

Reactions to the EDHEC Study "Assessing the Quality of Stock Market Indices"

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Executive Summary

A recent publication¹ by the EDHEC Risk and Asset Management Research Centre has drawn conclusions that highlight the shortcomings of well known capitalisation- or price-weighted stock market indices and argues that the choice of benchmark for asset allocation or performance measurement is a task requiring particular care. In a call for reactions to this publication, EDHEC finds that the answers of the more than eighty respondents (asset management firms, pension funds, insurance companies, private banks, etc.) tend to reinforce the conclusions drawn by the original publication.

Although it would at first appear that the majority of respondents are not, in general, dissatisfied with the indices they use as benchmarks (18.82% of respondents express degrees of dissatisfaction), further examination soon reveals that the shortcomings of these indices, such as inefficiency, lack of stability, and susceptibility to price bubbles, are widely recognised by the industry professionals responding to EDHEC's call for reactions. The call for reactions also shows that a considerable majority of respondents plan to review the indices they use as benchmarks, either immediately or in the future.

Overall, responses to the call for reactions suggest that, in some ways, industry practices reflect the concerns highlighted by EDHEC in its 2006 publication on the quality of stock market indices. Nearly 70% of the respondents, after all, indicated that they used customised benchmarks and other indices in an attempt to compensate for the flaws inherent in the use as benchmarks of such indices as the CAC 40, the S&P 500, the DAX 30, the FTSE 100, or the Dow Jones Industrials 30. It is clear then that, for a significant majority of investors, the choice of benchmark is a fundamental choice. In the end, the name of the index provider, the volumes managed, turn out to matter less than such attributes as its efficiency, its stability, its immunity to bubbles, or its risk exposure.

1 - EDHEC, 2006, "Assessing the Quality of Stock Market Indices: Requirements for Asset Allocation and Performance Measurement", EDHEC Publication.

Introduction

A recent publication by the EDHEC Risk and Asset Management Research Centre² assessed the quality of well-known stock market indices and concluded that investors need to be more careful when using benchmarks for either asset allocation or performance measurement. In particular, the study argued that stock market indices are neither neutral choices of risk factors nor efficient portfolios. The study also proposed a number of pragmatic remedies for the shortcomings of stock market indices. For views from the industry on its research, EDHEC surveyed European asset managers and investors and asked them for their opinions on the findings of the research. This document first summarises the results of the study and then outlines the reactions that were received from the survey respondents.

² - EDHEC, 2006, "Assessing the Quality of Stock Market Indices: Requirements for Asset Allocation and Performance Measurement", EDHEC Publication.

1. Summary of Previous Results



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Lack of Stable Risk Exposure

The EDHEC study assesses the stability of the weighting allocations in existing indices. The goal is to identify the evolution of the component weights in a range of broad market indices. We conduct this analysis since investors are typically interested in the allocation across the different subcategories of their equity portfolio. The most relevant subcategories for equity investors are investment styles such as growth and value and industry sectors. Size (large cap, small cap, etc.) and style (growth, value), after all, have been shown to account for a significant portion of the cross-sectional difference in expected stock returns (see section one of the study). Likewise, industry sectors are useful building blocks to construct equity portfolios as different sectors have different exposure to the business cycle. As the choice of style and sector has a direct impact on risk and return, this choice requires major attention.

Our analysis is motivated by the fact that investment in an index is often viewed as a somewhat neutral decision. However, opting for an index as an investment support makes a choice of allocation implicit rather than explicit. Our focus is on qualifying style- or sector-allocation choices made by investing in an index. We test the stability of existing indices in terms of exposure

Exhibit 1: Style Drift Score based on style exposures

	Style Drift Score
CAC 40	4.2%
DAX 30	5.5%
FTSE 100	4.2%
DJ Euro Stoxx 50	4.9%
DJ Euro Stoxx 300	2.6%
DJ Stoxx 600	5.5%
Nikkei 225	17.6%
Topix 500	8.2%
S&P 500	2.3%
Russell 2000	11.0%
Dow Jones Industrials 30	26.0%

Results for the style weights indicated in illustrations 4, 5, 6 and 7 of the full document. The style drift indicator is calculated with the Idzorek and Bertsch method, described in the complete text.

to both investment styles and industry sectors and we find that the relative weight of the different sub-indices varies drastically over time.

To summarise how the style weights of broad market indices vary over time, we calculate the style drift score. This score indicates the average variability of the style or sector weights for each index.

The sector weights of the market indices that we analyse also show drastic variation over time. Given that our period covers the growth and burst of the technology bubble, this variation may be expected, but it is also considerable even when looking at relatively calm periods on the stock market. The following table shows the sector drift scores, calculated in a manner analogous to that used to calculate the style drift scores.

Exhibit 2: Sector Drift Score based on sector capitalisations

Geographical Zone	Index	Sector Drift Score
Germany	Prime All Share Index 380	10.4%
United Kingdom	FTSE All Share Index 700	7.1%
Euro zone	DJ Euro Stoxx 300	7.2%
Europe	DJ Stoxx 600	6.6%
Japan	Topix 1666	7.0%
USA	S&P 500	7.3%

Based on the sector capitalisation weights shown in illustrations 8, 9, 10, 11, 12 and 13 of the full document. These sector weights are based on the capitalisations for the period October 1995 to September 2005. The sector drift indicator is calculated with the Idzorek and Bertsch method, described in the complete text.

The variation of the weights of the sectors in the global market index leads to a problem for the investor. Sector instability shows all the more clearly that sector allocation—when it stems from the choice of index—is an implicit rather than explicit choice on the part of the investor. We show that this implicit choice corresponds to a “view” on the returns of the different sectors, and we argue that holding the global market index is not optimal for an investor, unless he or she happens to share the views implied by the market capitalisation weights of different industry sectors.

1. Summary of Previous Results

Lack of Efficiency

As efficiency is the major advantage touted by index providers who claim that capitalisation weighted indices are a good investment choice, the EDHEC study also examines the validity of these claims about the efficiency of existing stock market indices.

We test the distance in terms of efficiency between a market index and its alternatives. To avoid bias linked to a different universe of assets for the style/sector versus the market index, these alternatives are based on portfolios of individual stocks rather than portfolios of style or sector indices. So index efficiency boils down to whether an investor can obtain better results with the same universe of stocks but with a weighting scheme different from that of the index. We assess two weighting schemes, mean-variance optimisation and equal weighting.

Our conclusion is that, compared to the mean-variance optimal portfolios, the existing stock market indices are highly inefficient. We show that the indices lie below the efficient frontier. Interestingly, even a simple weighting method such as equal weighting the component stocks leads to more efficient portfolios than the capitalisation-weighted indices.

We can summarise the results obtained for existing stock market indices by showing their efficiency ranking. This result is shown in the following table.

Exhibit 3: Efficiency Ranks of Indices

	Rank for Efficiency (from Mean Variance Analysis)
Dow Jones Industrials 30	1
DJ Euro Stoxx 50	2
CAC 40	3
DAX 30	3
FTSE 100	5
S&P 500	6
Nikkei 225	7
Topix 500	7
DJ Euro Stoxx 300	9
DJ Stoxx 600	9
Russell 2000	11

These efficiency rankings are taken from table 15b of the complete document.

The poor efficiency score of capitalisation-weighted indices is not surprising, given that the weighting method mechanically gives very high weights to some components and leads to concentrated portfolios. Usually, the ten to thirty largest stocks make up the majority of the weighting in the index. Put differently, even if an index has more than 500 components, 90% of the components make up an almost negligible share of the index weights. In addition, as shown by the dramatic changes in sector weightings, certain sectors can, at certain moments, dominate.

It is interesting to note that the index that performs best is the only index that is not capitalisation-weighted. The Dow Jones Industrials Average, as it happens, is price-weighted. Although price-weighting is hardly above criticism, it seems that, in terms of efficiency, capitalisation-weighting is even less attractive.

Implications and Remedies

In the last section of the study, we show some implications of the results from the empirical sections for different stages of the investment process, namely asset allocation and performance measurement. Is it then that commercial indices are sub-optimal investment vehicles that should simply be avoided by investors? We actually believe not, as there is evidence that commercial indices can be used as building blocks for efficient allocation strategies.

To deal with the problem of exposure to risk factors that vary over time, we recommend building completeness portfolios that neutralise the sector biases of any given index.

An obvious way to deal with the lack of stability is to construct portfolios that have constant weights over time. However, if the investor chooses to construct a portfolio himself, he will forego some of the advantages of investing in broad stock market indices (such as low management fees, low transaction costs, low information costs and simple implementation of orders dealing with intermediate cash flows). Therefore, we propose

1. Summary of Previous Results

to construct completeness portfolios that allow investment in broad stock market indices while neutralising the sector shifts inherent in the indices. We concentrate on sector biases (rather than style biases) since sector weights are directly observable from market capitalisation. The analysis is done for all the portfolios for which we did the sector stability analysis above, using the same dataset.

Adding the completeness portfolio resolves the problem of the investor's lack of control of his equity portfolio's sector exposures compared to a buy-and-hold strategy. In addition, the investor holds a portfolio whose weights remain fixed.

These completeness portfolios not only have more stable sector exposure, but also perform better in terms of risk and return. Thus, a simple neutralisation strategy (holding both a global index and a completeness portfolio made up of sector indices), can result in the most attractive risk-return profile. Likewise, by choosing a combination of indices, it is possible, for performance measurement purposes, to construct benchmarks that are more sophisticated than a global index. Such benchmarks are often called "customised benchmarks", to emphasise that they are not simply global indices.

The fact that the global indices show a pronounced lack of efficiency is probably the most interesting result of this study. The remedy we proposed for the asset allocation phases of the investment process is to construct efficient portfolios—from sector indices, for example. These sector indices can be used as building blocks in an optimisation procedure that allows the drawbacks of the global indices to be neutralised. The approach we proposed avoids estimation risk by focusing on the minimum risk portfolio and shows significant enhancement of efficiency in an out-of-sample exercise.

Our results show that the volatility of the minimum variance portfolio is always significantly lower than that of the corresponding market index. It is important to note that this

dominance is not achieved by construction and the portfolios can actually be obtained *ex ante* by an investor.

It is striking that, for five out of six indices, the lower risk of the minimum variance portfolio does not lead to a lower expected return. The single exception is for the minimum variance portfolio of sectors composing the S&P 500. All the other minimum variance portfolios have higher expected returns than the corresponding index. Consequently, the Sharpe ratios show strong improvements compared to the market index, except for the S&P 500.

On the Usefulness of Equity Indices

While our findings show that commercial indices pose serious challenges for an investor who wishes to use them in the investment process, these challenges do not necessarily mean that an investor should not use indices at all. Indeed, we have shown that there are straightforward remedies for the problems of commercial stock market indices. We have looked at these remedies for both asset allocation and performance measurement.

In conclusion, this study identifies numerous problems with commercial stock market indices. At the same time, we propose a number of pragmatic solutions to these problems. All of these solutions are based on indices that reflect sub-segments of the equity market such as investment styles or industry sectors. The main drawback of global stock market indices may actually be that they imply somewhat confusing allocation by sub-segments rather than precise and explicit asset allocation. Sector indices and style indices are appropriate tools that allow investors to gain control over the investment process, all without neglecting asset allocation, the most rewarding part of the process.

2. Reactions

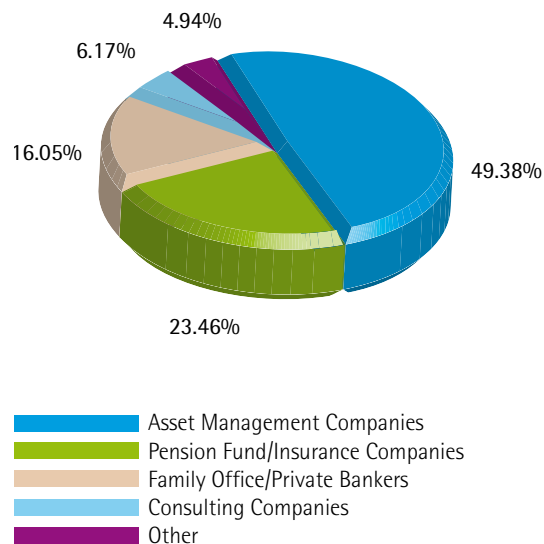


2. Reactions

For feedback from industry participants on market capitalisation-weighted indices and on the results presented in the EDHEC study, we issued a call for reactions after having published the study. This call for reactions contained a questionnaire, which consisted of six multiple-choice questions and one open question. This questionnaire was sent to asset management companies, pension funds, insurance companies and consulting companies, most of them based in Europe. We received 85 responses to the call for reactions. The survey period is from February 23, 2007 to April 13, 2007.

Of the 85 respondents, 81 specified their activity. 49.38% of the 81 respondents were asset management companies. 23.46% were pension funds/insurance companies, followed by 16.05% family office/private bankers. 6.17% were consulting companies. The remaining 4.94% of respondents were other types of investors.

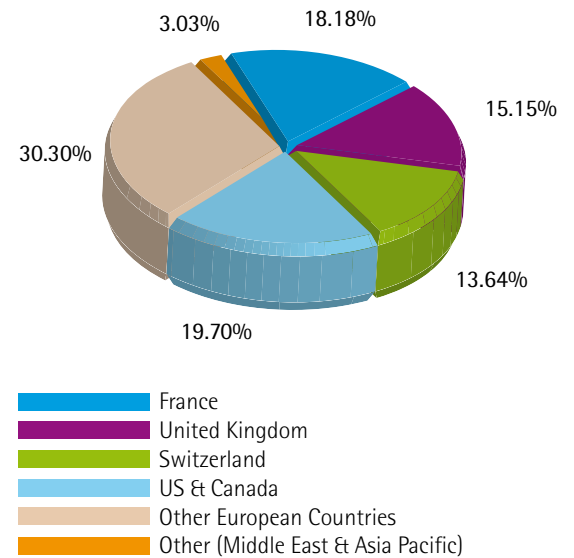
Exhibit 4: Type of Activities of the Respondents



3 - We counted only the companies that disclosed their assets under management.

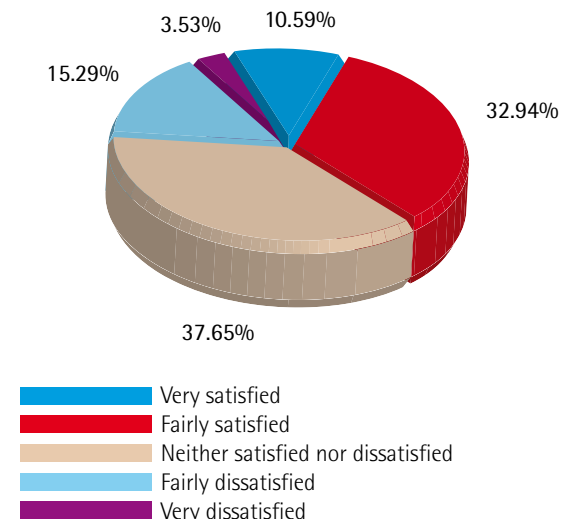
The range of assets under management³ of these institutions and individuals was from USD 0.1 million to USD 1.1 trillion. The average was USD 141.85 billion. With respect to the breakdown by country of these respondents, 66 specified their countries—77.27% of the 66 respondents were from Europe, followed by 19.70% from North America. The graph below shows details about the distribution by country.

Exhibit 5: Country Distributions of the Respondents



The questionnaire began by asking whether practitioners are satisfied with the indices they use as benchmarks. Our motivation for this question was to see whether practitioners are aware of the shortcomings of existing stock market indices. As the responses show, the stock market indices do encounter considerable dissatisfaction. Although 10.59% and 32.94% of the 85 respondents who answered this question chose "very satisfied" and "fairly satisfied" respectively, 37.65% chose not to make a decisive statement, while a total of 18.82% replied that they were dissatisfied ("fairly dissatisfied" or "very dissatisfied").

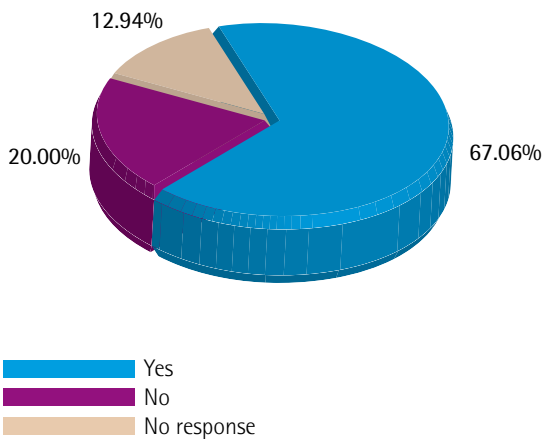
Exhibit 6: Are you satisfied with the indices you use as benchmarks?



2. Reactions

An interesting question, given the considerable percentage of respondents who do not say that they are satisfied, is why only a minority of respondents claim satisfaction with the existing indices. The EDHEC study argued that cap-weighted indices have two main drawbacks—inefficiency and lack of stability. This conclusion convinced most respondents, according to the replies to a question asking whether the respondents share this conclusion. The majority of respondents (67.06% out of 85 that answered this question) stated that they share EDHEC's opinion on cap-weighted indices while 20% respondents disagreed and 12.94% of respondents chose no response. Consequently, we can safely say that the inefficiency and lack of stability of cap-weighted indices are well recognised problems for the practitioners who replied to our call for reactions.

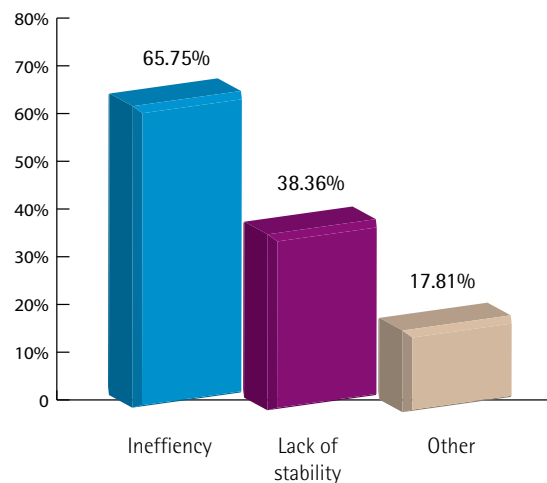
Exhibit 7: Do you share EDHEC's opinion on cap-weighted indices?



In order to make a finer distinction as to which problems with the existing stock market indices are perceived as the most severe, we asked what bothered respondents most about cap-weighted indices. 73 survey participants responded to this question. To all appearances, inefficiency is the most serious problem as it was stated by 65.75% of respondents. Lack of stability was chosen by 38.36%. 17.81% of respondents brought up other problems. 4.11% believed that the cap-weighted indices are susceptible to price bubbles and fads. 6.85% of respondents suggested problems such as return drag, momentum strategies, free

float issues, lack of history and incompleteness. The remainder (6.85%) of respondents stated that nothing bothers them. One particularly noteworthy result is that although a total of 43.53% of the 85 respondents insisted they were very or fairly satisfied with the indices they used as benchmarks, only 5.88% of these respondents said nothing bothered them with the use of indices as benchmarks. This result lends support to the view that, while indices are widely accepted and their quality unquestioned, most practitioners are able to make out some drawbacks once specific questions are asked.

Exhibit 8: What bothers you about cap-weighted indices?

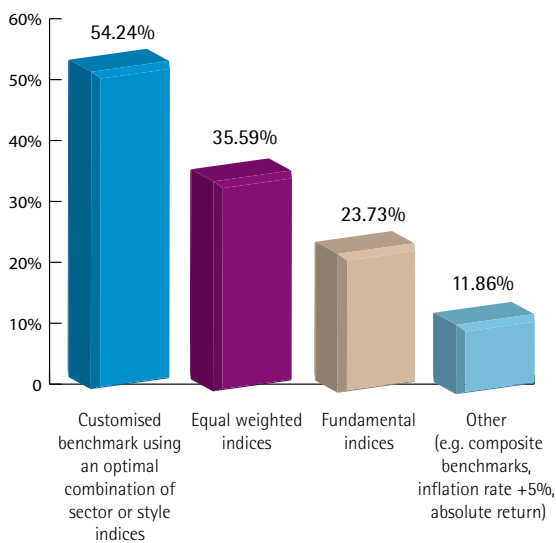


Given the perceived drawbacks, a natural question is to ask whether respondents use indices other than cap-weighted. 69.41% of the 85 respondents affirmed that they do. 54.24% of those who answered this question said they used a customised benchmark with an optimal combination of sector or style indices. These responses revealed that most investors agree with the remedy proposed in the EDHEC study, which recommends style analysis to construct customised benchmarks. A further 35.59% of those who answered this question chose equal-weighted indices, followed by fundamental indices, chosen by 23.73% of respondents. Other kinds of benchmarks were specified by 11.86%. 3.39% used a benchmark made up of various indices and 5.08% constructed benchmarks from

2. Reactions

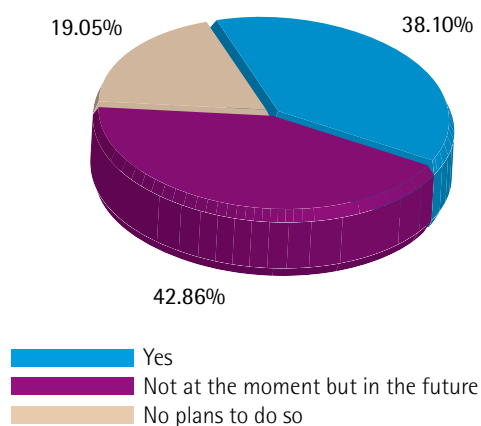
other factors. A further 3.39% adopted liability-oriented benchmarks, such as the inflation rate plus 5%. It is only to be expected that most of the users of composite benchmarks (comprised of various indices or other components) are asset management companies, while all of the liability-oriented benchmark users are pension funds or insurance companies.

Exhibit 9: If you use a benchmark other than cap-weighted indices, please specify what it is.



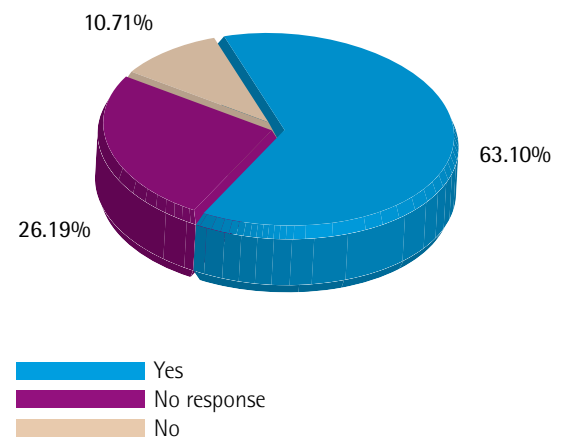
84 responded to the question of whether they intend to review the indices currently in use. 38.10% said they would review them soon and 42.86% said they intend to review in the future. Only 19.05% of respondents said they have no plans to do so. Obviously, the limitations of the indices currently in use are well recognised.

Exhibit 10: Do you intend to review the indices that you are currently using?



We also asked whether respondents found the EDHEC study convincing. Out of 84 responses, 63.10% chose "Yes", followed by 26.19% who chose not to respond. Only 10.71% of respondents thought the study was not convincing. Finally, 19 respondents gave other comments overall, in which 68.42% were positive comments for this study and 31.58% raised other or opposite opinions. Among the positive comments, 47.37% thought that this study was professional and well researched and that such studies should be continued; another 21.05% of respondents also want to share their own research with EDHEC. 21.05%, on the contrary, insisted that cap-weighted indices are nearly perfect and reflective of market conditions.

Exhibit 11: Do you think that EDHEC's study was convincing?



3. Conclusion



3. Conclusion

To conclude, we take the high number of responses to our call for reactions as an indication that the EDHEC study was well received and that its topic was pertinent. We also see that the inefficiency and lack of stability of cap-weighted indices are well recognised and though a few respondents insisted that the cap-weighted indices are useful as they are and need not be improved, most asset managers and pension funds are adopting benchmarks other than cap-weighted indices. Overall, the replies to our call for reactions—with both praise and criticism of the study—along with the high participation, make for a strong incentive to pursue further research into this timely topic.

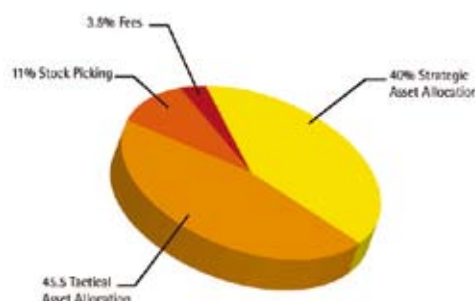
About the EDHEC Risk and Asset Management Research Centre

EDHEC is one of the top five business schools in France. It was ranked 7th in the Financial Times Masters in Management Rankings 2006. Its reputation is built on the high quality of its faculty (104 professors and researchers from France and abroad) and the privileged relationship with professionals that the school has been developing 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 is one of the few business schools in Europe to have received the triple crown of international accreditation: AACSB (US-Global), EQUIS (Europe-Global) and AMBA (UK-Global). EDHEC pursues an active research policy in the field of finance. Its "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.

The choice of asset allocation

The EDHEC Risk and Asset Management Research Centre structures all of its research work around asset allocation. This issue corresponds to a genuine expectation from the market. On the one hand, the prevailing stock market situation in recent years has shown the limitations of active management based solely on stock picking as a source of performance. On the other, the appearance of new asset classes (hedge funds, private equity), with risk profiles that are very different from those of the traditional investment universe, constitutes a new opportunity in both conceptual and operational terms. This strategic choice is applied to all of the centre's research programmes, whether they involve proposing new methods of strategic allocation, which integrate the alternative class; measuring the performance of funds while taking the tactical allocation dimension of the alphas into account; taking extreme risks into account in the allocation; or studying the usefulness of derivatives in constructing the portfolio.

Percentage of variation between funds



Source: EDHEC (2002) and Ibbotson, Kaplan (2000)

An applied research approach

In a desire to ensure that the research it carries out is truly applicable in practice, EDHEC has implemented a dual validation system for the work of the EDHEC Risk and Asset Management Research Centre. All research work must be part of a research programme, the relevance and goals of which have been validated from both an academic and a business viewpoint by the centre's advisory board, which is made up of both internationally recognised researchers and the centre's business partners.

To date, the centre has implemented six research programmes:

- Multi-style/multi-class allocation
- Performance and style analysis
- Indices and benchmarking
- Best execution and operational performance
- Asset allocation and derivative instruments
- ALM and asset management

Research for business

To optimise exchanges between the academic and business worlds, the research centre maintains a website devoted to asset management research for the industry (www.edhec-risk.com), circulates a monthly newsletter to over 100,000 practitioners, conducts regular industry surveys and consultations, and organises annual conferences for the benefit of institutional investors and asset managers. The centre's activities have also given rise to the business offshoots EDHEC Investment Research, which

About the EDHEC Risk and Asset Management Research Centre

supports institutional investors and asset managers in the implementation of the centre's research results and proposes asset allocation services in the context of a 'core-satellite' approach encompassing alternative investments, and EDHEC Asset Management Education, which helps investment professionals to upgrade their skills with advanced risk and asset management training across traditional and alternative asset classes.

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