

Scientific Diversification in Practice: Reactions to EDHEC-Risk Efficient Indices

January 2011



EDHEC-RISK
Indices & Benchmarks



Table of Contents

1. Introduction	5
2. The Rationale for Efficient Indexation.....	7
3. A Broad Swathe of Industry Respondents	11
4. Usefulness of Efficient Indices	13
5. Index Transparency.....	17
6. "Still an Index?" Acceptance of a Quantitative Weighting Scheme As a Replacement for Simple Cap-Weighted Indices?	21
7. Conclusion	23
References	25
About EDHEC-Risk Indices & Benchmarks	27
EDHEC-Risk Indices & Benchmarks Publications	31

About the Authors



Felix Goltz is head of applied research at EDHEC-Risk Institute and director of research & development at EDHEC-Risk Indices & Benchmarks. He does research in empirical finance and asset allocation, with a focus on alternative investments and indexing strategies. His work has appeared in various international academic and practitioner journals and handbooks. He obtained a PhD in finance from the University of Nice Sophia-Antipolis after studying economics and business administration at the University of Bayreuth and EDHEC Business School.



Lin Tang is a research analyst at EDHEC-Risk Institute. She has a master's in risk and asset management from EDHEC Business School. Lin worked as a product engineer for one year after receiving her bachelor's in engineering, with first-class honours, from Nanyang Technological University in Singapore.

1. Introduction



1. Introduction

Capitalisation weighting in equity index construction has come in for harsh criticism of late. Our research into efficient indexation returns to the roots of modern portfolio theory to provide an alternative to current methods of constructing equity indices. In 2010, as it happens, EDHEC-Risk Institute launched a set of efficient equity indices as an alternative to cap-weighted indices. The aim of these indices is to be more risk/reward efficient than cap-weighted indices (see Amenc *et al.* 2010 for a description of the method). The constituent weights in the index are obtained from a formal Sharpe ratio maximisation, thus taking into account expected returns, volatilities, and the correlation of constituent stocks. The index series is based on all constituent securities in the FTSE All-World Index Series. The recent launch of a worldwide index series using the efficient weighting includes indices on the main countries (US, Japan, UK) and regions (Europe, Asia Pacific, etc.); it also includes worldwide indices (All World, Emerging Markets, etc). To assess industry views of this initiative, we surveyed asset managers and investors. This document begins with an overview of efficient indexation and then outlines the reactions received from survey respondents.

2. The Rationale for Efficient Indexation



2. The Rationale for Efficient Indexation

Indices have played an important role in performance measurement and in decision making. Criticism of market-cap-weighted indices has fuelled the pursuit of more representative weighting schemes. For a rational investor, the goal is to hold a portfolio that achieves the highest risk-adjusted performance. In the end, one should then focus on designing a portfolio with the highest reward-to-risk ratio, that is, with the highest Sharpe ratio (tangency portfolio). Following Markowitz (1952), Tobin (1958) suggested that any investor can separate his investment decisions into two phases. First, find the portfolio that provides the highest reward per unit of risk, *i.e.*, the highest Sharpe ratio and then use an investment in the risk-free asset to obtain an overall portfolio that corresponds to the investor's risk aversion.

The idea behind efficient indices is to obtain an investable proxy for this maximum Sharpe ratio portfolio. Although there are several alternative weighting schemes for equity indexation, efficient indexation is the only approach that focuses explicitly on obtaining an investable proxy for the maximum Sharpe ratio portfolio. Other approaches to non-cap-weighted indices may improve the Sharpe ratio of cap-weighted indices as a by-product rather than as a direct consequence of an objective that they have set for themselves. The advantage of focusing explicitly on maximising the Sharpe ratio is that doing so also makes explicit the assumptions under which efficient indexation will lead to optimal portfolios. Other alternative weighting schemes do not set out to maximise the Sharpe ratio, but under often very restrictive assumptions about the risk and return properties of constituents they often coincide with Sharpe ratio maximisation. Rather than

relying on implicit assumptions, efficient indexation relies on explicit assumptions whose reasonableness investors can judge for themselves.

To generate the proxy for the maximum Sharpe ratio portfolio, efficient indexation resorts to standard mean-variance optimisation. Extending the preliminary tests reported in Martellini (2008), we generate proxies for tangency portfolios that rely on robust input parameters for both the covariance matrix and expected returns.

One of the major challenges is to estimate the expected return parameters. Instead of relying on past realised returns, known to generate poor expected return estimates, we use common sense, which relies on a risk/reward trade-off to estimate the expected returns. We use the insight that the return on a given stock in excess of the risk-free rate is proportional to the riskiness of the stock. Since investors are often under-diversified they are concerned about both systematic and specific risk. They are equally likely to be concerned about higher-order moments and downside risk, so we use the semi-deviation of a constituent to sort stocks into high-risk and low-risk categories. High-risk stocks will then be attributed high expected return estimates and low-risk stocks low expected return estimates. This highly parsimonious approach relies not on a model but on the insight that there should be a trade-off between avoiding stocks with high risk and seeking stocks with high expected returns.

Another challenge is to estimate the covariance of stock returns. The key problem in covariance matrix estimation is the curse

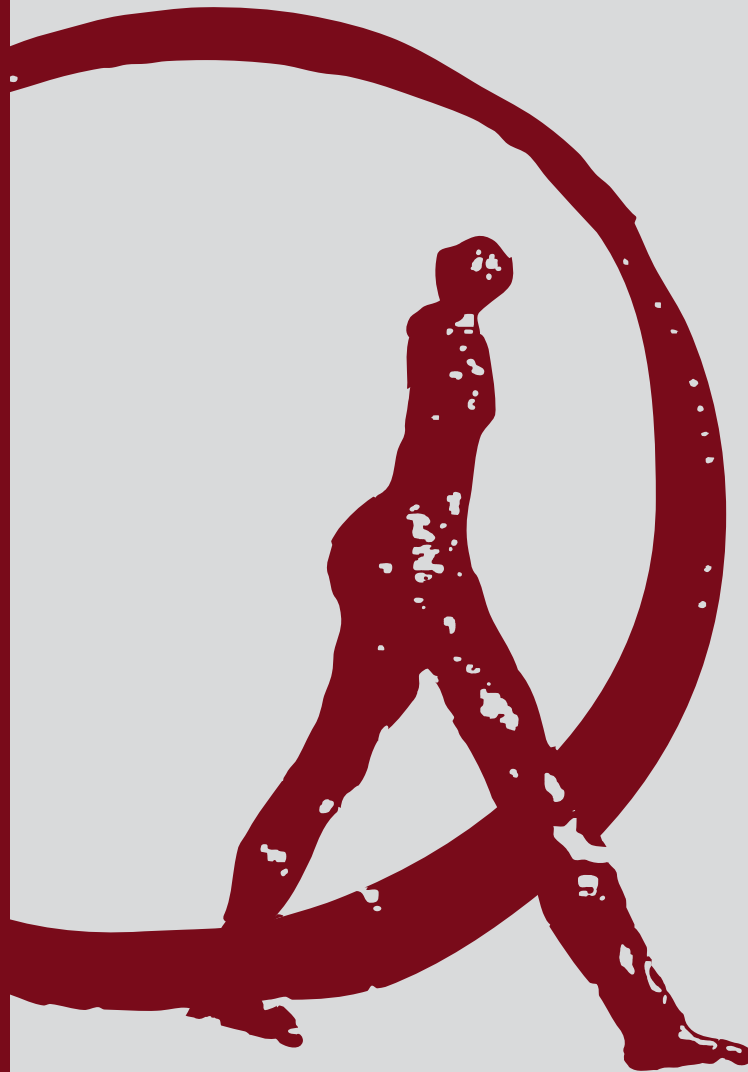
2. The Rationale for Efficient Indexation

of dimensionality; when a large number of stocks is considered, the number of parameters to estimate grows exponentially. Factor models make it possible to reduce dimensionality for a more robust estimate of the covariance matrix. We rely on principal component analysis (PCA) to determine the underlying implicit risk factors from the data. The number of parameters to estimate can thus be greatly reduced.

Once expected returns and the covariance of stock returns are appropriately estimated, the efficient indexation method makes it possible to construct proxies for the maximum Sharpe ratio portfolio, whose risk/reward ratio is significantly better than those of cap-weighted indices. Empirically, it has been shown that efficient indices obtain both higher average returns and lower volatility than cap-weighted indices. This improved risk/reward trade-off does not come at the cost of extreme risks, and it holds throughout the business cycles and when implied volatility changes (Amenc *et al.* 2010).

2. The Rationale for Efficient Indexation

3. A Broad Swathe of Industry Respondents



3. A Broad Swathe of Industry Respondents

For feedback from industry on EDHEC-Risk's efficient indexation initiative, we issued a call for reaction containing four multiple-choice questions. This questionnaire was sent to global asset management firms, pension funds, insurance companies, and consulting companies. The survey period is from 8 June to 21 September 2010; we received forty-nine responses.

Forty-six percent of respondents to the survey (see exhibit 1) are asset and wealth managers, 26% are asset owners (pension funds and insurance companies), 13% are banks, and 9% are consulting firms. The remaining 6% of respondents are from regulators/public bodies and other types of investors. Most respondents are from different parts of Europe (74%), followed by 13% from Asia Pacific and 11% from the Americas (see exhibit 2).

be more familiar with alternative equity indexing methods in general and with efficient indices in particular. However, the call for reaction does allow us to get feedback from a broad swathe of those in the industry and thus provides insight into the general reception of our initiative by those who are aware of it.

Exhibit 1: Respondent activities

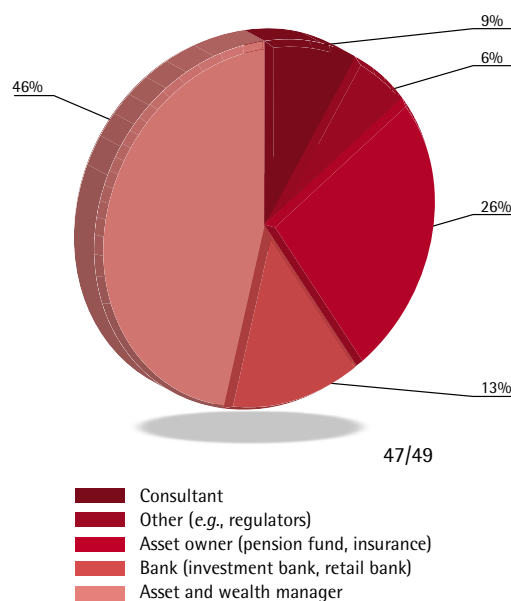
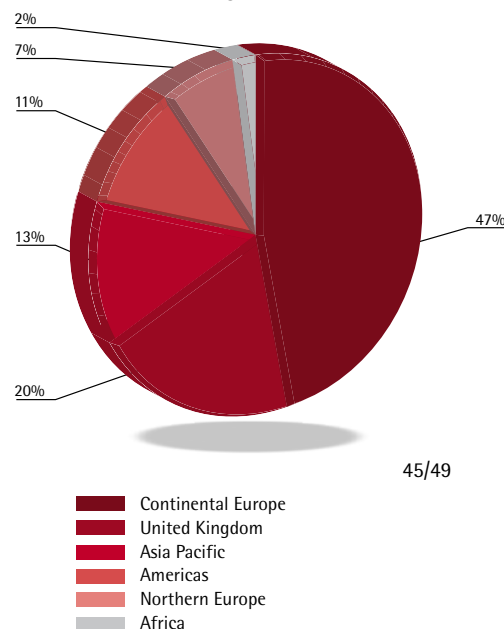


Exhibit 2: Breakdown by region



It is not our intention to argue that the practitioners who responded to our questionnaire are representative of the investment community at large. The respondents to our call for reaction will

4. Usefulness of Efficient Indices



4. Usefulness of Efficient Indices

The questionnaire first asks the respondents to state whether they believe this efficient indexation initiative is of interest to practitioners. Our motivation for this question was shed light on the importance practitioners accord our new index method. As the responses show (exhibit 3), the initiative is, on the whole, deemed important. Slightly more than 71% of respondents consider the initiative important to them; nearly half consider it very important or crucial. Another 24.5% deem the initiative useful but not of great importance. No one, we are happy to report, considers it entirely useless.

Although the results in exhibit 3 show that efficient indexation is, on the whole, considered an important initiative, it is also interesting to see how practitioners see the role of efficient indices in their portfolios. Would they be combined with other alternatively weighted indices, with cap-weighted indices, or are they seen as a standalone index that would replace other indices?

As shown in exhibit 4, 75.5% of investors indicate that the efficient indices could complement other alternative indices such as fundamentally weighted indices. The intuition behind this preference for combining weighting schemes is probably that alternative weighting schemes use very different sets of information. Investors seem to prefer not to rely on a single alternative but to combine several alternatives and, in a sense, "diversify", by relying on weighting schemes that use either accounting-based or risk-based information. More generally,

given the central importance of the choice of index, they sense that it may be in their interest to diversify across index methods.

Another 10.2% of respondents note that efficient indices would be used only in combination with cap-weighted indices. These respondents would choose efficient indices to improve the Sharpe ratios of their equity portfolios. Combining the efficient index and a cap-weighted index would in fact reduce the error with which the overall portfolio tracks the cap-weighted index. Such an approach could be explained by constraints that respondents face when they move away from cap-weighted indices in their investments without changing the cap-weighted policy benchmark their performance is measured against. As the error with which efficient indices track cap-weighted indices is on the order of 5%, combining efficient indices and cap-weighted indices would make it possible, depending on the relative weights of both components, to obtain even lower tracking error. Very few respondents (4.1%) mention other reasons—that investors should choose between different types of indices depending on market conditions, for example—to use efficient indices only in combination with cap-weighted indices. In addition, 8.2% of respondents believe that efficient indices could not be used in combination with other alternative weighting schemes. This view is perhaps most consistent with modern portfolio theory, for which there is only one maximum Sharpe ratio portfolio. As the theoretical motivation for efficient indices is to construct proxies

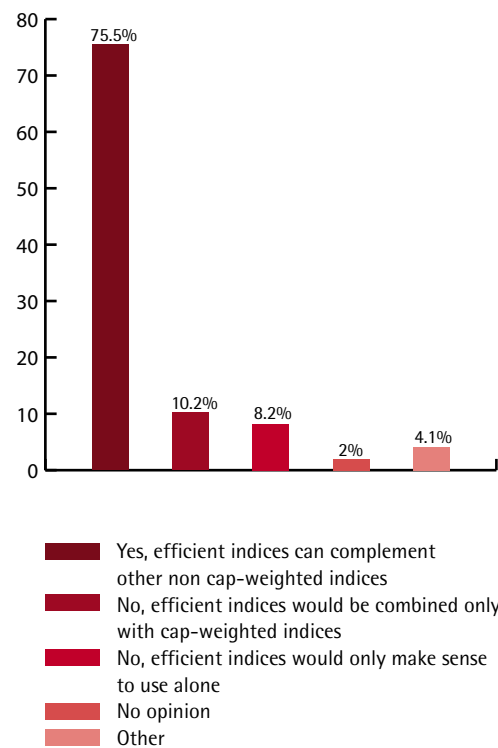
Exhibit 3: Is this initiative by EDHEC-Risk Institute of interest to you?

Crucial	Very important	Important	Useful but not very important	Not necessarily useful	No use at all
8.2%	36.7%	26.5%	24.5%	4.1%	0.0%

4. Usefulness of Efficient Indices

for this maximum Sharpe ratio portfolio, using them in combination with other portfolios is redundant. Given practical considerations, however, efficient indices are perceived instead as one component that would improve overall efficiency.

Exhibit 4: Do you think that efficient indices can be a complement to other alternative weighting schemes?



4. Usefulness of Efficient Indices

5. Index Transparency



5. Index Transparency

One of the major attractions of equity indexing is the transparency such indices provide. This transparency enables investors to fully understand the mechanism of a chosen investment and it enables asset managers to replicate the returns of such indices reliably.

Many index providers, then, publish not only the returns data for their indices but also the detailed rules used to select constituents, attribute weights, incorporate corporate actions, and conduct periodic rebalancing or reconstitution. Index providers also provide the list of constituents of their index and the corresponding weights, though this information is sometimes inaccessible without a paid subscription. For the efficient indices, EDHEC-Risk strives to maintain transparency by providing detailed ground rules on the estimation of risk/return parameters, the optimisation procedure, and the incorporation of weight and turnover constraints. In addition, the efficient indices are backed by finance and economics concepts that draw on fifty years of portfolio theory and have been outlined in an academic paper (Amenc *et al.* 2010) providing the basis for the index method. The returns data and the index weights for the long-term data on the efficient indexation method are also freely available.

We seek practitioners' views on the transparency of several aspects of efficient indices (see exhibit 5a and 5b). A score from -1 to 3 is assigned for each response. Zero is a non-response, -1 is "insufficient transparency" and 3 is "exemplary transparency". The average score for each aspect is shown in the second row of exhibit 5a. To all appearances, sufficient transparency is achieved in all areas.

A glance at exhibit 5a shows that investment professionals are more concerned with the transparency of the method than with simple transparency of index weights. In fact, the availability of an academic research paper describing the method contributes much more to a perception of transparency than does the availability of index weights. This finding underscores the notion that having the index method backed by concepts is more important than making available a set of weights. The publication of the conceptual underpinnings also leads to a more positive view of the transparency of an index than does the availability of a fifty-year track record; in short, when it comes to transparency, concepts seem to matter to respondents more than numbers alone.

Exhibit 5a: Do you think the efficient indices provide sufficient transparency under the following aspects?

This table excludes four respondents who did not answer any of the questions. The score is assigned for each answer. Zero is "non-response", -1 is "insufficient transparency"; 1 is "sufficient transparency"; 2 is "highly sufficient transparency"; 3 is "exemplary transparency". The average score for each option is shown in the table. AO refers to asset owners and AWM to asset/wealth managers.

	Publication of detailed ground rules fully describing the concept and implementation details	Publication of an academic paper fully describing the conceptual background	Publication of fifty-year track record for US long-term data	Availability of data on index weights	Explanation of a complex method in understandable terms
Score	1.22	1.51	1.42	1.20	1.31
% positive judgement	86.7%	91.1%	80.0%	73.3%	84.4%
% negative judgement	13.3%	8.9%	20.0%	26.7%	15.6%

5. Index Transparency

We also compute the average score for third-party asset managers and other respondents. We are interested in any differences from one group of respondents to another, as third-party asset and wealth managers are sometimes believed to prefer cap-weighted indices, even if they consider them inefficient, simply because it may be easier to outperform such inefficient benchmarks. Such a preference for simple cap-weighted indices may be reflected in their views of index transparency. Exhibit 5b shows the average score of the two groups. As it happens, other respondents have generally more favourable views of the transparency of efficient indices than do third-party asset managers, though few of the differences are statistically significant (see notes 1 and 2).

A major difference between a weighting scheme that focuses on diversification and more *ad hoc* weighting schemes is that the focus on diversification introduces a layer of complexity. If one wants to find optimal portfolio weights, one relies on portfolio optimisation procedures and on a set of

input parameters that must be estimated using statistical techniques. As long as these procedures and techniques are described in detail (such as in the academic paper and in the ground rules for the efficient indices), they do not detract from transparency. All the same, methodological complexity may create, at the very least, the appearance of opacity. Exhibit 6a shows responses to the question about whether the use of optimisation and parameter estimation allow sufficient transparency.

On the whole, scores are near one, so the results suggest that even the use of such rather complex techniques makes it possible to maintain sufficient transparency. At the same time, the estimation of risk and return parameters is connected to the lowest transparency score, underscoring the importance of explanations of the ways optimisation input is obtained. These findings likewise underscore the importance of making public, as the ground rules for the EDHEC-Risk Efficient Indices do, all details on input estimation.

1 - The difference between third-party asset managers and others is statistically significant at the 10% level.
2 - The difference between third-party asset managers and others is statistically significant at the 10% level.

Exhibit 5b: Comparison of the views of third-party asset managers and others

	Publication of detailed ground rules fully describing the concept and implementation details	Publication of an academic paper fully describing the conceptual background	Publication of fifty-year track record for US long-term data	Availability of data on index weights ¹	Explanation of a complex method in understandable terms ²
Score third-party asset managers	1.11	1.42	1.16	0.79	0.89
Score others	1.31	1.58	1.62	1.50	1.62

Exhibit 6a: Do you think the efficient indices provide sufficient transparency under the following aspects?

This table excludes four respondents who did not answer any of the questions. The score is assigned for each answer. Zero is "non-response"; -1 is "insufficient transparency"; 1 is "sufficient transparency"; 2 is "highly sufficient transparency"; 3 is "exemplary transparency". The average score for each option is shown in the table. AO refers to asset owners and AWM to asset wealth managers.

	Use of advanced statistical methods to estimate risk and return	Use of quantitative portfolio optimisation
Average score	0.87	1.13
% positive judgement	75.6%	84.4%
% negative judgement	24.4%	15.6%

5. Index Transparency

Exhibit 6b shows that third-party asset owners have less positive views of the transparency that can be achieved with parameter estimation and portfolio optimisation than do asset owners and other respondents.

Exhibit 6b: Comparison of the views of third-party asset managers and others

	Use of advanced statistical methods to estimate risk and return	Use of quantitative portfolio optimisation
Score third-party asset managers	0.63	0.89
Score others	1.04	1.31

6. "Still an Index?" Acceptance of a Quantitative Weighting Scheme As a Replacement for Simple Cap-Weighted Indices?



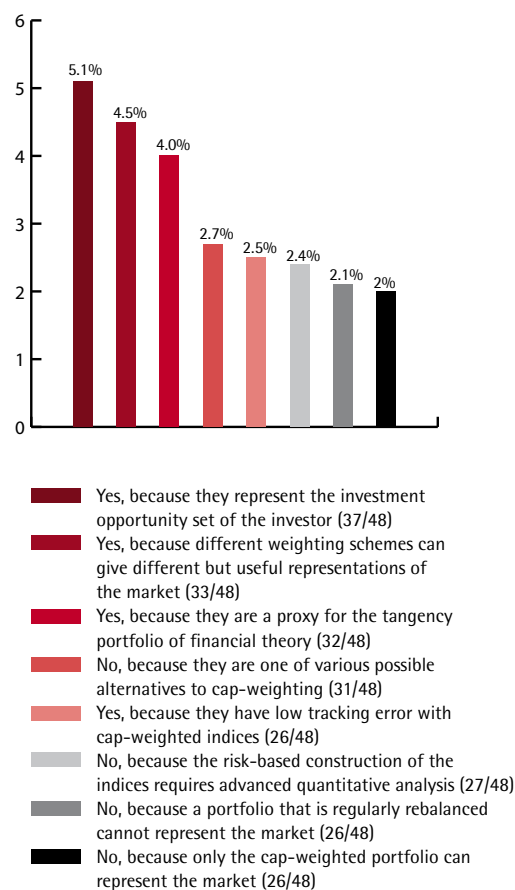
6. "Still an Index?" Acceptance of a Quantitative Weighting Scheme As a Replacement for Simple Cap-Weighted Indices?

The objective of a weighting scheme that focuses on portfolio diversification is to provide a proxy for the equity risk premium if it is extracted efficiently. In this respect, efficient indices can indeed be understood as market indices, but the finance industry is so used to the default market-cap-weighted indices that any deviation from capitalisation weighting is sometimes seen as a deviation from indexation. For an idea of whether respondents see efficient indices as market indices or whether they believe only cap-weighting can represent the market, we asked respondents for their views of efficient indices as representative market indices.

Respondents were asked to express the extent to which they agree with several statements. A score from eight (rank one, or greatest degree of agreement) to one (rank eight) was then given to each rank; a zero was assigned for any non-response. The average score, which indicates agreement with each statement, was computed and plotted in the following figure (see exhibit 7; the number after the statement shows the number of respondents who express a degree of agreement). On the whole, the results show that efficient indices are considered representative market indices. The greatest agreement is with the notion that efficient indices represent the investment opportunity set of an investor seeking risk/reward efficiency. Practitioners also agree that different weighting schemes could be useful representations of the market and that efficient indices are a proxy for the tangency portfolio. The strongest argument against qualifying them as indices is that efficient indices are only one of several alternative weighting schemes. This finding corresponds to a restrictive view of some respondents, who believe that there can

be only one possible weighting scheme, which would have to be applied to all assets. Such a view also conflicts directly with the perception, shown in exhibit 4, that efficient indices would be more of a complement to other alternative weighting schemes or to cap-weighted indices than a standalone investment.

Exhibit 7: Can efficient indices be representative equity indices?



7. Conclusion



7. Conclusion

On the whole, responses show that EDHEC-Risk's efficient indexation initiative is regarded as a relevant one by the practitioner community. Views of the role of efficient indices, which are seen more as a complement to other forms of indexation than as a substitute, are interesting. In general, respondents express favourable views of the transparency of these indices and of their justification as indices rather than as active portfolio strategies. In terms of index transparency, respondents accord great importance to having the method of computing index weights backed by economic concepts and rather less importance to descriptive information on index weights. As it happens, one advantage of a publicly available and detailed method is that the conceptual groundings and the assumptions behind a weighting method are made transparent. As a result of our initiative, investors move away from accepting implicit assumptions and begin to assess properly the conceptual underpinnings of indexation approaches.

References



References

- Amenc, N., F. Goltz, L. Martellini, and P. Retkowsky. 2010. Efficient indexation: An alternative to cap-weighted indices. EDHEC publication.
- Markowitz, H. 1952. Portfolio selection. *Journal of Finance* 7 (1): 77-91.
- Martellini, L. 2008. Towards the design of better equity benchmarks: Rehabilitating the tangency portfolio from modern portfolio theory. *Journal of Portfolio Management* 34 (4): 34-41.
- Tobin, J. 1958. Liquidity preference as behavior towards risk. *Review of Economic Studies* 67:65-86.

About EDHEC-Risk Indices & Benchmarks



About EDHEC-Risk Indices & Benchmarks

Founded in 1906, EDHEC is one of the foremost European business schools. Accredited by the three main international academic organisations, EQUIS, AACSB, and Association of MBAs, EDHEC has for a number of years been pursuing a strategy for international excellence that led it to set up EDHEC-Risk Institute in 2001.

With 64 professors, research engineers, and research associates, this centre has the largest asset management research team in Europe.

While EDHEC-Risk Institute makes important public contributions to the advancement of applied financial research and the improvement of industry practices, it also employs its expertise to conduct proprietary research for clients and develop new products with business partners. The insights drawn from EDHEC-Risk's "Indices & Benchmarking", "ALM and Asset Management" and "Derivatives and Asset Management" research programmes over the past several years have led to a series of products that provide more efficient or more academic-based solutions to investors' needs than the indices and benchmarks currently available on the market. In order to clearly identify this type of activity and distinguish it

from the fundamental research activities, EDHEC-Risk Institute created a spin-off in 2010, EDHEC-Risk Indices & Benchmarks, which aims to be one of the leading beta designers for the investment industry.

FTSE EDHEC-Risk Efficient Index Series

FTSE Group, the award winning global index provider, and EDHEC-Risk Institute launched the first set of FTSE EDHEC-Risk Efficient Indices at the beginning of 2010. Offered for a full global range, including All World, All World ex US, All World ex UK, Developed, Emerging, USA, UK, Eurobloc, Developed Europe, Developed Europe ex UK, Japan, Developed Asia Pacific ex Japan, Asia Pacific, Asia Pacific ex Japan, and Japan, the index series aims to capture equity market returns with an improved risk/reward efficiency compared to cap-weighted indices.

The weighting of the portfolio of constituents achieves the highest possible return-to-risk efficiency by maximising the Sharpe ratio (the reward of an investment per unit of risk). In order to maximise the Sharpe ratio, the methodology seeks to reliably estimate two essential inputs

Long-Term Robust Outperformance: Risk and Return

Index	Ann. average return (compounded)	Ann. standard deviation	Sharpe Ratio (compounded)	Information ratio	Tracking error
Efficient index	11.63%	14.65%	0.41	0.52	4.65%
Cap-weighted	9.23%	15.20%	0.24	0.00	0.00%
Difference (efficient minus cap-weighted)	2.40%	-0.55%	0.17	-	-
p-value for difference	0.14%	6.04%	0.04%	-	-

The table shows risk and return statistics portfolios constructed with the same set of constituents as the cap-weighted index. Rebalancing is quarterly subject to an optimal control of portfolio turnover (by setting the reoptimisation threshold to 50%). Portfolios are constructed by maximising the Sharpe ratio given an expected return estimate and a covariance estimate. The expected return estimate is set to the median total risk of stocks in the same decile when sorting by total risk. The covariance matrix is estimated using an implicit factor model for stock returns. Weight constraints are set so that each stock's weight is between $1/2N$ and $2/N$, where N is the number of index constituents. P-values for differences are computed using the paired t-test for the average, the F-test for volatility, and a Jobson-Korkie test for the Sharpe ratio. The results are based on weekly return data from 01/1959 to 12/2008.

About EDHEC-Risk Indices & Benchmarks

needed for portfolio optimisation: the expected returns of each stock which are calculated indirectly by the riskiness of each stock; and the covariance matrix of returns for all stocks which is calculated using statistical factor models that describe the co-movement of stock prices through their exposure to common risk factors.

These indices provide investors with an enhanced risk-adjusted strategy in comparison to cap-weighted indices, which have been the subject of numerous critiques, both theoretical and practical, over the last few years. The index series is based on all constituent securities in the FTSE All-World Index Series. Constituents are weighted in accordance with EDHEC-Risk's portfolio optimisation, reflecting their ability to maximise the reward-to-risk ratio for a broad market index. The index series is rebalanced quarterly at the same time as the review of the underlying FTSE All-World Index Series. The performances of the EDHEC-Risk Efficient Indices are published monthly on www.edhec-risk.com.

www.edhec-risk.com/indexes/efficient

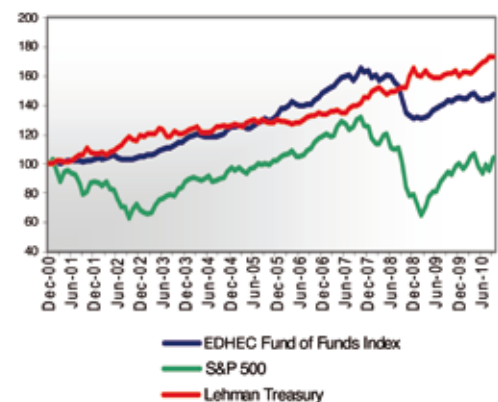
EDHEC-Risk Alternative Indices

The different hedge fund indexes available on the market are computed from different data, according to diverse fund selection criteria and index construction methods; they unsurprisingly tell very different stories. Challenged by this heterogeneity, investors cannot rely on competing hedge fund indexes to obtain a "true and fair" view of performance and are at a loss when selecting benchmarks. To address this issue, EDHEC-Risk was the first to launch composite hedge fund strategy indexes as early as 2003.

Using factor analysis techniques, the EDHEC Alternative Indexes are built as the best one dimensional summaries of the information conveyed by competing indexes for a given style. The EDHEC composites are thus able to capture a very large fraction of the information contained in the competing indexes while implicitly minimising their various biases. Consequently, the EDHEC Alternative Indexes tend to be very stable over time and thus are easily replicable.

The 13 EDHEC Alternative Indexes are published monthly on www.edhec-risk.com and are freely available to managers and investors.

www.edhec-risk.com/indexes/pure_style



The EDHEC IEIF Commercial Property (France) Index

Institutional investors allocate considerable shares of their portfolios to real estate, primarily in anticipation of diversification benefits. Institutional investors would like to use index-based products for this purpose; however, real estate indexing has proven challenging. It has been challenging largely because real estate features such characteristics—rarely found in other asset classes—as high unit values and indivisibility, limited

About EDHEC-Risk Indices & Benchmarks

liquidity, great heterogeneity; active property management is also required. As a consequence, existing indices based on direct or indirect investment have several drawbacks. Indices based on direct investment are generally not investable and rely on subjective appraisals, so they show smoothed and lagged returns and the transparency of their components is wanting. Indirect investment indices usually rely on listed real estate investment vehicles and consequently have great exposure to equity market risk.

The EDHEC IEIF Commercial Property (France) Index addresses these issues by using unlisted property funds under the French SCPI scheme as the index underlying, given a certain liquidity threshold. The index has very attractive diversification properties and is representative of the real estate market; at the same time it is fully transparent and investable and has little exposure to financial market risk. These characteristics make the EDHEC IEIF Commercial Property (France) Index an interesting underlying for index-based products that could satisfy the demands of institutional investors.

www.edhec-risk.com/indexes/property

EDHEC-Risk Indices & Benchmarks Publications



EDHEC-Risk Indices & Benchmarks Publications

2010

- Amenc, N., F. Goltz, and L. Martellini. Improved beta? A comparison of index-weighting schemes (September).
- Amenc, N., F. Goltz, and P. Retkowsky. Efficient indexation: An alternative to cap-weighted indices (January).
- Goltz, F., and V. Le Sourd. Does finance theory make the case for capitalisation-weighted indexing? (January).

For more information, please contact:
Séverine Anjubault on +33 493 187 863
or by e-mail to: severine.anjubault@edhec-risk.com

EDHEC-Risk Indices & Benchmarks
393 promenade des Anglais - BP 3116
06202 Nice Cedex 3 - France

EDHEC Risk Indices & Benchmarks—Europe
10 Fleet Place - Ludgate
London EC4M 7RB - United Kingdom

EDHEC Risk Indices & Benchmarks—Asia
1 George Street - #07-02
Singapore 049145

EDHEC Risk Indices & Benchmarks—North America
1230 Avenue of the Americas - 7th Floor
New York, NY 10020 USA

www.edhec-risk.com/indexes