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The A,B,Cs of Hedge Funds: Alphas, Betas, and Costs

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ABSTRACT

In this paper, we focus on two issues. First, we analyze the potential biases in reported hedge fund returns, in particular survivorship bias and backfill bias, and attempt to create an unbiased return sample. Second, we decompose these returns into their three A,B,C components: the value added by hedge funds (alphas), the systematic market exposures (betas), and the hedge fund fees (costs). We analyze the performance of a universe of about 3,500 hedge funds from the TASS database from January 1995 through April 2006. Our results indicate that both survivorship and backfill biases are potentially serious problems. The equally weighted performance of the funds that existed at the end of the sample period had a compound annual return of 16.45% net of fees. Including dead funds reduced this return to 13.62%. Excluding backfill further reduced the return to 8.98%, net of fees. In this last sample, we estimate a pre-fee return of 12.72%, which we split into a fee (3.74%), an alpha (3.04%), and a beta return (5.94%). Overall, even after correcting for data biases, we find that the alphas are significantly positive and are approximately equal to the fees, meaning that excess returns were shared roughly equally between hedge fund managers and their investors.

1. Introduction

Hedge funds have become the hottest investment vehicle over the past several years. According to the Van Hedge Fund Advisors, at the end of 2005 there were over 8000 hedge funds with more than one trillion dollars under management. In 1990 there were only about 530 hedge funds managing about $50 billion. The strategy mix of the hedge fund industry has also changed. In 1990, the industry was dominated by funds following a global macro strategy, while today the largest numbers of funds belong to equity-based strategies like long-short equity and event driven. Hedge funds have gained increasing acceptance among both institutional and individual investors. The average allocation to hedge funds among institutional investors in North America has grown from 2.5% in 2001 to 5% in 2003, and had been projected to reach 7.5% by 2005.[1] Even individual investors are jumping into hedge fund-of-funds products.

This paper updates the Brown, Goetzmann, and Ibbotson (1999) paper that one of the authors participated in originally, which found that statistically significant alphas were earned in the hedge fund industry. But that paper covered the 1989–1995 period, before much hedge fund data was available.[2] By starting in 1995 and analyzing the period through April 2006, we are now able to analyze a relatively complete data set that includes dead funds, marked for backfilled data over more than eleven year period. Many other researchers have also studied hedge funds. These include Fung and Hsieh (1997, 2000, and 2004); Asness, Krail, and Liew (2001); and Liang (2000), and Malkiel and Saha (2005).

[1] According to the 2003 Goldman Sachs International and Russell Investment Group Survey of Alternative Investing among institutional investors.

[2] Brown, Goetzmann, and Ibbotson (1999) hand collected their data from printed sources. They recognized the potential biases in their database, but unlike the current study they did not have clear information on which data was backfilled or a complete sample of dead funds. From Table A1 in the appendix, we can see that the TASS data as of January 1995 included 918 funds, but only 40 of them did not include backfill data.

Despite the growing mainstream use of hedge funds, the industry is largely unregulated because the funds are usually either limited partnerships or off-shore corporations. This gives hedge fund managers considerable flexibility, but makes accurate measurement of performance difficult. Since hedge funds are not required to report their returns, most of the hedge fund returns are reported to data collectors on a voluntary basis. There are several data vendors that collect and measure hedge fund returns,[3] but most of the data published are subject to two main biases. The first is survivorship bias. When a fund fails, it is often removed from a database along with its performance history. This elimination creates a survivorship bias because the database tends to only include the more successful funds. The second common bias is backfill. Hedge funds tend to start reporting performance after a period of good performance, and that previous good performance history (or backfill) may be incorporated into the data base.[4]

Hedge funds also have a different fee structure than traditional long-only managers; they not only have a management fee, but also an incentive fee. The typical hedge fund fee structure is 1.5% plus a 20% incentive fee.[5] Although the typical management fee of mutual funds may be in the same range as that of hedge funds, incentive fees are very rare in the mutual fund industry. Even when they exist, they tend to be quite small so that the total fees would be positive each year, thereby eliminating the need for high water markets or give backs.

It is important to distinguish between the returns that come from alphas and betas. The alpha component is clearly value added, and does not appear to be present in the mutual fund industry in aggregate. On the other hand, the return from betas can readily be produced by investing in

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[3] For example, Hedge Fund Research, Inc., TASS/Tremont, Managed Accounts Reports, Zurich Capital Markets, and Morningstar.
[4] Another bias sometimes cited in hedge fund data is selection bias, which refers to not having a representative sample of funds. We do not know to word extent our sample is representative, and therefore we have no way to make any adjustments. .
[5] Median fee structure, according to TASS Data.

mutual funds, or by just directly investing in stocks and bonds without any special skill of the investment manager. Presumably, it is the high alphas the hedge fund industry has earned, along with their low correlations with other asset classes, that have led to the great interest in this industry with the corresponding high cash inflows. The results of this paper confirm the statistically significant positive alphas, but also show that a substantial part of the return can be explained by simple stock, bond, and cash betas.

2. Hedge Fund Return Measures

To effectively determine the sources of hedge fund returns, we first attempt to measure historical hedge fund returns accurately and without bias. Hedge fund returns tend to suffer from many biases, because reporting of returns is voluntary.

2.1 Data

We use monthly hedge fund return data from the TASS database from January 1995 through April 2006. The TASS database is an excellent data base to use because the dead funds are included and backfilled data is so marked. Fund of fund data is also included, and marked accordingly.

We first combine the live funds and dead funds. There are 6,364 funds in the database, 1,534 of which are categorized as fund of funds. We eliminated fund of funds from this analysis. Out of the remaining 4,826 funds, 2,806 funds were still alive and 2,020 funds were dead at the end of April 2006. Table 1 presents the detailed breakdowns. For each fund, the after-fee monthly return data were collected. With the live, dead, and backfill measures, we constructed the following six subsamples of the returns data:

- Live funds only with backfill data
- Live funds only without backfill data
- Live and dead funds with backfill data
- Live and dead funds without backfill data
- Dead funds only with backfill data
- Dead funds only without backfill data

For each subsample, we compiled three portfolios and calculated the monthly returns for each:

- An equally weighted portfolio
- A value-weighted (using previous month's assets under management) portfolio[6]
- An equally weighted portfolio with only funds that have reported an assets under management (AUM) amount.

Table A1 in the appendix gives the number of funds in each of the six subsamples year-by-year. For survivorship bias, we compare the returns between portfolios with and without the dead funds. For backfill bias, we compare the returns between the subsamples with and without the backfilled return data. We then analyze the survivorship bias and backfill bias in hedge fund return data by comparing returns on the above three portfolios across the six subsamples of funds.[6]

2.2 Survivorship Bias

When a fund fails, it is often removed from a database along with its performance history. Its elimination creates a survivorship bias because the database then only tracks the successful funds.

[6] Many funds only report assets under management once a quarter. We impute the AUM amount using the return figures, if the AUM was not reported that month. Funds with no AUM data are excluded from the value-weighted portfolio.
[6] Table A2 in the appendix provides detailed summary return statistics for each of the three portfolios across the six subsample databases.

Survivorship bias typically occurs when a dying fund stops reporting performance. The performance of a dying fund tends to be much lower compared to the other live funds, thus creating an upward bias in a fund database with only live funds. It is well known that the sample of live only funds contains survivorship bias. When Brown, Goetzmann and Ibbotson (1999) analyzed survivorship bias using off-shore hedge funds, they reported an attrition rate of about 14% per year over 1989–1995. Their estimate of the survivorship bias was an over estimate of the return of about 3% per year. This result is consistent with the 3% estimate provided by Fung and Hsieh (2000) on the TASS database from 1994–1998. However, only a 0.2% survivorship bias was estimated in Ackermann, McEnally and Ravenscraft (1999). Liang (2000) showed that differences in these estimates may be explained by compositional differences in the databases and different timeframes[8]. Barry (2003) also studied the characteristics of dead funds using the TASS data from 1994 to 2001. His estimate of the survivorship bias is 3.8%, which is higher than the Fung and Hsieh (2000) estimate, due to three extra years of return data.

Table 2 presents our estimates of the survivorship bias from January 1995 to March 2004 using the equally weighted portfolio. In the database with backfilled return data, the equally weighted portfolio with live only funds returned 16.45% per year, compared to 13.62% with both live and dead funds. Therefore, with backfilled data the survivorship bias is estimated to be 2.74% (16.45%–13.62%) per year. But including backfilled teturn data underestimates the potential survivorship bias in the data. When we exclude the backfilled data, the live only funds returned 14.74% per year, compared to 9.06% for the equally weighted portfolio with dead and live funds. This indicates a more accurate estimate of survivorship bias of 5.68% (14.73%–9.06%) per year, which is substantially higher than others have estimated.

[8] More specifically, the lower estimate by Ackermann et. al. can be explained in terms of the lower proportion of dead funds retained in the combined HFR/MAR database, the inclusion of fund of funds (less susceptible to overall failure), and the pre-1994 start date, since the leading databases only retain returns on dead funds that died after this date.

2.3 Backfill Bias

Backfill bias occurs because many hedge funds include previously unreported performances to the data collectors when they first start reporting their returns. These backfilled returns tend to provide an upward bias to the overall return data, since typically only favorable early returns are reported (not the unfavorable ones). Few studies have attempted to estimate this instant history bias. Fung and Hseih (2000) study the distribution across funds of the lag between each fund's inception date and the date at which it enters the database. They find a median lag of 343 days and delete the first 12 months of all funds' reported returns, finding an instant history bias of 1.4% per year. Malkiel and Saha (2005) also studied the impacts of various reporting biases in the hedge fund data. They estimate that the backfill bias is over 500 basis points higher than the contemporaneously reported returns from 1994 to 2003. Posthuma and van der Sluis (2003) report that more than 50% of all returns in the TASS database are backfilled returns. They estimate a backfill bias over the period 1996–2001 of about 400 basis points.

Table 2 also presents our estimates of the backfill bias from January 1995 to April 2006 using the equally weighted portfolio. In the database with backfilled return data, the equally weighted portfolio with live only funds returned 16.45% per year, compared to 13.62% without the backfilled data. Therefore, the survivorship bias is estimated to be 2.83% (16.45%–13.62%) per year for the live funds. When we included the dead fund data, the equally weighted portfolio with backfilled data returned 13.62% per year, compared to 8.98% for the equally weighted portfolio over without the backfilled data. This indicates that backfill bias is 5.01% per year over the live plus dead sample. Thus the backfill bias can be substantial, especially when using the complete sample of live plus dead funds.

Another interesting finding is that the backfill bias is measured to be much smaller using the value-weighted portfolios than the equally weighted portfolios. Table 3 presents the average returns calculated using both the equally weighted portfolio and the value-weighted portfolio, constructed with only funds that have reported their assets under management. For the equally weighted portfolio with AUM, the backfill bias is estimated to be 4.64% (13.62%–8.98%). For the value-weighted portfolio, the backfill bias is estimated to be only 0.27% (11.93%–11.66%). This seems to indicate that bigger funds are much less likely to have backfilled data in the database. We will take a more detailed look at fund size and performance in the next section.

2.4 Is a Bigger Hedge Fund Better?

As we have seen, larger funds tend to have less backfill bias. To further study the impact of fund size on returns, we construct a series of portfolios ranked according to the reported AUM for each fund. We rank funds based on the last month's AUM, then we group them into various categories based on the ranking each month. We then calculate the returns of an equally weighted portfolio for each category. Table 4 presents the results. On average, the largest 5% of the funds (which represented those funds with over $1 billion in AUM at the end of the sample in April 2006). returned 14.44% after fees. The largest 20% of funds (those funds with over $200 million AUM in 2006) returned 14.71%: Smaller funds did substantially worse.

It is widely speculated that hedge funds with larger AUM are more likely to underperform, because the bigger size makes it difficult for managers to find enough investment opportunities to generate superior returns. Although this might be true for a fund over its own life-cycle, our cross-sectional results indicate that larger funds on average outperform smaller funds. This result might have two possible explanations. First, managers of larger funds are likely to have greater skill than the average fund manager, so that even with a bigger fund they are still able to deliver better than average returns. Second, larger AUM means the managers do not have to worry about resources or the survival of the fund as much as the smaller funds do. Therefore, they may be better equipped and better able to concentrate on running the fund, rather than worrying about paying the bills.

2.5 The Bias Issue and Indexes

The above results show that survivorship bias and backfill bias can be quite large for individual hedge fund return data in the Tass hedge fund data base. Analysis that does not correct for these biases can lead to overstated results. Value-weighted indexes are likely to have less severe biases, since larger funds are more likely to survive and have been around longer so that they are less likely to have backfill data during our sample period. We also compared returns from two popular hedge fund overall indexes with our equally weighted portfolios. The HFRI index is an equally weighted index, while the CSFB index is a value-weighted index. The two indexes returned 11% and 13% per year over the same time period respectively. Although their returns are still higher then the 8.98% equally weighted portfolio return on the live and dead with no-backfilled sample, they are more reasonable compared to the 16.45% on the live only with backfilled data. Also, since most of the hedge fund indexes (such as HFRI and CSFB/Trement) are created on the fly, we believe the biases are much smaller in the return data of the hedge fund indexes, and are more likely to occur only in their older data.

3. Sources of Hedge Fund Returns

After controlling the survivorship and backfill bias in the returns, we investigated the sources of hedge fund returns. Hedge funds are often characterized as investment vehicles that are uncorrelated with the traditional stock and bond markets so that most of their returns are generated through manager skills. In other words, compared to traditional investment vehicles (e.g., mutual funds), the return of hedge funds comes mostly from alpha instead of beta.

In this paper, we focus on determining what portion of hedge returns is derived from traditional long beta exposures (i.e., stocks, bonds, and cash) and what portion is from hedge fund alpha. Asness (2004a and 2004b) further proposed breaking hedge fund alpha into: 1) beta exposure to other hedge funds, and 2) manager skill alpha. Fund and Hsieh (2002 and 2004) analyzed hedge fund returns with traditional betas and non-traditional betas, which include trend following exposure (or momentum) and several derivative-based factors. They found that adding the non-traditional beta factors can explain up to 80% of the monthly return variation in hedge fund indexes. Although we agree that a portion of the hedge fund returns can be explained by non-traditional betas (or hedge fund betas), these non-traditional beta exposures are not readily available to individual or institutional investors. Since hedge funds are the primary way to gain exposure to these non-traditional betas, these non-traditional betas should be viewed as part of the value-added that hedge funds provide compared to traditional long-only managers.

Therefore, our analysis concentrates on separating the sources of the hedge fund returns using only the traditional stock, bond, and cash beta exposures that are easily assessable for investors without hedge funds. We calculate the average amount of hedge fund returns that come from long-term beta exposures versus the hedge fund value-added alpha. We also compare the fees hedge funds charge to the amount of alpha that hedge funds add.

3.1 Data and Model

We use the equally weighted index using the live and dead funds without backfilled data constructed above as the hedge fund return series for this analysis, because it has the least amount of survivorship and backfill bias. We also construct indexes for each of 10 hedge fund subcategories in the TASS data base using the same methodology (equally weighted, live and dead funds with no backfilled data). The 10 subcategories are convertible arbitrage, emerging market, equity market neutral, event driven, fixed income arbitrage, global macro, long/short equity, managed futures, dedicated short, and fund of hedge funds.

The model we use is based upon the return-based style analysis model developed by Sharpe (1992) on mutual funds. We maintain the constraint that all style weights sum to one. We allow individual style weights to be negative or above one to account for shorting and leverage. We also include lagged betas as well as contemporaneous betas to control for the stale pricing impact on hedge fund returns.[9] The benchmarks used in the return-based analysis are the S&P 500 total returns (including both concurrent and with one-month lag), U.S. Intermediate-term Government Bond returns (including one-month lag), and cash (U.S. Treasury Bills).[10] Again, we choose to include only the traditional stocks, bonds, and cash as the beta exposures, because we are mostly interested in the value-added by hedge fund to investors that hold portfolios allocated to only traditional stocks, bonds and cash.

3.2 Results

We analyze the performance of a universe of almost 3,000 hedge funds in the TASS database from January 1995 through April 2006. We use the live plus dead fund sample that excludes the backfilled data. This sample has been corrected for the biases that we have discussed.

Table 5 presents the equally-weighted compound annual return of the ten categories, and the equally weighted index of all the funds. Note that the index of all the funds has an annual

[9] Asness, Krail, and Liew (2001) point out that many hedge funds hold, to various degrees, hard to price illiquid securities. For the purposes of monthly reporting, hedge funds often price these securities using either the last available traded prices or estimates of current market prices. These practices can lead to reported monthly hedge fund returns that are not perfectly synchronous with monthly S&P 500® returns, due to the presence of either stale or managed prices. Non-synchronous return data can lead to understated estimates of actual market exposure.

[10] We also ran the analysis with other benchmarks (small cap, growth, value, high-yield, etc.), and the results were similar. We use the data from *Stocks, Bonds, Bills, and Inflation® 2006 Yearbook*, Ibbotson Associates.

compound return of 8.98% over the period. This return was not as high as the S&P 500 return of 11.58%, but given the low betas on stocks (0.33) and bonds (–0.23), with a beta on cash of almost one (0.90), the alpha was high at 3.04% and statistically significant at the 5% level. Also note that all ten subcategories had positive alphas, with five of the alphas statistically significant at the 5% level. Most subcategories have low RSQs as well. Thus, our results confirm that hedge funds added alpha over the period, and also provided excellent diversification benefits to stock, bond, and cash portfolios.[11]

The overall annual compound return of the equally weighted index was 8.98% over the period. Subtracting out the 3.04% alpha return leaves 5.94% of the return that can be explained by the stock, bond, and cash betas. Estimating fees based upon the median fee level of the funds (usually a 1.5% management fee and 20% of the return as an incentive fee) gives us an overall fee estimate of 3.74%, which when added to the reported post-fee return, gives us an estimated pre-fee return for the index of 12.72%.[12] The results for the index and the subcategories are shown in Table 6 and in Figure 1.

The index alpha was positive and significant (3.04%), but was actually a smaller part of the return than that explained by the betas (5.94%). The alpha was approximately the same as the fees (3.74%). Although the index return of 8.98% was considerably lower than the S&P500 of the 11.58% over the period, the Sharpe Ratio, information ratio, and the alpha-fee ratio for the index are higher than S&P 500. The alpha/fee ratio (0.81) was almost one since the gross alpha were almost shared equally between managers and investors.

[11] For example, Fung and Hsieh (2004) showed that hedge fund alphas are significantly positive even with the inclusion of non-traditional beta factors.

[12] The funds in the TASS database are reported net of fees. Median fund fees are used to estimate fees. It is not possible to perfectly measure fees for many of the funds, since many fees are privately negotiated and not reported.

4. Conclusions

We wish to measure the sources of hedge fund returns. In particular, we estimate what portion of the returns come from alphas, betas, and costs. The portion that comes from alpha is most relevant to us, because this is the part that investors would have difficulty in achieving with stock, bond, and cash portfolios.

In order to measure returns, it is first important to select data that is as free as possible from biases. We study a period (January 1995–April 2006) in which it was possible to delineate the backfilled data and include the dead funds. We include both live and dead funds so that we can correct for survivorship bias. We exclude backfilled data that managers submitted when they joined the database. Our results indicate that both survivorship bias and backfill bias are potentially serious problems. The equally weighted sample of funds that existed at the end of the sample period had a compound return of 16.45% net of fees. Including dead funds reduced this return to 13.62%. Excluding the backfilled data further reduced the return to 8.98% net of fees.

Both biases were much smaller for the value-weighted index of hedge funds. Larger funds had much lower attrition rates, and many joined the database before the sample period started in 1995. Even when backfill data existed, it was likely given a low weight. After both biases were removed, the largest funds outperformed smaller funds.

We estimate the alpha of the equally weighted sample to be 3.04%. All ten subcategories of types of funds had positive alphas, and the index and five of the subcategories were statistically significant. In general, when combined with stock, bond, and cash portfolios, hedge funds add positive alpha and excellent diversification.

Finally, we estimated a pre-fee return from the equally weighted index of hedge funds to be 12.72%, which consisted of fees of 3.74%, an alpha of 3.04% and returns from the betas of 5.94%. Although the returns from the systematic betas exceeded the post-fee alpha, the alpha was approximately equal to the amount paid in fees. This gives the somewhat reasonable result that during the period the excess returns (gross alpha) were almost shared equally between the managers and the investors.

The results presented here are only a reflection of historical returns. Hedge funds are a relatively young investment opportunity and very dynamic. We expect them to continue to evolve going forward. A significant amount of money has flowed into hedge funds in the past several years. Therefore we cannot be assured that the high past alphas we measure are a good prediction of the future alpha in the hedge fund industry.

Table 1. Number of Hedge Funds in the TASS data base excluding fund of funds

(Jan. 1995 ~ April 2006)	Total	Fund of Funds	Total Excluding FOF
Live	3947	1141	2806
Dead	2417	393	2020
Live + Dead	6364	1534	4826

Table 2. Measuring Hedge Fund Returns: Survivorship Bias and Backfill Bias

	Compounded Annual Return	STD
With Backfill*		
–Live Only	16.45%	6.54%
–Live + Dead	13.62	6.57
Without Backfill*		
–Live Only	13.99	7.69
–Live + Dead	**8.98**	7.32
HFRI Weighted Composite	10.97	8.42
CSFB/Tremont	12.42	8.71

* Equally weighted post fee returns from the TASS database (1995-April 2006)

Table 3. Measuring Hedge Fund Returns: Equal- vs. Value-weighted

Jan. 1995 ~ April. 2006, Live + Dead	Compound Annual Return	STD
With Backfill		
–Equally Weighted	13.62%	6.57%
– Value Weighted	11.93	5.98
Without Backfill		
–Equally Weighted	8.98	7.32
– Value Weighted	11.66	7.11

Table 4. Is Bigger Better?

Jan. 1995 ~ April. 2006	Equally WTD, Live + Dead, No Backfill	End of Sample Category Min. AUM ($M)*
Largest 5%	14.44%	$1,021
Largest 10%	13.97	486
Largest 20%	14.71	202
Largest 50%	11.20	86
Smallest 50%	6.79	NA

*Categories were formed at the beginning of each period, with the returns measured afterward (out of sample); AUM amounts are as of April 2006. This sample includes only the funds that contain AUM data.

Table 5. Regression Results: Equally Weighted* 1995 – April 2006						
	Compound Annual Return (%)	Annual Alpha (%)	Betas (Sum of Betas = 1)			
			Stocks	Bonds	Cash	RSQ
CV Arb	9.48	4.03**	0.18	-0.05	0.87	0.26
Emerging	9.89	3.29	0.71	-0.80	1.09	0.34
Equity Mkt Neutral	7.86	1.94	0.05	0.00	0.95	0.14
Event Driven	10.02	4.41**	0.27	-0.19	0.93	0.39
Fixed Inc Arb	6.25	3.91**	0.01	-0.29	1.28	0.04
Global Macro	6.20	1.33	0.15	0.16	0.69	0.09
L/S Equity	13.10	5.41**	0.52	-0.23	0.70	0.51
Managed Futures	5.74	1.69	-0.08	0.56	0.51	0.13
Short	-1.97	3.54	-1.01	0.28	1.73	0.58
Overall Equally Weighted	8.98	3.04**	0.33	-0.23	0.90	0.41

*Live + dead, no backfill, post fee returns.

**Significant under 5% confidence level

Table 6. Source of Return: Alpha, Beta, and Cost (1995 – April 2006 Equally Weighted)

	Pre-Fee Return*	Fees*	Post-Fee Return	Alpha	Systematic Betas	Alpha/Fee Ratio	Information Ratio	Sharpe Ratio
CV Arb	13.35%	3.87	9.48	4.03	5.45	1.04	2.88	1.99
Emerging	13.86%	3.97	9.89	3.29	6.60	0.83	0.81	0.55
Equity Mkt Neutral	11.32%	3.46	7.86	1.94	5.92	0.56	1.33	2.70
Event Driven	14.02%	4.00	10.02	4.41	5.61	1.10	3.41	1.86
Fixed Inc Arb	9.31%	3.06	6.25	3.91	2.34	1.28	2.40	1.39
Global Macro	9.25%	3.05	6.20	1.33	4.87	0.44	0.58	0.96
L/S Equity	17.88%	4.78	13.10	5.41	7.69	1.13	2.49	1.20
Managed Futures	8.67%	2.93	5.74	1.69	4.04	0.58	0.56	0.55
Short	-0.97%	1.01	-1.97	3.54	-5.51	3.51	0.93	-0.10
Overall Equally Weighted	12.72%	3.74	8.98	3.04	5.94	0.81	1.81	1.23

*Post-fee compounded returns and alphas are from Table 5, with systematic beta return being the difference between them. Fees are based upon median fees, usually 1.5% and 20%. Pre-fee returns are post-fee returns plus fees. All results are dead + live, no backfill.

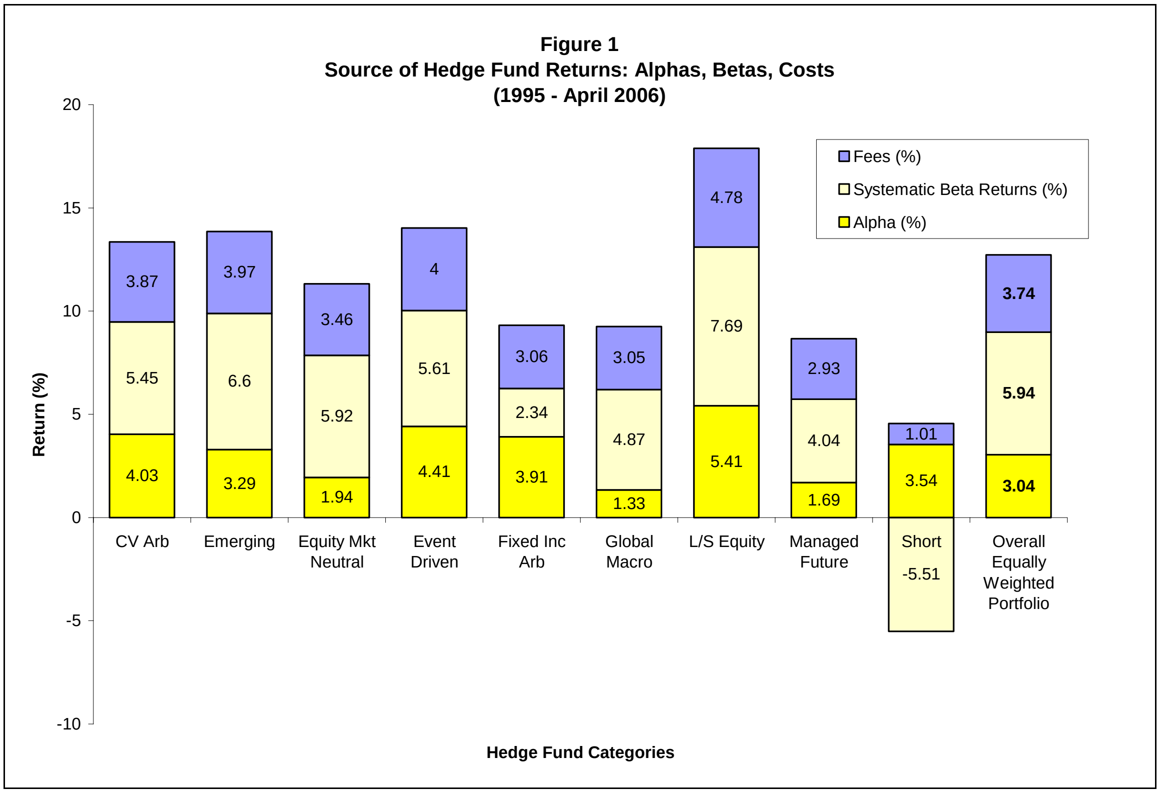
Figure 1
Source of Hedge Fund Returns: Alphas, Betas, Costs
(1995 - April 2006)
Fees (%)
Systematic Beta Returns (%)
Alpha (%)
Return (%)
20
15
10
5
0
-5
-10
3.87
5.45
4.03
3.97
6.6
3.29
3.46
5.92
1.94
4
5.61
4.41
3.06
2.34
3.91
3.05
4.87
1.33
4.78
7.69
5.41
2.93
4.04
1.69
1.01
3.54
-5.51
3.74
5.94
3.04
CV Arb
Emerging
Equity Mkt Neutral
Event Driven
Fixed Inc Arb
Global Macro
L/S Equity
Managed Future
Short
Overall Equally Weighted Portfolio
Hedge Fund Categories

Table A1. Number of Funds in the Six Subsamples (Dec. 1994 – Dec. 2006)*

	Live & Dead no Backfill	Live no Backfill	Dead no Backfill	Live & Dead with Backfill	Live with Backfill	Dead with Backfill	Full Sample
Jan-95	40	5	35	878	291	587	918
Jan-96	240	34	206	1077	391	686	1317
Jan-97	428	96	332	1257	507	750	1685
Jan-98	579	147	432	1482	626	856	2061
Jan-99	717	234	483	1659	758	901	2376
Jan-00	781	305	476	1868	943	925	2649
Jan-01	991	468	523	2034	1143	891	3025
Jan-02	1421	807	614	2290	1436	854	3711
Jan-03	1635	1070	565	2500	1734	766	4135
Jan-04	1868	1368	500	2755	2109	646	4623
Jan-05	2223	1854	369	2979	2567	412	5202
Jan-06	2615	2575	40	2775	2735	40	5390

*Funds are listed as dead if they died at any time during the sample period from Jan. 1995 ~ April 2006. For example, the 40 funds listed in January 1995 were live with no backfill at the beginning of 1995, but only 5 of them remained alive through April 2006. The full data set in January 1995 included an additional 878 funds, but this data was backfilled, it was reported at a later date when these funds joined the TASS universe. (This sample includes the fund of funds data.)

Appendix

Table A2. Returns from Subsamples (1995 – April 2006)

Equal Weighted		Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)
Live + Dead, No Backfill*		8.98	9.22	7.32
Live + Dead, With Backfill		13.62	13.81	6.57
Live, No Backfill		13.99	14.25	7.69
Live, With Backfill		16.45	16.63	6.54
Dead, No Backfill		4.87	5.13	7.48
Dead, with Backfill		9.34	9.55	6.78
Value Weighted				
Live + Dead, No Backfill*		11.66	11.88	7.11
Live + Dead, With Backfill		11.93	12.09	5.98
Live, No Backfill		12.81	12.98	6.25
Live, With Backfill		13.33	13.46	5.39
Dead, No Backfill		9.40	9.75	8.89
Dead, with Backfill		8.28	8.54	7.52

* Unbiased

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