

What Goes Up, Comes Down

Predicting future hedge fund investment losses.

Standard deviation is a simple and effective quantitative measure of historical risk. In fact, it has helped many hedge fund investors predict the magnitude of their future losses over the years.

Despite this, many investors dismiss return volatility among hedge funds that have only had positive returns as 'upside' volatility. They believe historical standard deviation overestimates the future risk of funds that have only experienced upside volatility. Investors say this is the case because standard deviation penalizes funds equally for both above- and below-average returns.

Such investors look to downside risk measures such as historical maximum drawdown and downside deviation as their primary quantitative predictors of future losses. With the right data, however, the question of which risk measure best predicts future losses is an empirical issue.

Predicting future losses

The monthly return data for this research comes from the hedge funds that a large fund of funds invested in between December 1991 and December 2000.

Historical standard deviation, downside deviation, semi-deviation and maximum drawdown were calculated using only data available before the fund of funds invested in each hedge fund. Then, each hedge fund's downside deviation and maximum drawdown were calculated for the subsequent period during which the fund of funds was invested with each hedge fund.

This methodology accomplished several objectives. First, the analysis does not have any survivor bias, unlike a similar analysis conducted on commercially available databases. Second, the analysis represents a true, out-of-sample test. It only uses data available before the actual investment was made in each hedge fund in order to predict results in the subsequent period of investment in each fund.

Downside risk measures

Three downside risk measures were evaluated as alternatives to standard deviation: semi-deviation, downside

deviation and maximum drawdown. Semi-deviation is similar to standard deviation except it only penalizes hedge funds that have monthly returns below the average monthly return. Downside deviation is not unlike standard deviation, but it only penalizes hedge funds for the amount that their monthly returns are below zero.

Lastly, maximum drawdown is the largest peak-to-trough percentage loss over any number of months in the data (or zero if there are no negative returns). If an investment was made at the worst possible time and also pulled out of the market at the worst possible time, then the investor would lose this amount.

For hedge funds, historical standard deviation is helpful in predicting future risk. The correlation between pre-investment standard deviation, downside deviation and maximum drawdown during the subsequent period of investment is significant. In addition, historical standard deviation appears to be a better predictor of future losses than downside risk measures such as historical downside deviation and maximum drawdown.

Regardless of its strengths, standard deviation is only one part of a much larger picture that hedge fund investors should look at. At the same time, when attempting to forecast an individual hedge fund's future risk, investors should put more emphasis on a fund's historical standard deviation and less on downside risk measures such as maximum drawdown and downside deviation. All too often, what goes up, also comes down. ■

