

PROFITING FROM INCREASED VOLATILITY

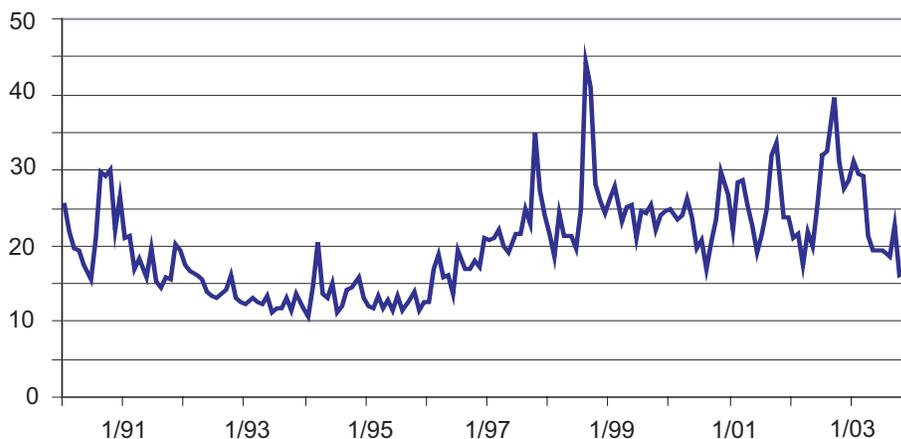
“Buy low, sell high” – it’s the mantra of every traditional, stock-and-bond investor. But in today’s market, finding a low-priced, “undervalued” asset can be challenging. Interest rates are at long-term lows, meaning that bond prices are very high. The valuation levels of equity markets appear high as well, as measured by price/earnings or other traditional indicators. Where is there a bargain in these financial markets?

Perhaps the answer lies in the historically low volatility of markets. Despite war, global energy turmoil, massive deficits, a hotly contested U.S. presidential election, and other complicating factors, volatility – as measured by the Volatility Index (VIX) – has dropped to unexpectedly low levels and stayed there.

The VIX, plotted in *Chart 1*, measures the implied volatility in the prices of a basket of options on the S&P 500 Index, and, as such, serves as a measure of the volatility investors expect from the average stock over the near future. Sometimes dubbed the “fear index,” it provides insight into investor psychology, as well as recent market action. At current levels, the VIX could be viewed as an index of complacency, rather than a measure of fear.

For those who believe that volatility will increase and who want to profit from that move, one strategy would be to take a long position in VIX futures. But there are many other possible strategies, including some that we view as more attractive than direct investment in the VIX. Moreover, there is an equally important

Chart 1
VIX Volatility Index



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consideration before making any final decisions: When volatility rises, there are a number of widely practiced investment strategies that are negatively affected. So the wise investor will not only seek to profit from increasing volatility, but also to avoid portfolio damage from positions that are likely to suffer adverse effects.

Hedge Funds and the Long & Short of Volatility

An investor does not need to have a direct volatility position to be affected by changes in the volatility of markets. The economic driver of many investment strategies is an implicit position in volatility.

Consider high-yield, “junk” bonds. The bondholder collects a coupon which in effect consists of interest on money lent, plus a premium for a put option. The borrower can default on the bond and put the corporate assets to the lenders. The incremental yield spread paid by high-yield debtors is the premium for that put. When the economy suffers from recessionary spasms, defaults abound and the bondholders (sellers of default puts) lose money.

Similar economic considerations underlie merger arbitrage, mortgage arbitrage, distressed securities, emerging market debt, and other hedge fund strategies. A study by University of Illinois professor Oleg Bondarenko¹ details the extent to which the majority of hedge fund strategies build their profitability on the foundation of a persistent short position in market volatility. They do not (necessarily) engage in the direct sale of options, but rather maintain positions that collect a risk premium for being short some sort of volatility. They have to pay, however, when an unlikely event occurs: a blown merger, a bankruptcy, a dramatic widening of credit spreads, a sudden market spike up or down.

What’s the Alternative?

Investors who allocate funds to hedge fund strategies will be dismayed by Bondarenko’s paper. It suggests

that many of the alternative strategies they have chosen as “uncorrelated” are to some extent variations on a single theme, that of collecting a high risk premium to provide variance insurance to risk-averse investors.

In fact, it appears that investor demand for hedge funds is reaching a crescendo, just at the moment when the economic engine that has driven hedge fund returns appears to be sputtering. *However, there are alternative strategies for which Bondarenko does not find a statistical link to a short position in volatility. Chief among these is an investment in Managed Futures. According to Bondarenko, the returns from Commodity Trading Advisors (CTAs) that he studied actually are correlated with a long position in volatility, opposite to the underlying economics of typical hedge funds.*

Why CTAs Are Long Volatility

Bondarenko’s results raise two interesting questions. First, why do the strategies practiced by CTAs lead to long-volatility positions? And second, how can they make money with long-volatility positions when all the hedge funds of the world are making money with short-volatility positions?

The answer to the first question lies in the trend-following strategies of the top-performing CTAs. A typical trend-following strategy is quite similar to a policy of synthesizing straddles, as we will show.

Consider trading an asset according to the following system. Denote the current price of the asset by P . Choose a trigger price K . Always hold a position E such that $E = m(P-K)$. Select the multiplier m to determine the aggressiveness of trading.

Suppose we constrain E so that we never hold negative positions, and our maximum position is capped at some value Max . This simple policy will in effect create payoffs similar to those of a call option with

strike price K. Let's try it with some numbers. Suppose today's price is 80, and we set K to match it. As prices go up and down, exposure E will vary as shown:

K	80
m	5
Max	100
P	E
70	0
75	0
80	0
85	25
90	50
95	75
100	100
105	100
110	100

Exposure is 0 for prices at or below K, rising to a maximum of 100.

As prices fluctuate, the position E will have to be adjusted. The trader will buy on rallies, sell on declines. If the price bounces up and down but ends near where it began, he will suffer a loss. On the other hand, an uptrend will result in a profit. The payoff after a period of time, say a few months, will resemble that shown in *Chart 2*.

This resembles the payoff from a call option, because the strategy is economically identical to synthesizing a call. This technique of option creation was first suggested by Robert Merton,² and

was later elaborated upon and popularized by Andre Perold, Fischer Black, and others.³

It should be obvious that if we remove the requirement that short positions are not allowed, this procedure will generate a positive payoff when prices trend down, as well as up, and will (as before) lose money if prices bounce around but end near where they began. This is equivalent to the payoff of a straddle, illustrated in *Chart 3*.

Let us make one final, simple change. Instead of fixing K at some predetermined value, we set K equal to the average price over some recent past period and update it as new prices arrive. Now we have a trading rule that closely resembles one of the many moving-average, trend-following rules adopted by professional CTAs. And, as we have seen, it is nearly identical to Merton's straddle-synthesis formulation.

Bear in mind that the purpose of this discussion is not to propose a specific trend-following trading rule. Rather, the intent is to illustrate why CTA returns represent a long position in market volatility, as opposed to the short-volatility posture of the majority of hedge funds.

Both Sides Can't Win

Many different types of hedge funds have posted excellent track records while following strategies that involve short positions in volatility. How then can CTAs make money on the opposite side of these trades?

Chart 2

Potential Payoff of Proposed Strategy

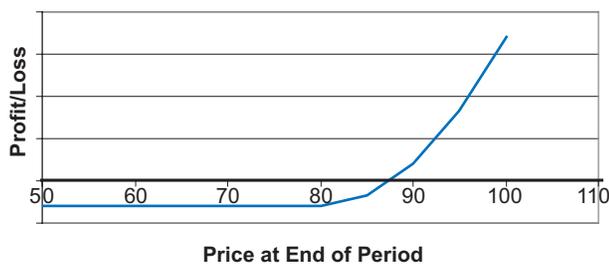
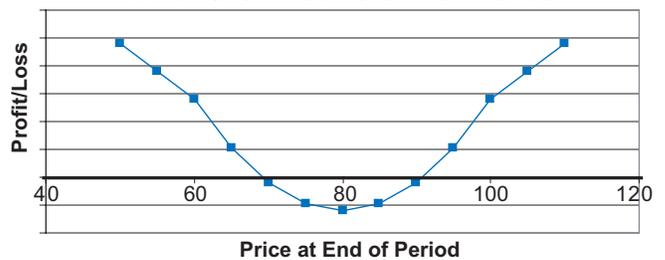


Chart 3

Potential Payoff of Proposed Strategy When Short Positions Are Allowed



The brief answer is that although CTAs may have an opposite position with respect to the direction of market volatility, they are most definitely not on the opposite side of the hedge funds' trades. Hedge funds sell volatility through financial instruments, not by synthesizing optionality. For example, they may own high-yield debt or mortgage securities that contain an imbedded option. Because of the complexity of such instruments, the option may be mispriced. And it is the difference between the price of volatility and its actual economic value that provides the economic source of returns to holders of these positions. There is a rich academic literature regarding the price of variance risk in the markets; all conclude that the price of such risk has been extremely high. In other words, sellers of prepayment, default and variance options have collected premiums that have compensated them richly for the actual contingent liability they have assumed.

CTAs, by contrast, are achieving their long-volatility position through dynamic trading. This produces an option that is "fairly priced," i.e., the volatility cost of the option is equal to the realized volatility of the underlying instrument. They don't pay the excess premiums that generate the returns of professional sellers of optionality.

But What's the Payoff?

Of course, being able to synthesize a fairly priced option will not by itself generate profits. A strategy of

buying fairly priced options on a random series will simply break even over time. CTAs rely on the underlying properties of the data series.

For example, if successive price changes exhibit some positive autocorrelation, trend-following will produce profits. Some contracts may exhibit negative autocorrelation at one time interval, positive at another. Contracts may have a positive carry with respect to the spot (in some cases attributable to interest rates, in others, to storage and insurance costs). In some markets, consumers are the dominant hedgers, seeking to stabilize the cost of their supply; in others, producers are the main hedgers. These different circumstances produce opposite signs for the risk premium, or "convenience yield," of the futures contracts. Some underlying physicals have a positive expected return, others do not. All these and other, still more subtle, properties can be accounted for in the design of a CTA's trading models.

With market volatility near a seven-year low, now might be an excellent time for investors to allocate assets to strategies that are positioned for more volatile markets in the future. For the investor in alternative strategies, the bottom line is that a professional CTA, armed with sophisticated trading and analytical technology, can produce a stream of profits that will likely increase when market volatility rises and other investment strategies are struggling.

FOOTNOTES

- 1) Bondarenko, Oleg, "Market Price of Variance Risk and Performance of Hedge Funds," University of Illinois at Chicago, 2004.
- 2) Merton, Robert, "Rational Theory of Option Pricing," Bell Journal of Economics and Management Science, 1973, vol. 4, pages 141-183.
- 3) Perold, Andre F., and Fischer Black, "Theory of Constant Proportion Portfolio Insurance," Journal of Economic Dynamics and Control, 1992, vol. 16, pages 403-426.

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