

The Fund of Hedge Fund Reporting Puzzle

Reconciling Investors' Expectations and Fund Managers' Constraints



Noël Amenc

Professor of finance and director of research
and development, EDHEC Business School

Philippe Malaise

Professor of finance, EDHEC Business School

Mathieu Vaissié

Research Engineer, EDHEC Risk and Asset
Management Research Centre

Abstract

The development of alternative investment has not yet been accompanied by a genuine consideration of the specific characteristics of the risks and returns of hedge funds with regard to the provision of information to investors. This inadequacy came to light in a study published by EDHEC in 2003, a study that showed that a very large majority of European hedge fund managers were satisfied with a reporting method designed for investment in traditional asset classes. This method proposes a mean variance-structure that is inappropriate for the risk and return profiles of alternative investment and does not inform investors of extreme risk and risk factors affecting the different returns of the hedge fund strategies in which the funds of funds are invested. To address this issue, in 2004, EDHEC launched, an international consultation process for the implementation of a new framework for funds of hedge funds reporting. This consultation process was based on a series of recommendations proposed by EDHEC with regard to the academic state-of-the-art on risk measurement in the alternative universe. The findings of the survey, which brought together the opinions of 98 institutional investors and fund managers, allow a consensus to be established on the information required for the implementation of a relevant reporting method in the field of alternative investment. Despite somewhat conflicting goals, investors and fund managers, except for slight discrepancies, agree on what makes information relevant and on what information future reports should contain.

EDHEC is one of the top five business schools in France. Its reputation is built on the high quality of its faculty (110 professors and researchers from France and abroad) and the privileged relationship with professionals that the school has cultivated since its establishment in 1906. EDHEC Business School has decided to draw on its extensive knowledge of the professional environment and has therefore focused its research on themes that satisfy the needs of professionals.

EDHEC pursues an active research policy in the field of finance. The EDHEC Risk and Asset Management Research Centre carries out numerous research programmes in the areas of asset allocation and risk management in both the traditional and alternative investment universes.

1. Introduction

Alternative investment has gone through two phases of development in the past fifty years. Initially, there was a long period of incubation, during which only a few wealthy private investors bought shares in hedge funds in a search for absolute performance. The burst of the Internet bubble then broadened the range of subscribers. Since all investors were looking for investments that were likely to improve the diversification of their portfolios, they naturally turned to hedge funds. The mass arrival of institutional investors and the diversification of the risk profiles of final investors allowed an in-depth examination of the management practices in the alternative universe to take place, highlighting risk control in particular. The initial work that aimed to rationalise and, above all, to standardise these management practices, was carried out under the impetus of the Investor Risk Committee (IRC), set up by the International Association of Financial Engineers.

This work is all the more important in that the risk-taking and control that should result from it form, essentially, the basis of alternative investment. Even the so-called non-directional alternative strategies, i.e. those that are not directly subject to market risk, are exposed to multiple risk factors such as volatility risk, credit risk, liquidity risk, etc. (cf. Amenc *et al.* (2003)). It is therefore true to say that correct assessment and rigorous monitoring of risks are requisite conditions for a hedge fund to function well. It is thus vital for investors to ensure that the funds in which they have invested or in which they wish to invest (again) have adequate control over the risks being run. However, in spite of this obvious fact, investors are rarely in a position to implement satisfactory risk monitoring and control. The main reason put forward relates to the low level of information generally provided by hedge funds. A study carried out recently by EDHEC involving 61 European multimangers (cf. EDHEC (2003)) shows that, while 84% of the firms questioned include a volatility calculation in their monthly activity report (69% also include a Sharpe ratio, 22% a Sortino ratio and 20% a Value-at-Risk calculation), none provides a truly robust measure of the extreme risks, even though this is a measure that represents an element of information that is capital for all investors.

Besides, the inadequacies of the monthly activity reports published by funds of hedge funds (hereafter FoHF in the text) do not stop there. Numerous studies have posed the question of the relative performance of hedge funds compared to traditional asset classes. Many have concluded that there was conditional and unconditional outperformance from strategies, thereby feeding the myth of "absolute return strategies." On the basis of this observation, researchers and investors have tried to highlight the eventual persistence of hedge fund performance so as to justify the usefulness of stock picking. Paradoxically, the results obtained are largely favourable for the allocation and risk management process. While no study has been able to produce tangible proof with regard to the persistence of hedge fund performance beyond a six-month horizon, some have underlined the stability of the funds' risk profile (cf. Kat and Menexe (2003) or Mozes and Herzberg (2003)), thereby justifying the investors' transfer of interest from the alpha (i.e. absolute performance logic) to the beta (i.e. diversification logic) of alternative strategies. To adapt to this evolution, multimangers have offered investors FoHF that are specialised by strategy and FoHF that provide particular diversification objectives. Unfortunately, the reporting from these FoHF has not met the new needs of investors. None of the respondents to the EDHEC survey (2003) provides, for example, the exposure of his funds to the principal risk factors. This is obviously in total contradiction with the fact that 95% of the FoHF consider that the quality of reporting and of risk control is the second most important criterion when they select a fund (with the most important criterion being the coherence and the quality of the explanations given by the managers on the subject of their investment strategy).

The objective of the international consultation process launched by EDHEC in 2004 is to contribute to the debate on the relevant information to transmit to investors who hold shares in FoHF. As such, it provides – in light of recent research – a recapitulative list of the figures that it would be desirable to include in the reports sent out to investors by the FoHF, in conformity with the recommendations of the IRC, and more particularly with those presented by the task force responsible for examining the

specific problems posed by FoHF (cf. Minimum Transparency Requirements for Fund-of-Hedge Funds – IRC Meeting Findings Amsterdam, June 2002, Hedge Fund Disclosure for Institutional Investors, July 2001).

2. Methodology

A discussion paper on fund of hedge fund reporting, which included EDHEC's recommendations, was addressed to major financial institutions and pure alternative players at the beginning of 2004. In order to receive detailed feedback on market participants' views on the importance and suitability of a multitude of risk and performance measures, we enclosed a questionnaire, asking them to rate a series of indicators from irrelevant to very important.

The study generated responses from 98 institutions in both the traditional and alternative worlds, representing a total volume of over 1.1 trillion USD in assets under management as of June 2004. As can be seen from Illustration 1, FoHF managers showed great interest in taking part in our consideration of the puzzling question of defining relevant information. As a matter of fact, 61% of our respondents were FoHF managers, and only 39% were investors. Information will definitely be a key success factor for FoHF in the future, which doubtless explains why FoHF managers wanted to participate in discussions about defining the content of FoHF reports. To avoid any bias in our definition of relevant information, we will differentiate between managers' and investors' answers when interesting points can be made. As regards the average size of respondents, the breakdown is well balanced, with 34% being small funds (i.e., under \$250m), 33% medium-sized funds (i.e. from \$250m to \$1bn) and 33% large funds (i.e., over \$1bn). On the other hand, the vast majority of respondents appear to be made up of experienced professionals, with 78% of them having at least 5 years of experience in the asset management industry. We should thus benefit from their awareness of the technical and theoretical challenges that the alternative industry is currently facing with regard to investor information.

To make sure that our analysis would not be biased due to the heterogeneity of the respondents, we further investigated the profile of both the investors and managers who took part in the study. Our sample appears to be relatively homogeneous in terms of both fund size and respondent experience. The FoHF managers primarily work for small- to medium-sized funds. Note, however, that despite the fact that large funds account only for 33% of the answers, they still represent the lion's share of assets under management. On the other hand, managers tend to be slightly more experienced than the average respondent, with 80% of them having 5 or more years of experience in the investment field. As with fund managers, the average size of investors is well balanced, except for a slight tilt towards medium-sized funds (i.e., 40% of investors). In terms of average experience, however, the investors tended to be significantly less experienced than the fund managers, with 37% of the investors having less than 5 years' experience in the industry, and only 11% having more than 15 years' experience (versus 20% for fund managers).

3. Key Findings

The debate on FoHF reporting raises the question of investor information. As such, it is very much a part of the process of the institutionalisation of the alternative investment industry. What is the information that investors absolutely must possess in order to measure and manage satisfactorily the risks to which they are exposed? The degree of transparency necessary to obtain this relevant information is the subject of considerable debate. On the one hand, there are those who, on the pretext of better investor protection, plead for the absolute transparency of hedge funds, and on the other hand, those for whom alternative investment, by its very nature, cannot accommodate any transparency. Our position is more nuanced.

To allow investors to measure and manage the risks to which they are exposed, it is essential for funds of hedge funds to communicate details on their returns by asset group, by management style, by sector, by country, or by any other criterion that is considered relevant with regard to the sources of return. That is not systematically the case today. In the interest of investors (i.e., for better risk management), but also in the interest of the funds of hedge funds themselves (i.e., to attract institutional investors), it is necessary for the latter to make a move towards greater transparency. As such, our contribution is to propose a pragmatic solution that allows final investors to be offered relevant information without simultaneously placing FoHF at risk. However, establishing and imposing a standard monthly report is not an easy task. It requires reconciliation of the often conflicting interests of market participants (i.e., fund managers and investors), and thus implies reaching a compromise between their specific needs and constraints. By so doing, one can hope that in the end they will all adhere to the project and abide by standard rules. For this reason, we decided to compare investor and manager perspectives on the sensitive issue of the content of FoHF reports. In other words, we asked for their definition of relevant information.

3.1. Granularity and Frequency

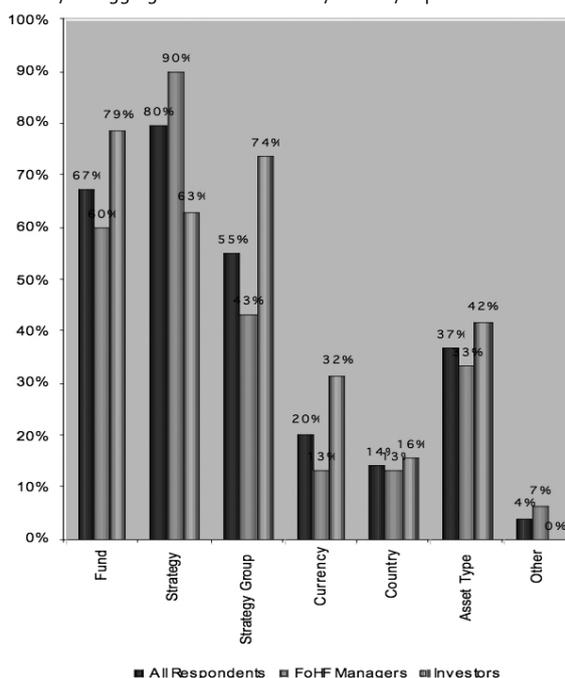
Before going into more detail, and covering the range of risk and performance indicators that should be included in the activity report disclosed to investors, the first question to answer concerns the frequency of publication and the granularity of the report. What is the best solution according to investors and fund managers: an exhaustive monthly report or a less detailed weekly report? Which provides a better fit in terms of the needs of investors and the capacity of managers?

In line with the findings of a previous study on European multimanager investment practices (see EDHEC (2003)), a large majority of market participants, 67%, considers that the monthly activity report can account for most of the issues relating to the risk and return dimensions. Surprisingly, however, fund managers appear to be more demanding than investors in terms of publication frequency. While 30% of them doubt that monthly frequency is enough to monitor risk properly, only 21% of the investors think so. This result seems to contrast with what is usually said on the insatiable need for information of investors. One distinction must, however, be made among fund managers. Managers of small FoHF tend to be more inclined to publish more frequent data (29% and 13% of small and large fund managers respectively consider that monthly frequency is not enough), especially to account for issues like intra-month volatility or weekly drawdowns. The reluctance of large funds to publish results on a weekly basis is doubtless due to the operational limitations inherent to cumbersome structures.

However, the answers suggest that, while large structures tend to be less flexible, and as a result, generally plead in favour of monthly frequency, they tend at the same time to be more inclined than small structures to give detailed reports, with data aggregated at strategy or even fund level. This is certainly due to their desire to take advantage of their sophisticated IT systems in order to set high entry barriers, especially towards small- and medium-sized funds. Interestingly, it turns out that this corresponds precisely to the needs of investors. Indeed, most of them appear to be looking for detailed information rather than frequent information (i.e., 79% of investors want information at the fund level, 74% at the strategy group level and 63% at the strategy level). Some investors even ask for details on the position pricing policy of underlying funds. However, it is worth noting that most of them appear to be aware of the overkill effect that too much information represents. Collecting and processing large amounts of information is time consuming and implies huge costs for the fund (meaning lower net returns for investors), whereas the marginal utility for investors is relatively low since they do not have the time to analyse this flow of information. Fund managers place emphasis on information aggregated by strategy (90%) and to a lesser extent by strategy group (43%) and by fund (60%). After these, aggregation at asset-type level is considered the most useful by managers and investors (respectively 33% and 42%). However, as stressed by several participants, liquidity is an acute issue in the alternative arena; assets could thus be classified according to their

level of liquidity within strategy groups or strategies (i.e., monthly, quarterly and annually). Finally, aggregation at the currency or regional level is regarded as interesting but not necessary.

Illustration 2: How should information ideally be aggregated in the monthly activity report?



As a conclusion, most investors and managers ask for monthly frequency and reports that include three principal levels of aggregation, namely strategy group, strategy and fund. Many of them also agree on the fact that detailed information should not be given for every single fund in the portfolio. We thus suggest fitting the degree of granularity of the information to the aggregation level. In other words, we propose to increase the quantity of information at higher aggregation levels (e.g., strategy group), and decrease it at lower aggregation levels (e.g., fund). We argue on the other hand that a breakdown by asset type and level of liquidity should be given at the strategy group level.

3.2. Return Analysis

As expected, 100% of investors and fund managers consider that monthly return figures should be included in FoHF reports. More surprising, however, is the lower level of interest of investors and, to a lesser extent, fund managers, in annual figures (76% on average consider monthly figures very important versus 51% for annual figures). This is all the more surprising in that investors and fund managers are often forced to have up to annual investment horizons.¹ Indeed, due to both the significant illiquidity caused by long lock-up and redemption periods and also funds' illiquid underlying positions, it is technically difficult to allow for monthly or even quarterly entry and exit. It is thus inconsistent and even dangerous for investors and fund managers to focus on short-term performance, because it forces fund managers to maximize their short-term performance, and it is well known that short-sighted investment strategies rarely serve investors' long-term interests. The same conclusion can be drawn at the strategy and fund levels, with 31% of respondents rating monthly returns as very important, compared to 20% for annual returns.

Nevertheless, it is worth noting that investors and fund managers, although they are more inclined to receive monthly rather than annual figures, appear in practice to be reluctant to forgo detailed information on underlying fund performance. As a result, only 20% of them think that monthly returns should not be disclosed at fund and strategy levels.

On the other hand, results indicate that 72% of the respondents consider that relative returns should be disclosed in monthly activity reports. However, this consensus masks the fact that investors

¹ - It should be noted that these results do not necessarily reflect investors' and fund managers' preference for monthly returns over annual returns. Hedge funds and, to a lesser extent, FoHF present relatively short track records, which might explain the – forced – focus on monthly returns.

are more interested in absolute performance than fund managers. While only 58% of investors are interested in receiving the cumulative performance of a fund relative to a benchmark, 80% of managers consider that it is important to very important information. This raises an important issue. Hedge funds have historically been associated with the absolute return paradigm, but this is not consistent with the very nature of hedge funds. Hedge fund returns, like traditional investment vehicle returns, are influenced by beta and alpha drivers. Beta drivers correspond to the fair reward for exposures to risk factors, and alpha drivers to the talent of the manager. There is, however, a significant difference between traditional and alternative investment vehicles. While the former generally follow buy-and-hold strategies, the latter implement dynamic strategies. As a result, hedge fund beta drivers are made up of two distinct components, i.e., static and dynamic beta drivers. It thus makes sense to calculate the relative returns of hedge fund strategies, provided that particular attention has been paid to the choice of benchmark. It has been widely argued in the literature that the risk-free rate or equity or bond indices are not well suited for hedge fund strategies (cf. Amenc et al. (2003)). Investors and fund managers must use benchmarks that include the specific characteristics of hedge funds. Hedge fund indices are thus natural candidates to serve as pseudo risk factors. Due to the varying quality of the indices available on the market, we suggest using the index of indices series published by EDHEC.

Again, investors and fund managers agree on the need to integrate indicators such as percentage of positive and negative returns (respectively percentage of up/down months in up/down markets) in the monthly activity report (82% and 89% of respondents, respectively, think of this as important to very important information).

Illustration 3: How important, in your opinion, are relative returns?



3.3. Risk Analysis

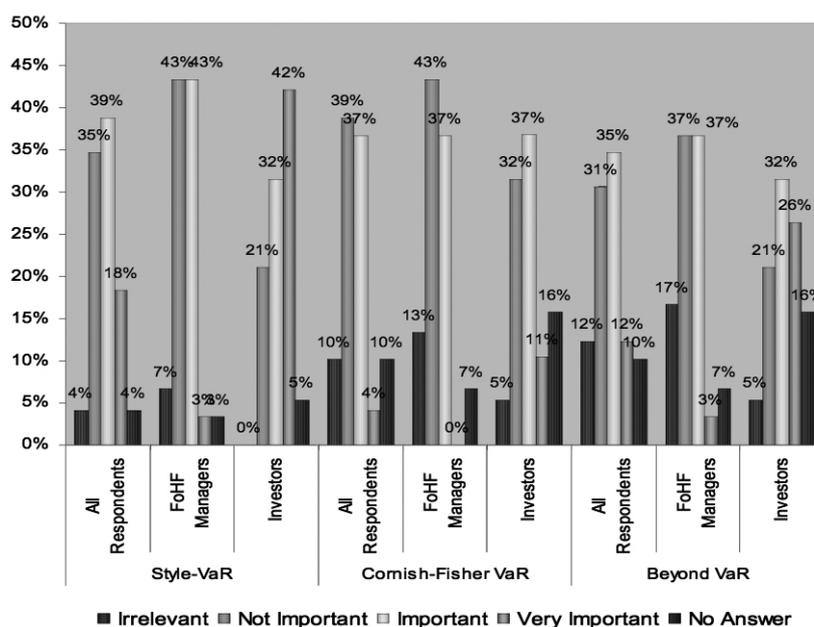
One of the central assumptions of modern portfolio theory is that agents are risk averse. This is confirmed by the fact that 100% of respondents consider that risk measures such as volatility are important to very important. Similarly, as highlighted in many empirical studies, investors are particularly averse to loss. It is thus not surprising to find that 94% of respondents think that it is important to very important to look at indicators such as the maximum drawdown or uninterrupted loss. Not surprisingly, investors seem to be more concerned by losses than fund managers, as is illustrated by the fact that 74% of investors, compared to 57% of managers, think that it is very important to include these indicators in the monthly report.

Hedge funds tend to take advantage of the leverage effect and often invest in illiquid markets with high default risk. As a result, extreme risks are of major concern in the alternative arena. This is well illustrated by the fact that 84% of respondents think that it is important to very important to look at the third and fourth order moments of return distributions (i.e., skewness and kurtosis). However, as many as 14% of respondents continue to neglect the fat tail effect, and consider that the analysis of gross and net leverage is not important or even irrelevant (30% for managers versus 11% for investors). Surprisingly, the Jarque-Bera statistics (see Bera and Jarque (1981)), which aim to assess

the joint effect of third and fourth order moments on the normality of the return distribution, are not important or even irrelevant for 57% of the respondents (52% for investors and 60% for managers). Again, investors seem much more sensitive to extreme risks, and as a result, much more demanding with regard to the information disclosed on this issue in the monthly report. Notwithstanding the fact that 76% of the respondents consider that liquidity ratios provide important to very important information, only 17% of fund managers think of it as very important information, as opposed to 58% of investors. In the same vein, while 32% of investors consider stress tests to be very important, only 23% of fund managers think so (on average, however, 80% of respondents think of it as important to very important). Results are similar when it comes to Value-at-Risk (VaR) measures: 42% (respectively 11%, 16% and 26%) of investors think that it is very important to have a Style VaR (respectively Cornish Fisher, Incremental or Component VaR, Beyond VaR) while only 3% (respectively 0%, 0%, 3%) of fund managers think so. More worryingly, 18% (16%, 39% 49%, 51%, 43%, respectively), consider that it is not important or even irrelevant to insert liquidity ratio (stress test, Style VaR, Cornish Fisher, Incremental or Component VaR, and Beyond VaR) indicators in the report.

As a conclusion, even if investors seem to be more concerned by risk than fund managers, there is a broad consensus on the fact that the whole spectrum of risk dimensions should be covered in monthly reports, ranging from normal risks (e.g., volatility) to extreme risks (e.g., VaR measures) and loss risks (e.g., minimum monthly return, maximum drawdown, uninterrupted loss).

Illustration 4: How important, in your opinion, are the following extreme risk indicators?



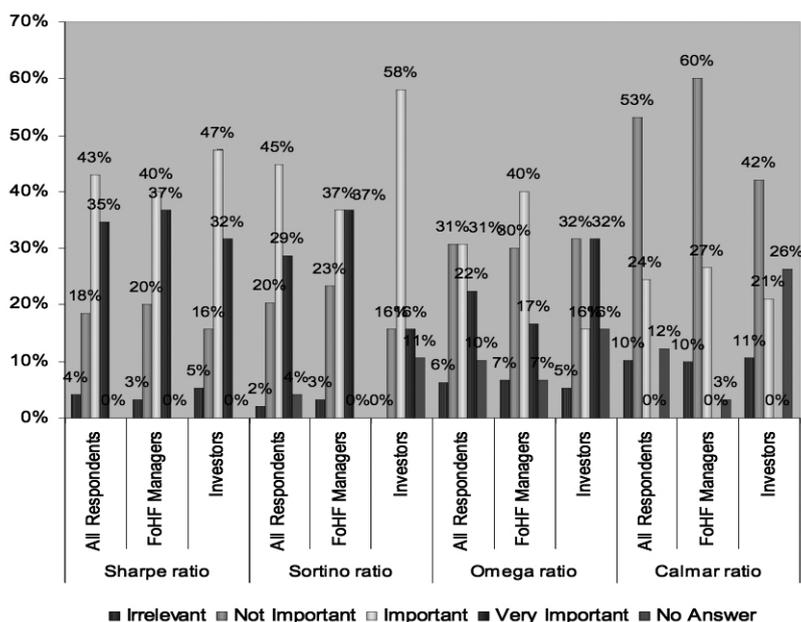
3.4. Risk-Adjusted Return Analysis

Return and risk are two sides of the same coin. They must thus be examined in parallel. For this purpose, a range of risk-adjusted performance indicators has been proposed to investors and fund managers. In line with the findings in EDHEC (2003), both investors and fund managers generally use ratios that are inherited from the traditional world. The Sharpe ratio and the Sortino ratio are regarded as important to very important by 78% and 74% of respondents respectively. Even though it has been widely argued that these traditional performance measures fail to account for the specific risk characteristics of hedge funds, only 22% think that these ratios provide unimportant or irrelevant information. The Omega ratio (see Keating and Shadwick (2002)), however, which has recently been introduced to make up for the failure of traditional performance measures to account for the third and fourth order moments of hedge fund return distributions (skewness and kurtosis), is rated as important to very important by only 53% of the respondents. In line with the results obtained regarding extreme risk measures, investors seem to be more interested in this ratio than managers. While 32% of the investors think that it is very important, only 16% of the fund managers feel the same. This suggests that hedge funds' asymmetric remuneration contracts (management +

incentive fees) fail to align investors' and fund managers' interests properly. Investors turn out to be much more concerned by extreme losses than fund managers. To address this issue, we suggest including indicators that take investors' pronounced aversion to extreme risks into account in the monthly activity report.

As a conclusion, monthly reports should include risk-adjusted performance measures with the definition of risk covering the aforementioned dimensions of risk (normal risk, extreme risks, etc.). Risk-adjusted performance indicators should span traditional (e.g., Sharpe ratio) and alternative ratios (e.g., Omega ratio) so that investors can be provided with information that they are familiar with and also ratios that are robust for the specific features of hedge fund strategies. We suggest that detailed information be given at the strategy group and strategy levels. We consider that the results of the performance attribution process should also be included in the report at the strategy group and strategy levels.

Illustration 5: How important, in your opinion, are the following risk-adjusted performance indicators?



Once one is informed of the risk-adjusted performance of an investment, it may be interesting to go one step further and try to understand where the added value comes from. This is precisely the objective of the performance attribution process. Information provided by the attribution process is essential for both investors and fund managers. It helps the former to better understand the performance of their investment and helps the latter to manage the investment process better. It is therefore not surprising to see that performance attribution is important to very important for 96% of the respondents, but particularly for investors, with 68% considering performance attribution very important, while only 43% of managers think the same.

3.5. Beta and Correlation Analysis

Hedge fund strategies are increasingly used by investors to improve their diversification. In other words, investors try to include hedge funds in traditional portfolios to benefit from the diversification potential offered by alternative betas (due to non-linear – see Fung and Hsieh (1997), Edwards and Caglayan (2001) or Agarwal and Naik (2004) – and dynamic exposure to risk factors – Brealey and Kaplanis (2001) or Lo (2001)). In order to manage their diversification strategy efficiently, it is essential for investors to be able to monitor the evolution of the FoHF exposures to the different hedge fund strategies. It is thus not surprising to see that static and dynamic style analysis (see Sharpe (1992)) are considered to be important to very important by 74% of the respondents. Predictably, investors show more interest in finding such information in the report than fund managers (37% think that it is very important versus 20% for managers). This is in turn illustrated by the fact that 24% of fund

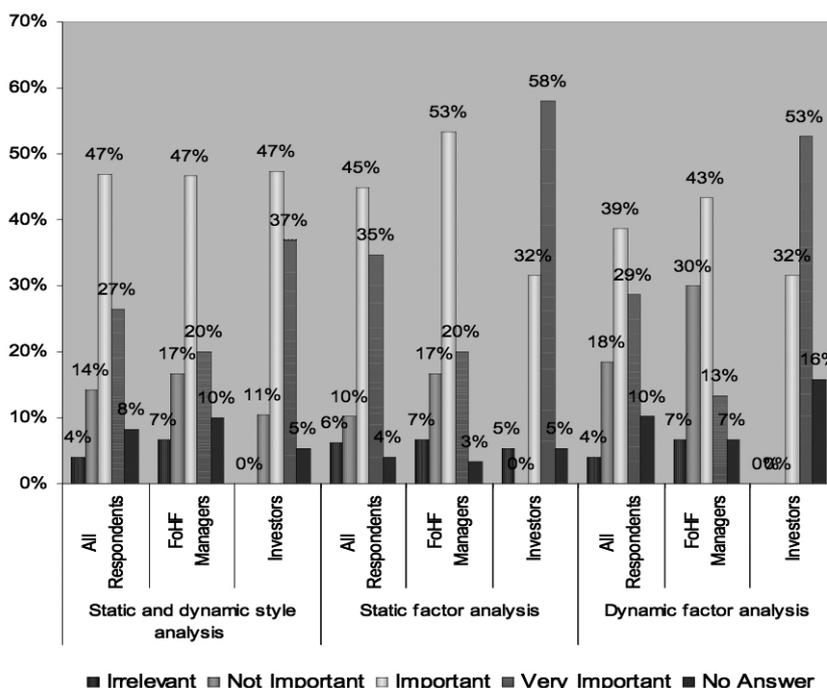
managers think that it is not important or irrelevant (only 11% of investors think so). We note that style analysis is extremely useful, since it enables investors to ensure that fund managers are doing what they are supposed to do. As stressed in DiBartolomeo and Witkowski (1997), "the easiest way to win a contest for the largest tomato is to paint a cantaloupe red and hope the judges do not notice". We strongly believe that investors should be able to distinguish tomatoes from cantaloupes thanks to the monthly activity report.

Hedge fund strategies are generally represented by hedge fund indices and exposures computed through Sharpe's style analysis model (see Lhabitant (2001)). One may, however, want to go one step further and handle true risk factors (volatility, liquidity, credit risk, etc.) rather than pseudo risk factors like hedge fund indices. This is the case for 85% of the investors but only 56% of fund managers, who think that factor analysis is important to very important (37% of fund managers consider that it is not important or irrelevant, compared to 0% for investors!). Finally, 84% of respondents think that it is important to very important to give a detailed analysis of unconditional and conditional correlations with traditional indices (equity and bond indices). Similarly, it is very important for 47% of investors but for only 33% of fund managers. Even more strikingly, 58% of investors think that it is very important to obtain a detailed analysis of unconditional and conditional correlations with risk factors, versus only 20% for fund managers. Such an analysis is considered not important to irrelevant by only 5% of investors, but 22% of fund managers.

Again, large funds seem to want to take advantage of their IT systems by including a wide variety of risk-adjusted performance indicators.

Hedge fund strategies are increasingly used for their diversification properties. Unfortunately, this cannot be done optimally with black boxes. Investors need to check their portfolio diversification, and must as a result be able to monitor the FoHF risk profile on a regular basis. For this reason, we argue that monthly activity reports should include in-depth style and factor analysis, both static and dynamic, at the FoHF level. It would also be interesting to include a factor analysis at strategy group and strategy levels, to perform the risk attribution process² in parallel with the performance attribution process.

Illustration 6: How important, in your opinion, are style and factor analysis?



2 - Otherwise, investors could definitely opt for the transparency of investable hedge fund indices. It is thus in the interest of fund managers to improve their communication on key return drivers and, more generally, on the risk profile of their fund.

4. Conclusion

Information is a crucial issue for the future development of the alternative industry. Until recently, only accredited investors³ had been allowed to invest in hedge funds. Now, however, the range of potential investors has widened considerably. It is thus high time for a better definition of the level of information that investors should be provided on a regular basis. We strongly believe that activity reports should be seen by fund managers not as a constraint but as a privileged means of communication with investors.

Activity reports should first inform investors about the levels of risk (i.e. normal, extreme and risk of loss) and performance of the FoHF. To this end, a series of risk and return measures with corresponding risk-adjusted performance indicators should be disclosed to measure the returns per unit of risk (volatility, VaR, drawdown, etc.) that the fund generated. FoHF reports should also offer more insight into the way the fund is managed. Investors should, for example, be informed of the effective style mix of the fund through style analysis. In the same vein, factor analysis should be provided to inform investors about sources of risk. Performance attribution, finally, could inform investors about sources of value-added.

As mentioned previously, there is a significant risk of data overkill. We argue that only those investors who really need complete information should be provided detailed analysis at all levels of aggregation. For the others, we suggest adapting the degree of detail to the level of aggregation. Detailed information should be available at strategy group and strategy levels, but only basic information on performance and risk should be disclosed for every single fund in the portfolio.

Alongside the think-tank that we set up on the standardisation of the content of FoHFs' monthly activity reports, numerous actors from the hedge fund industry are working on standards for hedge fund position pricing methods (notably for exotic derivative instruments and non-quoted assets). May all this work allow multimangers to improve their reporting (only 13% of European multimangers today affirm that their reporting is certified by a third party) and thereby help final investors to obtain reliable and relevant data on FoHF, so that they can approach alternatives strategies as confidently as they approach the so-called traditional asset classes (stocks, bonds, etc.).

References

- Agarwal, V., and Naik, N., 2004, Risks and Portfolio Decisions Involving Hedge Funds, *Review of Financial Studies*, 17, 1, 63-98.
- Amenc, N., Martellini, L., and Vaissié M., 2003, Benefits and Risks of Alternative Investment Strategies, *Journal of Asset Management*, 4, 2, 96-118.
- Bera, A. K., and Jarque, C. M., 1981, An Efficient Large Sample Test for Normality of Observations and Regression Residuals, Australian National University, *Working Papers in Econometrics* 40, Canberra.
- Brealey, R., and Kaplanis, E., 2001, Hedge Funds and Financial Stability: An Analysis of their Factor Exposures, *International Finance*, 4, 2, 161-187.
- DiBartolomeo, D. & Witkowski, E., 1997, Mutual Fund Misclassification: Evidenced Based on Style Analysis, *Financial Analysts Journal*, 53, 32-43.
- EDHEC, 2003, EDHEC European Alternative Multimangement Practices Survey
- Edwards, F. and Caglayan, M., 2001, Hedge Fund and Commodity Fund Investment Styles in Bull and Bear Markets, *Journal of Portfolio Management*, 27, 4, 97-108.
- Fung, W. and Hsieh D. A., 1997, Empirical Characteristics of Dynamic Trading Strategies: The Case of Hedge Funds, *Review of Financial Studies*, 10, 2, 275-302.
- Kat, H., and Menexe, F., 2003, Persistence in Hedge Fund Performance: The True Value of Track Record, *Journal of Alternative Investments*, 5, 4, 66-72.
- Keating, C., and Shadwick, W., 2002, A Universal Performance Measure, *Journal of Performance Measurement*, 6, 3, 59-84.
- Lhabitant, F.S., 2001, Assessing Market Risk for Hedge Funds and Hedge Funds Portfolios, *Journal of Risk Finance*, Spring 2001, p.1-17.
- Lo, A., 2001, Risk Management for Hedge Funds: Introduction and Overview, *Financial Analysts Journal*, 57, 6, 16-33.
- Mozes, H. A., and Herzberg, M., 2003, The Persistence of Hedge Fund Risk: Evidence and Implications for Investors, *Journal of Alternative Investments*, 6, 2, 22-42.
- Sharpe, W., 1992, Asset Allocation: Management Style and Performance Measurement, *Journal of Portfolio Management*, Winter 1992, Vol. 18, p.7-19.