SelectAlts
Wisely Managed Absolute Return Portfolios

HEDGE FUND BENCHMARK INDEXES

Uses of Hedge Fund Benchmark Indexes

Investors have two primary uses for any benchmark index:

- *To evaluate the historical attractiveness of a broad category of investment* (such as an asset class)
- *To evaluate the comparative performance of a particular investment within the broad category*

Most benchmark indexes measure the returns of asset classes, such as U.S. large cap stocks (often using the S&P 500 Index) or U.S. investment-grade bonds (often using the Barclays US Aggregate Bond Index). Analyzing the historical returns and risks of these representative indexes may provide some clues about future risks and returns. The qualities of a good benchmark index include:

- *Representativeness*. A benchmark index should closely mimic the return, risk, and other characteristics of the complete category it is intended to represent. Usually representativeness is increased by including more of the assets in the category, a concept known as "completeness."
- *Investability*. A benchmark index should be able to provide the basis for a passive investment option such as a mutual fund or ETF. This means that its constituents and weights must be known before returns are measured, and returns must be objective and verifiable.

Most hedge fund indexes fail on both counts:

- *Representativeness:* No hedge fund index even comes close to being complete. Hedge funds themselves select the databases to which they will submit their performance. The overlap in coverage among databases is surprisingly low. Some hedge funds do not share their performance with any database.
- *Investability:* Although some investable versions of hedge fund indexes have been developed in recent years, few passively managed hedge fund vehicles are available to investors, and none are accessible for retail U.S. investors. Also, investable hedge fund indexes by their nature must be selective regarding the funds they include, introducing a possible source of bias that may inhibit representativeness.

It is important to note that hedge funds are not an asset class any more than mutual funds are an asset class. Like mutual funds, hedge funds are a collective ownership structure. (Critics call them more of a compensation structure for hedge fund managers.) Unlike mutual funds that

must comply with a rather complicated and expensive set of legal requirements intended to protect the investing public, hedge funds are private vehicles (usually limited partnerships or limited liability companies) that offer managers:

- Virtually unlimited investment flexibility, including the aggressive use of leverage and shorting
- Lower operating costs due to less expensive governance, reporting, and compliance
- Enhanced compensation through a flexible fee schedule that usually includes a performance-based incentive fee

Stocks, bonds, commodities, and currencies are all examples of asset classes. To describe hedge funds as "a $3 trillion asset class" poses two problems:

- *Double counting*, since the assets in which hedge funds invest are themselves the genuine asset classes
- *Non-homogeneity*, since the strategies used by different types of hedge funds are vastly different, resulting in vastly different risk and return characteristics

Yet, many people think of hedge funds as one representation of the broad category of "alternative investments." Alternative investments are usually thought of as investments other than long-only stocks, bonds, and cash, and are normally expected to diversify these traditional investments and thereby lower overall portfolio volatility.

Consequently, many investors have sought a single overarching index that they can use to represent this broad category of investment, as heterogeneous as it may be. *The purpose of this paper is to provide some guidance to investors in their use of hedge fund indexes.*

Performance Bias in Hedge Fund Databases

Academics have often been critical of the quality of hedge fund databases, and rightly so. Particularly in the early days of the 1990s, not all hedge fund databases were careful about keeping careful records that would allow researchers to control for two very important *biases*:

- *Survivorship bias*. If an index includes only the current ("surviving") members of a database in its historical index returns, the result can be a large upward bias.
- *Backfill bias*. Also called "instant history bias," this bias arises when a database updates its index return history to include a hedge fund's previous return history after it begins supplying return data to the database.

Most of the major hedge fund databases seem to have "gotten religion" since the early 2000s, and have since that time included non-survivors and excluded back-filled performance, or at least they claim to have done so. However, because hedge fund databases of necessity rely upon the cooperation of hedge funds to voluntarily report their performance, several potential performance biases remain:

- *Self-reporting bias.* Mistakes are made by reporting hedge funds. When they are intentional, it is called "fraud." Sometimes mistakes are honest but due to sloppiness or inexperience.

- *Smoothing bias.* Many hedge funds invest in illiquid assets that may not be objectively priced every day. Most studies indicate that illiquid assets are "marked to market" in ways that are slow to reflect reality, resulting in lower volatility and potentially higher returns than would be the case with market-based pricing.
- *Self-selection bias.* Only a minority of hedge funds will report to any given database. Some hedge funds do not report to any database. Funds that do not report may have higher than average returns if their reason for not reporting is that their strong performance has attracted sufficient assets, or lower returns if their performance is so poor that reporting to databases will not attract assets.
- *De-listing bias.* Most hedge funds will stop reporting to some, or all, databases, at some point, either because they have closed to new investment or because they believe it will not help them attract assets. The evidence indicates that most stop reporting due to poor performance.

De-listing bias may be the most significant of these biases. A recent article in *The Journal of Alternative Investments* (2014) estimates that de-listing bias inflates returns by 35 to 100 basis points per year, and tends to be higher when overall performance is worst (1998, 2001, and 2008). Authors Jorion and Schwarz obtained their data by cross-referencing three different hedge fund databases to get returns for hedge funds that de-listed in at least one of the three. The problem, of course, is that the *worst* performing funds may often opt to de-list in *all* databases at the same time. Thus, the authors admit that their estimate provides only a lower bound for the de-listing bias.

Another paper by Aiken, Clifford and Ellis (ACE, 2012) measures the de-listing bias by estimating the returns of a large number of *non-reporting* hedge funds using data from registered funds-of-funds, which since 2004 have been required to list the hedge funds in which they invest and the amounts invested. Of the roughly 1500 quarterly hedge fund returns thus obtained during the 2004-2009 time period of the study, nearly *half* had not reported to *any* of the five major hedge fund databases they aggregated for their study (Lipper Tass, HFR, BarclayHedge, Morningstar, and EurekaHedge). To test for alpha, the authors used the Fung and Hsieh (2004) 7-factor model to control for risks normally associated with hedge funds, including option-like payoffs. With the sample limited to *reporting* funds (those appearing in hedge fund databases), they found an average alpha (regression intercept) of 120 bps/quarter, or 4.80% per year. Adding the *non-reporting* funds to the sample in a regression that included a variable to cleanly separate the reporting from the non-reporting funds, they found that reporting funds had an average alpha of 133 bps/quarter (t-statistic = 6.09), or 5.32% per year, and the non-reporting funds have an average alpha that was not statistically different from zero.

Non-reporting funds included both those that had *never* reported to a database as well as those that *stopped* reporting at some point (*de-listed*). Contrary to popular perception, funds that never reported to a database had slightly *lower* returns than those that did, but the majority of the underperformance of non-reporting funds was for those that de-listed. The authors found that most of those that de-listed did so following a period of poor performance. They found that after de-listing, the average de-listed fund underperformed the reporting funds by an average of 146 bps/quarter (t-statistic = -4.85), or 5.84% per year.

How much should be subtracted from the return of a hedge fund index to account for this de-listing bias? ACE found that about 10% of funds delisted from their union of the five major hedge fund databases each year. The de-listing rate from any single database would probably be much higher given the very low overlap among databases. Therefore, an estimated *lower bound* on the de-listing bias would be the average risk-adjusted return spread of de-listed funds compared to reporting funds multiplied by the de-listing rate: 5.84% X 10% or .58%. Thus, ACE seems to confirm the 35-100 bps lower bound de-listing bias estimate suggested by Jorion and Schwarz above. The actual bias is probably much higher than these lower bound estimates.

It is commonly thought that most of the biases in hedge fund databases are greatly reduced by using only funds-of-funds (FOFs) returns. FOFs are free to invest in all hedge funds, including those that choose not to report their performance to any database, which may enhance the representativeness of a FOF benchmark index relative to a broad hedge fund index. However, FOFs include additional fees which will reduce returns. Also, FOFs are themselves hedge funds and may be subject to all of the same biases that apply to other hedge funds. Furthermore, FOFs rely upon the (possibly biased) returns reported by their downstream hedge funds for their own return calculations. Finally, an index of FOFs is not investable.

As stated above, investability is a fundamental requirement for a good benchmark index.

Investable Hedge Fund Indexes

Soon after cleaning up their databases to address survivorship bias and backfill bias, some of the major hedge funds databases created sets of "investable" indexes, which were essentially subsets of their broader indexes restricted to hedge funds that met certain criteria, which generally included:

- Minimum assets under management—usually $50 to $100 million
- Willingness to accept new investments

Sometimes other liquidity, reporting, or performance history requirements applied. These requirements may result in some level of *adverse selection bias* if the best hedge funds refuse to participate, which may detract from the returns of investable hedge fund indexes.

However, a 2010 paper by Heidorn, Kaiser, and Voinea (HKV, 2010) documents a study of investable hedge fund indexes from 2002 to 2009 and finds them to have "high correlations and beta to noninvestable hedge fund indices." The authors find that they "constitute a solid alternative to FHF [fund-of-fund] investments, while costing substantially less, and offering generally more transparency and liquidity." HKV observed a very high correlation among the leading investable hedge fund indexes, ranging from 0.88 to 0.98. When compared to "three of the most widely used [non-investable] benchmarks" (Credit Suisse Hedge Fund Index, Greenwich Global Hedge Fund Index, and HFRI Fund Weighted Composite Index), the authors find a similarly high correlation between investable and non-investable hedge fund indices, ranging from 0.88 to 0.96. They conclude that "investable hedge fund composite indices are truly representative of the overall hedge fund universe when measured against non-investable indices."

UCITS Hedge Fund Index Tracker Funds

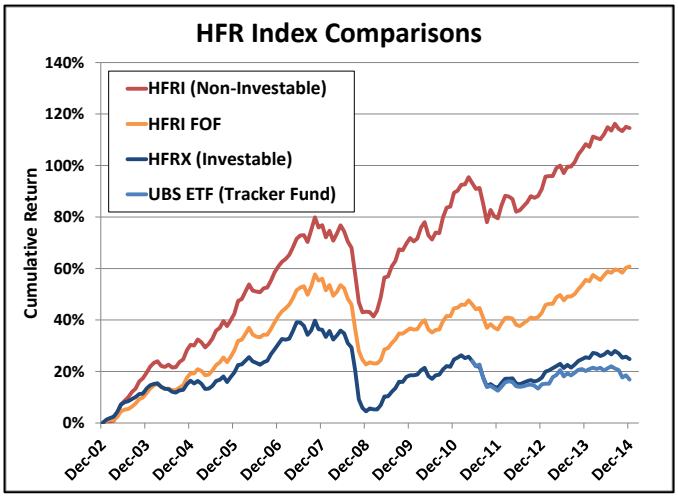
Some of these investable indexes have become the basis of index tracker funds available to non-U.S. investors through the UCITS structure that allows fund issuers to market throughout Europe under a common set of rules and regulations. UCITS funds have become quite popular even outside of Europe, including in the Far East, Latin America, and the Middle East. The only holdout, for regulatory reasons, is the U.S. (U.S. institutional investors may invest in a UCITS fund through a privately offered vehicle, much like they would an offshore hedge fund.)

Unfortunately for U.S. investors, investments in UCITS funds are limited to qualified institutions or ultra-high net worth individuals. However, the fact that investable hedge fund indexes have real money invested in tracker index funds provides investors with a "live" track record of the these indexes net of all frictions and costs, as measured by the performance of the UCITS funds relative to the index.

These UCITS funds typically use swaps, certificates, or other derivatives which pay the return of the underlying index to the fund, after subtracting fees. Investing in a myriad of hedge funds would be too unwieldy to be practical for the UCITS funds. As such, there is exposure to the credit risk of the issuer, typically a major global bank. The issuing bank may invest in many of the underlying hedge funds to hedge its risk, but that is transparent to the UCITS fund investor. This structure, of course, has fees embedded in the derivatives used as well as fund management fees and other expenses that go into its expense ratio. Relative to the original "investable" hedge fund index, the net return to the investor appears to be about 1.5% to 2.0% lower.

Hedge Fund Research Indexes

Perhaps the most widely cited source for hedge fund indexes, Hedge Fund Research (HFR) is one of only two well-known firms that currently has a US Dollar-based UCITS fund tracking its investable hedge fund. (The other firm is Credit Suisse, which we will study below.) HFR has the added benefit of maintaining a composite fund-of-funds (FOF) index, which we include in the cumulative return comparison graph (at right) and table (below).



The large return differences provide a stark illustration of the illusory nature of the returns contained in non-investable indexes, no doubt due to the variety of biases cited above. Since the 2002 inception of the *investable* HFRX Global Hedge Fund Index, the spread between it and the *non-investable* HFRI Fund Weighted Composite Index has been 4.5% per year on average. While the shortfall of the non-investable fund-of-funds index was "only" 2.4% per year relative to the non-investable composite index, that may be more of an indication of lingering biases in the FOF index return rather than a sign of value-added. As mentioned above, FOF are themselves hedge funds, and as such may be subject to the same biases as other hedge funds.

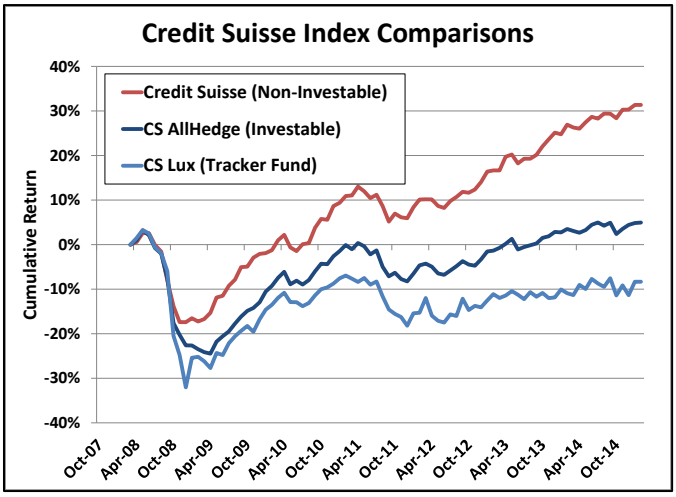
HEDGE FUND RESEARCH INDEX COMPARISONS

Index Name	BB Ticker	2002-2014 Annlzd. Avg. Rtrn.	Annlzd. Return Spread	6/11-12/14 Annlzd. Avg. Rtrn.	Annlzd. Return Spread
HFRI Fnd Wtd Composite	HFRIFWI Index	6.6%		3.1%	
HFRI Fund of Funds Cmpst	HFRIFOF Index	4.2%	-2.4%	2.8%	-0.3%
HFRX Global Hedge Fund	HFRXGL Index	2.1%	-4.5%	0.3%	-2.8%
UBS ETF HFRX GL. HF USD	HFUSAS SW Equity			-1.6%	-1.8%

UBS launched at tracker UCITS fund based upon the HFRX Global Hedge Fund Index on May 3, 2011. Although the fund's published expense ratio is only 0.6%, the actual returns of the fund have averaged 1.8% less than the underlying index, no doubt a reflection of the additional fees assessed by the providers of the OTC derivatives that constitute the actual investments of the fund. The investable index itself fell short of the non-investable index by 2.8% per year since the fund's launch. So compared to the non-investable index, the fund was 4.6% behind this illusory return.

Credit Suisse Indexes

Credit Suisse launched a US Dollar-based UCITS fund designed to track its *investable* hedge fund index, the Credit Suisse AllHedge Index, on March 19, 2008. It had created the AllHedge Index only a few months before, so the graph and table at right use the same March 31, 2008 start date to facilitate comparisons. (Unlike HFR, Credit Suisse does not maintain separate funds-of-funds indexes.)



Compared to the *non-investable* Credit Suisse Hedge Fund Index, the investable index fell short by 3.2%. Although the fund's published expense ratio is 1.0%, the actual returns of the fund have averaged 1.6% less than the underlying index, no doubt a reflection of the additional fees assessed by the providers of the OTC derivatives that

CREDIT SUISSE INDEX COMPARISONS

Index Name	BB Ticker	4/08-12/14 Annlzd. Avg. Rtrn.	Annlzd. Return Spread
Credit Suisse Hed	HEDGNAV Index	4.1%	
Credit Suisse AllH	SECTAH Index	0.9%	-3.2%
CS LUX CS ALLHED	CSALLBU LX Equity	-0.7%	-1.6%

constitute the actual investments of the fund. When combined with the 3.2% shortfall of the investable index itself, the fund was 4.8% behind the illusory return of the non-investable index.

Conclusion

Although the major providers of hedge fund indexes claim to have largely eliminated survivorship bias and backfill bias, substantial positive return biases remain. These include self-reporting bias (inflating returns due to incompetence or fraud), smoothing bias (inflating returns due to pricing flexibility for illiquid securities), self-selection bias (not even starting to report until returns are attractively high), and de-listing bias (ceasing to report because of poor returns). One indication of the size of these biases is the enormous return spread between investable and non-investable hedge fund composite indexes. For example, the two leading providers, HFR and Credit Suisse, show spreads of -4.5% and -3.2%, respectively, between their investable and non-investable hedge fund composite indexes.

Investors would be well advised to avoid the using any of the non-investable hedge fund indexes for either asset allocation purposes or for manager performance evaluation purposes. Investable hedge fund benchmark indexes provide a much sounder basis for analysis, though they do not have as much history or as many constituent funds as non-investable indexes, and may be subject to adverse selection bias which may reduce their returns to some extent.

Kevin Means, CFA
Principal
Select Alternative Investments LLC

March 16, 2015

SELECT ALTERNATIVE INVESTMENTS LLC

GENERAL DISCLAIMER

THIS DOCUMENT IS BEING PROVIDED ON A CONFIDENTIAL BASIS SOLELY TO ITS DIRECT RECIPIENT AND SHALL NOT BE REPRODUCED, QUOTED FROM OR DISTRIBUTED WITHOUT THE EXPRESS CONSENT OF SELECT ALTERNATIVE INVESTMENTS LLC AND IN ANY EVENT IS NOT INTENDED FOR PUBLIC USE OR DISTRIBUTION. THE INFORMATION CONTAINED HEREIN IS SUMMARY IN NATURE AND INCOMPLETE AND IS SUBJECT TO CHANGE OR ADDITION WITHOUT NOTICE. SUCH INFORMATION HAS BEEN PREPARED WITH REASONABLE CARE BUT DOES NOT CONSTITUTE ANY REPRESENTATION OR WARRANTY BY SELECT ALTERNATIVE INVESTMENTS LLC, THE INVESTMENT MANAGER OR ANY OF THEIR AFFILIATES. PAST INVESTMENT PERFORMANCE IS NO ASSURANCE OF FUTURE RESULTS. THERE ARE IMPORTANT MATTERS (INCLUDING RISK FACTORS, TAX CONSEQUENCES AND RELEVANT INVESTMENT CONSIDERATIONS) TO BE CONSIDERED IN CONNECTION WITH BECOMING A CLIENT THAT ARE NOT DISCUSSED HEREIN AND PROSPECTIVE CLIENTS ARE RESPONSIBLE FOR REVIEWING THE SAME WITH THEIR PERSONAL ADVISORS. PROSPECTIVE CLIENTS ARE NOT BEING SOLICITED AS SUCH IN ANY JURISDICTION IN WHICH SUCH SOLICITATION WOULD BE UNLAWFUL UNLESS AND UNTIL THE REQUIREMENTS OF THE LAWS OF SUCH JURISDICTION HAVE BEEN SATISFIED. THIS DOCUMENT IS NOT INTENDED FOR USE BY BROKER-DEALERS, MARKETERS OR OTHER THIRD PARTIES.