Negatively Skewed Trading Strategies

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Imagine a speculative trading strategy that is guaranteed to make money 98% of the time. Are you interested? There are many ways to accomplish this. Here is a stylized example: You draw a card from a 52 card deck. If it comes up any card other than the ace of spades, you earn a million dollars. If it comes up the ace of spades, you lose 52 million dollars. On average, you will lose just over $19,000 each time you play, but you will win 51 out of 52 hands. This is what is known as a skewed trading strategy.

Here is a non-stylized example. A client of mine recently hired a new head trader. One five-minute meeting with the guy was enough to convince me he was a bad apple, but my stark warnings weren't enough to curb the client's enthusiasm for their new hire. The trader set to work and quickly established himself as a consistent money-maker. Month in and month out, he earned three million dollars for the client. It was like clockwork. He was the champion trader—the trader who walked on water. He went around telling people "I'ze the man!" Less than a year after he joined the firm, it all fell apart. In one bad month, he lost 30 million dollars. To make matters worse, he tried to cover up the losses by hiding losing trades in his desk draw, but that is another story. The trader had been making his money by selling way out-of-the-money options. Month in and month out, he pocketed three million dollars in premiums, until one month when the markets moved dramatically against him and the options were exercised. He had been trading a skewed strategy.

Skewed trading strategies derive their name from the shape of the probability distribution of the P&Ls they generate. Exhibit 1 indicates the shape of the distribution for the P&L of a non-skewed trading strategy. It is symmetric. Absent a competitive advantage or disadvantage, this strategy will, on average, break even before financing and transaction costs. This means that the distribution will have an expected P&L of zero. Fifty percent of the time the strategy makes money. Fifty percent of the time it loses money.

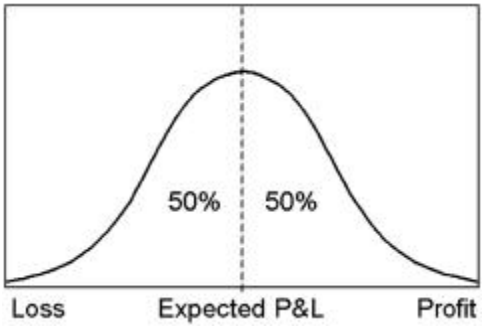

Exhibit 1: A non-skewed trading strategy has an equal probability of outperforming or under performing its expected P&L.

While the actual shape of the P&L distribution of a skewed trading strategy depends upon the particular strategy and the length of time over which P&Ls are calculated, they all are skewed. Exhibit 2 illustrates such a P&L distribution. Again, absent a competitive

advantage or disadvantage, the strategy will break even on average. Its expected P&L is zero. However, because of the negatively skewed distribution, there is now a high probability of making a little money and a low probability of losing a lot. Overall, there is a sixty percent probability of making money and a forty percent probability of losing money.

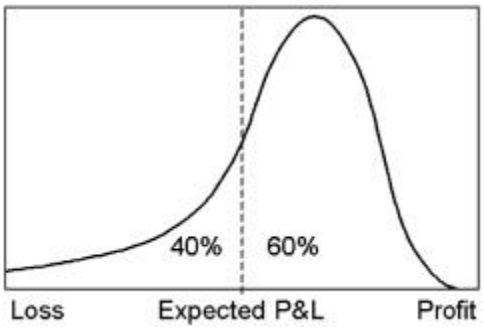

Exhibit 2: A negatively skewed trading strategy may have the same expected P&L as a non-skewed strategy, but it has a higher probability of outperforming its expected P&L. This is offset by a small probability of suffering a significant loss.

Those probabilities can be made more extreme by increasing the skewness of the distribution. How do you do that? The answer depends upon your particular trading strategy. If you are selling out-of-the-money options, sell options with even further out-of-the-money strikes.

There is an old saying on trading floors:

> Watch the trader who makes consistent money. He is the one who is going to blow up.

Hedge funds are a category of investors that make consistent money. They also have a noticeable tendency to blow up. Long Term Capital Management (LTCM) is the obvious example, but there have been others … the Granite Fund, Fenchurch Capital Management and the Manhattan Fund.

Many of the trading strategies—statistical arbitrage, convergence trades, risk arbitrage—that hedge funds employ are negatively skewed strategies. Here is an example. A trader tracks over time the credit spreads of a large set of bonds. When a bond's spread widens, the trader buys the bond. He waits for the spread to return to its historical levels, sells the bond, and pockets a profit. It works like a charm, except occasionally the spread continues to widen, and the trader is left holding a distressed bond.

When a bond's spread widens, this usually means something has happened to cause investors concern about the issuer. Most of the time, those concerns aren't realized, and the spread returns to its past levels. Occasionally, the concerns prove all too valid, and the spread continues to widen. In this sense, statistical arbitrage is like selling far out-of-the-

money options. It makes consistent money, but occasionally realizes a dramatic loss. It is a negatively skewed trading strategy.

Do hedge funds add value? No one is sure. Their returns are so dominated by the skewness in their trading strategies that it is impossible to tell. I suspect that, after the managers have subtracted their management fees, investors are taking a bath. Of course, this can be true only on average. Investors in hedge funds that don't blow up often make money. Investors in hedge funds that do blow up lose their shirts.

Value-at-risk (VaR) is the standard tool for assessing market risk in trading portfolios. Most implementations are poorly equipped to warn of skewed trading strategies. Depending upon the specific trading strategy and the specific VaR implementation, your VaR measure may or may not recognize what is going on. If a trader is selling far out-of-the-money options, a Monte Carlo or quadratic VaR measure will recognize this. Either type of VaR system can be modified to report the (mathematical) skewness of a trader's P&L distribution along with the usual measure of his VaR. The more negative that skewness number, the more you should be concerned.

Most VaR systems cannot recognize skewness arising from other trading strategies, such as statistical arbitrage. They do not incorporate a sufficiently sophisticated model of relative price dynamics to do so. The solution is to be aware of what trading strategies are skewed and closely monitor traders to see how much they rely on those strategies.

If you have a trader walking around saying "I'ze the man," it may be too late.

Glyn A. Holton is a risk consultant and author of the new book *Value-at-Risk: Theory and Practice*.