# – Why Would One Invest in an Outlier? –

## An Analysis of the Bayou Fund

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## Background

On August 25, 2005, it was made public that Bayou Management LLC, a money-management firm that claimed to be overseeing $440 million in investments, was being investigated by the Connecticut Department of Banking, and the Justice Department for defrauding investors from 1998 through 2005. As more information becomes known about the fund, and more and more red flags are uncovered, this fund is being held up as a warning to investors who are not performing their own due diligence before making significant fund investments.

From 2000-2004, the SEC brought 51 cases against hedge-fund advisers who allegedly defrauded investors of more than $1.1 billion.[1] The potential for hedge fund fraud is greater because of lack of standard requirements for fund transparency. Even with the current environment, investors can do more to evaluate prospective fund investments to better protect themselves. The following paper reviews the outlier signs that were readily available from a standard review of monthly returns for the Bayou Fund.

## Data

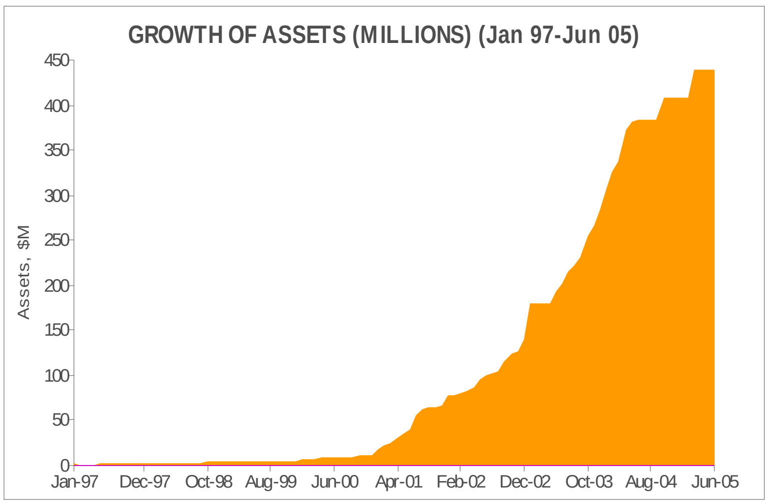
Information on the Bayou Fund is readily available from a number of commercial hedge fund performance databases. For this analysis we will use the database from Hedge Fund Research (HFR) in Chicago which provides basic administrative information on funds including their monthly performance track record. According to HFR, the Bayou Fund is classified by HFR as an Equity Hedge strategy which is described as follows:

"Equity Hedge investing consists of a core holding of long equities hedged at all times with short sales of stocks and/or stock index options. Some managers maintain a substantial portion of assets within a hedged structure and commonly employ leverage. Where short sales are used, hedged assets may be comprised of an equal dollar value of long and short stock positions. Other variations use short sales unrelated to long holdings and/or puts on the S&P 500 index and put spreads. Conservative funds mitigate market risk by maintaining market exposure from zero to 100 percent. Aggressive funds may magnify market risk by exceeding 100 percent exposure and, in some instances, maintain a short exposure. In addition to equities, some funds may have limited assets invested in other types of securities."

The following is the definition of the fund strategy found in HFR, which is very generic and unclear, requiring more careful qualitative and quantitative due diligence:

"The objective of the Bayou Fund will be long/short fast trade strategy focused on highly liquid, large-cap US equities, equity indexes and listed futures and options. Hedges can combine several elements, based on long/short dollar ratios, correlations, and a host of other factors. Indexes may be used to hedge groups of individual positions. There can be no assurance that hedges will reduce risk. Ranges from as low as 0-10% to more than 100% of investment capital. Exposure levels are a function of the Manager's assessment of market risk and individual securities risks. Bayou believes that any arbitrary numerical limits, while they can reduce the absolute level of risk, will also lower the risk-adjusted rate of return. Therefore, the manager observes guidelines for long/short, sector and individual exposures, but these guidelines may be overridden when circumstances warrant. Almost exclusively US listed securities, indexes, sub-indexes and options through this may include liquid ADRs of foreign large-caps. High turnover of the portfolio renders percentage breakdowns statistically irrelevant. Fundamental and quantitative data should both play significant, if not always equal roles in determining individual security selection, sector selection, index and options choices, and so forth. Finally, successful trading warrants increased risk, while poor results suggest that risk be more contained."

Although the Fund was in business since 1997, the assets started to grow exponentially only in 2001:

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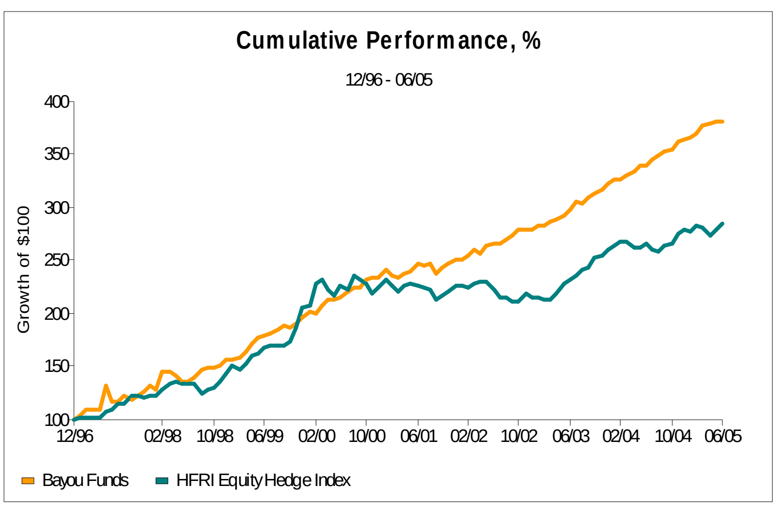
Below we show the cumulative performance chart for the Bayou Fund as compared with the HFR Equity Hedge strategy index (includes "dead" funds). The strategy is one of the most representative strategies with over 1,000 funds listed in the HFR database.

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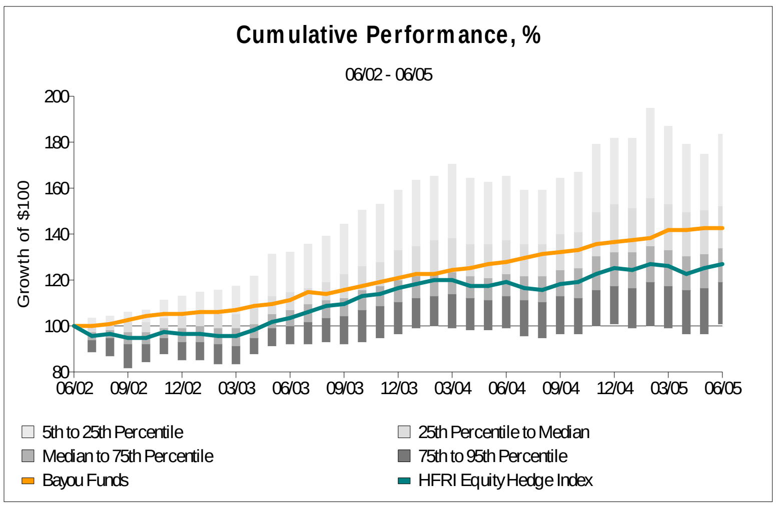
The pattern of returns is so unusual for the strategy that it is surprising that the fund didn't raise any suspicion before. And it's not only the magnitude of the growth but rather "growth without volatility" that is usually suspect.

## Analysis

In our analysis of the Bayou Fund we will focus on the last three years of the fund history ending June 2005, the period when it accumulated the majority of its assets. Again, the fund performance over this time period is not that unusual in its magnitude. Below we show a cumulative growth chart of Bayou vs. the peer group of about 600 Equity Hedge funds with assets over $10M. Note that the fund's performance is stable in the next to top percentile, so the fund didn't exhibit the best performance.

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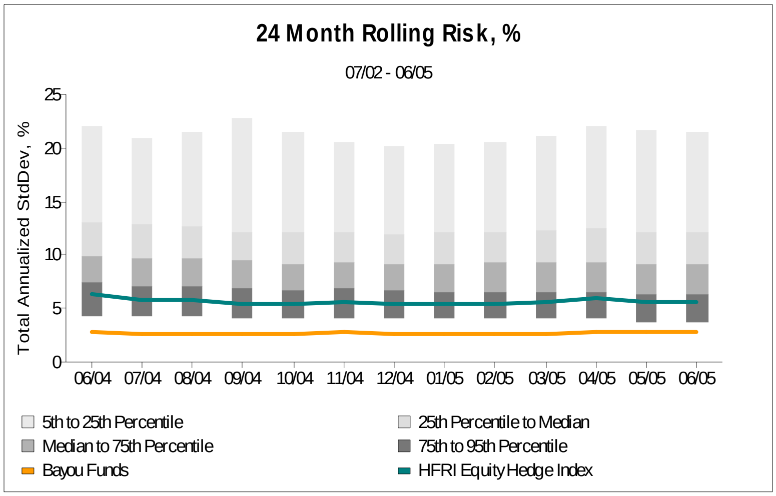
What <u>is</u> unusual is that the fund had the lowest possible risk profile. The chart below shows rolling 24-month risk as measured by the standard deviation of monthly returns vs. the same peer group of funds. The fund consistently appears below (better) the best possible risk percentile.

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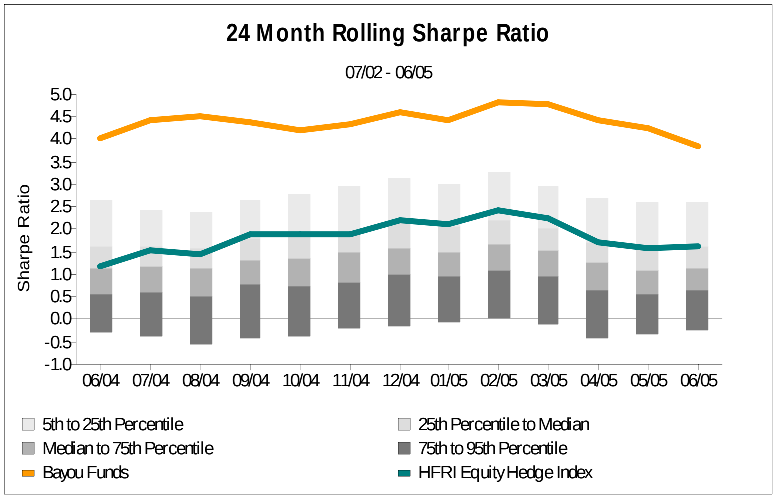
As a result, the fund is clearly an outlier in Sharpe Ratio. The rolling Sharpe Ratio chart below compares the fund with the peer group and the strategy index, and the ratio values around 4 do look unusually high. Sharpe Ratio is a common measure of performance efficiency, a "t-statistic in disguise," which is frequently used to select investment products – the higher SR the better. Such high value of SR is equivalent to a straight line going up without any fluctuations -- similar to the one that is shown on the growth chart above.

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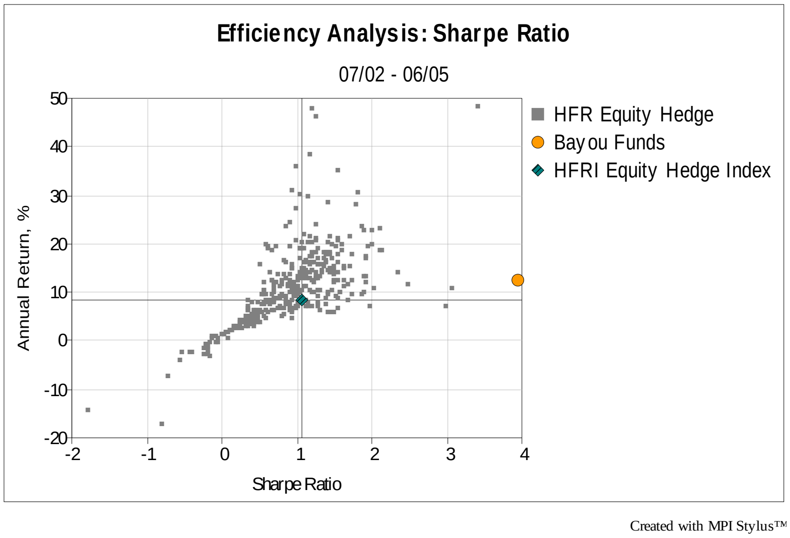
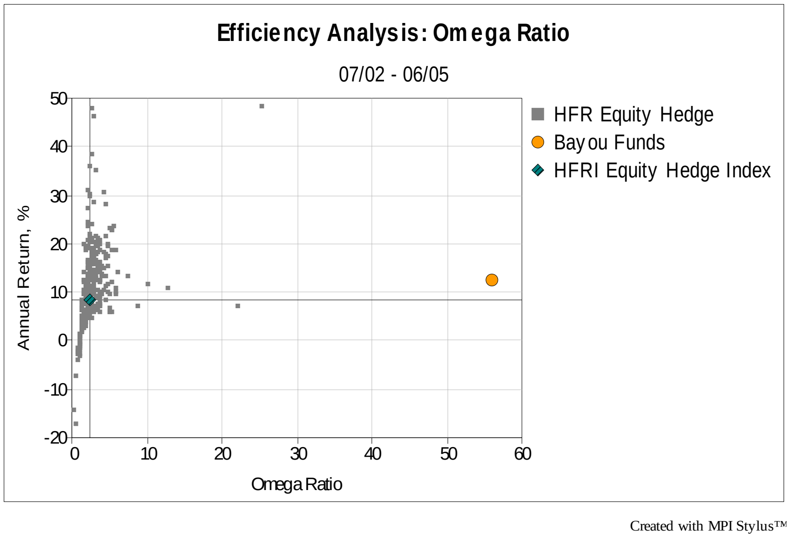
Although it can be argued that Sharpe Ratio is not suitable for hedge fund investments evaluation, because strategies can be designed to create an unusually skewed distribution of returns by using derivatives and thus achieve exceptionally high Sharpe Ratio values, in this case Sharpe Ratio can help to immediately point to an outlier.




Note that other common ratios such as Sortino, Kalmar and Omega would point to Bayou as an outlier as well. On the chart below we show Bayou's Omega Ratio vs. the universe of funds.

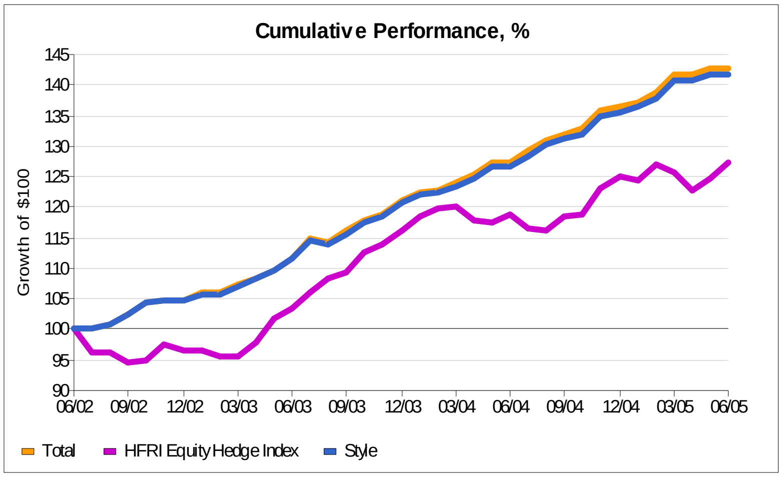



It is clear that such an outlier should have raised questions many years ago and better due diligence on the part of investors was needed. Interestingly, unlike the case with The Manhattan Fund and Beacon Hill[1] fund, the Bayou managers didn't even bother to create a pattern of returns that could be at least remotely trusted.

[1] Beacon Hill had an exceptionally high Sharpe Ratio of about 9 and was an outlier among Mortgage-Backed Fixed Income strategies.

## Replicating Bayou Strategy

We will attempt to replicate the Bayou long/short strategy using Dynamic Style Analysis (DSA). Below the fund performance is closely tracked by a dynamic portfolio of US Equity sector indices (two lines coincide) and compared to the Equity Hedge strategy.

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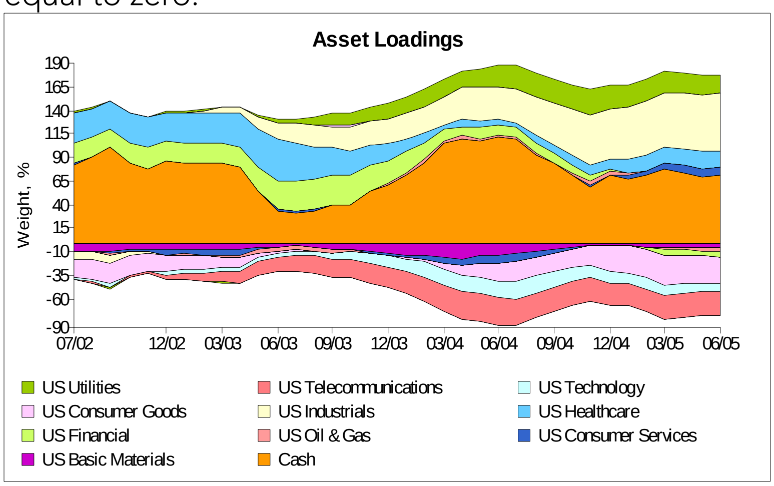
The replication of the strategy is presented below. It is definitely a "doable" strategy with the following caveat: its credibility measured by the proprietary MPI's statistic is equal to zero.

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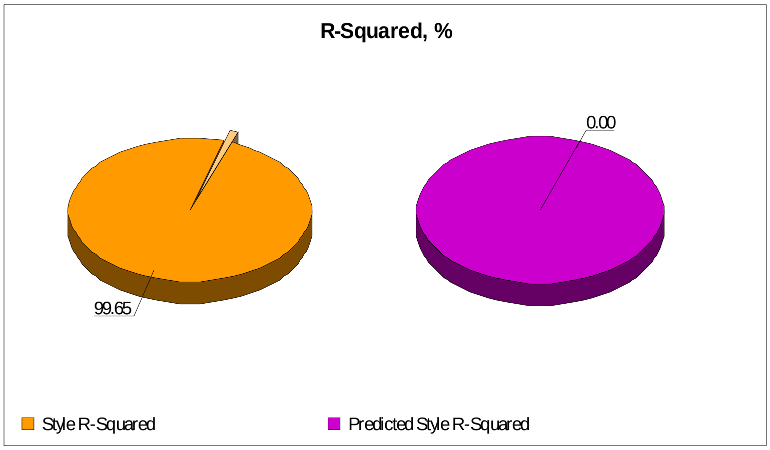
As it is shown below, we get over 99% tracking and zero percent credibility plus there's no time period in the fund history where a replication of any sort could be trusted. Unlike the case with The Manhattan Fund where Berger added numbers to otherwise normal portfolio returns, or in the case with Beacon Hill, where most of the returns were adherent to the strategy except for the last several months, in this case it is clear that the returns were possibly manipulated from the start.

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We don't claim that all performance patterns similar to the one analyzed are representing fraud without any question. This case seems to be raising red flags anywhere you look, yet was allowed to continue for such a long time.

## Summary

This fund is indeed an outlier on any chart one can possibly imagine. Given all the risks involved, what makes people invest in such a risky product? We have all heard about investment scams from time-to-time, on a smaller scale, as well as the ones that make the front page of the Wall Street Journal. Does the potential for large returns really blind investors to the risks? Certainly the clout of Hedge Funds makes such questionable investments more attractive, so the flow of money from individual investors will continue, and fraud will continue if investors are not vigilant in their due diligence.

At the same time, a lot of inflows are also fueled by fund-of-funds, most of which incorrectly approach analysis of hedge funds as individual securities and use technical analysis instead of proper quantitative tools. Plus, trying to limit risks, FoFs put together enormous numbers of individual funds with up to several hundred funds in a single FoF, making high quality due diligence impossible! The expansion of avenues for investment in Hedge Funds seems endless.

Even with this current climate, we need to understand that we're definitely in the middle of a bubble and it's not clear what will make it pop. Rising interest rates - possibly, but definitely not the cases like Bayou.

[1] Wall Street Journal, August 25, 2005 "Bayou is Probed as Investors Seek Their Cash" by Ian McDonald and Ianthe Jeanne Dugan