A Rough Start to the Year for Long/Short Hedge Funds | February 2008

MSCI Barra

Overview: A Look at the Recent Decline in Long/Short Hedge Fund Performance

In the last few months, many Long/Short hedge funds have been hit severely extending a decline for the segment which began in the middle of last year. While some fund categories such as Convertible Arbitrage and Event-Driven funds have remained resilient in the last year, others have not fared as well. In just the last month, both Directional and Non-Directional (i.e., Market-Neutral) funds have experienced significant losses. Table 1 puts these declines in context.

Table 1: Hedge Fund Performance Worsens in the First Months of 2008

	MSCI Hedge Invest Index	Equity Non-Direct-ional	Equity Direct-ional (Long Bias)	Equity Direct-ional (Variable Bias)	Conv Arb	Event Driven	Sys-tematic Trading	Discre-tionary Trading	Fixed Income Arb
January 5, 2005 to February 5, 2008 *Annualized returns*	4.3%	5.4%	5.5%	6.7%	2.9%	7.3%	5.4%	5.2%	1.8%
July 2, 2007 to February 5, 2008 *Annualized returns*	-5.3%	1.8%	-10.5%	-7.5%	3.4%	3.00%	-2.0%	5.2%	-9.8%
January 1, 2008 to February 5, 2008 *Annualized returns*	-20.4%	-17.5%	-36.5%	-35.4%	9.3%	-7.6%	-6.9%	6.5%	-25.2%

Given these declines, what factors appear to be at work?

In this article, we address this question using the new analytical framework built at MSCI Barra to capture hedge fund risk and return – the Barra Hedge Fund Risk Model. Specifically, the framework developed by the Hedge Fund modeling team provides the ability to:

- *Identify the equity factors and common sources of return* that are most meaningful for Long/Short hedge funds
- *Estimate separate hedge fund "strategy factors"* to capture the additional systematic risk for each category of fund
- *Allows individual hedge fund exposures to vary dynamically* through time via an estimation technique based on the Kalman Filter.

First we review the main highlights of the hedge fund risk model. Second, we isolate what factors appear to be at work in the recent months' declines.

A Framework for Analyzing Common Sources of Hedge Fund Return and Risk

The Barra Hedge Fund Risk Model is designed to forecast the risk of individual hedge funds using only the funds' return series and information regarding its peer group membership. Because hedge funds rarely make available their holdings, hedge fund risk models must rely primarily on returns. As with any returns-based analysis, identifying systematic sources of risk is made more difficult by the presence of noise in the return series. In addition, exposures to sources of risk are rarely constant, in particular, for hedge funds managers who are likely to change their strategy depending on their market outlook. Lastly, identifying the factors which are relevant for hedge fund returns can be more difficult since some hedge funds often expand into quasi-equity and fixed income instruments such as structured products which makes it harder to determine which factors are most appropriate.

The full details of the model are laid out in Alvarez and Levinson (2007). Here we give a brief summary of the salient features of the model.

The Barra Hedge Fund model is unique in that it identifies two major sources of hedge fund risk: (i) the factors that drive traditional securities markets and (ii) the strategies characteristic of certain hedge fund styles. The first set of factors are found by testing which Barra equity and fixed income factors are related to hedge fund returns.[1] The second set of factors--so-called "strategy" or "alternative" factors--are found using statistical techniques on the residuals from the first set of factors. Our studies show that these factors can explain a significant portion of hedge fund returns; in particular for Long/Short funds. Then, to estimate the exposures of each hedge fund to the identified factors for its category, we construct static and dynamic sensitivities to all factors using different statistical methods. Dynamic exposures are warranted in some cases if hedge funds are rapidly changing their factor exposures over time. For instance, long-short managers quickly moved from positive market exposure to negative market exposure after the Spring 2000 market correction within a matter of months.[2]

A Look at the Drivers of Recent Declines in Long/Short Hedge Fund Performance

In this section we focus on the performance of Directional and Non-Directional (i.e. Market Neutral) hedge funds. These categories correspond to the MSCI Long Bias Hedge Fund Index and MSCI No Bias Hedge Fund Index. Using weekly data, our goal is to understand what drivers are responsible for the recent declines in these funds as a whole.

Directional Funds (Long Bias)

We find that in addition to overall long exposure to the European and US markets, the recent declines in Long Bias funds appear to be related to following segments:

1. **US stocks with high earnings variability**
2. **European stocks with low yields**
3. **European growth stocks**
4. **European small caps**
5. **Emerging markets**

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[1] The relevant factors are selected using in-sample and out-of-sample statistical analyses based on stepwise regression.

[2] The Barra hedge fund model uses the state space model (Hamilton 1994) and Kalman filter to estimate time-varying exposures of hedge funds to the various factors. OLS exposures are used for some funds where out-of-sample tests show these to be superior to the dynamic exposures.

Tables 2A and 2B show the factors[3] we identify as important to the significant declines in Long Bias funds. We break up the results into two tables to highlight the extreme movements just in January and rank them by their importance. Average exposures to the factors over the time period are also shown.

Table 2A: Factors Driving the Recent Declines in the MSCI Long Bias Hedge Fund Index
October 2, 2007 to January 1, 2008

	Avg. Monthly Return	Average Exposure	Equiv. % of Loss**
US Equity Earnings Variability Factor	-0.4%	0.92	70%
European Equity Size Factor*	0.8%	-0.09	12%
European Equity Growth Factor	-0.2%	0.41	11.5%
MSCI USA Index	-0.8%	0.05	6.5%

* This factor experienced positive returns during the time period shown but the index is negatively significantly exposed to it.
** To gauge the relative importance of each source of decline, we multiply the first two columns to get an estimated loss in dollars and show each loss as a percentage of the whole. Note this figure is not the % of loss to the total index return arising from this source, just that of the factors shown.

Table 2B: Factors Driving the Recent Declines in the MSCI Long Bias Hedge Fund Index
January 8, 2008 to February 5, 2008

	Avg. Monthly Return	Average Exposure	Equiv. % of Loss**
MSCI Europe Index	-9.8%	0.25	62%
MSCI USA Index	-6.8%	0.06	11%
European Equity Yield Factor	0.5%	-0.86	10%
European Equity Growth Factor	-0.8%	0.46	9%
MSCI Emerging Markets Index	-6.9%	0.04	7%
US Equity Earnings Variability Factor	-0.1%	0.90	2%

These tables demonstrate that much of the decline in the performance of the MSCI Long Bias Hedge Fund Index appears to be related to a handful of six well-known and identifiable sources of systematic risk. What the results suggest is that Long Bias funds were taking directional bets on average towards European markets while only slightly long US markets. They were also, as a group, long European growth stocks and stocks in the US with high earnings variability. These bets constituted a large portion of the poor performance of Long Bias funds overall, though

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[3] Note the following definitions of these factors: The US Trading Model Size Factor represents the performance of large caps as defined by both the log of market capitalization and the log of volatility-adjusted volume. The European Equity Growth Factor represents the performance of stocks with higher than average earnings growth, asset growth, sales growth, and/or dividend growth. The European Equity Size Factor represents large caps based on log of market capitalization and total assets. The European Equity Yield Factor captures the performance of stocks with higher than average current yield. All factors can roughly be interpreted as baskets that are long all stocks that have a higher-than-average exposure to the criteria in question and short all stocks with a lower-than-average exposure. For a more detailed description of these factors and how they are constructed, please refer to the US Trading Model (USTM2) and European Equity Model (EUE2) research notes.

individual funds may have been differently impacted. But depending on the degree of leverage for each fund, the impact from these simultaneous down-movements could be dramatic.

To get a sense for how these exposures shown above evolve over time, we next plot the exposures of the MSCI Long Bias Hedge Fund Index to these seven factors. This is shown in Figures 1A and 1B beginning in 2003.

Figure 1A: Evolution of Exposures of the Long Bias Index: Market Indices
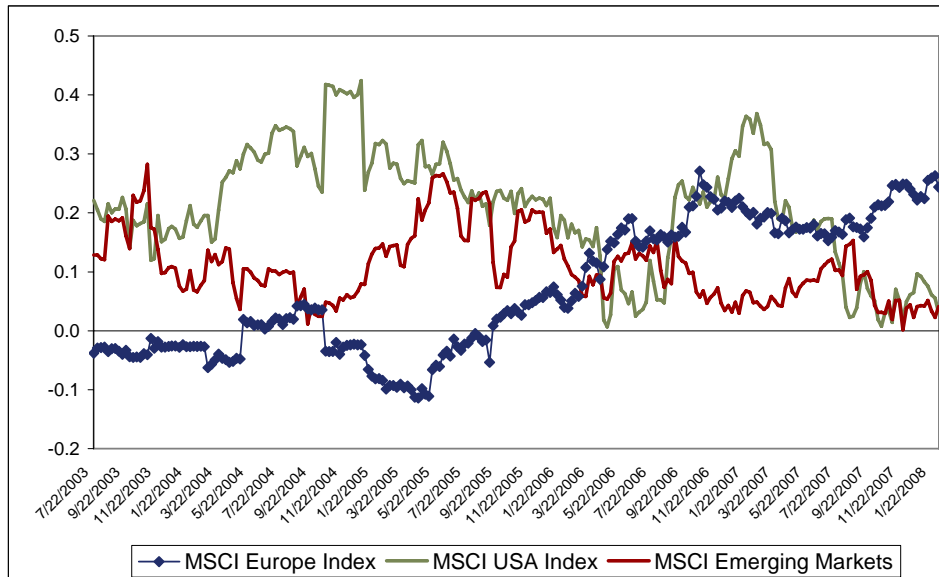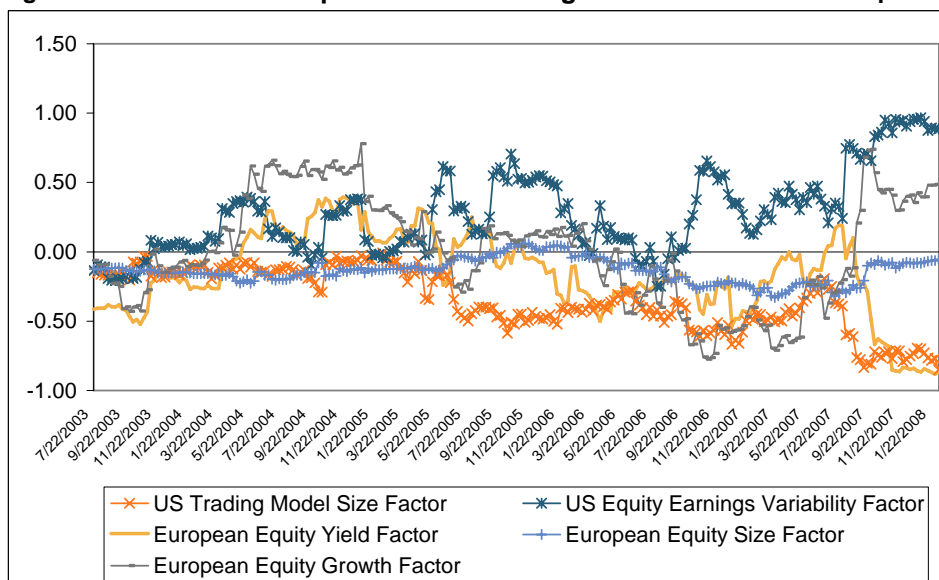

Figure 1B: Evolution of Exposures of the Long Bias Index: US and European Factors

These figures suggest several possible trends during the observed period:

- Long Bias funds have increased their exposure the European market.
- Just in the last year, Long Bias funds have significantly shifted towards the US high earnings variability and the European growth factor.
- Long Bias funds have kept their exposures to the overall US market and Emerging Markets relatively stable and slightly positive.
- Long Bias funds moved from neutral or slightly negative to strongly negative exposures to the European high-yield and US Size factor beginning in Sept/Oct of 2007.

In all four cases, the aggregate performance of Long Bias funds was dragged down as a result of these biases.

Non-Directional Funds (No Bias)

Similarly, we find that the recent declines in No Bias funds appear to be related to the overall decline of the US and European equity markets as well as the following declining segments:

1. **US stocks with low leverage**
2. **US stocks with high earnings variability**
3. **European stocks with low yields**
4. **European small caps**

In contrast to the Long Bias (Non-Directional) funds, Emerging Markets and the European Equity Growth factor are no longer relevant. In place, these funds appear to have been hurt by significant exposure to US stocks with higher than average leverage. Interestingly, another important factor that has helped offset these losses for No Bias funds pops up—exposure to US stocks with strong short-term momentum.

As before, we summarize the most important factors dragging No Bias fund performance in recent months in Tables 3A and 3B.

Table 3A: Factors Driving the Recent Declines in the MSCI No Bias Hedge Fund Index
October 2, 2007 to January 1, 2008

	Avg. Monthly Return	Average Exposure	Equiv. % of Loss**
US Equity Earnings Variability Factor	-0.4%	0.36	44.4%
European Equity Size Factor*	0.8%	-0.19	44.1%
MSCI USA Index	-0.8%	0.05	11.5%

* This factor experienced positive returns during the time period shown but the index is negatively significantly exposed to it.
** To gauge the relative importance of each source of decline, we multiply the first two columns to get an estimated loss in dollars and show each loss as a percentage of the whole. Note this figure is not the % of loss to the total index return arising from this source, just that of the factors shown.

Table 3B: Factors Driving the Recent Declines in the MSCI No Bias Hedge Fund Index
January 8, 2008 to February 5, 2008

	Avg. Monthly Return	Average Exposure	Equiv. % of Loss**
MSCI Europe Index	-9.8%	0.14	71%
MSCI USA Index	-6.8%	0.04	15%
European Equity Yield Factor	0.5%	-0.31	7%
US Equity Leverage Factor	0.2%	-0.55	6%
US Equity Earnings Variability Factor	-0.1%	0.39	1%

Like the Long Bias funds, No Bias (i.e. Market Neutral) funds appear to have been hurt by the overall performance of US and European markets as well as their positive exposure to US earnings variability and negative exposure the European Size factor. In addition, No Bias funds have been dragged down through a negative exposure to the leverage factor.

The fact that overall exposure to the markets suggests such a strong impact is surprising. On one hand, No Bias funds appear to have been less exposed compared to the Long Bias funds, as we would expect. On the other hand, these exposures are still not indicative of true market neutrality. A number of explanations are possible. For instance, market forces (i.e., the assumptions for correlations and volatilities used to create the hedge) may have unexpectedly moved against these funds. Or alternatively, short positions in Asian stocks may have implied a bias towards European and US markets depending on the portfolio construction method, for instance, global-sector-based hedging programs.

Summary

In this article, we explore what factors have been driving the recent poor performance in Long/Short funds. We focus on two subgroups of these funds—Long Bias (Directional Funds) and No Bias (Non-Directional Funds). We find that these funds' underperformance in recent months can, in large part, be attributed to declines in well-know systematic sources of return and risk. In particular, we find that generally:

1. **Directional funds appear to have been hurt by biases towards the following Barra Hedge Funds Risk Model factors:[4]**
 - Positive Overall exposure to US and European markets
 - Positive exposure to US earnings variability factor
 - Negative exposure to European yields factor
 - Positive exposure to European growth factor
 - Negative exposure to European size factor
 - Slightly positive exposure to Emerging markets

2. **Non-Directional (or Market Neutral) funds appear to have been hurt by biases towards the following Barra Hedge Funds Risk Model factors:**
 - Positive overall exposure to US and European markets
 - Negative exposure to US leverage factor

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[4] A positive exposure to a Barra Hedge Funds Risk Model can be achieved through either going long stocks with above average (positive) exposure or going short stocks with below (negative) exposures

- Positive exposure to US earnings variability factor
- Negative exposure to European yield factor
- Negative Exposure to European size factor

References

Alvarez, Miguel, and Levinson, Mike (2007), "Hedge Fund Risk Modeling," MSCI Barra Model Insight, April 2007.

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