

# Liquid Alternative Mutual Funds Versus Hedge Funds

Jonathan Hartley\*

The Wharton School, University of Pennsylvania

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## Abstract

Despite the rapid rise of the number of liquid alternative mutual funds (LAMFs) available to retail investors in recent years, few studies have compared how their return and risk characteristics differ from their hedge fund counterparts across their entire history. Being among the first comprehensive studies to look at over two decades of LAMF performance, we use risk based factors to compare the performance of LAMFs to hedge funds both in aggregate and broken down by investment styles including equity long-short, market neutral, multistrategy and managed Futures. Overall, we find that liquid alternative hedged mutual funds underperform hedge funds on average by 1-2% per year on a net-of-fee basis, controlling for standard risk factors. This is largely driven by underperformance in multialternative and managed futures strategies. These findings provide important implications for investors seeking hedge fund-like returns while considering the importance of liquidity, transparency, and fees as well as policymakers who have recently proposed imposing derivative position limits on liquid alternative mutual fund 1940 Act investment vehicles.

**Keywords:** Mutual Funds, Hedge Funds

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\*Address: 2930 Chestnut Street, Philadelphia, PA 19104, USA, telephone: (312) 560-3099, e-mail: *hartley@wharton.upenn.edu*. MBA Candidate, The Wharton School, University of Pennsylvania. The author is grateful for comments from Andrew Alford, Paul Lotito, Kent Clark, Armen Avanesians, and Gary Chropuvka.

# 1 Introduction

In this paper, we are principally concerned with comparing the net performance and basic characteristics (fees, liquidity, shorting, leverage, and turnover) of liquid alternative hedged mutual funds to private placement hedge funds.

Hedge mutual funds are broadly defined as 1940 Act mutual funds that employ historically popular hedge fund strategies including, but not limited to, equity long short, market neutral, and managed futures.

In compliance with the SEC and 1940 Investment Company Act rules, liquid alternative mutual funds (LAMFs) must limit borrowing to only one-third of total assets, cover short positions, restrict investment in illiquid securities to 15% of total assets, and provide daily liquidity and pricing. In contrast, hedge funds do not face such constraints and are largely unregulated. In addition to lighter regulation, hedge funds have better incentives as they usually charge performance-based incentive fees, while hedged mutual funds usually do not, only charging a flat fee. Differences in both regulation and incentives suggest that LAMFs are likely to underperform HFs (what is often referred to as the Regulation and Incentives Hypothesis).

In this study, LAMFs used in our sample are defined by alternative mutual funds identified in the Morningstar Alternative Universe, our sample of traditional mutual funds (TMFs) comes from the CRSP Survivorship-Bias Free Mutual Fund Database, and our sample of hedge funds comes from the live and dead fund Hedge Fund Research (HFR) databases. We find that LAMFs underperform HFs on average by 3-4% per year on a net-of-fee basis, however this could very well be a result of hedge funds having the ability to take on greater risk. Controlling for standard risk factors, we find that LAMFs underperform HFs on average by between 1-2% per year.

We also find that equity long-short and market neutral strategies appear largely unhindered in a 1940 Act vehicle as they are able to produce a similar amount of alpha when controlling for various risk factors. Interestingly, equity long-short mutual funds have roughly

the same market beta as their equity long-short hedge fund counterparts.

We do find that managed futures and multialternative mutual funds tend to have significantly smaller alpha, by roughly 1.5% and 2.0% respectively, compared to their hedge fund counterparts.

Such findings provide important implications for investors seeking hedge fund-like returns while considering the importance of liquidity, transparency and fees. Such findings may also have implications for policy makers interested in the overall leverage of LAMFs and their compliance with 1940 Act Rules.

The paper proceeds as follows: Section 2 discusses related literature and outlines the three hypotheses. Section 3 describes the data and empirical strategy around assessing performance. Section 4 investigates the results including differences in performance and risk factor exposures across different alternative vehicles and strategies. Section 5 concludes.

## 2 Literature and Theory

Only a few previous studies have explored the performance gap between liquid alternative mutual funds and hedge funds. Agarwal, Boyson and Naik (2009) compares the performance of "hedged mutual funds" and hedge funds between 1994 and 2004, finding that hedged mutual fund alphas lag hedge fund alphas between 5% and 7% per annum on a net-of-fee basis, using both Carhart (1997) four-factor models and Fung and Hsieh (2004) seven-factor models. One explanation they argue for why hedge funds outperform both hedged mutual funds and mutual funds is that hedge fund managers possess greater security selection skill, also known as the Skill Hypothesis, which is highlighted in the study.

One key finding from Agarwal, Boyson and Naik (2009) is that hedged mutual funds which are managed by diversified investment firms including previous or concurrent experience with managing hedge funds tend to outperform hedged mutual funds that are managed by specialized firms that have no hedge fund experience, with a difference in annual alphas

between 1% and 2% on a net-of-fee basis, using the same models mentioned previously.

More recently Cliffwater hedge fund consultants analyzed over 100 alternative asset firms that offer both private placement hedge fund and liquid offerings in the same alternative category, finding that liquid alternative performance lags hedge funds per annum by approximately 1% on a net-of-fee basis. This difference does not control for well known risk factors, however, the authors do note that this gap in performance shrinks during periods of market distress, when there is a premium for liquidity. Their definition of liquid alternatives includes 1940 Act mutual funds, separately managed accounts, UCITs funds, and listed securities, including closed-end funds. Since these vehicles all differ in the amount of illiquid assets they are limited to carry (1940 Act mutual funds can have no more than 15% of holdings illiquid while SMAs can hypothetically carry 100% of illiquid holdings), we restrict our own analysis of liquid alternatives to 1940 Act mutual funds.

Nohel, Wang and Zheng (2010) similarly explore side-by-side management of hedge fund managers who also manage mutual funds. They find that hedge fund managers who also engage in side-by-side management tend to underperform hedge fund managers that do not engage in side-by-side management. Cici et al. (2006) also studies side-by-side management finding that side-by-side managers underperform their mutual fund strategy peer group.

In *Winning With Liquid Alternatives* (McGraw-Hill, 2014), Norman Mains of Forward Management provides a good introduction to liquid alternatives and their brief history along with a cursory comparative performance analysis of hedged mutual funds to hedge funds without the use of any risk factors. Stulz (2007) also provides an excellent summary of hedge fund studies and their measurements of alpha.

McCarthy (2014) and McCarthy (2015) provides a good overview of equity long short alternative mutual funds and multialternative mutual funds respectively. Lewis (2016), Black (2015) and Maxey and Davis (2015) also provide a good overview of the benefits of liquid alternative mutual funds to retail investors and clarify other misconceptions behind the asset class.

Moreover, defining what constitutes a liquid alternative and what strategy categories comprise the liquid alternative universe is a critical task and one somewhat subjective. Furthermore, this task becomes even more difficult as funds change their strategy over time. While Morningstar has developed an alternative category for 1940 Act mutual funds, Wilshire Associates produces the Wilshire Liquid Alternative Index which produces a slightly different return stream than the Morningstar alternative universe. Whether to include UCITS funds or other products registered internationally is an important question of high consequence for the return stream of the liquid alternative universe. For the purpose of this study, we stick to analyzing the universe of 1940 Act alternative mutual funds identified in the Morningstar universe, in part for the benefit of U.S. retail investors and U.S. regulators.

## **3 Data**

### **3.1 Liquid Alternative Mutual Funds**

For the sample of liquid alternative mutual funds (LAMFs) , we begin by including all mutual funds from the Morningstar database that are listed in the Morningstar Alternative category. In particular, we look at institutional shareclasses of LAMFs since their fee structure should roughly be more comparable with the fees charged by hedge funds in the HFR database. Moreover, since the hedge fund return streams provided by HFR are net-of-fees, our objective of comparing LAMFs to HFs requires that we compare the net performance an institutional investor would receive in either setting.

Unlike other studies such as Agarwal (2009) that use hedge fund data from the Lipper/TASS Database, we instead use HF data from the HFR Database, which consists of a larger sample of hedge funds. This provides us with the final sample of many thousands of hedge funds.

We also look use the CRSP Survivor-Bias-Free US Mutual Fund Database to obtain a return stream for the the broader universe of mutual funds.

We combine duplicate share classes and take asset-weighted averages of the expenses, turnover, loads, and fees. We identify a total of 368 LAMFs during our sample period. We also gather corresponding quarterly SEC holdings filings to determine gross and net exposures as well as portfolio turnover.

## 3.2 Hedge Funds

For these same hedge funds, we gather their corresponding SEC 13-F filings for the purpose of determining portfolio turnover. We also use the weekly Morgan Stanley Prime Brokerage leverage reports, which include short positions, for the purpose of determining gross and net exposures.

## 3.3 Factors

Since mutual funds and hedge funds are exposed to a number of risk factors, we use risk-adjusted performance measures (alphas) for all the analyses.

Alphas are defined as the intercepts from various regression models. The first is the Carhart (1997) four-factor model widely used across mutual fund studies. The four factors include the CRSP value-weighted market excess return  $(r_{m,t} - r_{f,t})$ , the two Fama and French (1993) factors: size (SMB) and book-to-market (HML), and the Jegadeesh and Titman (1993) momentum (UMD) factor. Asness, Moskowitz and Pedersen (2013) provide similar value and momentum factors which could be substituted in this specification:

$$(r_{p,t} - r_{f,t}) = \alpha + \beta_{\text{MKT}}(r_{m,t} - r_{f,t}) + \beta_{\text{SMB}}\text{SMB}_t + \beta_{\text{HML}}\text{HML}_t + \beta_{\text{UMD}}\text{UMD}_t + \epsilon_t \quad (1)$$

The second model is the Fung and Hsieh (2004) seven-factor model, which includes an equity market factor, a size-spread factor, a bond market factor, a credit spread factor, and three option-based trend following factors for bonds, currencies, and commodities. For both models, we estimate alphas individually for each fund using the prior 24 months of gross-of-

fee and net-of-fee returns for our gross and net performance measures. The trend following (time series momentum) factors of Moskowitz, Ooi, and Pedersen (2012) would also be a good substitute in this specification with  $n$  factors each denoted as  $F_{i,t}$ :

$$(r_{p,t} - r_{f,t}) = \alpha + \sum_{i=1}^n \beta_i F_{i,t} \quad (2)$$

Finally, we estimate two other models for robustness. These include Carhart's (1997) 4-factor model augmented with (a) Pastor and Stambaugh's (2003) liquidity factor, (b) Frazzini and Pedersen's (2014) betting against beta factor, and (c) Agarwal and Naik's (2004) put and call option (out-of-the-money and at-the-money factors). Jurek and Stafford (2015) demonstrate that aggregate hedge fund returns can be replicated with a out-of-the-money put-selling strategy on the market. Demonstrating the extent to which liquid alternative mutual funds can be replicated by such a put-selling strategy is an interesting question and can provide some answers about how different the cost of capital for liquid alternative investments is from traditional hedge fund investments.

## 4 Results

### 4.1 Liquid Alternative Mutual Fund Asset Class Performance and Characteristics

Figure 1 displays asset class cumulative returns for (1) the average liquid alternative mutual fund (LAMFS) in the Morningstar Alternative Universe, (2) the average hedge fund in the HFR database, (3) the S&P 500 as a proxy for U.S. equity returns, (4) the Barclays U.S. Aggregate index as a proxy for U.S. fixed income returns, and (5) the risk-free rate.

Similarly, Table 1 displays the average annual return, volatilities, maximum drawdowns, Sharpe ratios (using returns data from 1994 to 2016 inclusive) and annual return in each year from 1994 to 2016 for each of the above asset classes.

While in average annualized return, the S&P 500 (returning 9.1%) outpaced hedge funds (8.01%), the Barclays U.S. Aggregate index (5.78%) liquid alternative mutual funds (5.73%), accounting for risk comes up with a very different ranking as the realized annualized standard deviation for the S&P 500 (14.73%) outpaces the realized annualized standard deviations for the average hedge fund (6.72%), the average liquid alternative mutual fund (5.11%) and the Barclays U.S. Aggregate (3.54%).

As a result, the Sharpe ratios for the Barclays U.S. Aggregate (0.92), the average hedge fund (0.82), the average liquid alternative mutual fund (0.63) sharply surpass the Sharpe Ratio for the S&P 500 (0.45).

Similarly, maximum drawdowns for the Barclays U.S. Aggregate (-5.15%), the average hedge fund (-21.42%) and the average liquid alternative mutual fund (-21.72%) are much smaller than the maximum drawdown of the S&P 500 (-50.95%) achieved during the 2008-2009 financial crisis.

For this reason, like hedge funds, liquid alternative mutual funds can be viewed as a form of downside protection relative to U.S. equities.



## 4.2 Risk Factor Exposures

Table 3 presents the regression results from our specifications in Section 3 that regress the return streams of Liquid Alternative Mutual Funds (LAMFs) and Hedge Funds (HFs) by style on various popular risk factors.

Looking at equity long-short alternative mutual funds across various the Carhart (1997), Pastor and Stambaugh (2003), Fung and Hsieh (2004) and Agarwal and Naik (2004) specifications fairly consistently suggests that these funds on average have a market beta of approximately 0.5, nearly identical to the market beta held by equity long-short hedge funds. This has several implications for the extent to which shorting and leverage takes place in liquid alternative mutual funds which are seen as being constrained by the 33

With regard to alpha, in the CAPM and Carhart (1997) four-factor specifications, equity long-short mutual funds have positive alpha of around 1.22% and 1.30% respectively which is approximately 50 basis points less than the alpha generated by equity-long-short hedge funds in these specifications (1.78% and 1.73% respectively).

This suggests that equity long-short strategies may not be significantly impacted by the constraints of a 1940 Act vehicle.

Moreover, market neutral liquid alternative mutual funds appear to have nearly identical alphas with their market neutral hedge fund counterparts across each specification (with the only exception of the Fung and Hsieh (2004) model).

This combined evidence suggests that 1940 Act vehicles may not hinder alternative stock selection strategies in either an equity long short or market neutral investment process.

Given the results from the Fung and Hsieh (2004) seven factor regression, it appears that managed futures style liquid alternative mutual funds have very similar exposures to their managed futures hedge fund counterparts, in particular being similarly long the commodity and currency trend following factors. Oddly, liquid alternative mutual funds appear short the bond trend following factor. A low R-squared of 0.14 for the specification might suggest that there are other unexplained factors beyond the Fung and Hsieh (2004) seven factors

which could be at play.

In terms of alpha, it appears that managed futures mutual funds underperform their managed futures hedge fund counterparts by between 1-2

## 5 Conclusion

After comparing liquid alternative mutual funds (LAMFs) to hedge funds (HFs) both in aggregate and across investment styles, this paper identifies several notable similarities and differences.

First, while the average LAMF and the average HF both have underperformed the S&P 500 in average annualized return between 1994 and 2016, the average LAMF and HF have significantly less realized risk as measured by standard deviation. They further have realized higher Sharpe ratios compared to the S&P 500, but still below the Sharpe Ratio of bonds as measured by the Barclays U.S. Aggregate.

In addition, liquid alternative mutual funds, like hedge funds, can be viewed as a form of downside protection relative to U.S. equities given their milder underperformance during the 2008-2009 financial crisis.

We also find that equity long-short and market neutral strategies appear largely unhindered in a 1940 Act vehicle as they are able to produce a similar amount of alpha when controlling for various risk factors. Interestingly, equity long-short mutual funds have roughly the same market beta as their equity long-short hedge fund counterparts.

We do find that managed futures and multialternative mutual funds tend to have significantly smaller alpha, by roughly 1.5% and 2.0% respectively, compared to their hedge fund counterparts.

As the SEC considers rule 18f-4 that would limit the use of leverage and derivatives in 1940 mutual funds including a 150% cap on derivatives exposure used to increase market risk and a 300% limit on derivatives used to reduce market risk, we hope that this paper

provides evidence of the risk and return characteristics of liquid alternative mutual funds, namely that they bear less risk and smaller drawdowns compared to U.S. equities. While most equity-long short and market-neutral mutual funds have positions that are within the limits proposed by the SEC, multialternative funds and managed futures funds may fall outside these limits. Most importantly, this paper demonstrates that derivative exposures taken by such strategies do not always equate to higher levels of overall risk.

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**Table 1. Asset Class Performance Comparison.** This Figure plots the cumulative total return for the aggregate group of liquid alternative hedged mutual funds from the Morningstar alternative category, the Hedge Fund Research Fund Weighted Index (HFRI), the S&P 500 index, and the Barclays Aggregate Bond Index from January 1994 to September 2016.

	Liquid Alternative Mutual Funds (Morningstar Alternative Universe)	Hedge Funds (HFRI Fund Weighted Composite Index)	S&P 500	Barclays US Aggregate Bond Index
Avg. Annual Rate of Return (%)	5.73	8.01	9.10	5.78
Annual Standard Deviation (%)	5.11	6.72	14.73	3.54
Sharpe Ratio	0.63	0.82	0.45	0.92
Maximum Drawdown (%)	-21.79	-21.42	-50.95	-5.15
Annual Return (%)				
1994	0.57	4.10	1.32	-2.92
1995	16.85	21.50	37.58	18.47
1996	12.86	21.10	22.96	3.63
1997	14.04	16.79	33.36	9.65
1998	8.61	2.62	28.58	8.69
1999	5.63	31.29	21.04	-0.72
2000	16.38	4.98	-9.10	11.63
2001	4.17	4.62	-11.89	8.44
2002	-3.47	-1.44	-22.10	10.26
2003	12.26	19.55	28.68	4.18
2004	7.65	9.05	10.88	4.41
2005	5.74	9.27	4.91	2.86
2006	9.28	12.89	15.79	4.33
2007	4.92	9.95	5.49	6.97
2008	-15.16	-19.03	-37.00	5.24
2009	11.97	20.01	26.46	5.93
2010	5.37	10.24	15.06	6.54
2011	-1.68	-5.25	2.11	7.84
2012	2.93	6.37	16.00	4.21
2013	7.35	9.14	32.39	-2.02
2014	5.64	2.98	13.69	5.95
2015	3.83	-1.11	1.38	0.57
Jan 2016 - Sept 2016	0.15	4.16	7.84	5.81

**Table 2. Asset Class Statistics** for Liquid Alternative Mutual Funds (LAMF), Traditional Mutual Funds (TMF), and Hedge Funds (HF).

	Liquid Alternative Mutual Funds		Mutual Funds		Hedge Funds	
	Net Assets	Number	Net Assets	Number	Net Assets	Number
1994	\$743	10	\$2,155	5325	\$167	1654
1995	\$782	11	\$2,811	5725	\$186	2006
1996	\$1,196	14	\$3,526	6248	\$257	2392
1997	\$1,321	15	\$4,468	6684	\$368	2564
1998	\$2,046	27	\$5,525	7314	\$375	2848
1999	\$3,216	31	\$6,846	7791	\$456	3102
2000	\$4,662	37	\$6,965	8155	\$491	3335
2001	\$5,278	42	\$6,975	8305	\$539	3904
2002	\$5,654	44	\$6,384	8243	\$626	4598
2003	\$10,142	46	\$7,204	8125	\$820	5065
2004	\$18,629	59	\$8,095	8040	\$913	5782
2005	\$24,300	80	\$8,891	7974	\$1,105	6665
2006	\$33,484	105	\$10,398	8118	\$1,465	7241
2007	\$43,679	135	\$12,002	8026	\$1,868	7634
2008	\$56,679	145	\$9,604	8022	\$1,407	6845
2009	\$57,879	189	\$11,113	7663	\$1,600	6883
2010	\$60,155	215	\$11,832	7555	\$1,917	7200
2011	\$75,387	275	\$11,627	7591	\$2,008	7574
2012	\$89,231	368	\$13,045	7596	\$2,252	7940
2013	\$132,341	408	\$14,031	7816	\$2,630	8329

Notes: Liquid alternative mutual fund (LAMF) and traditional mutual fund (TMF) totals data is from Morningstar. Hedge fund (HF) data is from Hedge Fund Research

**Table 3. Alphas and Risk Factors for Liquid Alternative Mutual Funds (LAMFs) and Hedge Funds (HFs) By Style using data from January 2004 to December 2013.**

	Multialternative			Equity Long Short			Market Neutral			Managed Futures*		
	Morningstar Multialternati ve Category	HFRI Fund Weighted Index	Difference	Morningstar Equity Long Short Category	HFRI Equity Hedge Index	Difference	Morningstar Market Neutral Category	HFRI Market Neutral Index	Difference	Morningstar Managed Futures* Category	Newedge CTA Index	Difference
CAPM Alpha	1.05	3.18	-2.13	1.24	1.78	-0.54	2.05	2.07	-0.02	2.60	3.61	-1.01
Carhart 4-Factor Alpha	1.09	3.15	-2.06	1.30	1.73	-0.44	1.98	1.85	0.12	2.74	4.06	-1.32
Pastor and Stambaugh 5-Factor Alpha	0.80	2.59	-1.79	0.95	1.06	-0.11	1.83	1.63	0.19	2.72	4.09	-1.37
Fung and Hsieh 7-Factor Alpha	-0.36	-0.09	-0.27	-0.16	-0.38	0.21	-1.01	0.66	-1.67	-1.75	-0.91	-0.83
Agarwal and Naik 4-Factor Alpha	0.40	2.12	-1.72	0.23	0.05	0.18	1.57	1.39	0.18	2.30	4.46	-2.15
CAPM Beta Estimates	0.35	0.35		0.50	0.50		0.08	0.10		-0.06	-0.05	
Beta Estimates (Carhart 1997)												
$\beta_{Market}$	0.36	0.37		0.49	0.52		0.09	0.12		-0.03	0.02	
$\beta_{SMB}$	-0.03	0.01		0.00	0.05		0.01	-0.02		-0.27	-0.25	
$\beta_{HML}$	0.03	-0.08		0.08	-0.12		0.01	0.02		0.11	0.08	
$\beta_{UMD}$	0.01	0.02		0.01	0.01		0.02	0.07		0.05	0.10	
Adjusted R <sup>2</sup>	0.88	0.68		0.93	0.76		0.29	0.39		0.05	0.06	
Beta Estimate (Pastor and Stambaugh 2003)												
$\beta_{Market}$	0.36	0.36		0.48	0.51		0.09	0.12		-0.03	0.02	
$\beta_{SMB}$	-0.04	-0.01		-0.01	0.03		0.01	-0.02		-0.27	-0.25	
$\beta_{HML}$	0.07	-0.02		0.12	-0.05		0.02	0.04		0.10	0.10	
$\beta_{UMD}$	0.01	0.00		0.00	0.00		0.02	0.07		0.05	0.09	
$\beta_{LIQ}$	0.06	0.11		0.07	0.13		0.03	0.04		-0.01	0.01	
Adjusted R <sup>2</sup>	0.90	0.73		0.94	0.80		0.31	0.43		0.04	0.05	
Beta Estimate (Fung and Hsieh 2004)												
$\beta_{S\&P500}$	0.36	0.33		0.49	0.46		0.08	0.07		0.03	0.08	
$\beta_{Size Spread}$	0.04	0.06		0.10	0.11		0.04	0.00		-0.22	-0.19	
$\beta_{10\text{-year Treasury Yield}}$	0.15	0.15		0.11	0.16		0.09	0.01		0.37	0.36	
$\beta_{Credit Spread}$	-0.02	-0.07		-0.04	-0.02		-0.02	-0.21		0.26	0.05	
$\beta_{Bond Trend-Following Factor}$	-0.14	-0.79		-0.90	-1.36		0.18	-1.26		-1.38	1.93	
$\beta_{Commodity Trend-Following Factor}$	0.68	0.13		0.74	-0.35		0.17	-0.35		3.94	3.27	
$\beta_{Currency Trend-Following Factor}$	0.21	0.00		0.30	-0.10		0.20	0.20		1.77	1.34	
Adjusted R <sup>2</sup>	0.90	0.90		0.94	0.74		0.28	0.34		0.14	0.13	
Beta Estimate (Agarwal and Naik 2004)												
$\beta_{Market}$	0.36	0.35		0.52	0.51		0.08	0.11		-0.05	-0.05	
$\beta_{ATM Call}$	1.70	1.87		2.10	1.68		0.91	1.63		6.73	0.01	
$\beta_{OTM Call}$	-1.58	-1.80		-1.87	-1.70		-0.93	-1.50		-6.13	0.22	
$\beta_{ATM Put}$	1.93	2.15		4.55	3.35		0.16	2.41		0.73	-3.11	
$\beta_{OTM Put}$	-1.98	-2.24		-4.30	-3.41		-0.28	-2.14		0.25	3.42	
Adjusted R <sup>2</sup>	0.89	0.68		0.93	0.75		0.28	0.26		0.05	-0.03	

\*Managed Futures hedged mutual fund data begins in April 1, 2007 with the inception of the Guggenheim Managed Futures Strategy fund.

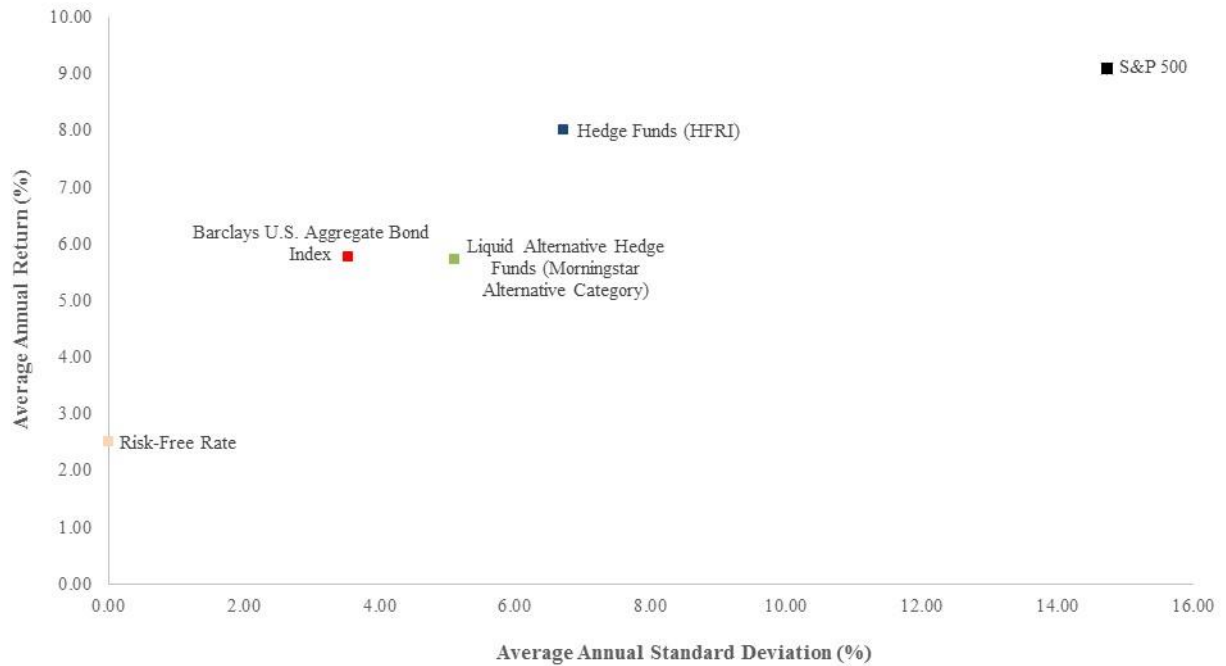
\*\*Agarwal and Naik factors are limited by Optionmetrics data through July 31, 2013.



**Figure 1. Asset Class Performance Comparison.** This Figure plots the cumulative total return for the aggregate group of liquid alternative hedged mutual funds from the Morningstar alternative category, the Hedge Fund Research Fund Weighted Index (HFRI), the S&P 500 index, the Barclays Aggregate Bond Index, and the risk-free rate from January 1994 to September 2016.



**Figure 2. Asset Class Average Annualized Returns and Standard Deviations.** This Figure plots the means and standard deviations for the aggregate group of liquid alternative hedged mutual funds from the Morningstar alternative category, the Hedge Fund Research Fund Weighted Index (HFRI), the S&P 500 index, the Barclays Aggregate Bond Index, and the risk-free rate from January 1994 to September 2016.



**Figure 3. Asset Class Maximum Drawdowns.** This Figure plots the maximum drawdowns for the aggregate group of liquid alternative hedged mutual funds from the Morningstar alternative category, the Hedge Fund Research Fund Weighted Index (HFRI), the S&P 500 index, the Barclays Aggregate Bond Index, and the risk-free rate from January 1994 to September 2016.

