



August, 2007

## Hedge Fund Performance Evaluation and Risk Measurement

### *First, the problems:*

There are three problems in assessing hedge fund performance that are not present for ordinary funds of traded securities.

First, hedge fund reporting generally incorporates some values or valuations that are stale, not current. Sometimes this is a result of holding thinly traded securities (often derivatives), other times it reflects estimated instead of actual market values for some non-traded securities (also often derivatives), and sometimes the smoothing is the result of using an amortization method of accounting that reflects a desired tax treatment. Hedge fund accounting and reporting is a matter of contract between investors and the fund, and is not subject to GAAP or SEC standards. As a result, one cannot generally analyze hedge fund returns the same way one would look at mutual fund returns. An approach that addresses the inherent smoothing of returns is required.

Second, hedge fund risk is often asymmetric. That is, sensitivity to market changes may be different for up markets vs. down because the fund holds asymmetric put or call positions. It is important but straightforward to test for different sensitivities to up vs. down markets.

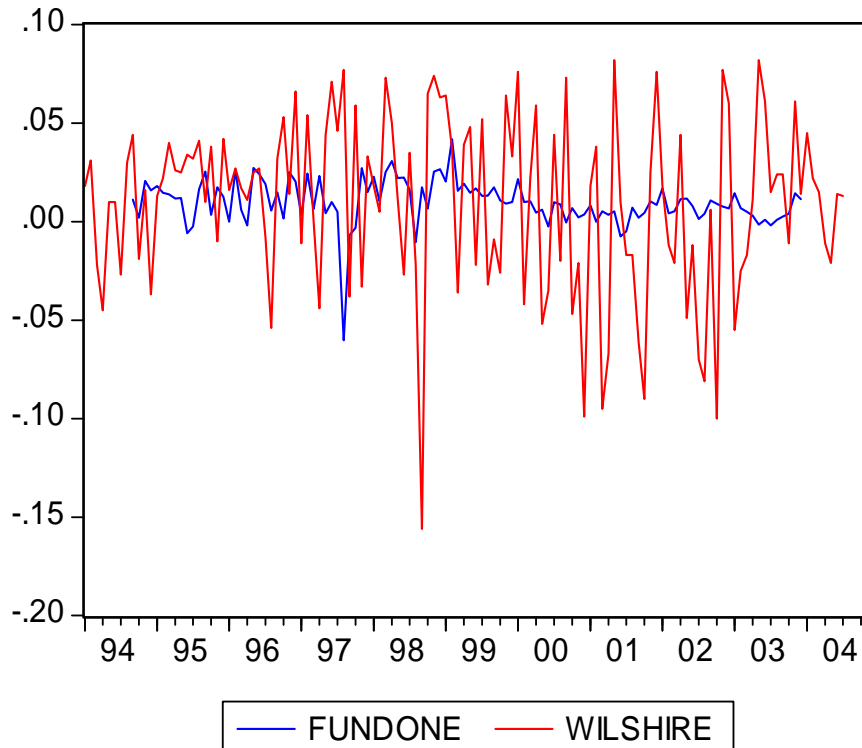
Third, hedge funds often have large, low-frequency risks present in their portfolios, often from selling out-of-the-money puts. The fund sells the put and books the sale price as part of return, smoothing it over the term to expiration, but does not mark the put to-market. Thus, should price fall sufficiently for the put to be exercised, the fund must either buy the security put to it at a price well above the current price or deliver cash equal to the difference between the security price and the exercise price, experiencing a big negative return. This risk often cannot be detected in a short return history if the fund has been lucky for the duration of that history. It can sometimes be detected in longer histories. While a long history may reveal the presence of such risks, the safest approach to knowing whether such risk is present is to ask the fund itself.

### *Next, the opportunities:*

Despite these risk and performance measurement challenges, hedge fund performance, unlike mutual fund performance, has considerable persistence. You **can** expect better future performance from funds that had better past performance.

### Sand Hill Assessment: FundOne:

Below are the reported monthly returns from FundOne (an anonymous but real hedge fund) from September 1994 through December 2003, shown against returns on the Wilshire5000:



The average return on the fund is about 1 percent per month and the standard deviation of monthly returns is 6 percent per year corrected for smoothing (vs. 4 percent per year uncorrected). The annual standard deviation of return on the Wilshire5000 over the same period is 17 percent. The naked eye can see one large negative return on the fund, indicating at least some presence in low-frequency large risks.

FundOne alpha: .59 percent per month, or 7.05 percent per year ( $t=3.93$ , highly systematic)

FundOne beta: .068 ( $t = 1.50$ ) (estimated with correction for autoregression)

Presence of smoothing? Yes. ( $t$ -statistic on autoregressive correction is 3.06 (this is big), lags are present back 3 months)

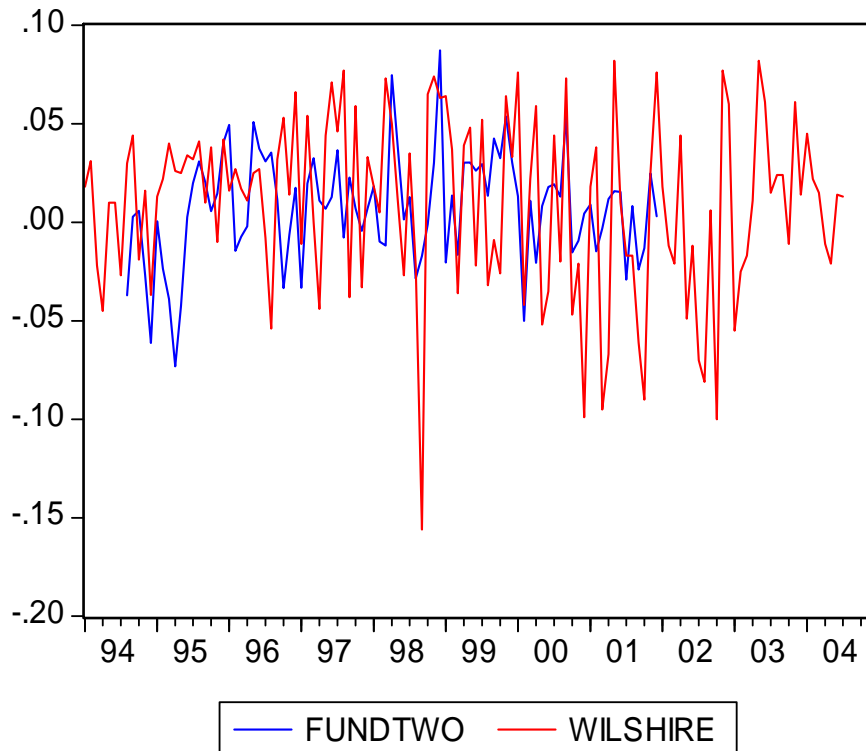
Residual risk: about 6 percent per year, same as the total standard deviation due to the nearly zero beta.

Up vs. down market betas: no statistically or economically meaningful difference.

Summary: This fund is an outstanding performer. With a beta of only 0.07, it has negligible systematic risk—the correlation with the stock market is virtually zero. It has returned roughly 7 percent per year in excess of the return on one-month Treasury Bills over this history. The total risk (standard deviation of return) is only about 6 percent per year, vs. total risk of about 17 percent per year for the stock market over the same period.

## Assessment: FundTwo

Below are the reported monthly returns from FundTwo (an anonymous but real hedge fund) from September 1994 through December 2001, shown against returns on the Wilshire5000:



The average return on the fund is about 0.7 percent per month and the standard deviation of monthly returns corrected for smoothing is about 15 percent per year (vs. 8.4 percent as reported).

FundTwo **alpha**: 0.0009 percent per month, which is economically and statistically zero.

FundTwo **beta**: .32 (t=1.38) (estimated with correction for autoregression)

Presence of smoothing? Yes. (t-statistic on autoregressive correction is 2.88, and lags are present back six months)

Residual risk: 12 percent per year corrected for smoothing

Up vs. down market betas: Up market beta is .82 (t = 1.8) and down market beta is .26 (t = .67)

**Summary:** This fund is a mediocre performer. It adds no value compared to an index fund. It appears to be limiting downside risk (perhaps by buying puts), but at a cost that cancels the value. It also appears to be smoothing reported returns aggressively.