

# Which hedge fund indices suit best for investors?

Working Paper

Authors:

Prof. Dr. Peter Meier

Stefan Wirth

Winterthur, May 26, 2010

Centre Alternative Investments & Risk Management

## Abstract

In contrast to most traditional assets, alternatives, especially hedge funds, do not have a distinct universe. This complicates proper performance measurement since most benchmarks suffer from statistical biases, deceiving investors about the “true” return an average hedge fund would have achieved. We investigate these influences, present an index for Swiss registered hedge funds which aims to avoid common biases and conclude that the systematic underperformance of funds of hedge funds compared to single hedge funds is mostly a result of bias mitigation. This indicates that the returns of fund of hedge funds indices are the most accurate for benchmarking both single- and funds of hedge funds.

*This working paper is supported by the Transparency Council Funds of Hedge Funds: Banque Privée Edmond de Rothschild SA, BrunnerInvest AG, BSI/Thalia SA, Clariden Leu AG, Falcon Private Bank, GL Funds AG, Harcourt Investment Consulting AG, ISPartners Investment Solutions AG, Lombard Odier Darier Hentsch & Cie, Man Investments, Pictet & Cie, Privatbankiers Reichmuth & Co, Union Bancaire Privée*

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## **1. Introduction**

Assessing the performance of an investment serves many purposes. Returns, their correlations and variances are key input parameters for optimization procedures. Funds and asset management mandates charge fees, whereas some are directly linked to performance. The many-sided character of performance brings up the question of how to measure it appropriately.

At a first glance, performance measurement seems not to be a tedious task. If a mutual fund invests in all kinds of Swiss stocks, the Swiss Performance Index (SPI) is an appropriate benchmark. If it invests in world equity of developed countries, the MSCI World Index is certainly a good reference. But what happens if a fund invests into many different assets, uses complex strategies such as derivatives and short selling or acts as private equity investor? This is exactly what hedge funds do. In addition, they usually chase an absolute return strategy, meaning that they intend to deliver always positive returns, independent from current environments on world markets. The expression “absolute return” also implied that there was no adequate index.

Since hedge funds and one sort of their investors, the so called funds of hedge funds (hereafter referred to as FoHF), gained more publicity and a wider circle of (private) investors, the demand for ascertaining the funds performance has increased. This, however, is not as easy as it is the case with traditional funds.

On the following pages, we explain why hedge fund indices differ and investigate the discrepancies over time. In addition, we introduce an index for Swiss funds of hedge funds, for which we believe it avoids most pitfalls.

All index data is obtained from the respective provider unless otherwise stated.

## 2. Databases and Biases

Since hedge funds perform different strategies with different kinds of assets, forming a benchmark out of the underlying assets is simply not possible. Instead, hedge funds can be compared with each other. The increasing number of those vehicles even allows a separation according to strategy. An investor is then able to compare the performance of her hedge fund with the benchmark and decide, whether she wants to keep holding her investment or sell it for another, (better) performing fund. Although this sounds simple, there is an inherent assumption hidden in above example. It is implied that the benchmark captures all hedge funds and is free from statistical biases. Unfortunately, both assumptions are not correct.

First of all, hedge funds are not as tightly regulated as other securities. Companies listed on a stock exchange have to comply with several regulations. In addition, the fact that they are listed and quoted helps to create a benchmark, including all (public) available securities. Hedge funds in contrast often use offshore locations and enjoy a looser regulation. The reporting to a database collecting performance figures is not mandatory, hence no database can contain data of all hedge funds.

Second, databases are vulnerable to several statistical distortions known as biases. We briefly focus on the most commons.

### Selection bias

The selection bias goes hand in hand with voluntary reporting to databases. There are two key reasons, why a hedge fund chooses not to report its performance. A) He does not perform well and hence tries to cloud the bad track record whilst hoping that new (or existing) investors do not compare its figures with adequate alternatives. B) The fund performs extraordinary well and is closed to new investors or is able to easily gain additional capital if wanted from existing clients due to its track record. It hence has no need and no incentive to report his figures to a broader public. The first reason leads to an upward bias, meaning that hedge fund index returns are higher than they would be if every hedge fund was included. The second reason probably biases the index downwards.

### Backfill bias

Generally speaking, a backfill bias can occur when the inception date of the fund is not the same as the entry date with a database. This fact alone is not problematic. However, since data in finance is always scarce, the database provider may also list the funds data previously of the official entry data, hence immediately showing a total return. Due to strategic considerations, a hedge fund manager may choose to start reporting to a database when his track record is favourable. As a consequence, the index returns are upward biased.

### Survivorship bias

The survivorship bias refers to the fact that hedge fund databases can only show returns from funds which deliver their data. If a fund stops doing so, it can no longer be included in an index. A way to mitigate this problem is keeping the time series of the fund in past index returns, hence not adjusting with retrospective effect. Nevertheless, the bias exists because funds which do not perform well and are most likely going to be closed chose a time before their liquidation to stop reporting. Assuming that a fund completely blows up, this decrease in net asset value will not be tracked. All in all, this effect is also likely to upward bias an index.

Several researches have investigated the influence of these biases on hedge fund index returns. Brown et al. perform some survival conditioning analysis and present interesting results about how many funds actually survived an investigation period.<sup>1</sup> Fung and Hsieh present mitigation approaches for several biases and refer to fund of hedge funds indices.<sup>2</sup> They also updated their publication and discuss effects from database merger and backfill biases.<sup>3</sup>

Duerr<sup>4</sup> presents a table with estimates of various researchers on survivorship and backfill bias:

<b>Researcher</b>	<b>Year</b>	<b>Survivorship Bias in % p.a</b>	<b>Backfill Bias in % p.a</b>
Brown et al	1999	2.6	na
Fung, Hsieh	2000	3	1.3
Fung, Hsieh FoHF	2000	1.3	0.7
Liang	2000	2.24	na
Fung, Hsieh	2001	na	1.4
Posthuma, van der Sluis	2003	na	4.4

Table 1: Bias estimates of various researches 1999 – 2003  
Source: Adapted from Duerr (2010)

There is a phenomenon, which gained attention among researchers due to the recent crisis: a new kind of survivorship bias, resulting not only from fund going into liquidation, but also from those which continue their operations for a couple of months before their demise, but stop reporting immediately. Xu et al call this kind of survivorship bias a “hidden” one. Their investigations indicate that this liquidation reporting bias can additionally affect the stated returns by 3.8% on an annualized basis.<sup>5</sup>

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<sup>1</sup> See Brown, S. et al (1998) p.14

<sup>2</sup> Fung W., Hsieh, D. (2000) p. 295

<sup>3</sup> Fung W., Hsieh, D. (2009) p. 36

<sup>4</sup> Duerr, F., (2010) p. 6

<sup>5</sup> Xu, X. et al (2010), p. 13

### 3. Fund of Hedge Funds Indices as Bias Reducer

The discussed biases do not affect every index in the same matter. Apart of the construction method by the database provider, fund of hedge funds indices are mitigating the biases. Fung and Hsieh argued that through FoHF returns reported to a database even non-reporting hedge fund returns are indirectly considered.<sup>6</sup> They refer to an earlier article concluding that not only the selection bias but also the survivorship bias is reduced because a FoHF that continues its operation after the liquidation of an included single hedge fund will have these losses implied in its return.

Assuming fund of hedge funds indices as good approximation for the average return a hedge fund investor can expect, one can conduct several comparisons between hedge fund and FoHF indices. Since the mentioned biases mostly overestimate the returns, FoHF indices are expected to show lower returns than their hedge fund pendants.

Before introducing several hedge fund and FoHF indices, some properties are required for an index to be accepted as such:<sup>7</sup>

- Representativeness
- Investability
- Transparency
- Unbiasedness

Investability does not imply direct investments in the index but rather the possibility to buy or sell its components. Man Financial shares this view on benchmarks. They conclude that “[...] funds of funds indices provide the most realistic indication of the returns achieved by the average investor”.<sup>8</sup>

Table 1 presents an overview of the most popular hedge fund and FoHF indices.

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<sup>6</sup> Fung W., Hsieh, D. (2004) p. 72

<sup>7</sup> See Lhabitant, F. (2006) p. 488 for additional information about indices, especially for hedge funds

<sup>8</sup> Man Investments Ltd. (2005) p. 17

Year	HFRI HF Composite	HFRI FoF Composite	HFRX HF Composite	Eurekahedge HF Composite	Eurekahedge FoF Composite	Edhec FoF	CS/Tremont HF	Barclay HF	Barclay FoF	SFoHFI USD	RBC 250 Hedge	Yearly Std. Deviation
1994	4.1%	-3.5%	n.a	n.a	n.a	n.a	-4.4%	n.a	n.a	n.a	n.a	n.a
1995	21.5%	11.1%	n.a	n.a	n.a	n.a	21.7%	n.a	n.a	n.a	n.a	n.a
1996	21.1%	14.4%	n.a	n.a	n.a	n.a	22.2%	n.a	n.a	n.a	n.a	n.a
1997	16.8%	16.2%	n.a	n.a	n.a	17.4%	25.9%	22.3%	17.7%	n.a	n.a	3.5%
1998	2.6%	-5.1%	n.a	n.a	n.a	4.2%	-0.4%	8.2%	4.1%	n.a	n.a	4.2%
1999	31.3%	26.5%	n.a	n.a	n.a	28.5%	23.4%	36.6%	26.9%	n.a	n.a	4.2%
2000	5.0%	4.1%	n.a	17.8%	10.1%	7.8%	4.8%	12.2%	10.2%	n.a	n.a	4.3%
2001	4.6%	2.8%	n.a	11.2%	6.0%	3.5%	4.4%	6.8%	4.4%	n.a	n.a	2.5%
2002	-1.5%	1.0%	n.a	7.4%	2.4%	1.3%	3.0%	1.4%	1.8%	0.4%	n.a	2.3%
2003	19.5%	11.6%	n.a	20.9%	11.7%	11.5%	15.4%	18.0%	10.4%	9.9%	n.a	4.0%
2004	9.0%	6.9%	2.7%	9.9%	6.9%	7.1%	9.6%	8.8%	6.7%	5.5%	n.a	2.1%
2005	9.3%	7.5%	2.7%	11.1%	8.0%	6.8%	7.6%	10.7%	6.9%	8.1%	n.a	2.2%
2006	12.9%	10.4%	9.3%	13.7%	10.5%	11.2%	13.9%	12.4%	9.4%	9.8%	10.6%	1.6%
2007	10.0%	10.3%	4.2%	14.0%	10.5%	10.1%	12.6%	10.2%	8.9%	11.0%	8.2%	2.4%
2008	-19.0%	-21.4%	-23.3%	-11.1%	-19.8%	-19.7%	-19.1%	-21.6%	-22.2%	-19.9%	-21.2%	3.0%
2009	20.0%	11.5%	13.4%	19.6%	9.8%	10.7%	18.6%	23.7%	10.2%	8.6%	19.2%	5.0%
<b>Ø Return p.a</b>	<b>9.8%</b>	<b>6.0%</b>	<b>0.7%</b>	<b>11.1%</b>	<b>5.2%</b>	<b>7.2%</b>	<b>9.3%</b>	<b>10.7%</b>	<b>6.8%</b>	<b>3.7%</b>	<b>3.0%</b>	
<b>σ p.a</b>	11.7%	10.7%	12.8%	9.1%	9.8%	10.8%	11.9%	13.5%	11.0%	10.3%	17.6%	
Number of funds as of March 2010	>2'000	>800	>250	2375	969	PCA of other Ind.	475	1966	1033	79	250	

Table 2: Different hedge fund / FoHF indices. Data since inception until December 2009.

The indices shown in table 1 differ in the number of funds and investment targets. The RBS 250 and the HFRX are the only investable indices analyzed and hence have to fulfil additional criteria (e.g. liquidity). These restrictive criteria have an impact on the returns of those indices. In addition, the number of funds contained in each index is far from equal. This clearly shows that each index has its own universe.

The last column contains the standard deviation of the returns for each year through all indices. It serves as an indicator for turbulent times where the differences among the index providers widened. The first three rows are not meaningful to calculate due to a lack of data and hence are treated as “not available”.

It is important to note that the time series of the indices do not share the same length. It is therefore not possible to compare their returns and their standard deviations. Table 2 and 3 compare the indices by classifying them according to their constituent parts.

<b>Hedge Fund Indices</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>Last 3y p.a</b>
HFRI HF Composite	20.0%	-19.0%	10.0%	2.2%
Eurekahedge HF Composite	19.6%	-11.1%	14.0%	6.6%
CS/Tremont HF Index	18.6%	-19.1%	12.6%	2.6%
BarclayHedge HF Index	23.7%	-21.6%	10.2%	2.2%
<b>Average HF Index Return</b>	<b>20.5%</b>	<b>-17.7%</b>	<b>11.7%</b>	<b>3.4%</b>
<b>Fund of Hedge Funds Indices</b>				
HFRI FoF Composite	11.5%	-21.4%	10.3%	-1.1%
Eurekahedge FoF Composite	9.8%	-19.8%	10.5%	-0.9%
Edhec FoF Index	10.7%	-19.7%	10.1%	-0.7%
BarclayHedge FoF Index	10.2%	-22.2%	8.9%	-2.3%
SFoHFI	8.6%	-19.9%	11.0%	-1.1%
<b>Average FoF Index Return</b>	<b>10.1%</b>	<b>-20.6%</b>	<b>10.1%</b>	<b>-1.2%</b>
<b>Investable Indices</b>				
HFRX Composite	13.4%	-23.3%	4.2%	-3.2%
RBC 250 Hedge Index	19.2%	-21.2%	8.2%	0.6%
<b>Average Investable Index Return</b>	<b>16.3%</b>	<b>-22.2%</b>	<b>6.2%</b>	<b>-1.3%</b>

Table 3: Index returns by category 2007 – 2009.

<b>Average</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>Last 3y p.a</b>
Average Hedge Fund Indices	20.5%	-17.7%	11.7%	3.4%
Average FoF Indices	10.1%	-20.6%	10.1%	-1.2%
<b>Difference</b>	<b>10.3%</b>	<b>2.9%</b>	<b>1.6%</b>	<b>4.7%</b>

Table 4: Differences in average returns of hedge funds vs. FoHF 2007 – 2009

Table 4 indicates that FoHF seem to systematically underperform their hedge fund equivalents. In 2007, the difference was small, while for 2008 and interestingly for 2009 the gap widened considerably. After the crisis, funds of hedge funds were not able to perform a strong rebound like hedge funds did. The same is true for the comparison of hedge funds versus investable indices, although the latter performed clearly better than FoHF in 2009.

### Explanations

The difference between hedge fund indices and investable indices arises from a selection constraint. Investable indices have to fulfil certain requirements, such as liquidity and transparency and hence have only a limited universe of investable components available. This can explain the performance difference compared to hedge fund indices but more important states why they are not an appropriate benchmark for hedge fund investments since they have to exclude many kinds of strategies. However, Man Financial states that investable indices do not claim representativeness for themselves.<sup>9</sup>

There are other possible reasons for the poorer performance of FoHF compared to single hedge funds than the discussed biases and the double fee structure. Ineichen brings in new arguments, especially for the 2008 / 2009 period.<sup>10</sup> We want to present the four most interesting to us:

- FoHF redeemed a lot in 2008 and thus were underinvested during the rebound in 2009.
- Due to their size, the redemptions of FoHF may have hurt single hedge funds. As a protection and for diversification issues, single hedge funds may now not be willing to accept every FoHF as an investor, hence downsizing the universe for FoHF.
- Some FoHF failed to properly allocate their asset after 2008. Since managed futures did well during the crisis but did not so during the rebound, an unintended constant allocation can result in the return differences we are observing.
- Many leveraged products invested in FoHF. Unwinding these structures was costly and thus lowering performance.
- We further believe that FoHF are still partly stuck due to illiquid positions, i.e. side pockets, they had to build when the big redemptions came in.

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<sup>9</sup> Man Financial (2005), p. 13

<sup>10</sup> Ineichen, A. (2010), p. 34 et seq.

Figure 1 demonstrates the difference between single hedge funds and FoHF from HFR. Again, the 2009 gap is striking.

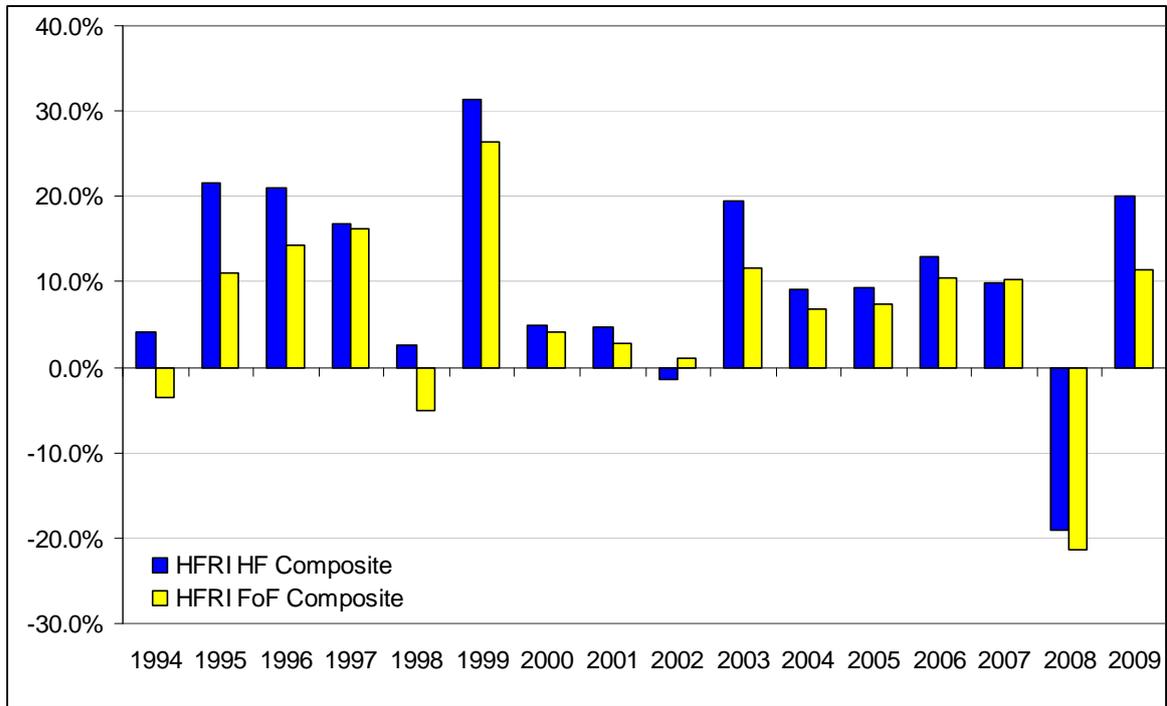


Figure 1: Differences between HF and FoHF 1994 - 2009 in HFR indices

Table 5 gives an insight into single hedge fund and FoHF indices from the same provider with the same length. It is possible to better compare the returns because in the averages of table 2 some indices led to distortions due to their strength / weakness compared to other benchmarks.

Year	HFRI HF Composite	HFRI FoF Composite	Difference	Eurekahedge HF Composite	Eurekahedge FoF Composite	Difference	Barclay HF	Barclay FoF	Difference
1994	4.1%	-3.5%	7.6%	n.a	n.a	n.a	n.a	n.a	n.a
1995	21.5%	11.1%	10.4%	n.a	n.a	n.a	n.a	n.a	n.a
1996	21.1%	14.4%	6.7%	n.a	n.a	n.a	n.a	n.a	n.a
1997	16.8%	16.2%	0.6%	n.a	n.a	n.a	22.3%	17.7%	4.7%
1998	2.6%	-5.1%	7.7%	n.a	n.a	n.a	8.2%	4.1%	4.1%
1999	31.3%	26.5%	4.8%	n.a	n.a	n.a	36.6%	26.9%	9.7%
2000	5.0%	4.1%	0.9%	17.8%	10.1%	7.6%	12.2%	10.2%	2.0%
2001	4.6%	2.8%	1.8%	11.2%	6.0%	5.2%	6.8%	4.4%	2.3%
2002	-1.5%	1.0%	-2.5%	7.4%	2.4%	4.9%	1.4%	1.8%	-0.4%
2003	19.5%	11.6%	7.9%	20.9%	11.7%	9.3%	18.0%	10.4%	7.5%
2004	9.0%	6.9%	2.2%	9.9%	6.9%	3.0%	8.8%	6.7%	2.1%
2005	9.3%	7.5%	1.8%	11.1%	8.0%	3.0%	10.7%	6.9%	3.8%
2006	12.9%	10.4%	2.5%	13.7%	10.5%	3.1%	12.4%	9.4%	3.0%
2007	10.0%	10.3%	-0.3%	14.0%	10.5%	3.5%	10.2%	8.9%	1.4%
2008	-19.0%	-21.4%	2.3%	-11.1%	-19.8%	8.7%	-21.6%	-22.2%	0.6%
2009	20.0%	11.5%	8.5%	19.6%	9.8%	9.8%	23.7%	10.2%	13.5%
<b>Average Difference</b>			<b>3.9%</b>			<b>5.8%</b>			<b>4.2%</b>

Table 5: Differences in yearly returns from the same index provider since inception until December 2009.

Table 5 gives the “fairest” insight into differences between hedge fund and FoHF returns if we assume that the index provider applies the same rules for inclusion or exclusion of funds for both indices.

What becomes obvious are the differences between the indices in every year. For example, in 2001 the hedge funds contained in the HFRI outperformed the HFRI FoHF by 1.8%. In the same year, the difference in the Barclay indices accounts for 2.3% and in the Eureka hedge family for 5.2%. This indicates that each provider uses a distinct universe of funds. Nevertheless, the ups and downs in the differences move in tandem, as figure 2 demonstrates.

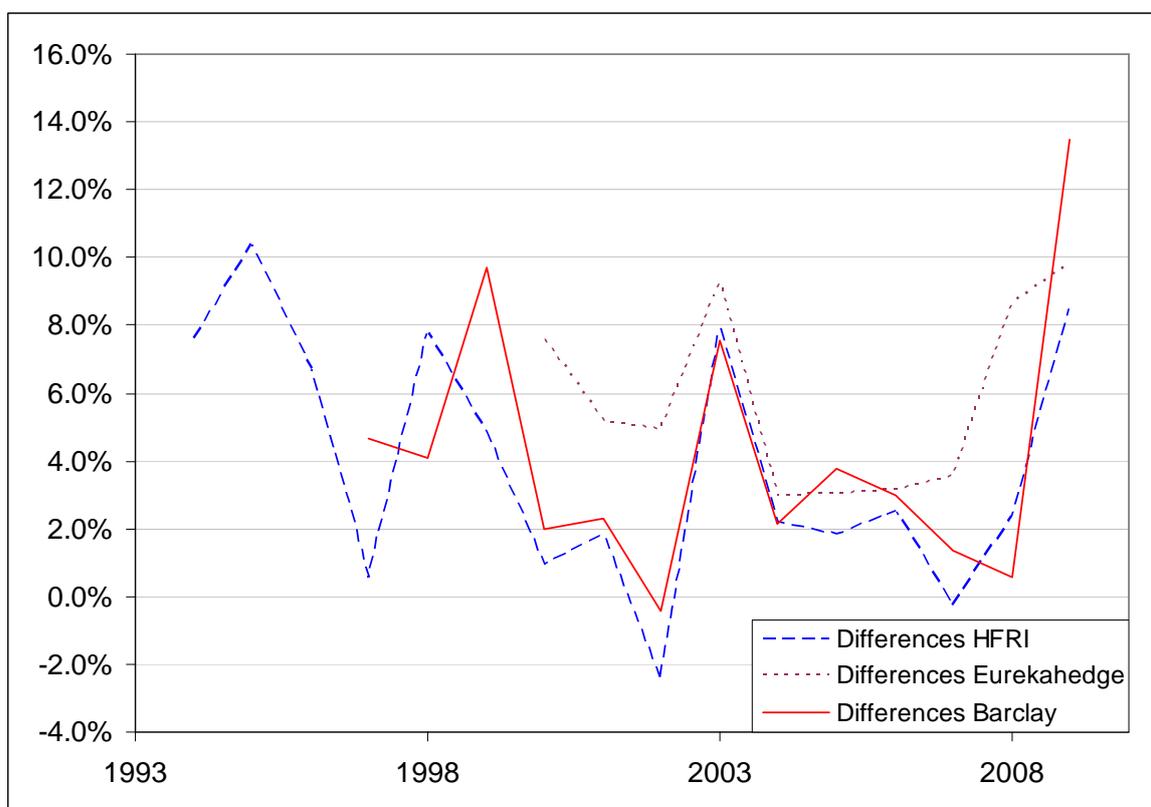


Figure 2: Differences between HF and FoHF for three index providers

## 4. An Index for Swiss Registered Funds of Hedge Funds

In its effort to find an adequate benchmark for FoHF, the Centre Alternative Investments & Risk Management developed the SFoHFI (Swiss Fund of Hedge Funds Index). Aware of biases, the construction and inclusion of funds differs from other indices. If a FoHF provider wants to publicly attract investors in Switzerland, it has to register with the regulatory authorities (FINMA). Otherwise, the fund must not solicit funds from investors other than qualified ones. As a consequence, constructing an index with all Swiss registered funds included avoids the selection bias, brings the index returns closer to their true value and hence gives an investor a better basis for comparing her investments.<sup>11</sup>

The existence of different share classes brings up another difficulty when comparing an investment with a benchmark. Usually, the fund provider offers a currency hedge, helping to partially eliminate the risk associated with changes in foreign exchange rates. But even (or because of) with perfect hedging, differences in returns between two share classes arise due to forward prices and differences in the risk free rates. If the benchmark is only available in one currency (usually US Dollars), an investor can not easily compare the performances of hedge funds with a share class different than the one of the benchmark. This is the reason why the SFoHFI is calculated in several currencies.

Because the FoHF portal [hedgegate](#)<sup>12</sup> collects the net asset values of every share class a FoHF is offering, the SFoHFI can measure returns in CHF on a NAV-basis. Assuming nearly perfect hedging, the differences between the share classes should approximately equal the differences in interest rates. Figure 3 illustrates the returns for three major currencies and the HFR FoF Index from 2002 until 2009.

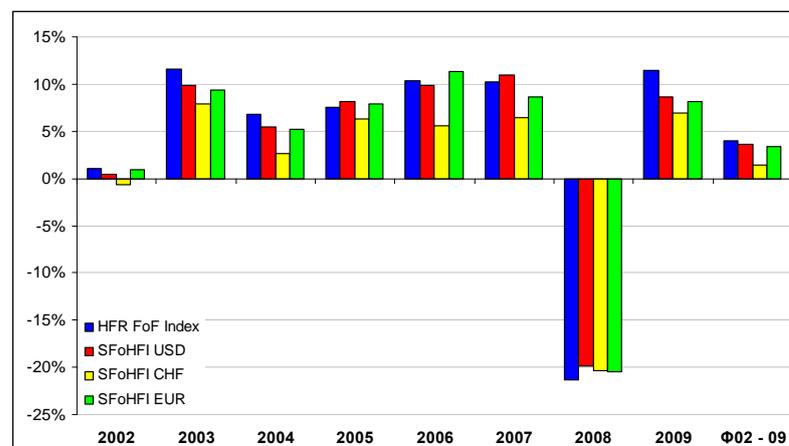


Figure 3: HFR FoF index and SFoHFI in different currencies 02-09

<sup>11</sup> See Duerr, F. (2010) for a discussion of bias impacts on the SFoHFI.

<sup>12</sup> [hedgegate](#) contains a lot of information about FoHF, as well as indices, ratings and style analysis with free registration for qualified investors. [www.hedgegate.com](http://www.hedgegate.com)

Figure 4 shows a breakdown of assets under management from all Swiss registered FoHF, listed on [hedgagate](#). It is apparent that only three currencies carry a major weight in the FoHFs listed on the platform.

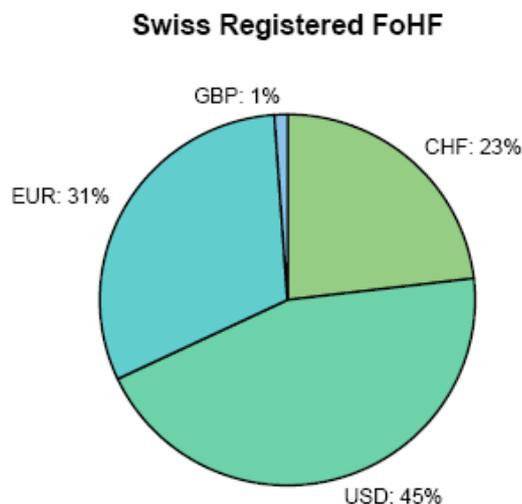


Figure 4: AuM breakdown Swiss registered FoHF as at August 2009  
Source: hedgagate industry report 2009, p. 25

### Criteria fulfilment

We investigate whether the SFoHFI meets the four key requirements for an index, mentioned in chapter 3 (representativeness, investability, transparency, freedom from biases). Due to the selection via distribution allowance by the FINMA, the index captures all Swiss registered FoHF. This offers representativeness for the Swiss FoHF industry. According to [hedgagate](#), all Swiss registered FoHF were open for investments as at March 31, 2010. Hence the stated index performance would have been achievable by an investor. The requirement regarding transparency goes hand in hand with the selection criteria, hence disclosing clear rules to investors. This partially leads to freedom from (especially selection) biases. Duerr estimates the potential survivorship bias of the SFoHFI to be about 1%.<sup>13</sup> This indicates a distortion, which would arise if we would not include the liquidated funds. Due to its construction, the SFoHFI avoids this bias.

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<sup>13</sup> Duerr, F. (2010) p. 17

## 5. Conclusion

Several biases affect the accuracy of hedge fund and FoHF indices in a more or less adverse manner. Estimations of the extent of these biases vary, but there is a wide consensus that the most recognized hedge fund indices do not actually reflect the return an average investor could have achieved by investing in hedge funds. In contrast, FoHF indices seem to mitigate at least parts of the biases and hence give a more accurate picture. By taking a look at the returns of both hedge fund and FoHF indices, it can be observed that the latter perform lower. The extent of this underperformance can not only be attributed to higher fees but seems to arise from bias mitigation, thus single hedge fund indices suffer from larger biases than FoHF indices.

Even among FoHF indices, several distinct facts are observable. They do not share the same universe and can still be affected by biases. The Swiss Fund of Hedge Funds Index is constructed under explicit rules to avoid statistical distortions. Duerr<sup>14</sup> conducted research regarding the biases and concludes that the SFoHFI is affected by a negative backfill bias of 0.09%, which is negligible. With respect to a potential survivorship bias, he finds that deviating from current calculation procedures, a positive survivorship bias of approx. 1% p.a. would result. A comparison between the SFoHFI and the HFR FoF index showed a non-significant selection bias.

This leads us to the conclusion that the SFoHFI is the most accurate benchmark for FoHF registered in Switzerland. This is underpinned by the fact that its constituents are 100% investable. Investors who hold single hedge funds or FoHF in their portfolios are well advised to compare the performance of their holdings with FoHF indices to gain a less distorted comparison picture.

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<sup>14</sup> Duerr, F. (2010) p. 16 - 17

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