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Introducing a Tool for Hedge Fund Performance Evaluation Based on MMS (Measure of Manager Skill)

European Quantitative Research Advisory Council

28 January 2020

Note: This is an updated version of the presentation originally published 5 June 2019, We are resending ahead of the forthcoming EQRAC conference, 28 January 2020.

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The Challenges in Evaluating Hedge Fund Performance

- One of the key tasks facing investors is identifying skilled portfolio managers
- This is especially challenging for hedge funds given their fee structure, lack of benchmark and large performance dispersion
- Most academic studies concluded hedge funds do not exhibit performance persistence
- Identifying performance persistence requires accurate estimates of “alpha”
- Factor-based regressions are commonly used to estimate hedge fund “alpha” in spite of the following:
 - ✓ The real set of factors is unknown
 - ✓ Set of factors changes over time as funds evolve
 - ✓ Lack of sufficiently long history for accurate estimation of factor loadings
 - ✓ Dynamic strategies result in nonlinear return profiles

MMS - Overview

- A fully algorithmic and objective measure of manager skill for hedge funds
- Controls for risk-taking behavior of funds
- Separates a fund's return into “systematic” part and “skill” part
- Applies to any hedge fund regardless of style
- Model free and requires only a limited track-record

MMS – History and New Development



CROSS ASSET RESEARCH

Quantitative Portfolio Strategy | 3 April 2012

PERFORMANCE PERSISTENCE IN HEDGE FUNDS

Identifying Future Outperformers Using a Measure of Manager Skill (*MMS*)

Introduction

Over the past two decades, the hedge fund industry has experienced exponential growth, with more than 8,000 funds and AUM exceeding \$2trn as of the end of 2011. The number of hedge funds available to investors as well as the large potential dispersion in their performances makes identifying future top performers challenging. One commonly used approach is to rely on funds' past track records and compute various performance statistics such as average returns and Sharpe ratios. Funds will then be evaluated based on these statistics, implicitly assuming that they are predictive

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2019

MMS tool



2013 – 2018

Bespoke structuring
of HF portfolios for
clients



2012

Publication:
Introducing the
MMS ([Link to Report](#))

FUNDS DATA

Upload Fund Returns Returns File Format

Uploaded 599 funds

Folder: Y:\Nyk\area\fi\groups\FI_RESEARCH\Quantitative_Portfol

File name: Fund returns1.csv

PERFORMANCE COMPARISON

Compare to Style

Another fund: Fund Example Y

Style: Long/Short Equity Hedge

FUND TO EVALUATE

Fund Example X

Self-reported style Long/Short Equity Hedge

Fund ID Fund ID Example X

of returns 60

In HFR No

EVALUATION Perform. only (no MMS)

Significance Level in Measuring Skill 97.5 %

Minimum AUM (\$Bn) 0 (0 = All)

Onshore-only

Analysis Range Override Mgr ret range

First month May 2014 201405

Last month Apr 2019 201904

Evaluate Fund Example X

Outline

**Part I: Measure of Manager Skill (MMS) –
Methodology and Empirical Results**



Part II: Introducing the MMS Tool

Part I: Measure of Manager Skill (MMS) – Methodology and Empirical Results

MMS – Methodology

- MMS calculation is based on the previous 12-month performance data
- The contemporaneous return of peer funds is used to separate a fund's systematic part and skill part
- The skill part of the fund performance is then adjusted for its risk level
- MMS represents how a fund's risk-adjusted skill compares with other peer funds

High MMS Funds Outperformed Lower-Ranked Funds

Portfolio Formation

MMS scores are calculated for all funds in December of each year



Funds are assigned to quartiles based on MMS scores



EW portfolio of funds within the same quartile is formed



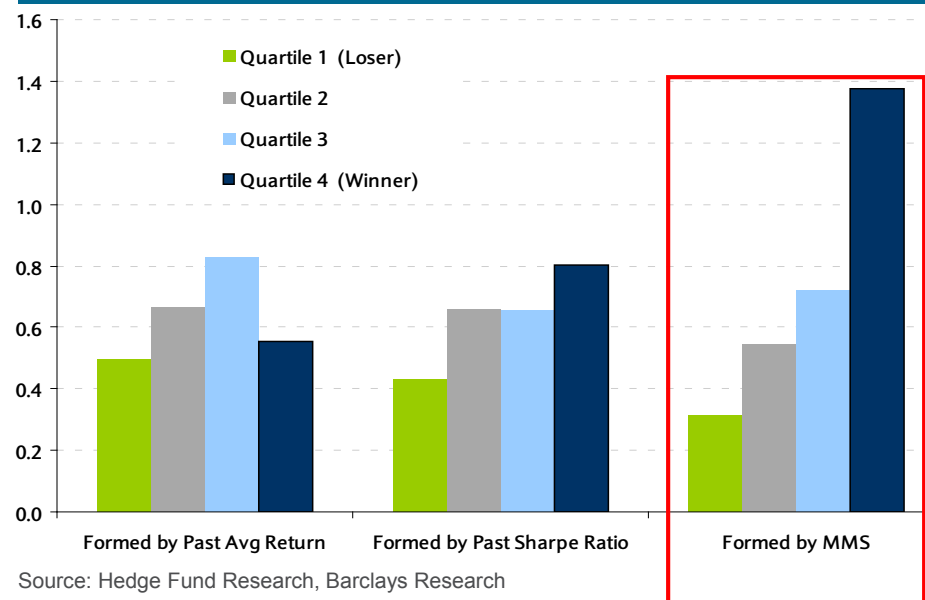
Constituents of portfolios remain unchanged until the next ranking date

- For example, Quartile 4 (“winner”) in 2009, includes funds with the highest 25% of MMS scores in 2008.

Post-Ranking Portfolio Performance

	Quartile 1 (Loser)	Quartile 2	Quartile 3	Quartile 4 (Winner)
Panel A: Full Sample (1997 - 2011)				
Avg. Return (%/mo)	0.53	0.67	0.74	0.89
Volatility (%/mo)	2.84	2.56	2.24	1.56
5% Percentile	-3.99	-3.32	-2.49	-1.59
Worst Month	-9.33	-8.72	-8.92	-4.98
Ma. Drawdown	-31.32	-26.31	-21.62	-12.81
Ann. Sharpe Ratio	0.32	0.54	0.72	1.37

Post-Ranking Sharpe Ratio

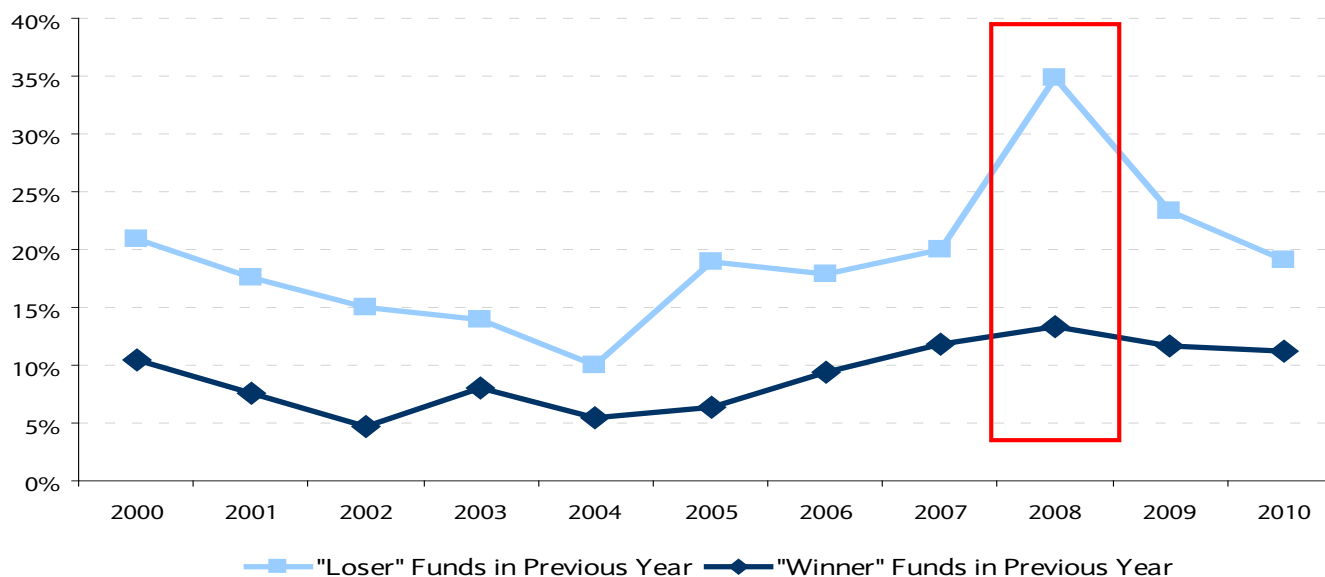


Note: Figures in this slide are all adapted from Ben Dor and Xu 2012: [Performance Persistence in Hedge Funds - Identifying Future Outperformers Using a Measure of Manager Skill \(MMS\)](#)

High MMS Funds Experience Lower Attrition Rate

- Significant difference in attrition rate (% of funds that stop reporting) between “winner” and “loser” funds
 - Average attrition rate: “winner” 9.38% vs. “loser” 19.33%
 - In 2008: “winner” 13.18% vs. “loser” 34.99%
 - Attrition rate is fairly stable for “winner” but varies significantly for “loser” funds
- Highlights MMS ability to distinguish among funds with different risk of being liquidated

Attrition Rate of “Winner” and “Loser” Funds



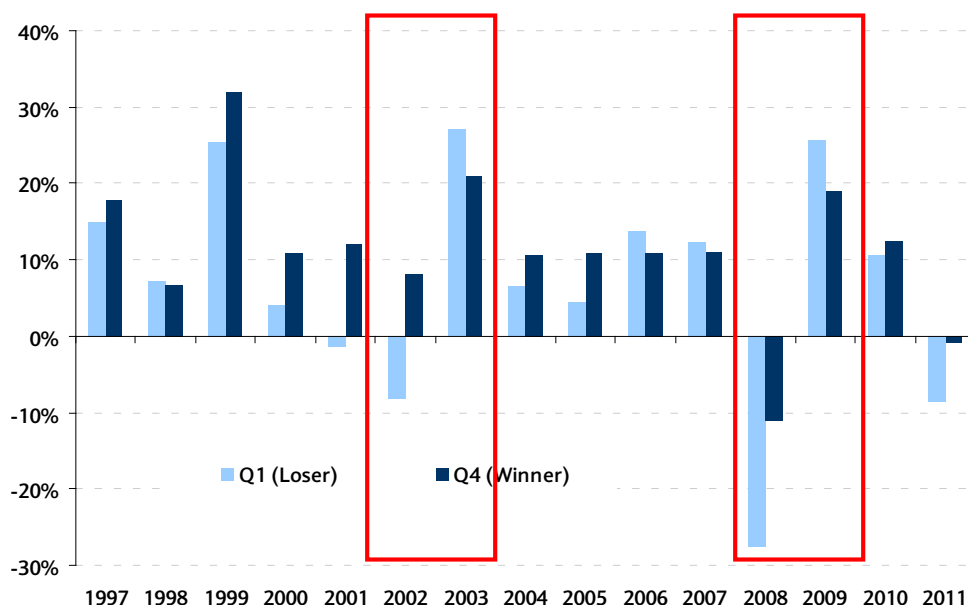
Source: Hedge Fund Research, Barclays Research

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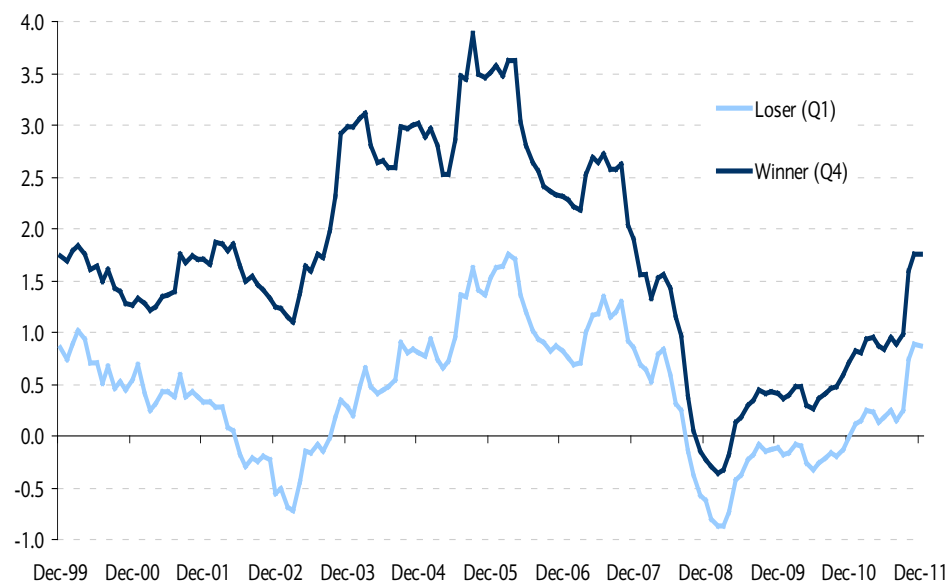
High MMS \neq High Absolute Return over Short Term

- **High MMS \neq High Absolute Return over Short Term**
 - For example, “winner” still underperformed “loser” by about 6% in 09 (net return)
- **But funds with high MMS should generate:**
 - Higher returns over the long run; and
 - Better risk-adjusted performance

Annual Return of “Winner” vs. “Loser”



3-year Rolling Sharpe Ratio



Source: Hedge Fund Research, Barclays Research

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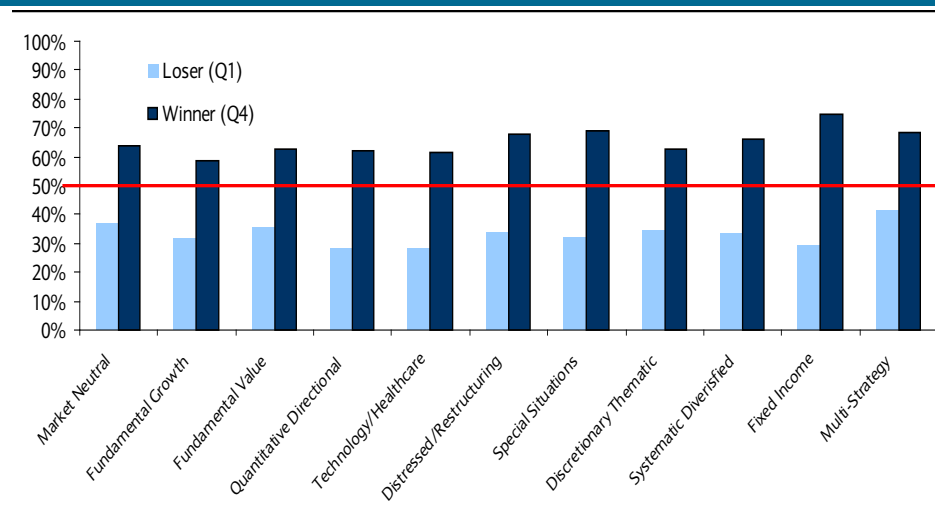
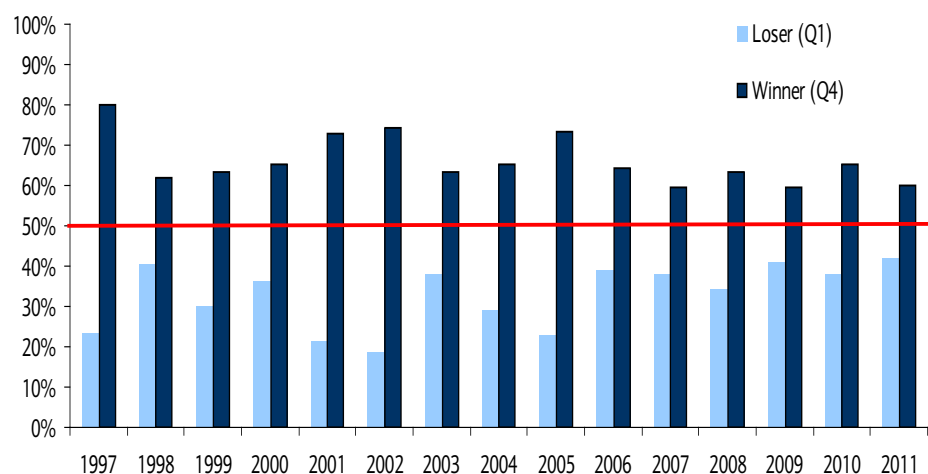
MMS Rankings are Persistent

- MMS rankings of both “winner” and “loser” funds exhibit strong persistence
- Prob. of above median MMS in post-ranking year: “winner”- 65%, “loser” - 33%
- Persistence exists across all years and styles

Transition Matrix of MMS Ranking

1997-2011		Ranking at Year t+1			
		Q1 ("loser")	Q2	Q3	Q4 ("winner")
Ranking at Year t	Q1 ("loser")	38%	28%	21%	12%
	Q2	29%	28%	25%	18%
	Q3	24%	26%	27%	23%
	Q4 ("winner")	15%	19%	25%	40%

Post-Ranking Probability of Having Above Median MMS Score



Note: “Winner” and “loser” are funds with top 25% and bottom 25% of MMS scores. See HFRI for strategy classifications. Source: Hedge Fund Research, Barclays Research

Note: Figures in this slide are all adapted from Ben Dor and Xu 2012: [Performance Persistence in Hedge Funds - Identifying Future Outperformers Using a Measure of Manager Skill \(MMS\)](#)

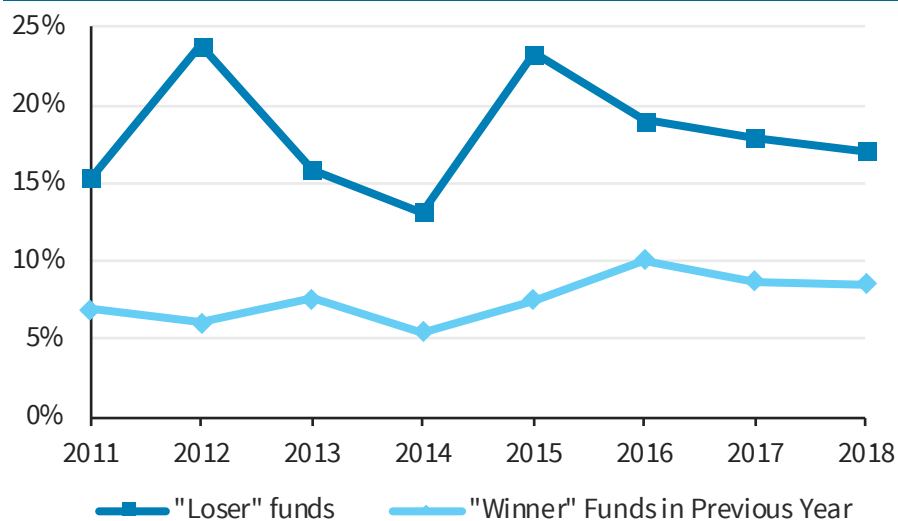
Dynamics Continue to Hold Up Out-of-sample

- High MMS funds continue to outperform after the publication of Ben Dor and Xu (2012)
- The attrition rate of “winner” funds is consistently lower and less volatile out-of-sample
- Persistence of MMS rankings is still present

Post-Ranking Sharpe Ratio (2012-2019)



Attrition Rate of High/Low MMS Funds



Transition Matrix of MMS Ranking

2012-2019		Ranking at Year t+1			
		Q1 ("loser")	Q2	Q3	Q4 ("winner")
Ranking at Year t	Q1 ("loser")	31%	26%	24%	20%
	Q2	28%	26%	25%	21%
	Q3	24%	26%	25%	24%
	Q4 ("winner")	18%	23%	26%	33%

Source: Hedge Fund Research, Barclays Research

Additional Results

- No “size effect” - MMS does not necessarily tilt towards small funds
- No “age effect” - high MMS funds are not significantly younger than low MMS funds
- No “correlation effect” - high MMS and low MMS funds have similar correlations with major asset classes such hedge fund indices, equities, commodities, rates and credit
- MMS works in small portfolios - using MMS to select a realistic size of funds (e.g., 10 - 30 funds) is able to consistently outperform a portfolio of same number of funds randomly selected from HFR universe*

*: The randomly selected funds would have similar style composition as the portfolio formulated by MMS

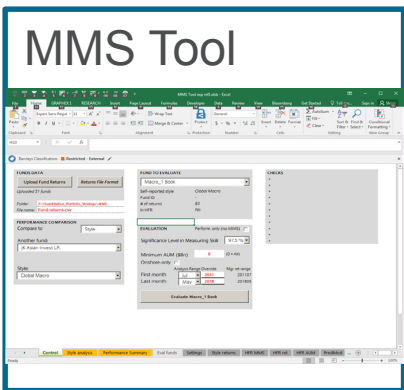
Key Takeaways

- Key Characteristics of MMS
 - ✓ MMS offers the ability to identify skill among hedge fund managers
 - High MMS funds outperformed lower-ranked funds on average in the subsequent year
 - Funds with higher MMS scores experienced lower attrition rate
 - ✓ MMS scores are persistent over time and across different investment styles
- MMS can be used to
 - ✓ Complement qualitative evaluation of hedge fund managers
 - ✓ Monitor the performance of existing hedge funds

Part II: Introducing the MMS Tool

Measure of Manager Skill (MMS) Tool – the Arrangement

Client site



Return series
of funds to
analyse

Barclays

HFR database: returns

HFR database: AUM

HFR funds' MMS

Hedge fund styles returns

CTA
Convertible Arbitrage
Equity Market Neutral
Event Driven
Fixed Income Arbitrage
Global Macro
Long/Short Equity Hedge

Inputs and Outputs

Inputs:

- Client funds' return series
- The HFR database (13,000+ funds): returns and AUM
- MMS (computed by Barclays) for every fund in the HFR database, for trailing 12-month periods ending on each month
- Hedge fund styles returns

Outputs:

- Return comparisons vs. other funds or investment styles
- Performance statistics and style peers rankings
- Breakdown of performance into skill (alpha) and systematic exposures (beta)
- Time series of 12-month MMS, and MMS peer rankings
- Probability distribution of expected next-year vs-peers performance

User Interface

Provide a set of user-supplied funds

FUNDS DATA

Upload Fund Returns Returns File Format

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File name: Fund returns1.csv

Select a fund to evaluate

FUND TO EVALUATE

Fund Example X

Self-reported style Long/Short Equity Hedge

Fund ID Fund ID Example X

of returns 60

In HFR No

CHECKS

+
+
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+

PERFORMANCE COMPARISON

Compare to Style

Another fund: Fund Example Y

Style: Long/Short Equity Hedge

EVALUATION

Perform. only (no MMS) ☐

Significance Level in Measuring Skill 97.5 %

Minimum AUM (\$Bn) 0 (0 = All)

Onshore-only ☐

Analysis Range Override

First month May 2014

Last month Apr 2019

Mgr ret range 201405 201904

Evaluate Fund Example X

Comparison basis

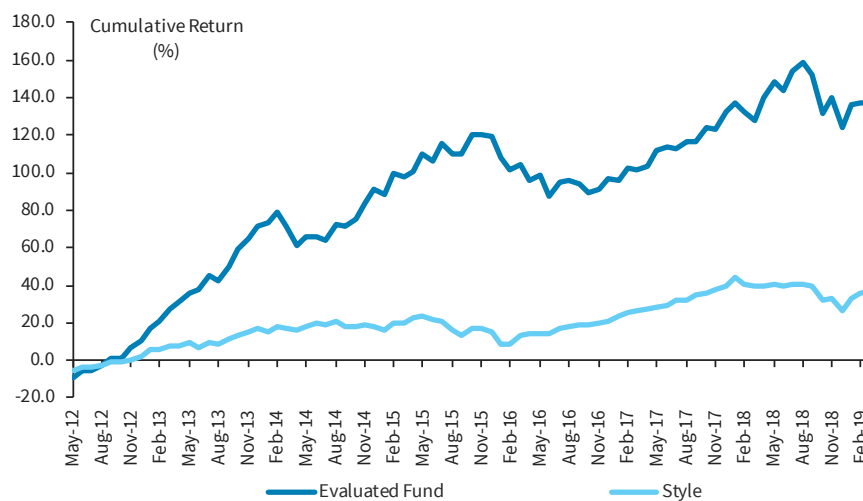
Parameters for analysis

Outputs: “Standard” Performance Measures

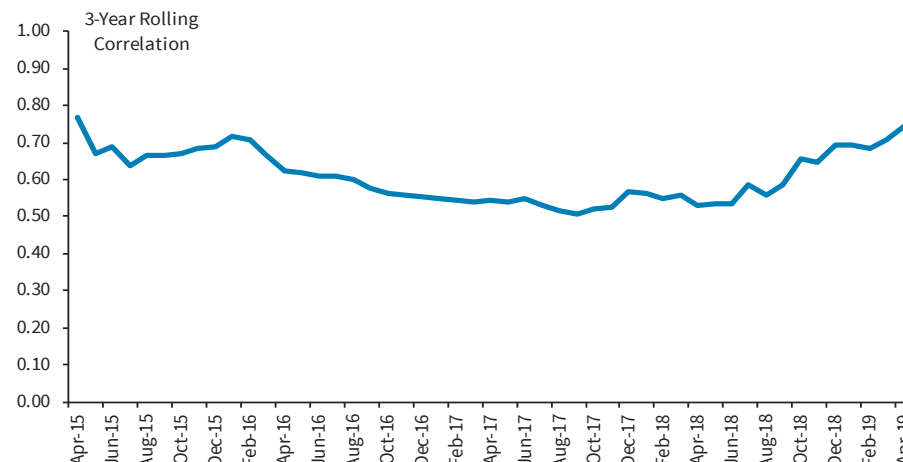
Performance Summary

	Fund Example X	Long/Short Equity Hedge Style
Average Return (%/mo)	1.14%	0.42%
Volatility (%/mo)	3.44%	1.99%
5% Percentile	-5.80%	-3.85%
Worst Month	-8.92%	-5.29%
Worst 6-Month	-14.51%	-9.62%
Maximum Drawdown	-15.18%	-12.24%
Ann. Sharpe Ratio (over Libor)	1.08	0.62
Beta to S&P 500	0.79	0.57
Correlation	-	0.71

Cumulative Return vs. Long/Short Equity Hedge Style



3-yr Correlation with Long/Short Equity Hedge Style



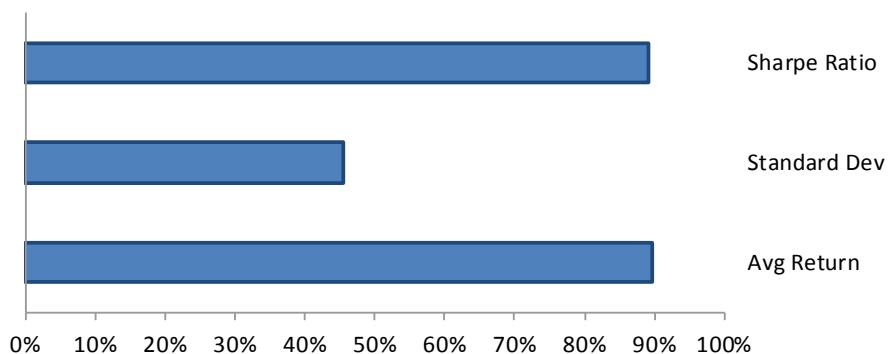
Rankings vs. HFR Peers (Any AUM)

Number of Eligible HFR Funds 284 (out of 5070 in Long/Short Equity Hedge)

Average Return (1.14%) is higher than 89.8% of the HFR peers

Return Volatility (3.44%) is lower than 45.4% of the HFR peers

Ann. Sharpe Ratio (1.08) is higher than 89.1% of the HFR peers



Source: Hedge Fund Research, Barclays Research



Outputs: The Benchmark Model (Style Exposures)

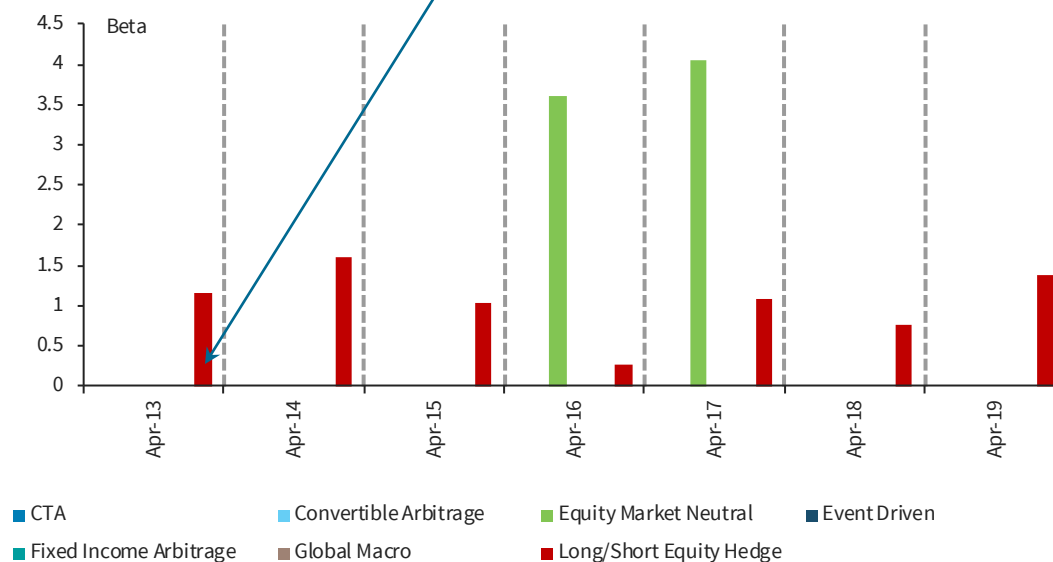
Date	Evaluated Fund	CTA	Convertible Arbitrage	Equity Market Neutral	Event Driven	Fixed Income Arbitrage	Global Macro	Long/Short Equity Hedge
201205	-8.92	-0.90	-0.27	-0.99	-2.12	-0.80	0.81	-5.12
201206	3.72	-0.81	0.95	0.27	0.14	0.68	-1.62	1.11
201207	0.42	1.85	1.39	0.28	0.48	0.69	2.19	0.14
201208	2.77	0.40	1.39	0.49	1.30	0.78	-0.31	1.32
201209	4.11	0.36	1.54	0.35	1.01	0.76	-0.18	2.20
201210	-0.53	-1.96	1.12	0.03	0.38	0.54	-2.03	-0.06
201211	5.49	-0.20	0.91	0.34	0.57	0.36	-0.07	0.45
-	-	-	-	-	-	-	-	-

Source: Hedge Fund Research, Barclays Research

Fund Return and Style Return

Style exposures are determined for each 12-month period (style betas)

Style Betas, by 12mo periods



Source: Hedge Fund Research, Barclays Research

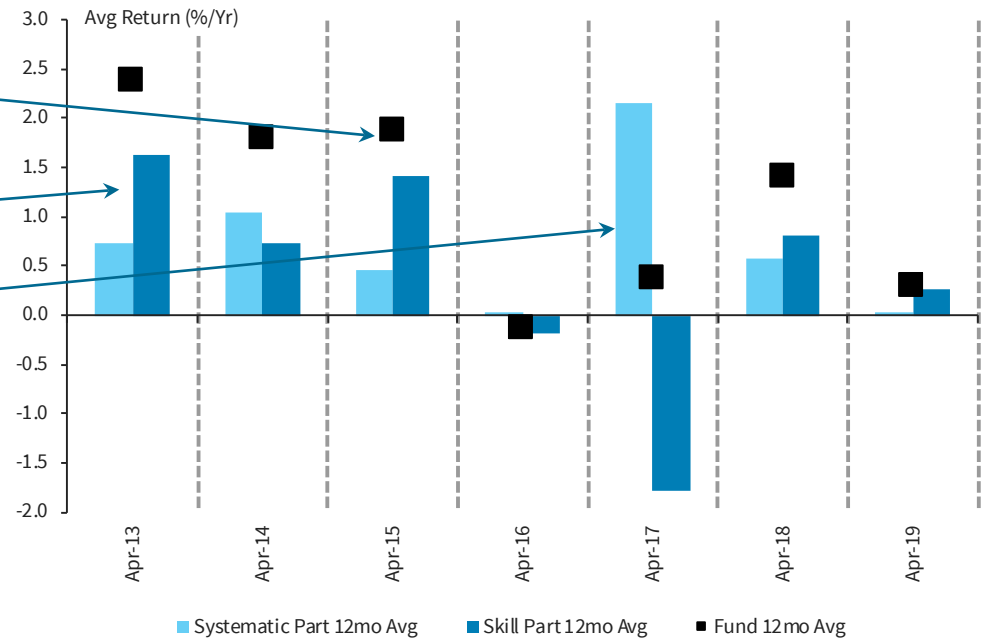
Outputs: Performance Breakdown: Style Exposures and Skill

Fund return, systematic part return, and skill part return, by 12mo periods

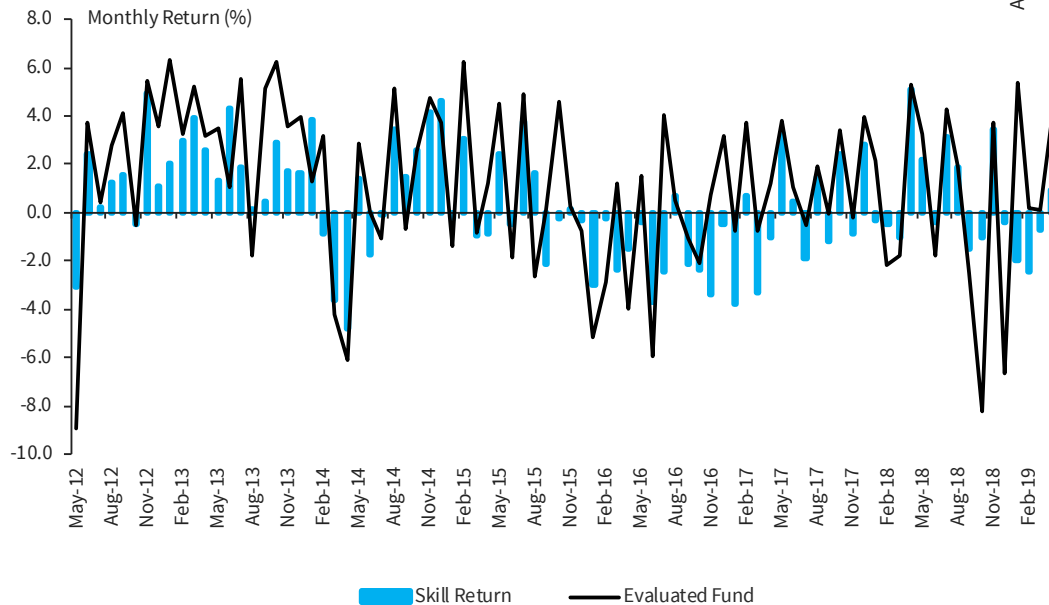
Actual Fund Return

*Skill Part Ret = Fund Ret
– Systematic Part Ret*

*Systematic Part
Return*



Fund return vs. its systematic part return, monthly

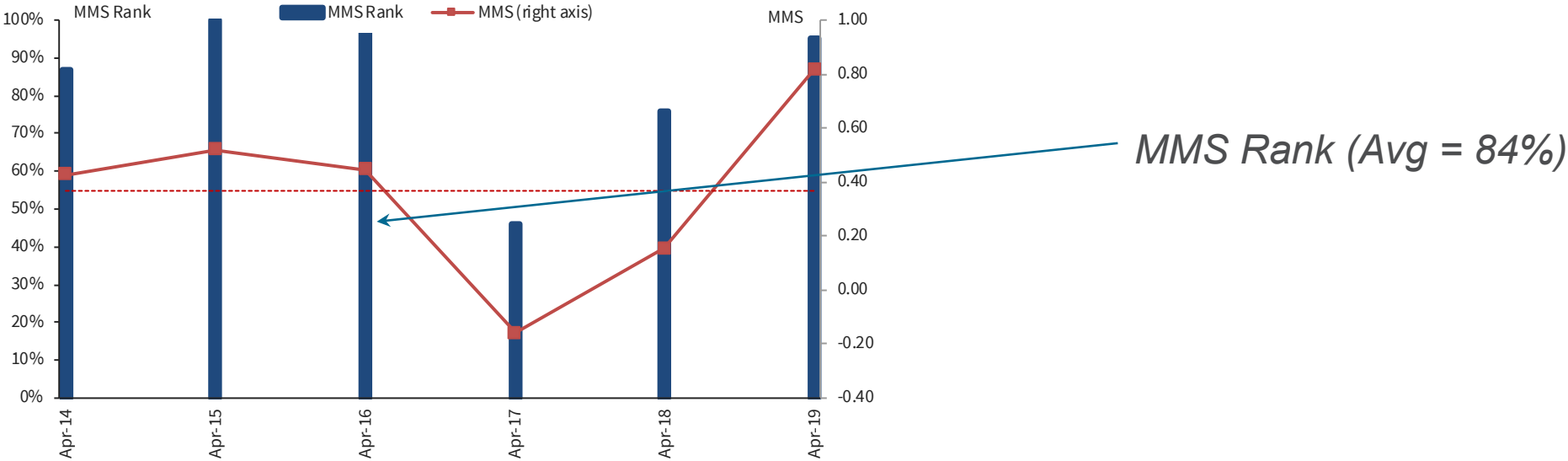


Source: Hedge Fund Research, Barclays Research

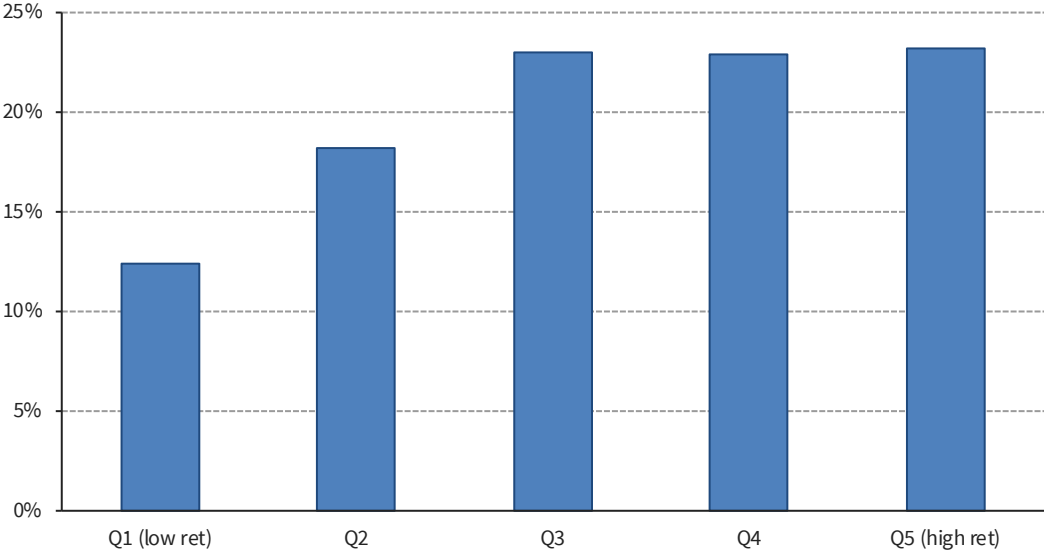
Source: Hedge Fund Research, Barclays Research

Outputs: Probability Distribution of Next Year Performance

MMS Rank, by 12mo periods



Probability Distribution of Quintile Ranking of Next Year Absolute Return over Peers



Source: Hedge Fund Research, Barclays Research

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