The search for hedge fund alpha

While hedge funds continue to increase their funds under management, the evidence of their ability to earn alpha or excess returns remains mixed. Our study considers whether hedge fund returns can be explained by a simple multi-factor model without the inclusion of complex option based investment strategies. We found that over the 1994–2006 period, only 5–7% of the hedge funds we studied earned statistically significant alpha, suggesting that hedge fund alpha is as elusive as ever.

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OUR STUDY EXAMINES the performance of hedge funds and their capacity to earn alpha or risk-adjusted excess returns for investors. An analysis of hedge funds is always somewhat controversial as advocates and critics fuel both sides of the alpha debate. Despite this, the global hedge fund industry continues to grow with Warsh (2007) estimating its size at US$1.5 trillion dollars of assets globally in 2006.

While studies by Brown, Goetzmann and Ibbotson (1999) and Kosowski, Naik and Teo (2007) have shown that hedge funds can generate alpha,[1] Capocci and Hubner (2004) and Fung and Hsieh (2004) demonstrated that hedge fund returns can be explained by market-based factors resulting in little or no alpha being delivered to investors. The hedge fund literature acknowledges the Fung and Hsieh (2004) seven-factor model as the benchmark framework to explain the variation of hedge fund returns, however, it relies on option investment strategies as independent variables in the model which makes it difficult for investors to implement in practice.[2]

In this study, we examine a long sample of hedge fund returns from 1994–2006 and we consider whether a more simple multi-factor model can explain hedge fund returns without the inclusion of complex option based investment strategies. This study proposes an eight-factor model and reveals that as few as 5–7% of 7355 hedge funds over the 1994–2006 sample period earned statistically significant alpha.

Related literature

The active nature of the hedge fund industry fascinates researchers and practitioners because it directly challenges the Fama (1970) Efficient Market Hypothesis (EMH).[3] The very existence of hedge fund alpha is at odds with the voluminous research on mutual fund performance since Jensen (1968), which has shown that traditional active fund managers, on average, do not outperform passive benchmark returns. Therefore, the question remains, do hedge fund managers exhibit skill?

While these hedge fund studies reveal a small variation in results due to various datasets, time periods and methodologies, a consistent conclusion from Capocci and Hubner (2004) and Fung and Hsieh (2004) is their important contribution that conventional market returns and risk factors can readily explain hedge fund returns.

The origins of hedge fund performance research can be traced back to the asset pricing and mutual fund performance literature.[4] The early hedge fund studies such as Brown et al. (1999) estimated significant hedge fund alpha, however, these findings were driven by omitted variable bias. This issue of omitted variables in the hedge fund literature led subsequent researchers including Capocci and Hubner (2004) and Fung and Hsieh (2004) to explore other market factors that may explain the variation of hedge fund returns.

The introduction of the Fung and Hsieh (2004) seven-factor model was developed to demonstrate that passive risk factors can explain hedge fund returns. With a 1994–2001 sample, Fung and Hsieh (2004) demonstrated that seven common risk factors can explain up to 80% of the variation of hedge fund returns. In another study, Capocci and Hubner (2004) propose an alternative multi-factor model which includes the Fama and French (1992, 1993) and Carhart (1997) risk factors. Capocci and Hubner (2004) revealed that hedge funds enjoy earning the small firm risk premia in equity returns. With a 1994–2000 sample, Capocci and Hubner (2004) estimated that only 25% of all hedge funds generate statistically significant alpha.

A critique of the hedge fund performance literature reveals two unresolved issues. First, the Fung and Hsieh (2004) model includes independent variables (IVs) which are returns derived from lookback straddle option strategies in bond, FX and commodity markets. These IVs make it difficult for the Fung and Hsieh (2004) model to be readily deployed by investors. An alternative model without the complex use of option strategies may better serve investors and researchers when examining hedge fund performance. Second, the work of Capocci and Hubner (2004) revealed the overuse of IVs in their 11-factor model and high collinearity problems associated with various bond indices. Furthermore, Capocci and Hubner (2004) did not consider foreign exchange markets as a source of return and risk in global hedge fund returns. While these hedge fund studies reveal a small variation in results due to various datasets, time periods and methodologies, a consistent conclusion from Capocci and Hubner (2004) and Fung and Hsieh (2004) is their important contribution that conventional market returns and risk factors can readily explain hedge fund returns.

To address these issues in the hedge fund literature, this study proposes a simple eight-factor model which incorporates the major asset classes and risk factors in global financial markets. In an attempt to simplify the Fung and Hsieh (2004) model, we do not employ option-based investment strategies as IVs. This study also includes global foreign exchange returns as an IV in the model.

Data

This study employs the Lipper/TASS dataset of individual hedge fund returns from January 1994 to December 2006. To minimise the impact of backfilling bias in individual hedge fund returns, we follow Edwards and Caglayan (2001), Fung and Hsieh (2000) and Kosowski et al., (2007) by removing the first 12 months of performance history from every fund. To minimise survivorship bias, we follow Brown et al., (1999), Fung and Hsieh (2000) and Liang (2001) by incorporating both hedge fund survivors and non-survivors in the study. To further mitigate survivorship bias, we avoid pre-1994 returns when estimating the regressions in this study.[5] After the removal of data exceptions, the study examines 7355 funds composed of 4160 survivors and 3195 non-survivors. The returns from 16 global currencies are converted to US dollar equivalent monthly rate of returns using the historical Federal Reserve Bank of New York noon buying rates. We employ the Ibbotson and Associates one-month US T-Bill rate as the risk free rate.

Table 1 (see Appendix) reports the descriptive statistics of the excess returns of the equal weighted portfolios of hedge funds in each investment category. Table 1 reveals the wide variation in risk-adjusted returns for the various hedge fund investment categories. The Jarque-Bera statistics reveal that most hedge fund returns are not normally distributed, which is a typical feature of the global hedge fund industry. A key characteristic of the data in Table 1 is the serial correlation and heteroscedasticity (i.e. time-varying variance) associated with hedge fund returns.

Table 2 lists the summary statistics of the market returns and risk factors which are employed as IVs in this study. We employ: the Center for Research in Securities Prices (CRSP) value-weighted portfolio of all NYSE, Amex and Nasdaq stocks as the US stock market proxy; the Fama and French (1992, 1993) Small-minus-Big (SMB) factor mimicking portfolio as the proxy for the small firm size risk premium in US stocks; the Fama and French (1992, 1993) High-minus-Low (HML) factor mimicking portfolio as the proxy for the value premium in US stocks; the Carhart (1997) PR1YR factor mimicking portfolio as the proxy for the momentum factor; the Lehman Brothers Global Aggregate Index as the proxy for global bond returns; the Dow Jones AIG Global Commodity Total Return Index as the proxy for global commodities; the US Dollar Index as a proxy for foreign

exchange movements of global currencies against the US dollar; and finally, the MSCI World Equity Index excluding USA as the proxy for global stock returns.

Table 2 (see Appendix) presents the summary statistics of the excess returns of these market proxies and risk factors. Table 2 reveals that global and US stock returns, SMB, HML and momentum risk factors exhibit varying degrees of heteroscedasticity. Global bonds exhibit significant autocorrelation while the SMB factor and global commodities report various degrees of negative autocorrelation. Overall, the summary statistics highlight the serial correlation in the first and second moments in returns, which may potentially affect the overall inferences in our OLS regression estimates.

Method

While individual regression estimates capture the number of funds that generate alpha, subsequent regressions based on equal-weighted portfolios provide aggregate performance of hedge fund strategies and inform investors seeking exposure to hedge fund indices. In this study we consider both methodological approaches. To fully evaluate hedge fund performance, this study proposes an eight-factor model based on some of the common market returns and risk factors proposed by Capocci and Hubner (2004) and Fung and Hsieh (2004).[6] The model proposed in this study considers eight conventional assets markets and risk factors that can be mathematically expressed as:

$$(R_{it} - R_{ft}) = \alpha_i + \beta_{i1}(R_{mt} - R_{ft}) + \beta_{i2}HML_t + \beta_{i3}SMB_t + \beta_{i4}UMD_t + \beta_{i5}(LGABI_t - R_{ft}) + \beta_{i6}(DJAIG_t - R_{ft}) + \beta_{i7}(USDI_t - R_f) + \beta_{i8}(MSWXUS_t - R_{ft}) + \varepsilon_{i,t}$$

Where:

α_i	=	the intercept of the regression or excess return
R_{it}	=	the return on fund or portfolio *i* in month t
R_{ft}	=	the risk-free return on month *t*
R_{mt}	=	the return on the market portfolio in month *t*
SMB_t	=	Fama-French factor-mimicking portfolio return for size in month *t*
HML_t	=	the Fama-French factor-mimicking portfolio return for book-to-market equity in month *t*
UMD_t	=	the Carhart (1997) factor-mimicking portfolio return for 12 month momentum
$LGABI_t$	=	return on the Lehman Global Aggregate Bond Index in month *t*
$DJAIG_t$	=	the return on the *t* Dow Jones-AIG Global Total Return Commodities Index in month *t*
$USDI_t$	=	the return on the US Dollar Index in month t
$MSWXUS_t$	=	return on the MSCI World Excluding U.S. Equity Index in month *t*
ε_{it}	=	the residual of the regression in month *t*

We employ the Fama and French (1992, 1993) SMB and HML factors as they have been included in numerous hedge fund studies including Edwards and Caglayan (2001), Agarwal and Naik (2004), Fung and Hsieh (2004) and Capocci and Hubner (2004). The rationale for the implementation of the SMB and HML factors from the Fama and French (1992, 1993) model is their dominance in the asset pricing literature and their extensive use in previous hedge fund studies.

The effects of autocorrelation in the first and second moments in the data as reported in Tables 1 and 2 may distort the inferences made in the regressions in this study. To control for these effects, we employ Newey and West (1987) heteroscedasticity and autocorrelation-consistent standard errors in all regressions. In the interest of brevity, this study reports the eight-factor model, however, the regressions of the traditional Jensen (1968), Fama and French (1992, 1993) and Carhart (1997) models have been estimated and the results are available upon request.

Results

Table 3 (see Appendix) reports individual fund regressions of the eight-factor model and the results reveal that, on average, individual funds report a regression intercept or alpha of approximately 0.10% per month (i.e. 1.2% per year). Table 3 also shows that only 7% of hedge funds in the sample reported statistically significant alpha over the 1994–2006 period. The percentage of funds with statistically significant alpha from 1994–2006 is lower than Capocci and Hubner (2004) who estimated that 25% of funds exhibited statistically significant alpha over the 1994–2000 period.

As mentioned in Fung and Hsieh (2004), fund of funds provide the most realistic measure of global hedge fund performance as their returns are less prone to the data biases inherent in hedge fund returns. Table 3 reveals that only 5% of all Fund of Funds exhibit statistically significant alpha with the average excess return estimated at -0.04% per month.

The regressions in Table 3 support the previous findings from Capocci and Hubner (2004) that some hedge funds exhibit statistically significant positive factor loading towards US stocks and the Fama and French (1992, 1993) US small firm size premium. Overall, the results from Table 3 show that there are very few individual hedge funds that generate returns over and above market related returns that can be easily sourced from global financial markets. These findings suggest that hedge fund alpha is elusive.

Table 4 (see Appendix) reports the returns of individual hedge funds when they are aggregated into equal weighted portfolios. The regression results in Table 4 reveal that all eight factors exhibit statistically significant loadings across the various investment categories and assist in explaining the variation and performance of hedge fund returns. The alpha reported for the All Funds equal weighted portfolio is 0.22% per month, however, this regression estimate is found to be statistically

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insignificant. The more realistic estimate of hedge fund portfolio returns comes from the Fund of Funds equal weighted portfolio which reports an alpha estimate of only 0.07% per month.

Overall, the findings from Tables 3 and 4 suggest that global hedge fund returns reflect the compensation for common asset markets and risk factors that are easily captured by the eight-factor model. The R^2 statistics of the eight-factor model in this study are not as high as the goodness of fit estimates reported in Fung and Hsieh (2004), however, the eight-factor model is simpler to use and can readily capture hedge fund alpha, if it exists at all. The evidence suggests that investors were overly optimistic in earning hedge fund alpha from 1994–2006 and more modest expectations are required for the future.

Conclusion

This study considers the performance of individual hedge funds and portfolios of hedge funds and examines whether they can deliver alpha for investors. Employing a simple eight-factor model over the 1994–2006 period, our estimates revealed that only 7% of 7355 hedge funds and 5% of Fund of Funds in this sample reported statistically significant alpha. We found that the eight-factor model is effective at identifying hedge fund alpha and is easier to implement than the benchmark seven-factor model proposed by Fung and Hsieh (2004).

The introduction of this eight-factor model along with Capocci and Hubner (2004), Fung and Hsieh (2004) provides investors with the necessary tools to evaluate hedge fund performance. However, the findings from these studies suggest that hedge fund alpha is as elusive as ever — the search for true skill continues.

TABLE 1: **Summary statistics — hedge funds**

This table presents summary statistics of the monthly excess returns of equally-weighted hedge fund portfolios (by category) of individual funds. Excess returns are measured as the hedge fund portfolio less the risk-free rate (1 Month T-Bill rate). Panel A provides the descriptive statistics of the monthly returns of the respective categories. Panel B reports the autocorrelation of returns. Panel C presents the autocorrelation of the second moment of returns (squared returns). AF denotes All Funds, AFXF denotes All Funds excluding Fund of Funds, CA denotes Convertible Arbitrage, DSB denotes Dedicated Short Bias, EM denotes Emerging Markets, EMN denotes Equity Market Neutral, ED denotes Event Driven, FIA denotes Fixed Income Arbitrage, FOF denotes Fund of Funds, GM denotes Global Macro, LSEH denotes Long/Short Equity Hedge, MF denotes Managed Futures and MS denotes Multistrategy. * and ** denote statistical significance at the 5% and 1% levels, respectively.

	AF	AFXF	CA	DSB	EM	EMN	ED	FIA	FOF	GM	LSEH	MF	MS
Panel A: Descriptive Statistics													
Mean	0.005	0.005	0.004	-0.004	0.006	0.004	0.006	0.003	0.003	0.003	0.007	0.004	0.006
Std. Dev.	0.016	0.016	0.012	0.052	0.045	0.007	0.013	0.010	0.015	0.017	0.026	0.027	0.014
Skewness	-0.075	-0.115	-0.866	0.294	-1.704	0.383	-1.741	-2.463	0.076	0.706	-0.181	0.100	-1.290
Kurtosis	4.442	4.320	5.355	3.889	11.412	3.361	11.988	13.855	4.629	4.819	5.046	2.690	8.538
Median	0.005	0.005	0.005	-0.007	0.012	0.004	0.007	0.004	0.003	0.001	0.009	0.003	0.006
Maximum	0.056	0.057	0.034	0.192	0.116	0.026	0.032	0.023	0.052	0.068	0.091	0.072	0.039
Minimum	-0.059	-0.061	-0.052	-0.162	-0.274	-0.014	-0.075	-0.060	-0.052	-0.047	-0.100	-0.065	-0.069
J-B Stat.	13.670	11.672	55.539	7.382	535.481	4.656	603.842	923.646	17.396	34.448	8.062	0.891	242.298
J-B p-value	0.001*	0.003*	0.000**	0.025*	0.000**	0.098	0.000**	0.000**	0.000**	0.000**	0.000**	0.641	0.000**
Sharpe Ratio	0.299	0.326	0.310	-0.065	0.132	0.642	0.474	0.260	0.186	0.152	0.291	0.117	0.399
Panel B: Autocorrelation (First Moment)													
AC1	0.206*	0.204*	0.504**	0.103	0.318**	0.232*	0.355**	0.405**	0.200*	0.112	0.200*	0.004	0.207*
AC2	0.044	0.038	0.204*	-0.105	0.034	0.150	0.092	0.134	0.067	-0.091	0.010	-0.100	0.159*
AC3	-0.066	-0.067	0.018	-0.064	0.015	0.188*	-0.060	0.127	-0.048	-0.053	-0.039	-0.060	0.100
AC6	-0.003	0.004	0.026	0.049	-0.083	0.167*	0.024	0.117	-0.022	-0.039	0.104	-0.087	-0.002
AC12	-0.113	-0.124	-0.009	-0.197*	-0.028	0.062	-0.050	0.009	-0.066	-0.097	-0.177	-0.070	-0.041
Panel C: Autocorrelation (Second Moment)													
AC1	0.023	0.006	0.150	-0.001	0.045	0.137	0.011	0.406**	0.103	0.045	0.043	-0.058	-0.015
AC2	0.155	0.141	0.058	0.240*	0.036	0.147	-0.056	0.077	0.206*	-0.018	0.257**	0.094	-0.026
AC3	0.056	0.053	0.088	0.225*	0.191*	0.254**	0.028	0.049	0.081	-0.017	0.085	-0.052	-0.008
AC6	0.056	0.061	-0.051	0.123	-0.011	0.220*	-0.013	0.064	0.033	0.071	0.121	-0.072	-0.009
AC12	-0.023	-0.035	-0.067	0.121	-0.029	0.004	-0.069	-0.024	-0.019	0.002	0.049	-0.059	-0.099

TABLE 2: **Summary statistics — common market returns and risk factors**

This table reports the summary statistics of the monthly excess returns of the common asset markets and risk factors employed in this study between January 1994 and December 2006. The traditional passive investments are the excess returns from the US market risk factor and the SMB, HML and momentum (UMD) factor-mimicking portfolios from Fama and French (1992, 1993) and Carhart (1997). The global passive investments are excess returns on bonds (Lehman Brothers Global Aggregates Index), commodities (Dow Jones AIG Commodity All Return Index), currencies (US Dollar Index) and world equities excluding U.S stocks (MSCI World ex USA). * and ** denote statistical significance at the 5% and 1% levels, respectively.

	US Market Return & Risk Factors				Global Markets			
	Market	**SMB**	**HML**	**Momentum**	**Bonds**	**Commodities**	**Currency**	**World Equities**
Panel A: Descriptive Statistics								
Mean	0.006	-0.001	0.006	0.007	0.002	0.004	-0.004	0.002
Std. Dev.	0.042	0.040	0.035	0.051	0.009	0.038	0.021	0.041
Skewness	-0.782	-1.150	0.481	-0.625	-0.315	-0.089	-0.057	-0.635
Kurtosis	4.023	9.901	5.380	8.132	3.283	2.658	2.924	3.667
Median	0.013	-0.003	0.005	0.007	0.003	0.005	-0.003	0.005
Maximum	0.082	0.135	0.137	0.184	0.029	0.096	0.050	0.095
Minimum	-0.162	-2.190	-0.098	-0.251	-0.022	-0.079	-0.056	-0.142
J-B Stat.	22.714	343.920	42.844	181.380	3.102	0.954	0.121	13.368
J-B p-value	0.000**	0.000**	0.000*	0.000**	0.212	0.621	0.941	0.001**
Sharpe Ratio	0.149	-0.025	0.169	0.144	0.223	0.115	-0.195	0.044
Panel B: Autocorrelation (First Moment)								
AC1	0.040	0.149	0.141	-0.069	0.200*	0.034	0.071	0.055
AC2	-0.048	0.024	0.026	-0.084	0.019	-0.185*	-0.052	-0.038
AC3	0.003	-0.210*	0.051	0.027	0.131	0.149	0.025	0.049
AC6	0.109	0.075	0.013	0.203	0.034	0.164*	0.016	0.104
AC12	-0.019	0.095	0.104	0.207	-0.174*	-0.104	0.050	0.046
Panel C: Autocorrelation (Second Moment)								
AC1	0.104	0.423**	0.307**	0.231*	0.048	-0.026	-0.102	-0.011
AC2	0.169*	0.145	0.396**	0.186*	-0.039	0.117	-0.101	0.208*
AC3	0.133	0.237	0.466**	0.071	0.007	0.082	-0.035	-0.054
AC6	0.162*	-0.015	0.108	0.116	-0.046	0.208	-0.014	0.070
AC12	0.074	0.016	0.345**	0.087	-0.046	0.106	-0.103	0.160

TABLE 3: **Individual hedge fund regressions: distribution of statistically significant factor loadings**

$$(R_{it} - R_{ft}) = \alpha_i + \beta_{i1}(R_{mt} - R_{ft}) + \beta_{i2}HML_t + \beta_{i3}SMB_t + \beta_{i4}UMD_t + \beta_{i5}(LGABI_t - R_{ft}) + \beta_{i6}(DJAIG_t - R_{ft}) + \beta_{i7}(USDI_t - R_f) + \beta_{i8}(MSWXUS_t - R_{ft}) + \varepsilon_{i,t}$$

This table presents the distribution of statistical significance of the factor loadings in the eight-factor model from January 1994 to December 2006 on individual hedge funds across the various investment categories. The table also reports the mean alpha, Durbin Watson statistic and adjusted r-squared of all individual regressions in each investment category. The symbols –/0/+ denote the distribution of statistically negative, zero and positive alpha estimates and beta factor loadings at the 5% level. Statistical significance is estimated with Newey and West (1987) heteroscedasticity and autocorrelation consistent standard errors.

	Mean	Alpha Distribution	RM Distribution	SMB Distribution	HML Distribution	UMD Distribution	LGABI Distribution	DJAIG Distribution	USDI Distribution	MSWXUS Distribution	Mean	Mean
	Alpha	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**- / 0 / +**	**DW**	R^2_{adj}
All Funds	0.10%	0/93/7	1/93/7	0/94/6	0/98/2	0/98/2	0/94/6	0/98/2	0/98/2	0/98/2	1.86	0.32
All Funds - Ex FOFs	0.14%	0/92/8	1/92/7	0/94/6	0/94/6	0/98/2	0/98/2	0/98/2	0/98/2	0/98/2	1.88	0.27
Convertible Arbitrage	0.07%	0/85/15	1/96/3	0/96/4	0/99/1	1/99/0	0/99/1	0/100/0	0/98/2	2/97/1	1.47	0.17
Dedicated Short Bias	0.18%	0/97/3	46/54/0	6/94/0	0/100/0	0/100/0	0/100/0	0/100/0	0/100/0	0/100/0	1.93	0.54
Emerging Markets	0.36%	0/93/7	0/98/2	0/90/10	0/99/1	0/100/0	0/98/2	0/100/0	0/94/6	0/92/8	1.81	0.33
Equity Market Neutral	0.08%	0/91/9	0/99/1	0/99/1	0/98/2	1/98/1	0/100/0	0/98/2	1/99/0	0/100/0	1.96	0.19
Event Driven	0.28%	0/84/16	0/90/10	0/87/13	0/88/12	0/100/0	0/100/0	0/99/1	0/100/0	0/99/1	1.78	0.25
Fixed Income Arbitrage	0.06%	0/84/16	0/100/0	0/99/1	0/100/0	0/100/0	0/95/5	0/99/1	0/99/1	0/100/0	1.75	0.13
Fund of Funds	-0.04%	0/95/5	0/95/5	0/93/7	0/96/4	0/98/2	0/97/3	0/98/2	0/97/3	0/98/2	1.81	0.47
Global Macro	-0.24%	1/97/2	0/100/0	0/97/3	0/97/3	0/100/0	0/96/4	0/98/2	0/98/2	0/98/2	1.96	0.18
Long/Short Equity Hedge	0.22%	0/96/4	1/86/13	0/94/6	0/95/5	0/95/5	0/100/0	0/99/1	0/98/2	0/97/3	1.92	0.36
Managed Futures	-0.13%	1/98/1	1/99/0	0/99/1	1/99/0	1/97/2	0/90/10	0/95/5	1/96/3	0/99/1	2.05	0.17
Multi-Strategy	0.31%	0/79/21	0/94/6	0/96/4	0/97/3	1/98/1	0/99/1	0/99/1	0/100/0	0/99/1	1.76	0.19

TABLE 4: **Equal weighted portfolio regressions**

$$(R_{it} - R_{ft}) = \alpha_i + \beta_{i1}(R_{mt} - R_{ft}) + \beta_{i2}HML_t + \beta_{i3}SMB_t + \beta_{i4}UMD_t + \beta_{i5}(LGABI_t - R_{ft}) + \beta_{i6}(DJAIG_t - R_{ft}) + \beta_{i7}(USDI_t - R_f) + \beta_{i8}(MSWXUS_t - R_{ft}) + \varepsilon_{i,t}$$

This table presents regression coefficient estimates of the eight-factor performance evaluation model from January 1994 to December 2006 on equal-weighted portfolios of hedge funds based on the various investment categories. The table reports the intercept term (i.e. alpha), US stocks (Rm), SMB, HML, UMD, global bonds (LGABI), commodities (DJAIG), foreign currency (USDI) and world ex-US equities (MSWXUS). Durbin Watson statistics and adjusted r-squared estimates are also reported. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Statistical significance is estimated with Newey and West (1987) heteroscedasticity and autocorrelation consistent standard errors.

	Alpha	RM	SMB	HML	UMD	LGABI	DJAIG	USDI	MSWXUS	DW	R^2_{adj}
All Funds	0.22%	0.19	0.10**	0.07	0.06	0.26	0.07*	0.14	0.11*	1.65	0.67
All Funds - Ex FOFs	0.27%	0.21**	0.11**	0.07	0.06	0.24	0.07*	0.13	0.11*	1.65	0.70
Convertible Arbitrage	0.29%*	0.09**	0.07*	0.03	0.01	0.19	0.01	0.11	0.06	1.03	0.26
Dedicated Short Bias	0.28%	-1.01***	-0.14	0.14	-0.15	0.22	-0.01	0.01	0.03	1.76	0.76
Emerging Markets	0.37%	0.27	0.29**	0.18	0.06	0.08	0.12	0.58**	0.54**	1.42	0.52
Equity Market Neutral	0.32%***	0.07	0.03	0.05*	0.04**	0.06	0.00	-0.01	0.00	1.48	0.17
Event Driven	0.41%**	0.20**	0.12**	0.13**	0.01	0.07	0.01	0.07	0.06	1.54	0.60
Fixed Income Arbitrage	0.23%*	0.00	0.07**	0.05	0.01	0.36**	0.01	0.18**	0.08	1.25	0.20
Fund of Funds	0.07%	0.12*	0.09**	0.06	0.08	0.31*	0.07**	0.18**	0.13**	1.69	0.54
Global Macro	0.00%	0.07	0.08**	0.13**	0.04	0.63**	0.06*	0.12	0.12*	1.84	0.25
Long/Short Equity Hedge	0.31%	0.49**	0.14	0.06	0.11	0.02	0.07	0.09	0.05	1.60	0.80
Managed futures	0.02%	-0.14	0.09	0.01	0.06	1.19**	0.18**	-0.04	0.09	2.12	0.21
Multi-Strategy	0.37%*	0.15**	0.05	0.04	0.03	0.25	0.07**	0.11	0.10*	1.34	0.54
									Mean R^2_{adj}		0.48

Notes

1 Alpha originates from the Capital Asset Pricing Model (CAPM) and was originally employed by Jensen (1968) in the performance evaluation of mutual funds. In this hedge fund study, alpha measures the expected returns of funds given the riskiness of each fund. When a hedge fund's return is higher than the risk-adjusted return, the fund is said to have generated 'excess return' or 'positive alpha'.

2 The Fung and Hsieh (2004) framework employs the returns of lookback straddle option investment strategies in bond, foreign exchange and commodity markets as independent variables in the model.

3 Fama's (1970) semi-strong EMH suggests that global capital markets operate efficiently and that very few anomalies, if any, exist for active hedge fund managers to exploit.

4 Refer to Campbell (2000) for a comprehensive review of the asset pricing literature. For an overview of the mutual fund performance literature, see Jensen (1968), Brown, Goetzmann, Ibbotson and Ross (1992), Malkiel (1995), Carhart (1997) and Drew and Noland (2000).

5 Hedge fund database vendors began archiving the performance of non-surviving hedge funds from January 1994 onwards.

6 Multiple regression is the technique employed which relates a hedge fund's risk-adjusted return to a linear combination of returns from conventional asset markets and risk factors. The readily available market returns are the independent variables or factors in the performance evaluation model in this study. The intercept term in the multiple regression is the estimated alpha.

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