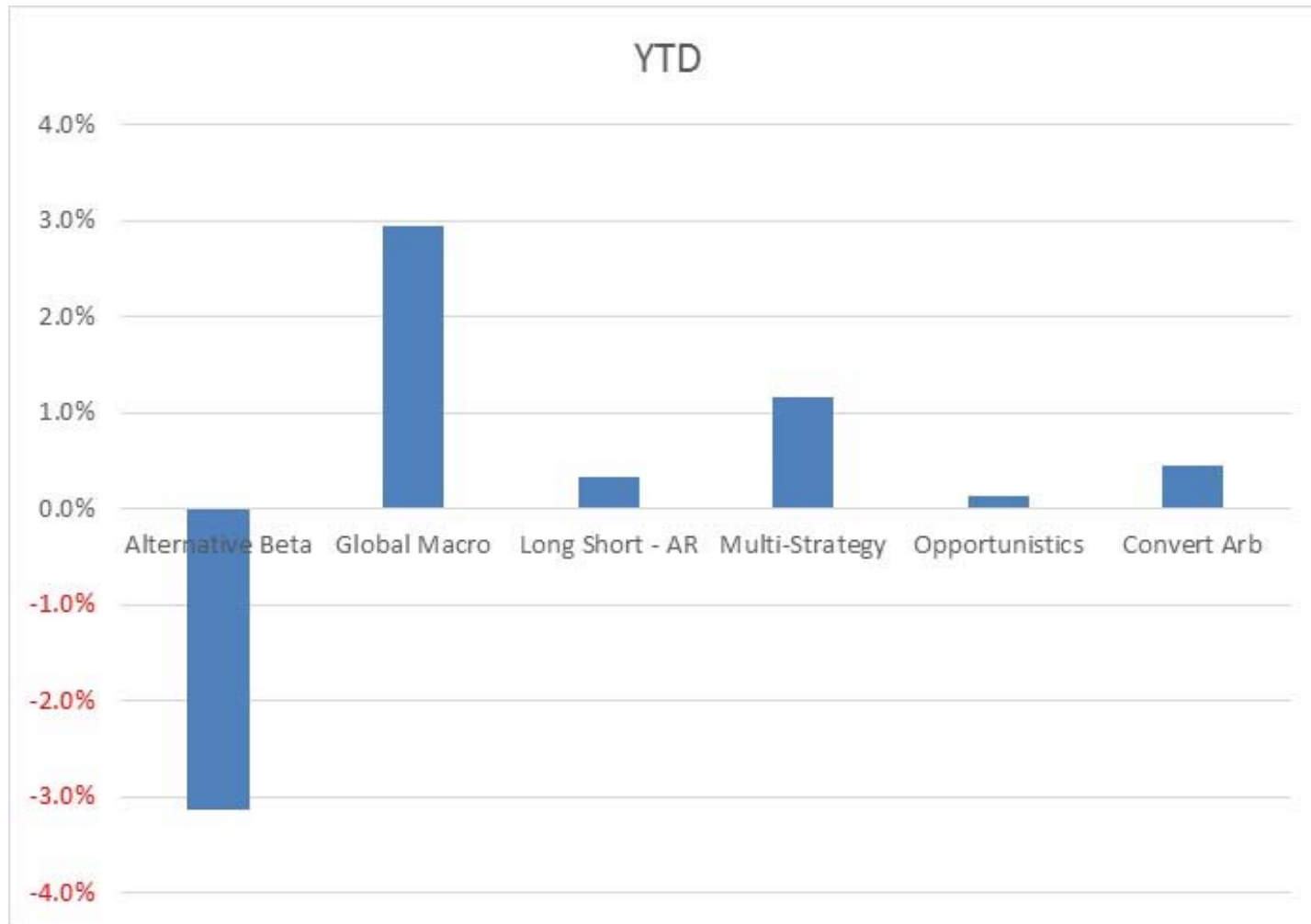
Rolling 30-Month Annualized Correlation to MSCI ACWI IMI



Rolling 30-Month Annualized Beta to MSCI ACWI IMI



Absolute Return Attribution



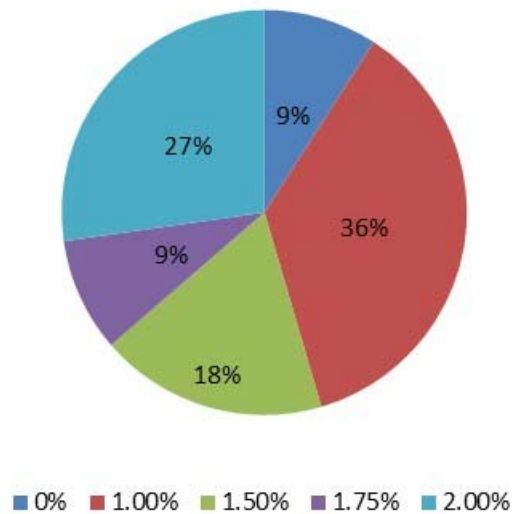
Absolute Return Correlation Matrix

Last 5 years Correlation Matrix	MSCI ACWI IMI.	Bloomberg Barclays U.S. Aggregate	HFRI FOF Diversified Index	HFRI Fund of Funds Composite Index	Alphadyne Global	AQR DELTA II	AQR SPF	Autonomy Global Macro	Citadel Kensington	HBK	Hudson Bay Arbitrage	Hudson Bay Fund LP	KCL Capital	Pharo Macro	Soroban
MSCI ACWI IMI.	1.00	0.01	0.78	0.82	0.09	0.13	0.05	0.19	0.09	0.17	0.15	0.20	0.39	0.14	0.55
Bloomberg Barclays U.S. Aggregate	0.01	1.00	-0.02	-0.01	-0.22	0.13	0.09	0.02	-0.06	-0.12	-0.03	-0.16	0.31	0.31	-0.00
HFRI FOF Diversified Index	0.78	-0.02	1.00	0.98	0.32	0.35	0.10	0.02	0.45	0.21	-0.09	0.36	0.28	0.25	0.63
HFRI Fund of Funds Composite Index	0.82	-0.01	0.98	1.00	0.28	0.32	0.09	0.04	0.44	0.22	-0.02	0.33	0.32	0.22	0.62
Alphadyne Global	0.09	-0.22	0.32	0.28	1.00	0.11	-0.02	0.22	0.44	0.05	-0.27	-0.05	-0.04	0.29	0.34
AQR DELTA II	0.13	0.13	0.35	0.32	0.11	1.00	0.69	-0.19	0.16	-0.22	-0.23	-0.10	0.10	0.31	0.03
AQR SPF	0.05	0.09	0.10	0.09	-0.02	0.69	1.00	-0.04	-0.02	-0.19	-0.22	-0.15	-0.01	0.21	-0.10
Autonomy Global Macro	0.19	0.02	0.02	0.04	0.22	-0.19	-0.04	1.00	-0.09	0.18	0.31	-0.14	0.10	0.42	0.28
Citadel Kensington	0.09	-0.06	0.45	0.44	0.44	0.16	-0.02	-0.09	1.00	0.12	-0.11	0.16	0.00	0.19	0.23
HBK	0.17	-0.12	0.21	0.22	0.05	-0.22	-0.19	0.18	0.12	1.00	0.17	0.23	0.19	0.07	0.33
Hudson Bay Arbitrage	0.15	-0.03	-0.09	-0.02	-0.27	-0.23	-0.22	0.31	-0.11	0.17	1.00	0.12	0.08	0.03	0.08
Hudson Bay Fund LP	0.20	-0.16	0.36	0.33	-0.05	-0.10	-0.15	-0.14	0.16	0.23	0.12	1.00	-0.18	0.09	0.15
KCL Capital	0.39	0.31	0.28	0.32	-0.04	0.10	-0.01	0.10	0.00	0.19	0.08	-0.18	1.00	0.08	0.10
Pharo Macro	0.14	0.31	0.25	0.22	0.29	0.31	0.21	0.42	0.19	0.07	0.03	0.09	0.08	1.00	0.24
Soroban	0.55	-0.00	0.63	0.62	0.34	0.03	-0.10	0.28	0.23	0.33	0.08	0.15	0.10	0.24	1.00

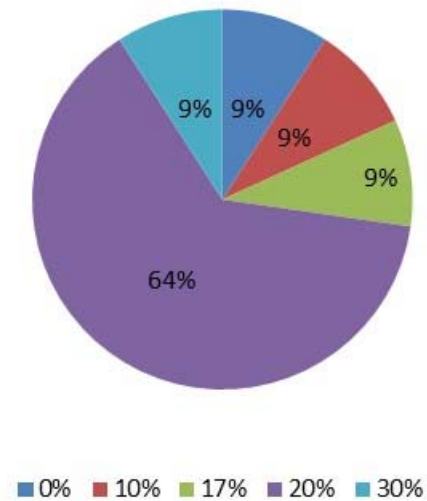
Absolute Return Fees

Absolute Return Weighted Average Fees	
	September-18
Management Fee	1.34%
Performance Fee	18.00%

Management Fee



Performance Fee



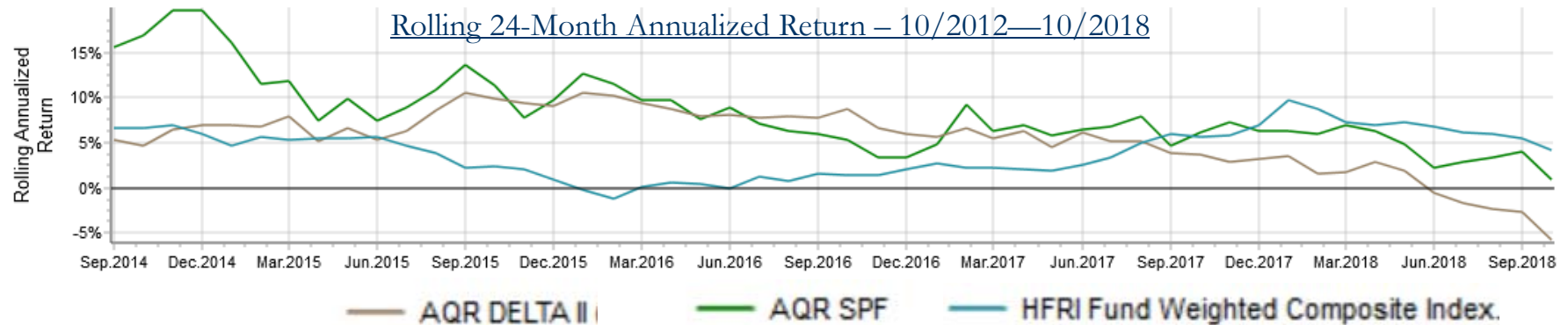
Alternative Beta and AQR

Background

- FPPA invested in AQR in July 2013 as part of a new alternative beta category
 - Thesis: Cost efficient, asset allocation flexibility, internal benchmark for hedge fund exposure
- AQR Delta (\$48M)
 - Launched October 2008
 - Seeks to replicate known directional and relative value hedge fund strategies
 - Stated goals: 10% volatility, 0.80 Sharpe Ratio, 0.0 equity beta
- AQR Style Premia (\$35M)
 - Launched September 2012
 - Seeks to harvest risk premia across value, momentum, carry, and defensive factors in a market neutral fashion
 - Stated goals: 12% volatility, 0.70 Sharpe Ratio, 0.0 equity beta
- Delta and SPF are expected to be 0.40 correlated to one another

Alternative Beta and AQR

Delta: October 2008 to October 2018 SPF: October 2012 to October 2018	AQR DELTA II	HFRI Fund of Funds Composite Index.	AQR SPF	HFRI Fund of Funds Composite Index.
Year-to-date Return	-15.74%	-2.08%	-11.63%	-1.82%
Annualized Return	4.96%	2.22%	7.62%	3.97%
Annualized Return Last 3 years	-3.13%	1.94%	0.65%	3.63%
Annualized Return Last 5 years	1.90%	2.28%	4.78%	3.14%
Annualized Volatility	5.79%	4.47%	8.75%	3.83%
Correlation to HFRI Fund of Funds Composite Index	0.32	1.00	0.14	0.92
Beta to MSCI World (Since Inception)	0.10	1.00	0.10	0.35
Beta to MSCI World (Last Three Years)	0.20	1.00	0.00	0.92
Annual Sharpe Ratio (Since Inception)	0.70	-0.34	0.70	-0.35
Annual Sharpe Ratio (Last Three Years)	-0.40	-0.34	0.10	-0.35
Max Drawdown	-16.84%	-10.05%	-13.45%	-7.23%
Date Max Drawdown	10/31/2018	12/31/2008	10/31/2018	2/29/2016
Max Time-under-water (months)	14.00	25.00	12.00	18.00

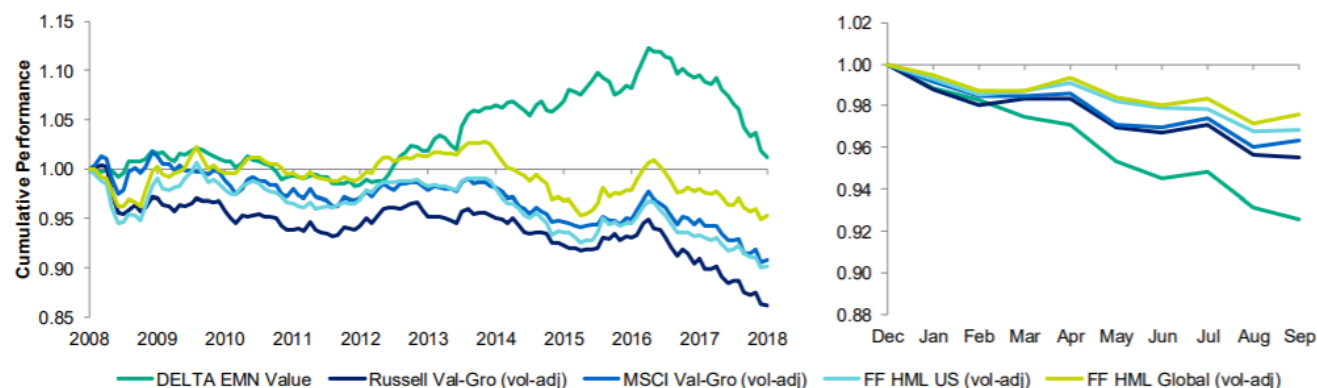


Alternative Beta and AQR

Primary Issues

- Underperformance of value factor, permeating across several sub-strategies
 - Value has been poor across the board, but AQR's industry-neutral approach has been hit harder

DELTA's Equity Market Neutral Value versus well-known Value indices
Since Inception & Year-to-date



- FPPA sizing within AR
 - Internal guideline of 5-15% allocation, but allocation has grown through redemptions of others
- Additional considerations
 - Firm size
 - Sub-Strategy diversification
 - Increased variability of equity beta
 - Consultant rating

Alternative Beta and AQR

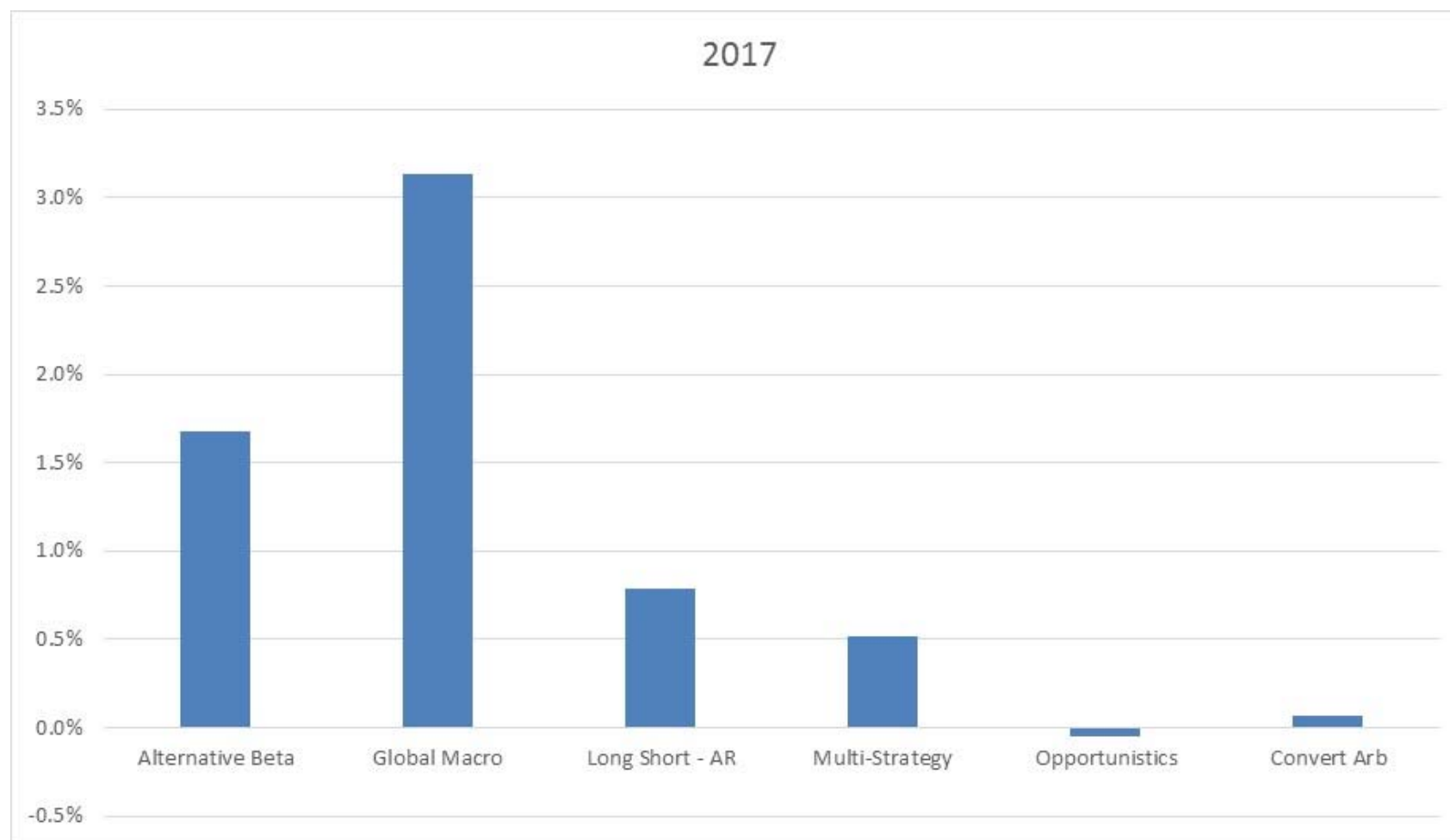
FPPA Monitoring

- Transitioned coverage in Q4 2017
- +15 meetings since Q4 2017 including two onsite meetings (12/2017, 09/2018)
- LST-specific internal watch list memo
 - Monitoring drawdown level, performance of value, sub-strategy cross correlations, application of the strategy's portfolio-level hedging and de-risking
 - Guideposts:
 - Stabilization of current drawdown by end of Q1 2019
 - Recovery of 1/3 current drawdown by end of Q2 2019
 - Seeking full recovery within 18-24 months
 - Seeking to lower AQR sizing through additional allocations (rather than direct redemptions)

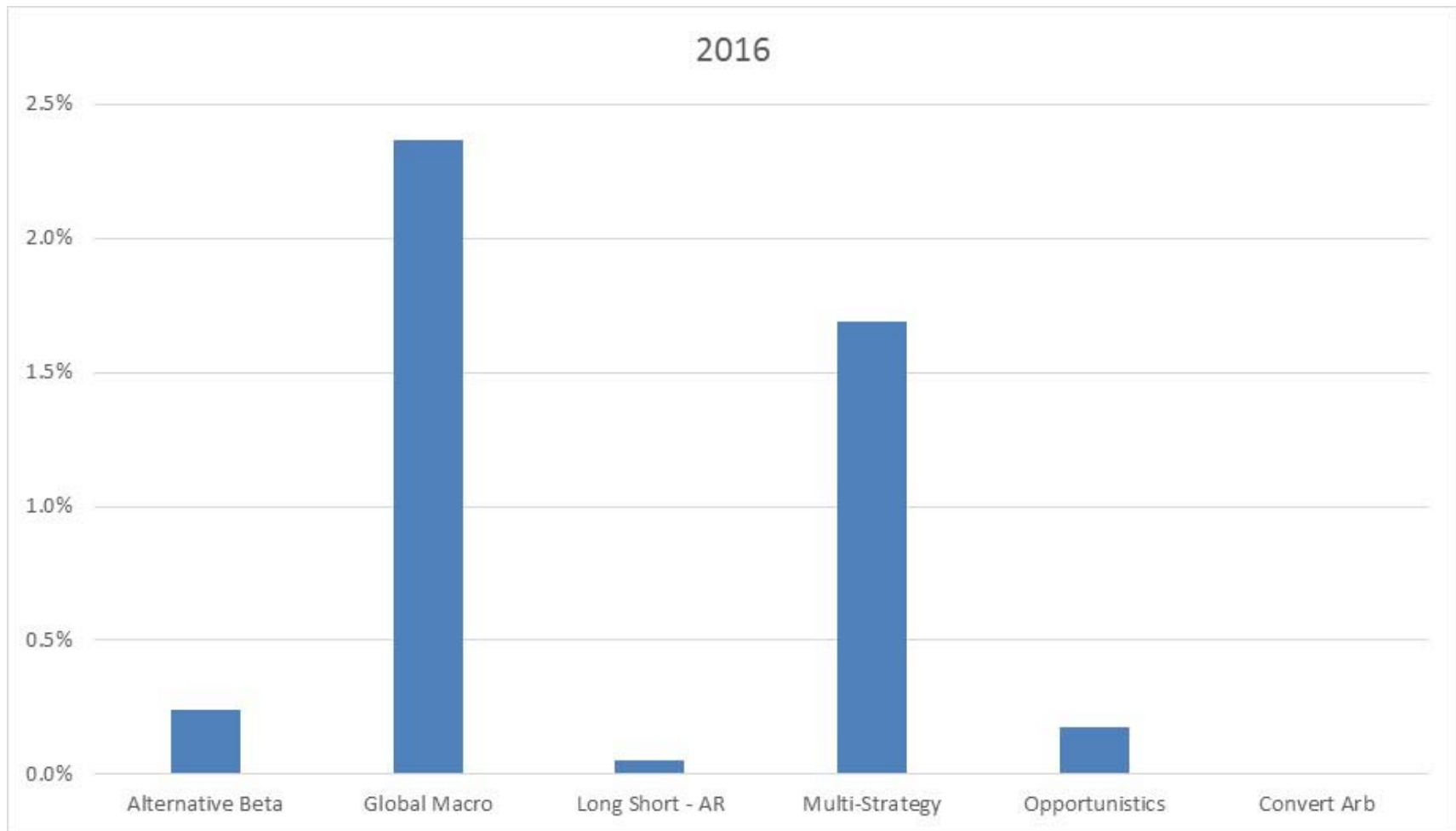
Absolute Return 2019 Objectives

- 2019 strategic planning
 - Manager coverage
 - Sub-strategy asset allocation
 - Managed futures
 - Risk/leverage monitoring
- Deal flow
 - Global macro
 - Opportunistic
 - Equity market neutral
 - Alternative beta
 - Etc.

Appendix – 2017 Strategy Attribution



Appendix – 2016 Strategy Attribution



Appendix – AQR SPF YTD Attribution

SPF Performance Attribution January – October 2018

	Stocks & Industries	Equity Indices	Fixed Income	Currencies	Commodities	Total
Value	-11.1%	-1.8%	-10.1%	0.9%	1.1%	-21.0%
Momentum	-0.6%	-1.2%	4.3%	-0.7%	-0.2%	1.6%
Carry	—	—	3.6%	0.0%	0.0%	3.7%
Defensive	3.3%	-1.8%	2.6%	—	—	4.1%
Total	-8.4%	-4.8%	0.5%	0.2%	0.9%	-11.6%

Source: AQR. Based on net performance from January 1, 2018 through October 31, 2018 for the AQR Style Premia Fund, L.P. Performance for the month ending October 31, 2018 is estimated and subject to change. Net returns for the AQR Style Premia Fund L.P. are calculated using an investment management fee of 0.75% and performance fee of 10.0%. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix. All performance figures contained herein represent preliminary unaudited estimates of gross realized and unrealized returns prepared by AQR Capital Management, LLC ("AQR"). All performance figures contained herein are in USD unless noted otherwise. Existing investors should refer to monthly statements provided by your custodian or administrator for actual returns.

Appendix – AQR Delta and SPF Drawdowns

Delta

Rank	Type	Dates			Drawdown Trough	Length of Time (Months)		
		Start	Bottom	End		Start-Bottom	Bottom-End	Start-End
1	Live	Feb 18	Oct 18		-16.5%	9		
2	Hypothetical	Jul 07	Nov 07	Jun 08	-14.8%	5	7	12
3	Hypothetical	Jul 08	Sep 08	Jan 09	-13.5%	3	4	7
4	Hypothetical	Feb 94	Feb 95	Jun 95	-9.9%	13	4	17
5	Hypothetical	Mar 04	Jul 04	Nov 04	-9.7%	5	4	9
6	Hypothetical	Mar 00	May 00	Dec 00	-6.3%	3	7	10
7	Live	May 11	Sep 11	Jul 12	-5.5%	5	10	15
8	Hypothetical	Jun 03	Jul 03	Oct 03	-5.2%	2	3	5
9	Hypothetical	Sep 98	Oct 98	Dec 98	-4.3%	2	2	4
10	Live	Feb 16	May 16	Oct 16	-4.1%	4	5	9

SPF

Rank	Type	Dates			Drawdown Trough	Length of Time (Months)		
		Start	Bottom	End		Start-Bottom	Bottom-End	Start-End
1	Hypothetical	Sep 98	Feb 00	Dec 00	-24.8%	18	10	28
2	Live	Feb 18	Aug 18		-10.6%	7		
3	Hypothetical	Jun 02	Oct 02	May 03	-10.6%	5	7	12
4	Hypothetical	Aug 92	Nov 92	Mar 93	-9.5%	4	4	8
5	Hypothetical	Feb 94	Mar 94	Nov 94	-8.9%	2	8	10
6	Hypothetical	Apr 10	Jul 10	Oct 10	-7.7%	4	3	7
7	Live	Jan 15	Feb 15	Sep 15	-6.8%	2	7	9
8	Hypothetical	Oct 90	Oct 90	Jan 91	-6.1%	1	3	4
9	Hypothetical	Jun 08	Jul 08	Nov 08	-5.8%	2	4	6
10	Live	Feb 16	Aug 16	Feb 17	-5.3%	7	6	13