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In This Issue

Improve Your Trading through Correlation Analysis

CSI's Correlation Studies give our customers the rare chance to either arrange a risk-adverse, truly diversified portfolio or to get an edge in "pair trading" by gauging how markets are likely to move in relation to each other. These studies allow the trader to participate in golden opportunities for profitable trading and wealth building.

As you may already know, correlation is a measure of the statistical relationship between any two time series. The subjects of our Correlation Studies can be any tradable investments such as two commodities, two stocks, a stock and an index or perhaps a stock and a commodity — always tracked as pairs.

In our world economy, every market coexists with all other markets, and each market responds in its own way to various stimuli. Whether the relationship between market elements (more precisely, pairs of markets) is causal, complementary, parallel or reciprocal, their relationship can be quantified and plainly expressed as a "correlation coefficient." This shows the level of association between the members of the pair over an extended period of time in numerical probability terms. The corresponding Z-score, a statistical derivative that is an integral part of the Correlation Studies, tips the trader off to future market direction.

Correlation analysis can stand on its own for trade timing and selection, or it can act as a wonderful supplement to any form of analysis that may be supplied by CSI or third party trading software. It provides instant insight into likely future market direction for either or both members for any market pair. In doing so, it can confirm or reject buy and sell recommendations.

Every evening immediately after the exchanges close, CSI's computers calculate the statistical level of correlation for each and every pair of markets in the massive CSI database. CSI covers over 100,000 world stocks and nearly every futures market traded. A host of different time periods are studied to enhance the comprehensiveness of the result.

This exercise takes about three hours on multiple high-speed computers to complete, but traders usually have at least 12 hours to comprehend the analytical results before the next trading session begins. A thorough screening of results allows customers to orient their trading focus and benefit from likely directional movement for the most promising of the many millions of pairs that are analyzed. Computer speed, depth of coverage and longevity of data reserves are three keys to the production of this amazing resource. Flawless CSI data seals the integrity of the correlation database.

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Description of Color coding	
From 1.0 To 0.8	High correlation
From 0.8 To 0.7	Moderate correlation
From 0.7 To 0.3	Marginal correlation
From 0.3 To 0.2	Low correlation
From 0.2 To -0.2	Minimal correlation
From -0.2 To -0.3	Low correlation
From -0.3 To -0.7	Marginal correlation
From -0.7 To -0.8	Moderate correlation
From -0.8 To -1.0	High correlation

Figure 1

vs.	C	CL	LH	BK	MER	MSFT
C	1.000	-0.085	0.454	-0.279	-0.123	-0.356
CL	-0.085	1.000	0.263	0.616	0.798	0.505
LH	0.454	0.263	1.000	-0.078	0.110	-0.120
BK	-0.279	0.616	-0.078	1.000	0.885	0.893
MER	-0.123	0.798	0.110	0.885	1.000	0.775
MSFT	-0.356	0.505	-0.120	0.893	0.775	1.000

Figure 2

Understanding Correlation Coefficients

As mentioned above, the relationship between markets can be stated as a correlation coefficient, which is an important subject of this newsletter. There are two parts to the correlation coefficient — the sign and the magnitude. The magnitude is an absolute value that ranges from zero (0) to one (1). It denotes the strength of the relationship. The sign (positive or negative) indicates the direction of the relationship.

A value of +1.0 represents perfect positive correlation, meaning the two members of a given pair move up or down together in perfect unison. If two markets move in exactly opposite directions with equal force, then they have a perfect negative correlation (-1). The closer to +1, the more strongly positive is the relationship and the more likely it is that the markets will move together. The closer the coefficient is to -1, the more negative the relationship and the more likely it is that the pair will consistently and reliably move apart. The closer to zero (0), the more likely is market independence. The correlation coefficient fluctuates depending upon the current strength of the relationship.

See the "Description of Color coding," Figure 1, above for a guide to determining the strength of the association between pairs of markets. Positive and negative situations are equally powerful to the trader. These levels should be viewed as probabilities, which are essentially the percentage likelihood that a pair will move together or apart into the future.

Using Correlation To Balance A Portfolio

The CSI Correlation Studies can be your expert guide to balancing (diversifying) your portfolio and guarding against coincident losses in ongoing trading activity. Independence, which is gained through a diversified portfolio, is tremendously important because of the outstanding implications of independent action.

If you are following the recommendations of any trading system or market advisory service that doesn't consider the ramifications of market interrelationships, you may benefit substantially by screening potential trades through the Correlation Studies. Otherwise, you may be faced with synchronized losses that can easily drive the best of traders from the market.

For example, great weather or even a change in government policies could cause a glut or economic tidal wave that might send all grain prices tumbling. This could be devastating to the trader who is long the entire grain complex. Your hard-earned investment capital could be lost like beads on a broken string, tumbling down together despite your best efforts to staunch the flow. Don't let this happen to you. Check out the correlation levels between all pairs of proposed market positions before adding an intolerable level of risk to your trading.

CSI's Correlation software can analyze your portfolio of tradable products to virtually guaranty independence of market movement. As shown in Figure 1, at the middle of the spectrum between strongly positive and strongly negative market correlations are independent markets with "minimal to low" relationships. Only market pairs with this characteristic should populate your active trading account if it includes anything other than a carefully selected pair trade. More on pair trading later.

To rate the diversification of your portfolio, go to the CSI website at www.csidata.com and click "Market Correlation Studies" at the top of the page. Near the top of the screen is a series of tabbed pages. The four tabs to the right are used for in-depth intermarket correlation analysis. Click the "Portfolio" tab to examine your mix of markets. When prompted to Login, enter the User ID and password provided to you by CSI, or call CSI Marketing and obtain a 3-day FREE trial for CSI's Correlation Studies.

After logging in, simply enter the commodity symbols of your proposed portfolio into the "Commodities" entry box and stock symbols into the "Stocks" entry box on the "Portfolio" tab. Click [View] and a color-coded matrix displays showing the correlation coefficient for every pair in the combined lists. (See Figure 2 on page 2.) This matrix is interpreted using the key on page 2 in Figure 1. Of course, each market will show a perfect correlation (1.0) with itself. These self-to-self comparison cells are colored white to avoid confusion. Unless you are engaging in specialized pair trading, which is discussed later, then all elements of your portfolio should have correlation levels of 0 to perhaps +/-.3 (green to aqua). It is recommended that you divest yourself of those positions that don't fit the minimal-to-low range. This will help you avoid potentially devastating coincident losses when correlated markets move together.

Pair Trading

Pair trading involves a systematic procedure in which pairs of correlated markets are pitted against each other and traded together for profit. The same analysis can also determine if a single member of the pair is appropriate to trade in a given direction. In seeking out correlated markets for this type of exercise, the trader might be tempted to look to those markets with the very highest correlation coefficients between .9 and 1.0. These are the best of the best, right? They are the most correlated markets, but they do not necessarily represent the most promising trading opportunities. Perfectly and near-perfectly correlated pairs don't oscillate on a regular basis, so few, if any, pair trading opportunities exist for them. However, many markets that are linked by industry, market segment, substitutability and other factors exhibit a moderate-to-high degree of correlation, and may prove to be viable opportunities for capturing short-term profits when they stray from their normal relationships. These typically exhibit correlation levels in the .7 to .9 range.

Introducing Z-Scores

To help you find suitable market pairs, the CSI host computer calculates a value that quantifies the profit opportunities for correlated markets. This value, called a "Z-score," is a dimensionless quantity that is derived by subtracting the sample mean from a raw score and then dividing the difference by the sample standard deviation. The Z-score represents the number of standard deviations between the raw score and the mean. It demonstrates how a given market is performing relative to its own norm. The Z-score may be positive or negative, depending upon whether the raw score is respectively above or below the mean.

Our commodity Z-scores are based on normalized Perpetual Contract®

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CSI's software is uniquely designed to help customers avoid coincident losses by following market products which rise and fall simultaneously to benefit from known negatively correlated market pair relationships. Be sure to read the forthcoming November CSI Technical Journal. It describes a new and novel CSI product that protects customers and promotes profitable trading.