C S I   N E W S   J O U R N A L .

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HOW TO AVOID FALSE CONCLUSIONS AND INCREASE REAL PROFITS THROUGH TIME SERIES ANALYSIS

Since most of our readers are destined to make or lose large sums of money in the markets through the analysis of time series, we thought it would be helpful to explain the discipline known as Time Series Analysis so that our readers might have more control over their destiny. This brief bulletin will focus on how PERPETUAL CONTRACTS® compare with traditional contracts and at the same time explain what should be known about the analysis of time series so it can be done better.

Technicians often spend countless hours of personal computer time to synthesize market behavior to capture a superior set of control input that will produce profitable trading experiences. Typically, such an exercise involves passing a set of input choices for a given systematic procedure against historical data such as commodity or stock prices.

In the event the technician wishes to focus on a commodity, there is a highly important aspect of time series analysis that is too often overlooked. If the day-to-day volatility tends to increase as delivery approaches, the time series analyst will be basing his market decisions on a market variance or variability that will be in effect to a much greater degree in a future predictive period. This small but often overlooked condition will tend to nullify the predictive capacity of a system and could easily turn expected profits into losses.

Time Series Analysts have chosen the peculiar term "heteroscedasticity" to describe a process where the time series variance is changing. The preferred result, known as homeoscedasticity (non-changing variance) is what is required as a prerequisite before a given series can qualify for unbiased testing.

But how does one remove the ever changing variance from a futures contract so that it can be analyzed properly? CSI did it twenty years ago in New York State when we introduced the PERPETUAL CONTRACT to the futures industry.

A PERPETUAL CONTRACT, because of its constant-period-forward vantage point to the market under study, tends to reduce or eliminate the chance a given time series will possess increasing variance. Paul Samuelson, a prominent contemporary economist and prolific author of the 20th century, hypothesized that the variance of a futures contract increases as delivery approaches. It is this expanding volatility and variance of the futures contract that should be eliminated before any testing should commence.

Controlling the variance is key to producing a viable system. In our development of the forthcoming UNFAIR ADVANTAGE™ product that we hope to make available, we experimented with both PERPETUAL CONTRACTS and traditional contracts. We were forced to throw out the exclusive use of traditional contracts because problems of heteroscedasticity plagued our progress in finding viable solutions. The same would be true on a greater scale with nearest futures contracts because of the surprise discontinuities that develop as one contract replaces another over time.

UNFAIR ADVANTAGE handles the non-stationary variance problem through a gradual blending of perpetual and traditional contracts that appends two to four months of the real contract to up to seven years of perpetual data. The result is a homogeneous time series that can be analyzed to produce comparably consistent results.

The blending process enables the user to issue orders on real tradeable data and at the same time develop important parameters that will control the future real time result in a positive manner.

It is fairly obvious to any student of the futures market that volatility increases throughout a given contract's one to three year life. At near the time of delivery the ranges of price and the day-to-day changes in price are at their extremes. In an analysis of price behavior over time, the technician has probably noticed that there are not only significant trends in price movement, but also definite trends in volatility. We have assumed that variance and volatility are synonymous.

The perpetual contract, because of its mathematical perspective, captures and retains price behavior trends and oscillations and helps eliminate the heteroscedasticity (changing variance) of the time series (stochastic process).

Since the perpetual contract views the market a fixed period forward (say 90 days), the blending process (described above) would best take place over a period of time such that the real contract and the perpetual contract merge as they pass through the period when they share the same future price. Once the merging process ends, the volatility will gradually increase over a short trading interval. The trading interval, the time when actual positions are taken and held from one trade to the next, will typically be for a finite period of say 10 to 30 days. The 30 to 45 day period just prior to delivery should be avoided to reduce the liklihood of delivery notices and to remove the possibility of experiencing variance extremes not representative of the system study period.

This explanation is not meant to be confusing, but at the same time it has introduced some terms which may produce some questions. For example, a stochastic process is a term that means random over time. Some may find it ironic that the "stochastic study" is derived from a word that suggests randomness. Although derived from it, the "stochastic study" you might have used as part of popular tool kits including QUICKSTUDY™ borrows from the discipline of Time Series Analysis to get the impressive name. At that point all similarity stops except for the data used to drive the tool kit study. The data, and in fact most economic time series data, are in themselves representative of a stochastic process.

The word stationary when applied to a time series defines a constant distributional form over time. Heteroscedasticity is simply an unusual term to identify processes which diverge from constant variance. Non-perpetual time series on futures are thought to possess the characteristic of heteroscedasticity and are therefore difficult to analyze profitably.

In the equity markets, the problems of changing variance over time are not affected by the delivery mechanism characteristic of futures, but the heteroscedasticity problem may disqualify many less actively traded stocks. The problems of non-constant variance can probably best be controlled through the study of any one of several major indices of stocks. It is also a good idea to adjust any dividend paying or capital gain paying stock or mutual fund before attempting any analysis.

As long as we are covering term definitions we may as well set the record straight on the misuse of the term "Relative Strength Index." Prior to a redefinition of the term imposed by Wells Wilder and others, Relative Strength was meant to measure the strength of one stock as compared to many other related stocks or to an index. Instead, buried in the jargon of computers and software descriptions, Relative Strength now has become an indicator of a market's strength relative to itself.

Next month we hope to present an update on our new UNFAIR ADVANTAGE product. Release of it will depend on our acceptance procedure which will place the product through a period of testing. The product must exhibit superior performance or it will not be offered.