EDHEC-Risk Institute

393-400 promenade des Anglais
06202 Nice Cedex 3
Tel.: +33 (0)4 93 18 32 53
E-mail: research@edhec-risk.com
Web: www.edhec-risk.com

Do Funds of Hedge Funds Really Add Value?

A Post-Crisis Analysis

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Serge Darolles
PhD, Research Fellow at CREST, Deputy Head of Lyxor Asset Management Research and Development Department

Mathieu Vaissié
PhD, Research Associate, EDHEC-Risk Institute, Senior Portfolio Manager at Lyxor Asset Management

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Abstract

In spite of a somewhat disappointing performance throughout the crisis, and a series of high-profile scandals, investors are showing interest in hedge funds. Still, funds of hedge funds keep on experiencing outflows. Can this phenomenon be explained by the failure of fund of hedge fund managers to deliver on their promise to add value through active management, or is it symptomatic of a move toward greater disintermediation in the hedge fund industry? Little attention has been paid so far to the added value, and the sources of the added value, of funds of hedge funds. The lack of transparency that is characteristic of the hedge funds arena and makes the performance attribution exercise particularly challenging is probably an explanation. The objective of this article is to fill in the gap. We introduce to this end a return-based attribution model allowing for a full decomposition of fund of hedge fund performance. The results of our empirical study suggest that funds of hedge funds are funds of funds like others. Strategic allocation turns out to be a crucial step in the investment process, in that it not only adds value over the long term, but most importantly, it brings resilience precisely when investors need it the most. Fund picking, on the other hand, turns out to be a double-edged sword. Overall, funds of hedge funds appear to succeed in overcoming their double fee structure, and add value across market regimes, although to varying degrees and in different forms.

Keywords: Fund of hedge fund performance, performance attribution model, strategic allocation, tactical allocation, fund picking, active management, added value, state-space models, Kalman filter.

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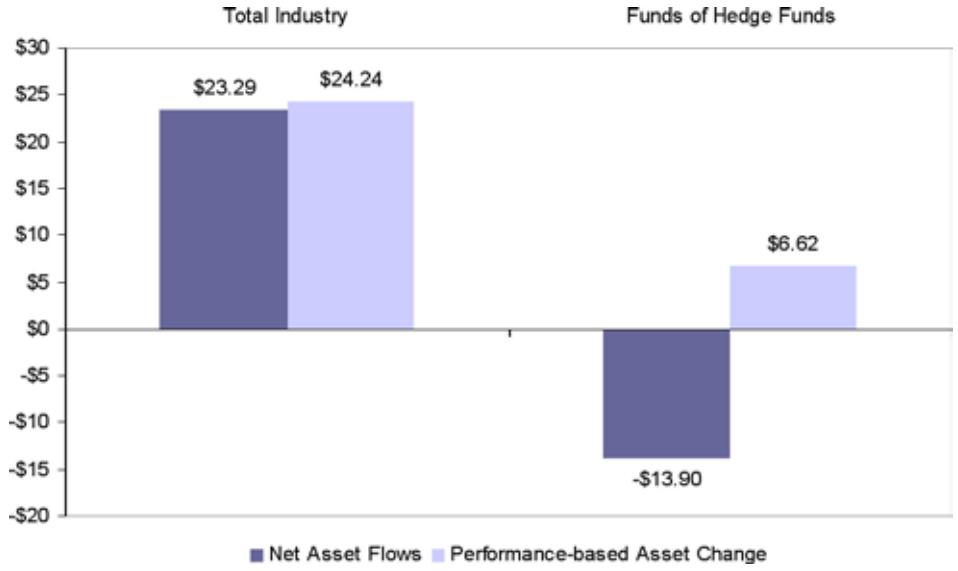
Introduction

Positive inflows since the third quarter of 2009 and a number of industry surveys (2010 Preqin Global Hedge Fund Investor Review) suggest that, in spite of a somewhat disappointing performance throughout the crisis, and a series of high-profile scandals, investors and especially institutional investors, are still showing interest in hedge funds. Against this backdrop, funds of hedge funds, which used to be the favorite route for traditional investors to gain exposure to hedge fund strategies, keep on experiencing outflows. Can this phenomenon be explained by the failure of fund of hedge fund managers to deliver on their promise to add value through active management, or is it symptomatic of a move toward greater disintermediation in the hedge fund industry?

Exhibit 1: Year-to-Date Estimated Change in Assets (in $ billion), as of the end of Q2 2010



Source: HFR Global Hedge Fund Industry Report, Q2 2010, www.hedgefundresearch.com

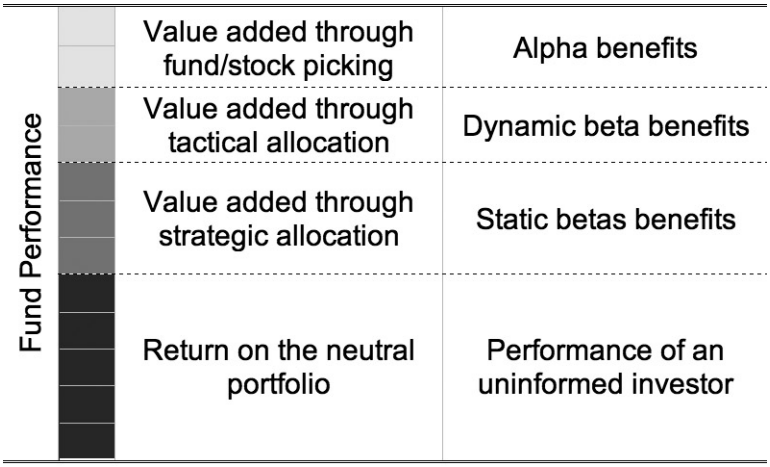
The debate on active versus passive management is not a petty local quarrel. It has been agitating the investment community and challenging one of the central assumptions of economic theory, namely market efficiency, for decades. In this respect, a large body of empirical literature has documented the performance of mutual funds, and most studies do not seem to support the proposition that professional money managers succeed in adding value through active management (see Sharpe (1966), Treynor (1966), Jensen (1968), Grinblatt and Titman (1992), Hendricks *et al.* (1993), Elton *et al.* (1996), Carhart (1997), or Blake *et al.* (1999), among other examples). But, despite traditional investors' significant exposure to funds of hedge funds, little attention has been paid to the added value of these investment vehicles. This is all the more surprising in that funds of hedge funds invest in funds that show themselves a persistence that appears to be at best shorter term than the typical fund selection process (see Agarwal and Naik (2000), Amenc *et al.* (2003), Baquero *et al.* (2005), Capocci *et al.* (2005), Capocci and Hübner (2004), Eling (2009), Herzberg and Mozes (2003), Kat and Menexe (2003), Kosowski *et al.* (2007), Malkiel and Saha (2005)).

The lack of transparency that is characteristic of the hedge fund arena and that makes the performance attribution exercise particularly challenging is probably an explanation. The objective of this study is to fill in the gap. Our contribution in this article is twofold. On the one hand, we propose a performance attribution model incorporating state-space models, which makes it possible to disentangle the value stemming from strategic allocation decisions (static betas), from tactical allocation bets (dynamic betas), and from the fund selection (alpha). The merit of this performance attribution model is therefore to allow for a full decomposition of the performance, *i.e.*, as with portfolio-based approaches (see Brinson *et al.* (1986, 1991)),[1] but in a

1 - The portfolio-based approach has also been applied to the hedge fund world (please refer to Lo (2008)). It is, however, practically difficult to implement it on a large sample of funds of hedge funds given the lack of transparency provided by many.

return-based setting. On the other hand, our observation period covers the recent systemic crisis. We can therefore test the extent to which the value added by fund of hedge fund managers is regime-dependent; we can also analyze more specifically the behavior of funds of hedge funds while they experience—for the first time on record—a period of significant capital outflows. Unsurprisingly, asset allocation and risk management being two sides of the same coin, we find that the value added at the strategic allocation level is significantly positive, especially during stressed market conditions. The results are more mixed when it comes to tactical allocation and fund picking.

Exhibit 2: Decomposition of the Performance of a Fund of Hedge Funds



The remainder of this article is organized as follows. In the first section, we will propose a performance attribution model allowing for a full decomposition of fund of hedge fund returns. We will then try in the second section to figure out whether strategic allocation really matters in the case of funds of hedge funds. In the third section, we will dig further and try to get a better understanding of the sources of funds of hedge funds managers' added value, and assess the extent to which it varies across market regimes. We will subsequently evaluate the impact of various exogenous variables on funds of hedge funds managers' added value. We will end this article with some concluding remarks and suggestions for future research.

I. A Performance Attribution Model for Actively Managed Portfolios

Most performance studies consider strategic allocation an exogenous variable, as if fund managers had no impact on this crucial part of the investment process. They therefore consider only the value added by the fund manager through tactical allocation, and stock or fund picking. However, as evidenced in the literature, strategic allocation appears to be the main determinant of a fund's performance (see Brinson *et al.* (1986, 1991), or Ibbotson and Kaplan (2000), among other examples). It is therefore inconsistent to ignore the value added at the strategic allocation level. To address this issue, we suggest extending the approach introduced in Bailey *et al.* (1990) and consider that the performance (P) of a fund of hedge funds is made up of four distinct components:

1/ the performance of an uninformed investor (N),
2/ the value added by the portfolio manager through the strategic allocation process (S),
3/ the value added by the portfolio manager through the tactical allocation process (T),
4/ the value added by the portfolio manager through the Fund Selection process (F).

By doing so, we can decompose the performance of a fund of hedge funds as follows:

$$(1)\quad P = N + S + T + F$$

or alternatively:

$$\begin{cases} N = R_{Neutral\ Portfolio} \\ S = R_{Strategy\ Benchmark} - R_{Neutral\ Portfolio} \\ T = R_{Tactical\ Benchmark} - R_{Strategy\ Benchmark} \\ F = P - R_{Tactical\ Benchmark} \end{cases}$$

Let us now develop the intuition beyond the different benchmarks involved in this decomposition. The impact of any investment decision can be measured by comparing its outcome with that of an alternative decision (*i.e., neutral portfolio*). As highlighted in Hensel *et al.* (1991), the results of the performance attribution process strongly depend on the choice of this alternative decision; there is, however, no consensus on its definition. One could choose the risk-free rate or the minimum risk portfolio. But it is highly questionable that this would be an appropriate benchmark for an uninformed investor. Another option would be to follow a liability-driven logic. But since investors have specific liability constraints such a benchmark would not fit them all equally; notwithstanding the fact that designing a liability matching portfolio is not straightforward when it is made up of alternative strategies. We thus took another route and opted for the equilibrium logic, by selecting the market portfolio, or more specifically, an industry composite index[2] as a *neutral portfolio*.

The strategic allocation of a fund of hedge funds reflects the long-term bets made by the portfolio manager. We assume in the following that these bets remain unchanged over the whole observation period. This is a crucial assumption for our sequential return decomposition, as any misspecification at this stage could induce spurious effects on the following terms of the decomposition.[3] From a practical standpoint, the *strategy benchmark* is obtained through a classical return-based style analysis, *i.e.*, with a constrained regression (see Sharpe (1992) for greater detail on the benefits of this approach).

The performance of all the funds of hedge funds of our sample is first regressed on the same set of risk factors:[4]

$$R_{Fund,t} = \beta' R_{F,t} + \varepsilon_t ,$$

where the error term is an independently identically distributed (*iid*) Gaussian white noise $\varepsilon_t \sim N(0,\Omega)$. The intercept term in the regression is set to zero, and the factor loadings are constrained to be positive and sum up to one.

The customized *strategy benchmark* of every single fund of hedge funds is computed as the linear combination $\beta' R_{F,t}$ of the statistically significant factors in the regression and their respective performance. The value added by the strategic allocation (*S*) is then defined as the return difference between the *strategy benchmark* and *the neutral portfolio*.

While strategic allocation shifts are expected to occur occasionally, tactical bets may be made on a continuous basis. Despite this obvious difference in terms of time horizon, strategic and tactical allocation decisions have one point in common. They both rely on—long-term and short-term respectively—forecasts of risk premia (bets on systematic risk) and can, as a result, be captured using a set of risk factors. In this respect, we assume that fund of hedge fund managers make tactical bets only on the risk factors entering into the composition of the *strategy benchmark*. Two arguments support this assumption. On the one hand, portfolio managers are not immune to the so-called familiarity bias (see Heath and Tversky (1991) for greater detail on this behavioral bias). They will therefore be inclined to focus, both at strategic and tactical allocation levels, on the same sub-set of strategies (*i.e.*, those strategies they are most familiar with). On the other hand, limiting the number of factors simplifies the statistical modeling of the time-varying

2 - A series of hedge fund indices built from various databases of individual hedge fund returns is available on the market. See Amenc *et al.* (2004) for greater detail on the characteristics of those indices. For this study, we selected the composite index provided by HFR Research; the HFR database is among the most representative of the industry and this fund-weighted composite index is, as a result, commonly used by market participants as a proxy for the market portfolio.

3 - One could include a structural break analysis to consider several strategic allocations, but such an analysis is beyond the scope of this paper and left for further research.

4 - See the next section for greater detail on the set of factors and on the distribution of the R^2 of the resulting factor models.

coefficients used to compute the tactical benchmark, and improves in turn the robustness of the results. Since information arrives randomly,[5] and tactical bets are assumed to be responses to new information, we expect the exposure to risk factors to evolve randomly over time. Unfortunately, risk factor exposures cannot be directly observed in the case of funds of hedge funds. The reason is twofold. Firstly, although the trend is very clearly towards more transparency, investors do not systematically have access to the full composition of funds of hedge funds, and its evolution over time. Secondly, fund of hedge fund managers themselves do not always have a complete view of the risk factor exposures of the underlying hedge funds, and, as a result, of the bets they implicitly make at the fund of funds level. This is all the more true when the trading frequency of the underlying funds is significantly higher than their reporting frequency (*i.e.*, embedded risks can be dramatically different from those shown at a specific date), or when the number and the diversity of positions make it difficult to come up with accurate aggregated factor exposures. Tactical bets explicitly (at the strategy level) and implicitly (at the underlying fund level) made by the fund of hedge funds' manager can alternatively add up or cancel each other. Using a return-based style analysis therefore allows us to mitigate one of the main shortcomings of holding-based approaches, by capturing and assessing both effects concomitantly.

Time-varying risk factors exposures are estimated using a state-space model (see Hamilton (1994) for a detailed discussion on state-space models). One of the advantages of this approach is to determine an optimal weighting scheme from the data. As a result, there is no need to specify an arbitrary window size, as is the case for regressions with rolling windows. Building on the growing literature (see Bogue (1973), Sunder (1980), Alexander *et al.* (1982), Annaert and Van Campenhout (2002), Swinkels and Van der Sluis (2002), among other examples), we model the evolution of *k*-dimensional risk factor exposures β_t (the transition equation) with a first-order Markov process:

$$\beta_{t+1} = A\beta_t + \eta_t,$$

where *A* is a *kxk* matrix and $\eta_t \sim N(0, H_t), H_t$ denotes the *kxk* variance covariance matrix of the independently identically distributed (*iid*) error terms. We thus link these dynamics to the observed fund returns with the following measurement equation:

$$R_{Fund,t} = \beta_t' R_{F,t} + \varepsilon_t,$$

where the error term is an independently identically distributed (*iid*) Gaussian white noise $\varepsilon_t \sim N(0, g_t)$. Therefore, β_t corresponds to the *kx1*-vector of non-observable factor exposures. It is generally referred to as the state vector. *A* is the *kxk*- transition matrix. g_t is the unexplained variance of the regression model indicating the covariance structure of the state variables at time *t*. In what follows, the parameters in *g* and *H* will be assumed constant over time and estimated by:[6]

$$g = \hat{\sigma}^2 = \frac{(R_{Fund} - R_F \hat{\beta}_{OLS})(R_{Fund} - R_F \hat{\beta}_{OLS})'}{T - k}$$

$$H = \hat{\sigma}^2 (R_F' R_F)^{-1}$$

where $\hat{\beta}_{OLS}$ is the unconditional least squares estimate and R_F the *Txk*-matrix containing the returns of the *k* factors over *T* observations.

It is worth mentioning that we do not impose the traditional unitary and positivity constraints for the estimation of the betas. The reason is twofold. On the one hand, funds of hedge funds tactically adjust their overall exposure, so that they can at times be over- or under-leveraged. On the other hand, the positivity constraint is typically applied at the fund of hedge fund level. But our definition of tactical allocation also takes into account the biases inherited from the underlying managers; a fund of hedge funds can therefore end up with an aggregated exposure to a specific factor, or a set of factors, that is negative.

5 - Our objective here is not to model the investor's information set or his decision making process but rather the impact on risk factor exposures.

6 - Conditional parameters modeled by GARCH or factor analysis models could be taken into consideration but would, to our mind, add too much complexity compared to the expected benefits. Conditioning regressors is independent from conditioning the residuals.

We let P_t be the time-conditional *kxk*-covariance matrix of the state vector β_t and apply the following two-step approach. The first step corresponds to the forecasting system:

$$\begin{cases} \beta_{t|t-1} = A\beta_{t-1|t-1} \\ P_{t|t-1} = AP_{t-1|t-1}A' + H \end{cases}$$

where $\beta_{t|t-1}$ and $P_{t|t-1}$ are the best predictors of β_t and P_t, conditionally on the information set available at time *t*-1. $\beta_{t|t}$ and $P_{t|t}$ are the updated values obtained by the following updating equations:

$$\begin{cases} \beta_{t|t} = \beta_{t|t-1} + K_t v_t \\ P_{t|t} = P_{t|t-1} - K_t S_t K_t' \end{cases}$$

with $v_t = (R_{Fund,t} - R_{F,t}\beta_{t|t-1})$ the innovation of the process and:

$$S_t = R_{F,t}P_{t|t-1}R_{F,t}' + g \qquad K_t = P_{t|t-1}R_{F,t}'S_t^{-1}$$

K_t is called the "Kalman-gain" at time *t* and determines the impact of the innovation on the estimated state parameters. This procedure, known as the Kalman filter,[7] is applied for any given *t=1...T*.

We initialize the filter with $\beta_{1|0}$ and $P_{1|0}$ as the parameters stemming from a least-square estimation over the whole sample period:

$$\beta_{1|0} = \hat{\beta}_{OLS} \text{ and } P_{1|0} = H \ .$$

We use the maximum likelihood method to estimate the transition matrix *A* from an initial point set to the identity matrix. The Kalman filter then gives the estimated time series of factor exposures β_t for *t=1...T*. The resulting factor loadings are then used to construct the *Tactical Benchmark* $\beta_t' R_{F,t}$. The value added by the tactical allocation (*T*) corresponds to the return difference between the *tactical* and the *strategic benchmarks*.

Finally, the residual term ε_t can be interpreted as the part of the performance that cannot be explained by static and/or dynamic exposures to risk factors. In the context of fund of fund management, this term can be interpreted as the value added through the fund selection process (*F*). It measures the ability of the portfolio manager to select the best alpha providers, *i.e.*, those funds able to produce value without any static or dynamic exposure to risk factors.

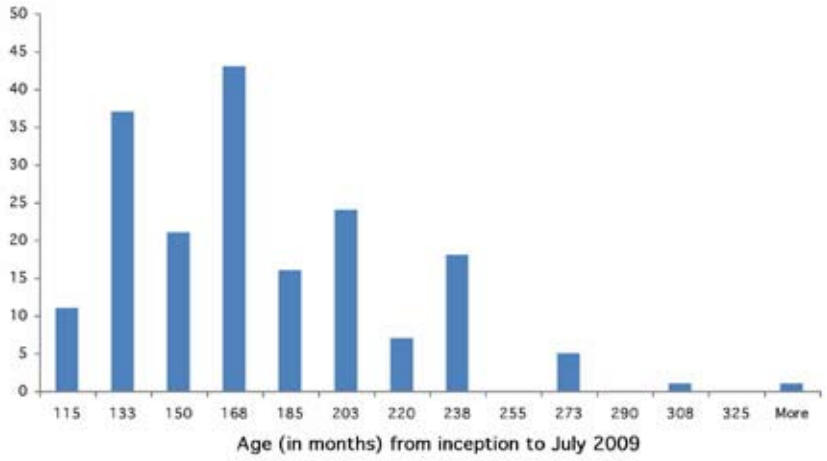
II. Does Strategic Allocation Matter?

Running a return-based style analysis requires a significant number of observations so that statistical inferences might be seen as meaningful. We thus merged two of the largest commercial data bases, namely HFR (https://www.hedgefundresearch.com) and Lipper TASS (http://tass.lipperweb.com), in an attempt to dispose of a representative sample; we extracted the 229 funds of hedge funds showing a continuous track record from January 2000 through July 2009 (of 1,015 available funds of hedge funds), so that we ended up with 115 monthly observations.

For the sake of our analysis, we will subsequently split this observation period in two sub-periods, namely, normal market conditions, ranging from January 2000 through June 2007, and stressed market conditions, ranging from July 2007 through July 2009. Finally, to avoid any double counting, we eliminated 45 funds presenting similar names and a correlation higher than 0.95 with another fund. The results of the empirical study therefore rest on a sample made up of 184 funds of hedge funds. Return data series are denominated in USD and net of all fees.

7 - One could argue that the Kalman smoother would offer a better fit, and would as a result be more appropriate for performance attribution purposes. But tactical allocation changes can be swift and they are more often than not made by fund of hedge fund managers on the basis of past information. We therefore believe that the Kalman filter will better capture the behavior of funds of hedge funds.

Exhibit 3: Distribution of Funds of Hedge Funds by Age



The selection of the input is a crucial step in a return-based analysis. As stressed in Sharpe (1992), style factors must be collectively exhaustive and mutually exclusive. For this reason we selected the series of hedge fund indices published by EDHEC. Indeed, as evidenced in Amenc *et al.* (2004), the merit of these indices of hedge fund indices is that they offer great qualities concerning both representativity and purity. In an attempt to mitigate the impact of performance measurement biases, we applied an adjustment factor consistent with Fung and Hsieh (2000, 2002), *i.e.*, an average annual survivorship bias of 3%, plus an average annual instant history bias of 1.4%. We finally charged an index calculation fee in line with market practice (60 bps p.a.). Since we selected only funds of hedge funds with a complete track record over the entire observation period, we controlled for survivorship bias by subtracting 80 bps p.a. from returns net of all fees (Malkiel and Saha 2005).

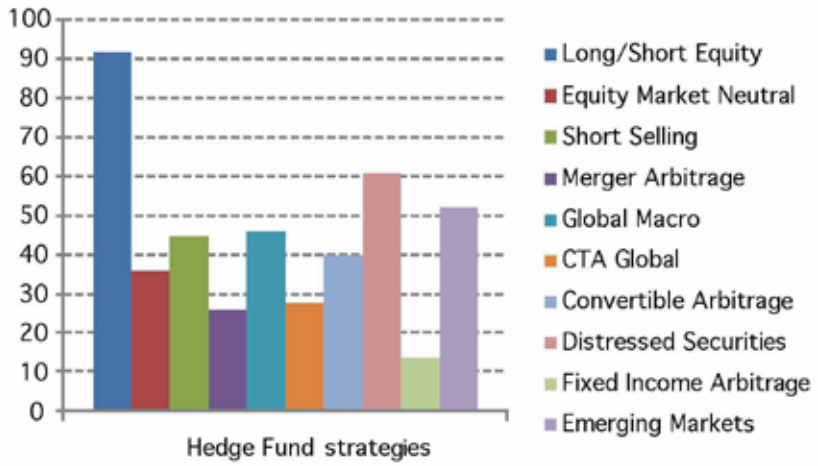
Last but not least, it is worth stressing that a major weakness of the return-based analysis is that it ignores the degree of significance of the exposures to style indices, which in turn may have significant consequences on the results of the performance attribution process. To circumvent this issue, and reduce statistical noise, we ran a stepwise regression and removed all the factors showing t-statistics lower than 1.65. As evidenced in Otten and Bams (2001), cases of misclassification might be reduced by 50% when the significance of factor loadings is taken into account. As a result, we expect the resulting models to be more accurate and robust, and in turn better suited for performance measurement.

By doing so, we end up with a limited set of factors, ranging from two to four depending on the fund of hedge funds.[8] Unsurprisingly, we find that the different funds of hedge funds are not exposed to the same factors, suggesting that they follow different investment policies. As one could have expected, equity-oriented strategies, such as Long/Short Equity, Short Selling, Equity Market Neutral or Merger Arbitrage show the highest rate of occurrence. We finally used the methodology presented in the first section to customize a *strategy* and a *tactical benchmark* for every single fund of hedge funds in our sample.

Numerous studies have examined the sources of the variability of mutual fund returns. They all led to the same conclusion: strategic allocation accounts for a large part of mutual fund return variability. This is not surprising as mutual funds follow buy-and-hold strategies. Since funds of hedge funds are actively managed, we expect active management (*i.e.*, tactical allocation and/or fund picking) to account for a substantial part of the variability of their returns. As a result, strategic allocation should mechanically account for a significantly lower part of fund of hedge fund return variability.

8 - Although surprising given the diversified nature of most funds of hedge funds, this result is consistent with the findings of Fung and Hsieh (1997), who observed that a limited number of factors could explain a significant part of the cross-sectional dispersion in hedge fund returns.

Exhibit 4: Results of the Factor Analysis



To measure the impact of strategic allocation on the variability of fund of hedge fund returns, we regressed these returns on the historical returns[9] of the corresponding *strategy benchmark*. As can be seen from exhibit 5, around 68% of fund of hedge fund return variability is explained by their investment policy. This number has to be contrasted with the one obtained by mutual funds, namely 88% (Ibbotson and Kaplan 2000). The first observation we can make is that strategic allocation plays a central role in the return variability of funds of hedge funds. Funds of hedge funds therefore appear not to be as different from mutual funds as one could have expected. The second observation we can make is that strategic allocation is a key driver of return variability whatever the market regime. In this respect, it is interesting to point out that it appears to be all the more true during stressed market conditions, although results must be interpreted with care, as part of the increase in the coefficient of determination can be attributed to the smaller sample size.

Exhibit 5: Range of Time Series Regression R^2 Values[10]

Percentiles	Full observation period	Normal market conditions	Stressed market conditions	Mutual funds*
5%	37.8%	37.3%	45.1%	46.9%
25%	55.8%	58.0%	69.7%	79.8%
50%	68.3%	74.3%	83.1%	87.6%
75%	79.9%	88.7%	98.9%	91.4%
95%	104.3%	107.2%	126.4%	94.1%

* Results are taken from Ibbotson and Kaplan (2000)

To measure the impact of strategic allocation on fund of hedge fund returns, we then computed the ratio of the *strategy benchmark* returns to total fund of hedge fund returns. As can be seen from exhibit 6, around 45% of fund of hedge fund returns are explained by their investment policy. Here again, the strategic allocation process turns out to play an important role; this time around, however, it does not appear to be the main driver, except during stressed market conditions, during which it accounts for nearly 80% of returns.

Exhibit 6: Range of Percentage of Total Return Explained by Policy Return

Percentiles	Full observation period	Normal market conditions	Stressed market conditions	Mutual funds*
5%	11.5%	30.1%	29.8%	82%
25%	28.1%	38.6%	45.4%	94%
50%	44.8%	46.7%	78.6%	100%
75%	67.0%	62.2%	111.5%	112%
95%	156.0%	111.0%	240.4%	132%

* Results are taken from Ibbotson and Kaplan (2000)

9 - Our objective is to measure the added value for the end investor; we therefore used net of all fees as opposed to gross returns (see Darolles and Gourieroux (2010) for a discussion on the way to obtain gross return from net— publicly available—returns).

10 - As described in the previous section, we use a regression model with no constant term. Results in this table correspond to ratios of variances, hence the values above 1.

So, does strategic allocation matter? The answer is clearly yes. We find that, despite common perception, mutual funds and funds of hedge funds are actually not that different. In both cases, strategic allocation turns out to play a central role in the return variability (*i.e.*, coefficient of determination ranging from roughly 70% to 80%), and it also appears to account for a substantial portion of total return. In the latter case, however, benefits of strategic allocation seem to be clearly higher during stressed market conditions (*i.e.*, 78.6% versus 44.8% for the full observation period). Can this regime-dependency be explained by the behavior of the *neutral portfolio* or is it due to a significant change in the nature of the value added by fund of hedge fund managers? This is what will try to find out in the next section.

III. The Alpha and Omega of Fund of Hedge Fund Added Value

Our objective in this section is twofold. We seek first to understand the sources of the value added by the managers of funds of hedge funds. We then attempt to assess the extent to which the added value of fund of hedge fund managers, and its sources, is regime-dependent.

To address the first point, we applied the performance attribution model introduced in the first section to the different funds of hedge funds of our sample, on the entire observation period (from January 2000 through July 2009). As can be seen from exhibit 8, funds of hedge funds turn out to add on average 3.42% p.a. (3.42% = 4.50% - 1.08%) over the performance of the *neutral portfolio*. Interestingly, most funds of hedge funds appear to create some value compared to an uninformed investor over the long term.

The first driver of this added value appears to be fund picking, which is positive in 92% of the cases and amounts on average to 2.66% p.a. There is one caveat, however. First, the estimation of the value added through fund picking very much depends on the adjustments we made to take into account performance measurement biases and other index fees; had these adjustments been lower, the value added would have decreased proportionally, and would eventually have turned negative. We must therefore interpret this result with care. It is nevertheless worth pointing out that fund picking appears to be a double-edged sword in that those funds of hedge funds failing to add value at this stage destroy as much as 2.50% p.a.

The second driver of managers' added value appears to be strategic allocation, which is positive in 83% of the cases and amounts on average to 1.08% p.a. And this time around, the estimation is not dependent on the performance adjustments we made (*i.e.*, adjustments made at the level of the *neutral portfolio* and the *strategy benchmark* are virtually the same). Moreover, strategic allocation does not appear to be a double-edged sword *(i.e.*, distribution is positively skewed and negative outcomes average to -0.31% p.a.). Not surprisingly, given the limited liquidity of their underlying assets, 66% of the funds of hedge funds in our sample destroyed 1.00% p.a. through tactical allocation decisions.

To address the second point, we applied the performance attribution model introduced in the first section to the different funds of hedge funds of our sample, over two different observation periods, *i.e.*, normal market conditions, ranging from January 2000 through June 2007, and stressed market conditions, running from June 2007 to July 2009. As can be seen from exhibit 10 and 12, while funds of hedge funds appear to add on average 4.21% p.a. (*i.e.*, 4.21% = 0.41% + 0.32% + 3.48%)) during normal market conditions, they turn out to add on average 0.73% p.a. (*i.e.*, 0.73% = 2.50% - 1.69% - 0.09%) during stressed market conditions.

When drilling down to the sources of fund of hedge fund managers, we have the confirmation that fund picking is a double-edged sword. It can be rewarding, during normal market conditions, and provided that the fund of hedge fund manager is able to identify the best hedge funds (*i.e.*,

+3.89% p.a. on average), but it is costly when the manager is not an expert at picking the right funds, especially during stressed market conditions (*i.e.*, -4.30% p.a.). In this respect, it is worth pointing out that while 93% of the funds of hedge funds in our sample succeeded in adding value at the fund picking level during normal market conditions, only 48% proved capable of doing so during stressed market conditions. It is thus precisely when one needs fund picking to bring resiliency that it seems to add to downside risk. And here again, the estimated value added by funds of hedge fund managers at the fund picking level very much depends on the performance adjustments detailed in the second section of this article. Fund picking could therefore prove to be an even riskier game to play than the results presented in exhibits 10 and 12 suggest.

Exhibit 7: Value Added over the Full Period

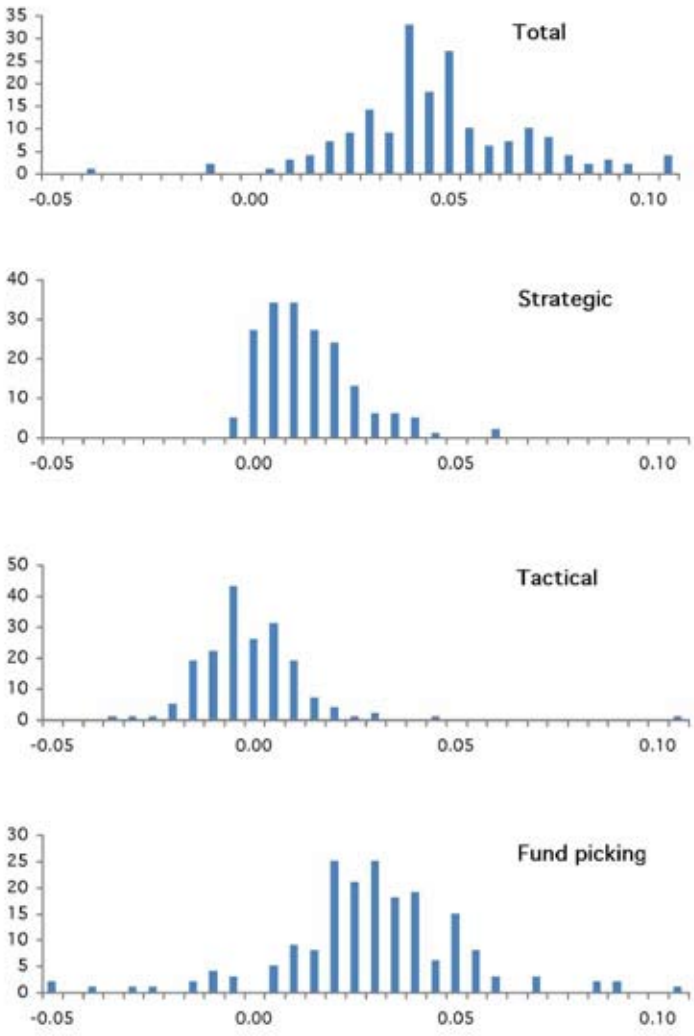


Exhibit 8: Value Added over the Full Period

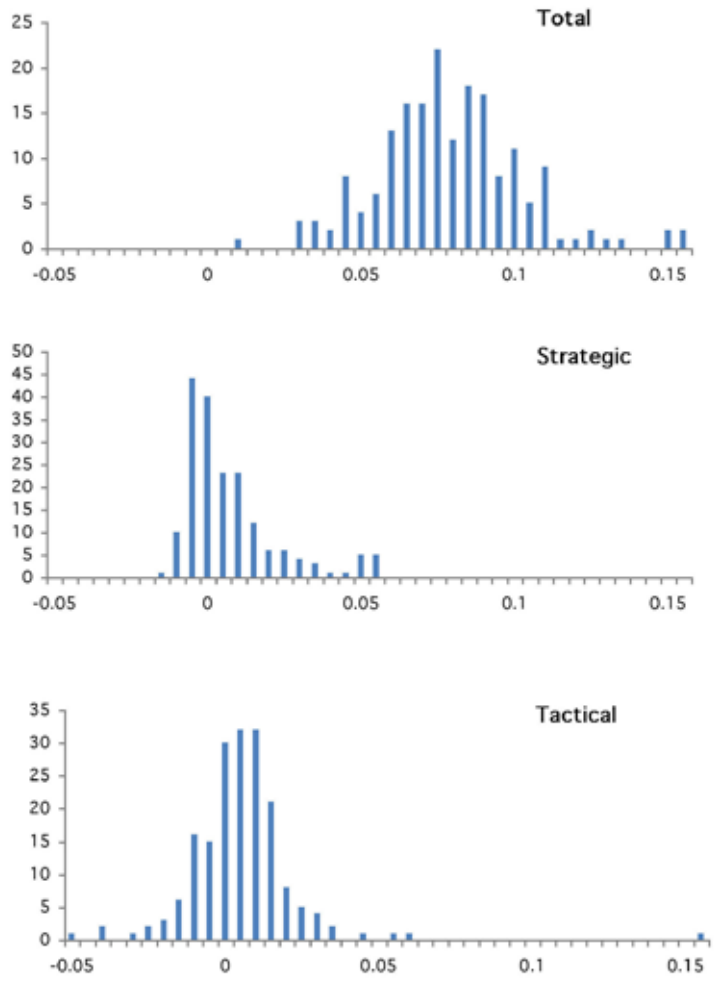
Percentiles	Total	Strategic	Tactical	Fund picking
Mean	4.50%	1.08%	-0.29%	2.66%
Volatility	2.39%	1.16%	1.72%	2.47%
Skewness	0.81	1.08	6.18	-1.57
Kurtosis	4.17	1.79	62.80	10.53
% > 0	98.4%	82.6%	33.7%	92.4%
Mean (> 0)	4.61%	1.37%	1.03%	3.11%
% < 0	1.63%	17.4%	66.3%	7.6%
Mean (< 0)	-2.38%	-0.31%	-1.00%	-2.50%

In other words, as far as the value added by fund of hedge fund managers at the fund picking level is concerned, there is not only a wide cross-sectional dispersion, but there is also a strong—and unfavorable—regime-dependency. The picture is very different when it comes to the value

added by funds of hedge fund managers at the strategic allocation level. First, as can be seen from exhibits 10 and 12, cross-sectional dispersion is fairly limited and the distribution of the added value is positively skewed whatever the market regime. As a matter of fact, funds of hedge funds that failed to create value (only) destroyed on average 0.64% p.a. during normal market conditions, and 0.99% p.a. during stressed market conditions. Those funds of hedge funds that proved more successful added 1.54% p.a. and 3.50% p.a. respectively. Secondly, although the value added at the strategic allocation level shows a certain regime-dependency, this time around it turns out to be very favorable. While funds of hedge funds in our sample added on average 0.41% p.a. during normal market conditions (48% were in positive territory), they added on average 2.50% p.a. during stressed market conditions (77% were in positive territory). As opposed to fund picking, it is precisely when it is needed the most that benefits from strategic allocation are the strongest. This positive asymmetry is not surprising in that strategic allocation and risk management are two sides of the same coin.

In line with the results found over the entire observation period, tactical allocation appears to account for a limited portion of the total value added by fund of hedge fund managers. Moreover, it shows a similar pattern as fund picking when the environment changes. Indeed, when funds of hedge funds add on average 0.32% p.a. at this stage during normal market conditions, they contract on average 1.69% p.a. when market conditions deteriorate. On top of that, while 61% of the funds of hedge funds in our sample showed a certain ability to time their strategy exposures during normal market conditions, only 31% managed to do so during stressed market conditions. This does not come as a big surprise, given the liquidity of the underlying funds, and their behavior throughout the recent crisis.

Exhibit 9: Value Added over Normal Market Conditions



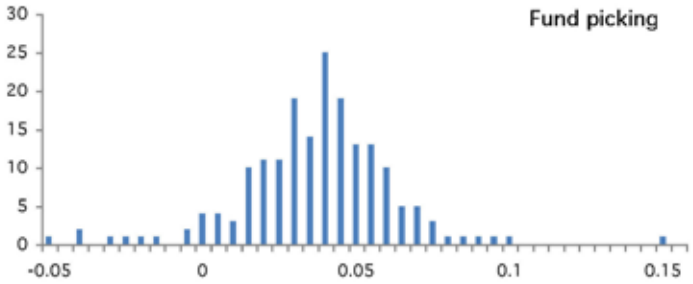


Exhibit 10: Value Added over Normal Market Conditions

Percentiles	Total	Strategic	Tactical	Fund picking
Mean	7.76%	0.41%	0.32%	3.48%
Volatility	2.77%	1.51%	2.24%	2.50%
Skewness	2.15	1.56	5.82	-0.19
Kurtosis	11.93	2.04	60.39	3.38
% > 0	100%	48.4%	60.9%	92.9%
Mean (> 0)	7.76%	1.54%	1.24%	3.89%
% < 0	0%	51.6%	39.1%	7.1%
Mean (< 0)		-0.64%	-1.08%	-2.11%

Exhibit 11: Value Added over Stressed Market Conditions

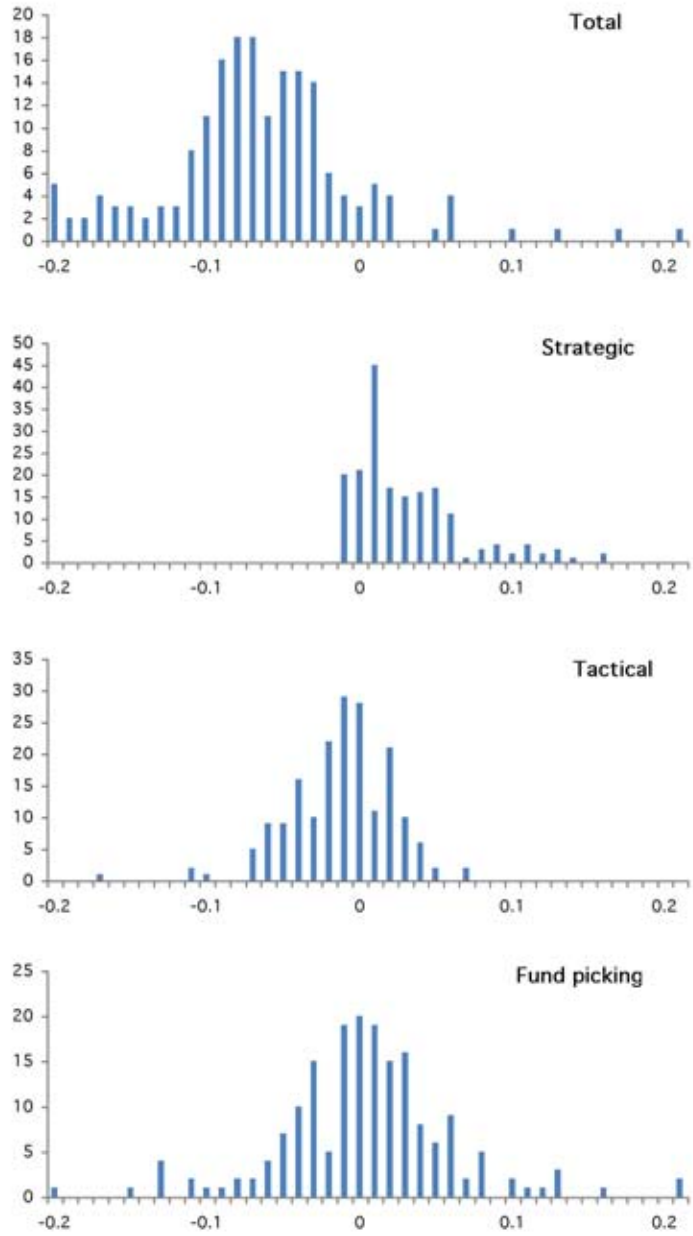


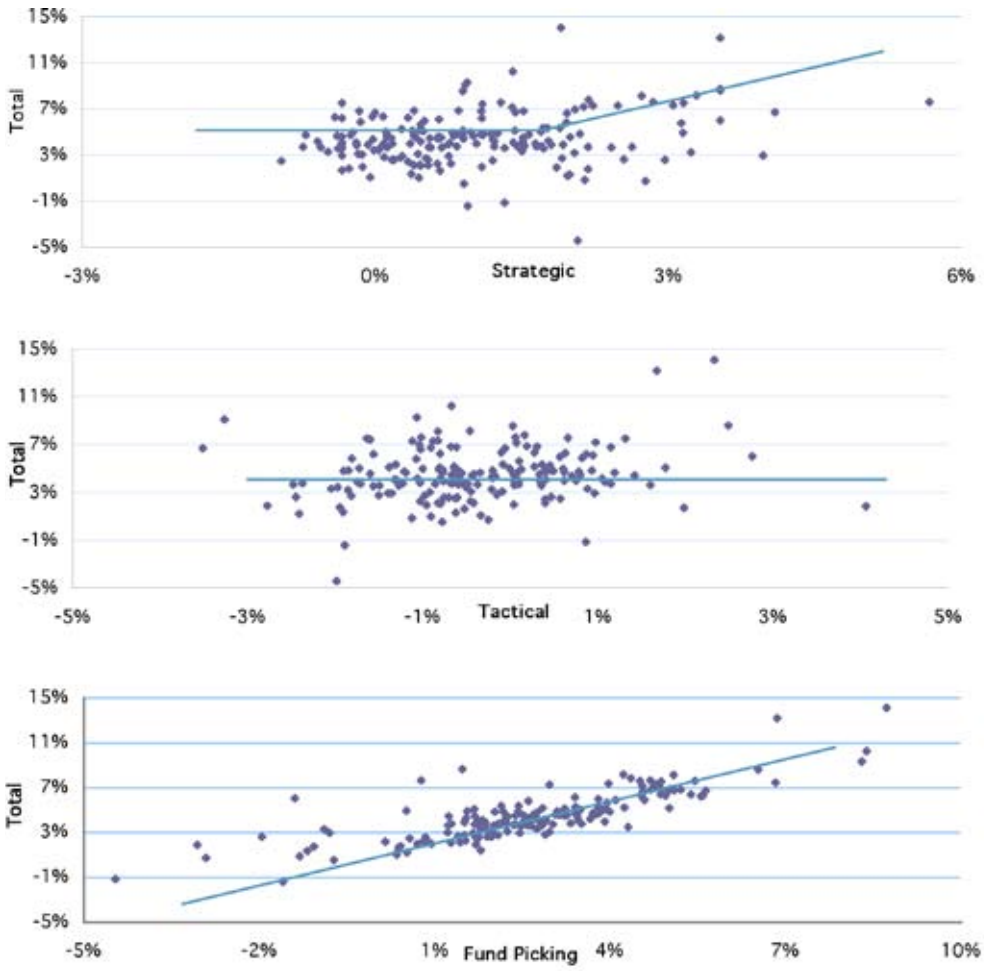
Exhibit 12: Value Added over Stressed Market Conditions

Percentiles	Total	Strategic	Tactical	Funds picking
Mean	-7.25%	2.50%	-1.69%	-0.09%
Volatility	7.31%	3.60%	3.31%	6.79%
Skewness	-0.63	1.37	-0.77	0.44
Kurtosis	11.09	1.74	2.30	13.73
% > 0	9.8%	77.7%	30.9%	48.4%
Mean (> 0)	5.64%	3.50%	1.86%	4.19%
% < 0	90.2%	22.3%	69.1%	51.6%
Mean (< 0)	-8.65%	-0.99%	-3.13%	-4.30%

From the above we can conclude that strategic allocation is the only step of the investment process where funds of hedge fund managers consistently add value and, more importantly, that helps mitigate the downside risk during stressed market conditions. It is therefore a key driver of the value added by funds of hedge fund managers.

The question is to find out which step of the investment process best explains the cross-sectional dispersion of fund of hedge fund returns. To address this point, we simply regressed the value added by the different funds of hedge funds at the different steps of the investment process on their total return. Results are presented below.

Exhibit 13: Cross-Sectional Dispersion of Fund of Hedge Fund Returns



As can be seen from exhibit 13, fund picking turns out to be a discriminating factor for fund of hedge fund performance, both on the upside and on the downside, while strategic allocation shows a positive asymmetry. And, in line with our previous conclusions, tactical allocation does not seem to be of great help in accounting for the performance discrepancy between the different funds of hedge funds of our sample. These results suggest that investment companies, with limited

resources and/or no specific fund picking skill, would clearly be better off focusing their efforts on strategic allocation.

In the next section, we attempt to find out whether fund of hedge fund characteristics such as assets under management, liquidity terms, or flows may also impact the ability to add value throughout the investment process.

IV. Shedding More Light on the Added Value of Funds of Hedge Funds

As we have seen in the previous section, the value added by funds of hedge funds, and the sources of this added value, depend largely on the market environment. Our objective in this section is to assess the extent to which they may also depend on fund characteristics.

We started by sorting funds of hedge funds by size and formed three groups with assets ranging from 0 to $250mn, from $250mn to $1bn, and with assets above $1bn. We then calculated the average value added by the three groups at the different stages of the investment process. The results presented in exhibit 14 confirm the intuition that we had in the previous section, in that the largest funds of hedge funds appear to be better equipped than smaller ones to add value through fund picking; fund picking even shows up as the main determinant of the outperformance of largest funds of hedge funds. The reason for that might be privileged access for star hedge fund managers or simply broader coverage of the investment universe. It is difficult, however, to draw a definitive conclusion given the sensitivity of this result to the adjustments made to account for performance measurement biases. Interestingly, the larger the fund of hedge funds, the smaller the value added at the strategic allocation stage. This suggests that when assets grow, funds of hedge funds get—at a certain point—cumbersome, and they lose the flexibility required to gain exposure to niche strategies. They therefore end up with a portfolio that is closer to the market portfolio than that of more nimble managers.

Exhibit 14: Impact of Fund of Hedge Fund Assets under Management (in $ million)

		All	0-250	250-1000	Over 1000
Total	Mean	4.50%	4.39%	4.64%	4.93%
	Vol	*2.39%*	*2.64%*	*1.82%*	*1.51%*
Strategic	Mean	1.08%	1.14%	1.05%	0.72%
	Vol	*1.16%*	*1.24%*	*0.91%*	*1.01%*
Tactical	Mean	-0.29%	-0.44%	-0.26%	-0.03%
	Vol	*1.72%*	*1.24%*	*0.93%*	*0.86%*
Fund picking	Mean	2.66%	2.64%	2.81%	3.20%
	Vol	*2.47%*	*2.40%*	*1.61%*	*1.40%*

The liquidity of fund of hedge funds may also have a material impact on their flexibility, and in turn, on their capacity to add value. The redemption frequency of funds of hedge funds can, *a priori*, be used as a proxy for the weighted average liquidity of the underlying hedge funds. The most liquid funds of hedge funds are therefore supposed to be those benefiting from the greatest capacity to adjust their strategic allocation to changing market conditions. One can consequently expect that these funds of hedge funds will tend to add more value than their less liquid competitors at the tactical allocation level. Conversely, as less liquid funds of hedge funds are less constrained than their most liquid competitors, they should be able to create more value at the strategic allocation and eventually at the fund picking levels. To test these hypotheses, we sorted the funds of hedge funds by liquidity terms, and contrasted the average value added by the corresponding funds of hedge funds at the strategic allocation, tactical allocation, and fund picking levels. As can be seen from exhibit 15, value added at the tactical allocation level declines when liquidity terms deteriorate, but only to a limited extent (*i.e.*, an average of -0.30% p.a. for

the monthly liquidity bucket vs. -0.55% p.a. for the annual liquidity bucket). The impact at the strategic allocation and fund picking levels appears to be somewhat higher. Surprisingly, value at the strategic allocation level increases when we go up the liquidity ladder (*i.e.*, an average of 1.15% p.a. for the monthly liquidity bucket vs. 0.87% p.a. for the annual liquidity bucket). As expected, value at the fund picking level is significantly higher when we go down the liquidity ladder (*i.e.*, an average of 3.74% p.a. for the annual liquidity bucket vs. 2.37% p.a. for the monthly liquidity bucket).

Exhibit 15: Impact of Fund of Hedge Fund Liquidity

		Total	Strategic	Tactical	Fund picking
All	Mean	4.50%	1.08%	-0.29%	2.66%
	Vol	*2.39%*	*1.16%*	*1.72%*	*2.47%*
Monthly	Mean	4.26%	1.15%	-0.30%	2.37%
	Vol	*2.80%*	*1.22%*	*0.97%*	*2.29%*
Quarterly	Mean	4.42%	1.13%	-0.11%	2.35%
	Vol	*2.32%*	*1.24%*	*2.61%*	*3.04%*
Annual	Mean	5.10%	0.87%	-0.55%	3.74%
	Vol	*1.33%*	*0.88%*	*0.99%*	*1.28%*

But, as made clear during the recent crisis, the liquidity of the assets and the liabilities of funds of hedge funds is not always perfectly aligned. The results presented in exhibit 15 may therefore give a biased picture of the relationship between liquidity and the ability of fund of hedge fund managers to create value at the different stages of the investment process. We proceeded as follows to address this issue and estimate the liquidity of their assets, and in turn, the extent to which it affects their ability to create value throughout the investment process. First, we classified hedge fund strategies in two groups, referred to as liquid (Long/Short Equity, Equity Market Neutral, Short Selling, Merger Arbitrage, CTA, and Global Macro) and illiquid (Convertible Bond Arbitrage, Fixed Income Arbitrage, Emerging Markets).[11] Secondly, using their customized *strategy benchmarks* we estimated the exposure of funds of hedge funds to liquid/illiquid strategies. Finally, we formed three groups, with varying exposures to liquid/illiquid strategies. We considered that those funds of hedge funds made up of at least two-thirds liquid strategies were liquid, whereas those with less than a third of liquid strategies were illiquid; the remaining funds of hedge funds fall into the so-called average category. As exhibit 16 shows, we get a very different picture from that obtained in the previous experiment. While the value destroyed at the tactical allocation level is also minimal for the most liquid funds of hedge funds, value added through strategic allocation and fund picking evolves in the opposite way. It improves when we go down the liquidity ladder for the strategic allocation (an average of 2.29% p.a. for the illiquid category vs. 0.69% p.a. for liquid one), but deteriorates a bit in the case of fund picking (an average of 2.99% p.a. for the liquid category vs. 2.27% p.a. for the illiquid one). This time around, most of the illiquidity premium appears to be captured, as one could have expected, at the strategic allocation level.

Exhibit 16: Impact of Fund of Hedge Fund Investment Policy

		Total	Strategic	Tactical	Fund picking
All	Mean	4.50%	1.08%	-0.29%	2.66%
	Vol	*2.39%*	*1.16%*	*1.72%*	*2.47%*
Liquid	Mean	4.67%	0.69%	-0.06%	2.99%
	Vol	*2.46%*	*1.04%*	*1.01%*	*2.18%*
Average	Mean	3.88%	1.03%	-0.75%	2.56%
	Vol	*2.46%*	*0.71%*	*0.84%*	*2.18%*
Illiquid	Mean	5.01%	2.29%	-0.60%	2.27%
	Vol	*2.63%*	*1.30%*	*1.65%*	*2.31%*

11 - Building on Getmansky *et al.* (2004), we could have used an econometric model of serial correlation to classify hedge fund strategies, but for the sake of simplicity we opted for a qualitative assessment.

Finally, as a result of a potentially significant mismatch between the liquidity of the assets and the liabilities, the ability of fund of hedge fund managers to add value at the different steps of the investment process may be sensitive to flows, especially outflows. In an attempt to test this hypothesis, we sorted the funds of hedge funds based on the flows they have experienced over the period corresponding to stressed market conditions, and compared the average value added by the corresponding funds of hedge funds at the strategic allocation, tactical allocation, and fund picking levels. As exhibit 17 shows, there is a high correlation between fund of hedge fund total performance and flows, but it is on fund picking that the impact of flows appears to be the greatest (an average of 4.34% p.a. for funds experiencing inflows vs. -3.84% p.a. for those experiencing outflows). It is difficult, however, to draw a definitive conclusion due to the endogeneity between flows and performance. Similarly, Ozik and Sadka (2009) found that hedge fund returns are sensitive to flows, and this sensitivity turns out to be asymmetric in the case of outflows. What is more interesting to observe is that funds of hedge funds add value at the strategic allocation level even in the case of massive outflows, although to a lesser extent (an average of 4.08% p.a. for funds experiencing inflows vs. 1.92% p.a. for those experiencing outflows). This confirms that strategic allocation brings resilience during market turmoil.

Exhibit 17: Impact of Fund of Hedge Fund Outflows over the Stressed Market Conditions Period

		Total	Strategic	Tactical	Fund picking
All	Mean	-7.25%	2.50%	-1.69%	-0.09%
	Vol	*7.31%*	*3.60%*	*3.31%*	*6.79%*
>0%	Mean	-1.60%	4.08%	-2.04%	4.34%
	Vol	*7.89%*	*4.58%*	*3.73%*	*8.54%*
[-50%; 0%]	Mean	-6.90%	2.24%	-1.72%	0.55%
	Vol	*4.85%*	*3.32%*	*3.12%*	*4.42%*
<-50%	Mean	-11.31%	1.92%	-1.41%	-3.84%
	Vol	*7.72%*	*3.06%*	*3.35%*	*6.75%*

V. Concluding Remarks and Extensions

Funds of hedge funds have long been the favorite route for traditional investors who are seeking alternative investments but lack the experience and, more generally, the resources to keep the entire investment process in-house. The flipside of funds of hedge funds' appealing value proposition, however, is a double fee structure. Our objective in this article was to find out whether fund of hedge fund managers manage to overcome this disadvantage through active management, or if, like mutual funds, they tend to fail to add value. We proposed to this end a return-based attribution model incorporating state-space models, a model that enables full decomposition of fund of hedge fund returns.

The results of our empirical study suggest that funds of hedge funds are funds of funds like others. Strategic allocation turns out to account for a significant portion of both the variability and the level of return of funds of hedge funds (68% and 45% respectively). Moreover, it adds value over the long term, and, most importantly, it brings resilience precisely when investors need it most. Strategic allocation is therefore a key driver of fund of hedge fund performance. Fund picking also turns out to be a potential source of enhanced returns, though more difficult to capture, as shown by significant cross-section dispersion; fund picking is clearly a double-edged sword that, to wield to good effect, requires extensive resources and seasoned expertise. Tactical allocation, on the other hand, has a marginal impact on the performance of funds of hedge funds. In sum, investors with limited resources and/or expertise would probably be better off focusing on strategic allocation.

On the whole, funds of hedge funds—unlike mutual funds—manage to overcome their double fee structure, and add value across market regimes, although to varying degrees and in different

forms. We can therefore conclude that the outflows from funds of hedge funds that we keep on observing cannot be attributed to a collective failure of fund of hedge fund managers to deliver on their promises. These results tend to corroborate the findings of a recent industry survey which concludes that "the trend for going direct is a result of an industry maturity rather than that of an individual player" (see "It Takes Three for a Tango", Barclays Capital Asset Management Solutions Group, April 2010).

There is, however, one caveat to these results. As mentioned in the first section, we made the assumption that funds of hedge funds maintained the same strategic allocation over the whole observation period. But market conditions have changed materially, and some managers may have adjusted their strategic allocation accordingly. Further research needs to be done to take this phenomenon into account in the design of the strategy benchmark. As highlighted by Merton (1981), Admati and Ross (1985), or Dybvig and Ross (1985), when a fund is timing the market, its exposure to the market will not be linear, generally leading to a biased estimate of its stock picking ability. The same remark probably holds true when considering changes in the strategic allocation of a fund of hedge funds, and the estimation of the value added at the tactical allocation and fund picking levels. One solution to this issue would be to include a structural break analysis to consider several strategic allocations.

From a practical standpoint, this article provides investors with a pragmatic approach to an in-depth understanding of the added value and the sources of the added value of funds of hedge funds. It can therefore help smaller investors separate the wheat from the chaff and mitigate so-called selection risk as they seek a partner. It can also help investors with more resources to determine whether they would be better off going on their own, or via a dedicated fund of hedge fund structure. Should they opt for the latter, it could help them monitor the hidden costs that typically come hand in hand with agency relationships.

Finally, our empirical study clearly showed that the contribution of tactical allocation to overall fund of hedge fund performance is limited, and more often than not negative. This can probably be explained partly by the poor liquidity offered by hedge funds in the past. But now that liquid products are available on the market, further research needs to be done on dynamic portfolio construction approaches, in order to take into account the dynamics of hedge fund strategies and, in turn, better control for the downside risk of funds of hedge funds.

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