Volatility, Robustness, & Long-term Performance of Futures Trading Systems

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The information on this paper is entirely my opinion. It is based on many years of experience in systems research, not on one particular study or another. I am unable to provide specific documentation for opinions formed in this manner from experience. To the best of my knowledge and belief, however, the opinions expressed herein have reasonable basis in fact.

I am often asked, "Why is your Tactical system of futures trading volatile?" Robustness and increased odds for survival have a lot to do with it. But I am getting ahead of myself...

Most investment administrators recognize that the relative volatility of any component investment in a portfolio is unimportant in itself as long as the investment is uncorrelated with the portfolio's other assets and improves the performance characteristics of the portfolio as a whole. Yet many still find it difficult to actually invest in a potentially beneficial yet volatile instrument.

This paper explains why I believe volatility should never be a concern with a Tactical commodity and currency futures investment and, in fact, why volatility is to be expected when we are doing things right!

The rationale for futures systems trading

The Tactical method is a "systematic," as opposed to a "discretionary," approach to futures trading, and the opinions expressed in this paper apply to systems trading, not discretionary trading. In a systems approach, all trading decisions are made by following algorithms that are specified exactly and are followed precisely. Decisions are totally unemotional and may therefore be established in every case on statistically validated trading principles.

Systems trading works because futures markets are not efficient in the classical sense: price movements ("trends") that are mathematically distinguishable from unprofitable random behavior occur with significantly greater than chance frequency. This deviation of futures markets from mathematical efficiency was addressed as early as the 1960's by papers in the Journal of Finance, yet astonishingly continues to be ignored by much of the academic community, perhaps because academics are more familiar with stocks which indeed behave more randomly.

Why futures behave as they do is beyond the scope of this paper. There are, however, whole families of quantifiable systems that can be shown to be profitable in futures markets. If this is a shock to any academic types, my apology. Of consolation perhaps, systems trading is by no means a free lunch, as I will explain.

NOTE THAT PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS AND THAT FUTURES TRADING ENTAILS RISK OF LOSS.

What you should know about systems trading

Systems lend themselves to computerization and rigorous historical testing. For over 20 years I have examined hundreds of types of systems, across multiple variable parameters, analyzing literally tens of thousands of systems. These four conclusions about futures systems trading have been overwhelmingly supported by my research:

1. The majority of futures trading systems do not hold up over time.

A large number of systems are "curve-fit." This means that the parameters chosen and the rules applied are relatively specific to the type of markets they were designed for. Also, those systems that are not specifically curve fit are often appropriate only for certain types of markets, i.e. "market-fit." Neither curve-fit nor market-fit systems are stable over time.

To illustrate, the family of systems that get their trading signals from increases in the near-term volatility of the markets can be highly curve-fit and notoriously seductive. They may appear to work beautifully, with minimal drawdowns for protracted periods. However, when market conditions change, such systems can be disastrous. They certainly do not work in slowly trending markets. Additionally, if volatility does not increase when a market changes direction, losses can accumulate very dramatically with many volatility-only signaled systems.

Various types of oscillator systems also fall into the category of systems that works well for certain periods only when markets behave in certain ways. In fact, the majority of all systems that initially appear to be excellent will be found to be unstable over time!

2. Stable trading systems tend to be longer term in nature.

Most systems that are very short term, holding trades on the order of one day to one week, appear to be unstable over time. There are again excellent examples of short-term systems that work well in certain types of market conditions. But once the market conditions are well defined, it is usually too late to implement the systems.

The shorter term systems that do, in fact, seem relatively stable over time, unfortunately suffer so much from transaction costs and skids on fills that they are most commonly rendered unattractive once real-life costs are figured in.

The stable systems seem to be those that capitalize on market inefficiencies, trends, which play themselves out over multiple weeks or months. These are the timeframes for which many successful families of systems exist.

3. For a system to succeed, it must be followed religiously.

If you design a system to capitalize on longer term trends, once you appropriately integrate portfolio-selection and money-management strategies (extremely important!), it is surprising that your choice of type of system or parameters thereof is often quite uncritical over the long run! Certain types of systems do perform better that others, and selecting certain clusters of variables within a system will affect system performance.

But what really counts is this: once a system's algorithms and parameters are established, the system must be followed exactly and religiously. A system cannot be second-guessed or used intermittently. Values of variables cannot be altered (unless so dictated by the pre-tested algorithms, i.e. adaptable systems). Parameters cannot be arbitrarily changed.

The idea is the probabilities in any particular system must be allowed to play themselves out over many trades. For example, suppose a system enters a trade relatively quickly after an apparent market turn, only to be stopped out with a loss that would not have occurred had the system reacted more slowly. Suppose the same system subsequently enters another trade in similar circumstances. Yet being in the market quickly this time more than makes up for the loss on the previous trade. Since the first trade was a loss because of quick entry, the natural human tendency to wait a little longer to enter the next trade, a losing strategy overall, is avoided in a religiously followed systematic approach.

As a corollary, it is a dangerous practice to replace one system with another during any period, particularly when the one is performing poorly with respect to the other. This is not to say that a truly superior system, if developed, should not replace an inferior one; simply that relatively similarly performing systems should not be switched back and forth.

4. The robustness of a trading system is proportional to its volatility.

This is the no-free-lunch part.

A robust system is one which works and is stable over many types of market conditions and over many timeframes. It works in German Bund futures and it works in Wheat. It works when tested over 1950-1960 or over 1990-2000. Robust systems tend to be designed around successful trading tactics (origin of our "Tactical" name), classical money management techniques, and universal principles of market behavior. These systems are not designed around specific types of markets or market action.

And here is the amazing thing about robust systems: The more robust a system, the more volatile it tends to be! This is because robust systems are not optimized to particular markets or market conditions. The converse is also true. You can design systems with excellent returns and low volatility on historical testing, but which work only for given periods in given markets. These systems tend to be curve-fit or market-fit and are not robust.

For a system to have the highest odds of profitability over time and markets, the inescapable tradeoff is volatility. Diversification is used of course, but it will only dampen the volatility so much.