LETTER FROM THE EDITOR

In this month’s issue, we are confident we have something for everyone.

Charlie Kirkpatrick, CMT, the only person to have written two Dow Award winning papers, explains an indicator he calls “the forward line.” In the first two articles of this issue, he explains the theory at the heart of the forward line, details the calculation of the indicator and demonstrates how to apply it to trading.

In this month’s member interview, Anthony Abry explains his work and identifies position sizing and Commitment of Traders (COT) data as potential areas for further study. To help start your study, we turned to Ralph Vince who was the first to detail the theory of position sizing and John Kosar, CMT, who is one of the most innovative analysts working with COT data. We include some recent research from John and then added a chart showing how the market actually performed after John made his real-time market call.

We conclude this issue with an article about market geometry by Scott Hathaway. Scott has been working on new geometric techniques, in some ways picking up where and Gann and Elliott left off.

Please let us know what topics you’d like to see covered in future issues by emailing us at editor@mta.org.

Sincerely,

Michael Carr
In recognition of my receipt of two Dow Awards, the MTA’s Mike Carr, CMT and Emily Meyer asked if I would provide information on recent research of interest to technical analysts. They specifically requested information on what I call the “Forward Line” – its basis, how it is calculated, and how it is used. In that regard, I found that the easiest way to describe this phenomenon, without extraordinary effort, was to provide an abbreviated version of Chapter 8 (“Cycles and the Forward Line”) in my book *Kirkpatrick’s Investment and Trading Strategies*.  

When I was first involved in technical analysis in the 1960s, looking for patterns in the price charts was the basic means of analyzing stocks or any other, freely-traded security. I learned point-and-figure first from the Abe Cohen book on three-point reversal charts, and I learned about bar charts from William Jiler in his 1962 book, “How Charts Can Help You in the Stock Market.” Because there were only hand-operated adding machines for calculators in those days, and no spreadsheets, I cranked through rolls of paper with moving average calculations of breadth figures and index prices but never seemed to find anything useful. I truly hated moving averages for the work they created and the limited and always late signals they gave when they crossed or turned. 

It wasn’t until 1970 when Jim Hurst wrote his famous book on cycles that I considered the use of moving averages with any seriousness. At that time I became a member of the Foundation for the Study of Cycles, which had been formed in 1941 by Edward R. Dewey, an early chief economist to President Hoover. Becoming more interested in and studying the possibility that markets have some harmonic components, I spoke several times at their seminars on the Kondratieff 50+ year cycle and the four year cycle in stock prices. But Hurst’s book was an eye-opener because, it showed for the first time how to analyze prices for cycles and even more exciting, how to make money using them. Hurst taught an educational course on his method in seminars across the U.S., and I attended one in Washington DC to learn first-hand how his method worked. 

Why be interested in cycles? Aside from the obvious purpose of finding a way to make money, if cycles existed in price data, I could predict as well as react by using them. Technical analysis doesn’t usually predict. Classically, it establishes the entry point in a trade or investment as a trigger to a previously recognized set up, and the exiting from a trade is

3 Blumenthal, Earl. *Chart for Profit Point and Figure Trading*. Larchmont, NY: Investors Intelligence, 1975.
rarely done as the result of a target or predetermined time being reached. Both entry and exit are performed as a reaction to how prices behave. It’s a mistake to suggest that technical analysts “forecast.” They don’t. They only gauge whether a particular security is attractive and wait for the price or an indicator to “breakout” of a pattern. Cycles, on the other hand, offer the possibility of actually predicting future price action. Cycles are strictly mathematical whereas most technical and fundamental indicators, until recently, are not. It seemed to me that, if valid, cycles could possibly beat the system with some precision.

Cyclicality in Prices

Both Hurst and Dewey theorized that the market is a composite of various length cycles. They believed that trading market prices were especially susceptible to cyclical effects but were unable to arrive at a reason. A reason for the existence of cycles isn’t absolutely necessary to believe in what is observed empirically though it is certainly more comforting to know “why” cycles exist. If their existence can be demonstrated empirically, however, the “why” can come later. The sun rose and set every day without explanation for millions of years, but only in the past 2,000 or so years has its transit been understood. Despite his lack of solar knowledge, the caveman could still accurately predict with reliability that the sun would rise the next morning. Thus, in trading markets, if cycles exist, we don’t know why, but still we can use what we have observed to analyze and predict.

In market price data, at present I believe cycles are only tendencies, not facts. If cycles exist in market data, they are not very precise. Were they precise, they would have been quantified many years ago. However, there does seem to be a tendency toward periodicity in market prices. That means highs and lows have a habit of occurring at somewhat regular intervals regardless of their strength and underlying trend.

Cycles

Cycles can be defined mathematically using trigonometric functions, specifically the sine and cosine formulas. For this reason, the mathematics of discovery are well understood, and cycles can be pulled out of time series data with ease using Fourier transforms, spectral analysis, or digital filtering. Why don’t these methods work in the stock market? Because while stock prices may have a constant periodicity to their price action, the amplitude of these oscillations is not constant, and most mathematics-based trigonometric functions assume constant amplitude. Thus the mathematics of cycles is unable to recognize the characteristics of ideal harmonics in market data. Figure 1 displays an ideal cycle as defined by a sine curve.
A harmonic, time-series cycle is defined by four variables: the period, the amplitude, the phase shift, and the vertical shift. The shifts refer to different cycle starting points; the amplitude is the height of the cycle from bottom to top; and the period is the distance in time from one low to the next. In the stock market, the period between cycles is of most interest to traders, and the amplitude, the projected peak or trough level, is of interest only to a limited extent because it is volatile and irregular.
When a cycle is duplicated to the right (or “forward” in time) by half a cycle period, it behaves identically to the original cycle. This new cycle is called a “Forward Line.” When carried back and overlaid over the actual cycle, the cycle plotted forward by half the cycle period makes the Forward Line appear as a mirror image of the actual cycle. However, in cycle time, its direction and values are almost always opposite from the actual cycle. In Figure 2, you can see that the peaks and troughs in the Forward Line (dashed line) appear exactly at the same levels as the actual cycle peaks and troughs (solid line) but halfway through the cycle. You can also see that when the cycle moves through a Forward Line, it does so at the halfway point of the distance from top to bottom or bottom to top. This implies that when a price breaks through its Forward Line, it will travel a distance equal to the distance it traveled to reach the break point. The breakthrough thus establishes a price target for the next cycle.

Of course, such analysis assumes a flat market without the effect of a large cycle or trend influencing the relative locations of the amplitude and crossovers. Figure 3 shows how the Forward Line can behave during a strong advance.
Notice in Figure 3 that if the trend is strongly upward, the price never crosses the Forward Line and thus a target is not possible to calculate. We can use this characteristic in real prices not only to show that a trend is very strong but also to use the Forward Line as a sell stop level because breaking it will indicate that the trend is no longer strong.

All analysis of cycles includes analysis of the next longer cycle or the underlying trend. It is the direction and strength of that trend that I want to know in order to profit from cycle analysis. I am interested in the specific cycle only in so far as it tells me what its underlying trend is doing and whether that underlying trend’s strength is shifting. I do this by looking at:

1. The comparison of cycle peaks and troughs. The most recent cycle low level compared to the previous cycle low indicates a trend. A succession of higher lows indicates the trend is upward, and the breaking of a prior cycle trough indicates that the trend is reversing downward. In a downward trend, the succession of lower cycle peaks indicates a downward trend. A period of irregular peaks and troughs indicate a flat trend and the likelihood that a technical pattern is forming.
2. The translation of the cycle. Translation refers to where the peak in the cycle occurs between each low. All stock market cycle periods are measured from low to low. The peaks can occur at irregular intervals based on the underlying trend. If the trend is upward, the peak is to the right of the center of the cycle. You can see in Figure 3 how each cycle peak is slightly to the right of the cycle center. This skew is called “translation” and is useful in determining if the underlying trend is still healthy. If the peak is beyond the
halfway point in the cycle, the translation is to the right, and the trend is still upward. If the peak within
a cycle occurs early in the cycle, it suggests that the underlying trend is downward. How would you
know the peak was early? Only by seeing the price break below the previous cycle trough in the first half
of the current cycle. At that point it is unquestionable that the underlying trend has turned downward.
By watching translation, I can thus reinforce my understanding of the trend direction and any changes in
it. The opposite interpretation is valid during a downward trend where the sequence of cycle peaks is
lower. An upward break of the most recent peak indicates that the longer-term trend is now upward.

3. The possibility of an inversion. In the stock market, cycle periods are fairly steady and troughs occur on
schedule, but troughs don’t always occur at the expected periodic interval. Sometime peaks occur when
a trough is expected. This is called an “inversion” and is relatively rare. It occurs when a longer-term
underlying trend is rising but about to reverse direction. It is often accompanied by an ADX peak. An
inversion is a frustrating event because it brings into doubt my analysis of the cyclical periods. I’ve found
that continuing with the original interpretation of cycle period and assuming that the sequence of
troughs will return to the earlier schedule is the best solution. It is unusual for an inversion to upset the
rhythm of the cycles. Inversions cannot occur at troughs.

4. A price target. In an upward trend, if the price target is established and the next peak fails to reach that
target, it implies that the upward trend is slowing in momentum. If the target is exceeded by a large
margin, I know that the underlying trend is accelerating. This will usually be accompanied by an upturn
in the ADX. In a downward trend, the relationship of the target price and the trough has the same
implications as in an upward trend. Failure to reach a downside target suggests the trend is turning
upward and exceeding the target is a sign of downward acceleration. As in the upward trend, if the
target is exceeded, the ADX will likely turn upward.
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Plotting and Understanding Moving Averages

Most of technical indicators require a period length. The MACD, Stochastic, CCI, DMI, ADX and ATR, etc., all require a length over which each is calculated. Different lengths in indicators have different results. It is important that the length of an indicator is related to the price action of the stock. Most indicators have their standard lengths, but in many cases these standards were not developed by any investigative approach. Most of the standards were developed before the advent of the computer and because they were easy to calculate on an adding machine. I've found instead that indicator lengths should be directly related to the cycle period of the prices being investigated. It is therefore imperative that I have a means of quantifying a cycle period. Underlying all my studies is recognizing what cycles are occurring in the market, and to profit from them, I need to understand how to calculate cycle periods.

Cycle period calculations

There are three methods of determining cycle length. The first is the use of moving averages, the second is by trial and error, and the third is by the use of linear regression.

Moving averages dampen the minor fluctuations in price series data and allow the longer trends or cycles to appear more clearly. They are thus the primary means of observing and calculating cycle periods.
Figure 4 – Normal rendition of a price chart with a moving average. (25-day moving average of the Standard & Poor’s 500 Exchange Traded Fund [SPY] from February 2012 to December 2012.

An average is the sum of numbers divided by the amount of numbers in the sum. Thus a 25-day average of closing prices is the sum of closing prices over 25 days divided by 25. It is also called the “mean.” A moving average is that same average calculated each new day and drawn on a price graph along with the price. Figure 4 shows a daily plot for the ETF (Exchange Traded Fund) of the Standard & Poor’s 500 Index (symbol = SPY) over a period just short of a year.

If we think of the market as a composite of various length cycles, we can use the characteristics of moving averages to our advantage. Because moving averages reduce the effect of fluctuations shorter than their length, a 25-day moving average reduces the short-term fluctuations or cycles of 25-days and less, and emphasizes the longer cycles in the price data. I chose the 25-day moving average for a reason. At this writing, there appears to be a 25-26 day cycle in the SPY. The moving average in its capacity to dampen out fluctuations of less than its length reduces the 25-day cycle fluctuations to a line on the chart with a much longer cycle identified by the low May and November. This longer cycle period is approximately 122 days, a multiple of the 25-day cycle by five. But we are interested in the shorter cycle in this discourse and can disregard the longer cycle for now.
Plotting a moving average coincident with the most recent price, however, is not strictly accurate because the average price actually occurs not on the most recent day but on the average day sometime in the past. More realistically, a moving average should be plotted at the mean day as well as the mean price. In the 25-day moving average, think of the 25 days as a box that is 25 days wide and so many points high to represent the price range. The moving average should be the average of both the height (the price) and the width (the time). The plot should be at its horizontal average in the middle of the box 12.5 days earlier than the present, and the price vertically at its average. Because I can’t plot at 12.5 days past, I must round up the number of days to 13. This adjusted plot is called a “centered moving average” to distinguish it from the more common moving average normally seen in price charts.

Figure 5 is a daily plot of the SPY with its 25-day centered moving average plotted correctly. Notice that because the average is a centered moving average in time as well as price, the average itself tracks almost exactly the price curve. It turns when the price curve turns, peaks when it peaks, and troughs when it troughs. The major problem here is that its last plot is 13 days ago. Because a 25-day moving average is late to turn anyway because it takes roughly 12 days of numbers to change its direction, the value of the centered moving average is limited to being an historical indicator for trading market turns. But Hurst found some interesting aspects of the centered moving average that I will discuss as I move along toward the construction and use of the Forward Line.
Figure 6 shows SPY over same period as shown in Figures 4 and 5 and displays its center line and its Forward the Line. This is a chart similar to the ideal cycle plotted in Figure 3 only with real prices and a slightly upward slope. Notice that the Forward Line parallels the centered moving average, which represents the actual cycle in SPY, and peaks and troughs at the same level as the cycle peaks and troughs in the real cycle. Notice also that the Forward Line extends into the future ahead of the last reported price. We now have a moving average that actually leads prices and tells us something about the future rather than just about the past. Finally, notice that the Forward Line acts as a stopping point, a support or resistance level, to prices. In December the price bounced directly off the Forward Line; in early October it also bounced off the Forward Line, and all the corrections in the period from June to September were contained above the Forward Line.

Buy and sell crossover signals occur when price breaks through the Forward Line. The first of these signals in Figure 6 occurred in April when the price broke below the Forward Line. This break didn’t indicate that the trend was reversing, only that the upward trend had ended. Eventually the price broke the earlier low and the trend turned downward. In June during the decline, the price attempted to break above the Forward Line but failed. In its attempt to break the Forward Line it did break above a previous high, thus suggesting that the downward trend had ended. Finally it broke upward through the Forward Line and remained above it until it broke its rising Forward Line and a previous price trough in October. At this point traders should have sold. The subsequent rally up through the Forward Line failed to reach new highs, suggesting that the trend was now flat, and in late October the price again broke below a previous low as well as its Forward Line, indicating a new downward trend. In December the price broke up through its Forward Line and
several days later broke above a prior peak, thus establishing an upward trend. Notice that on the last day of the year, just before an enormous upward trend, the correction failed to break below the Forward Line. In this respect, the Forward Line acted as a brake to the decline.

As for the usefulness of projections using the Forward Line as a halfway point, notice that the earlier high in March suggested a large decline was likely based on the distance from the Forward Line projected lower. This decline did not occur, and the correction below the Forward Line was small but projected only a small advance above the Forward Line for the next rally. The rally then fell far short of its price objective suggesting that the correction earlier indicated was about to occur.

As for the particulars of trading with the Forward Line, you will notice that the price often breaks the line for only a day and then reverses. The trading method of handling these false breakouts is to place a “fudge” factor or filter at the crossover day’s high or low on the following day depending on the direction of the Forward Line break. If that price plus the fudge factor is broken, the breakout is likely valid and the trend has changed. Such a method would have kept you from selling prematurely in April until the final break in early May at a higher price. It would have kept you from buying on the upward breakout of the Forward Line in June and given you a better price later in June, and depending on the amount of the fudge factor might have prevented a premature sale in October on the first downward crossover.

I think it is obvious that the Forward Line has value in confirming trend direction though I admit it is difficult to profit from Forward Lines alone. As a background trend-check, however, it is superb. Generally, when the price is above the Forward Line, the trend is upward, and vice-versa when the price is below the Forward Line. Because the signals occur late, they are not particularly useful by themselves except as confirmation of other signals. When I combine the Forward Line with the DMI and ADX, however, I get a much clearer and immediate picture with actual action signals. For example, an ADX low, which very few analysts use as a signal, is excellent in pinpointing a continued directional move based on whether prices are above or below their Forward Line. If above, and the ADX turns upward, the price will likely accelerate upward, and conversely when the price is below the Forward Line, and ADX upturn is an excellent short sale.
A moving average dampens out any cycle lesser than its length, and the raw daily data include all cycles. Thus, if we subtract the moving average from the raw data, we get a horizontal line with daily oscillations about it. This is shown in Figure 7 as a ratio of the daily data to the 25-day centered moving average. The moving average plot must be centered; otherwise the ratio will not represent the actual figures for specific days and will skew the results. This chart now displays all the cycles at or shorter than 25 days. I have drawn vertical lines at obvious low points in the chart to show the periodicity of lows in the SPY prices. The distance between each low is 25 days with a few days error at some troughs. This exercise then shows that the SPY has a tendency to bottom every 25 days. With that knowledge we can construct a Forward Line as well as use the 25-day period (or its half-cycle period of 13 days) for the period calculations in all our other technical indicators such as the DMI and ADX. This is the great value in interpreting cycles.
The other method of trial and error uses a moving average and Forward Line placed half the length of the moving average forward of the current price. By adjusting the moving average length until the Forward Line just traces the highs and lows of actual prices in the past, I get the correct length to use in the moving average and other indicators. For example, using the same chart of SPY, by adjusting the length of the moving average from 25 to 29, the picture in Figure 8 changes considerably and many of the false signals no longer occur. This moving average now projects the Forward Line 15 days ahead. To simplify calculations, I always use an odd number for the moving average because the mid-point is always a whole number. Thus with a 25-day average the mid-point is day 13, and with a 29-day moving average, the mid-point is day 15. The formula for the Forward Line advance is \( \frac{1}{2} \) the moving average plus 0.5.

Finally, the third method is to use the figures for lows generated in Figure 7 by observation and quantifying them in a linear regression formula that projects into the future the next series of cyclical lows and their probable error. This method I described in detail in the *Journal of Technical Analysis* (then known as the Market Technician Association Journal) in 1990 and is too lengthy to cover here.
Conclusion

When trading price trends, it is important to be able to quantify several necessary items. The first is to quantify the trend itself. The Forward Line provides a reliable way to do that. Second, all technical indicators require a length calculation in their makeup. The length can be arbitrary or more logically the length can be related to the trading cycle of interest. Cycle analysis provides this information. Finally, while there are more sophisticated methods to be used with cycles, the Hurst method and the Tillman\textsuperscript{5} method being the best, I prefer to use cycles only in the general sense because of my skepticism about the precision needed but lacking in cycle analysis.
The winner of the 1994 and 2001 Charles H. Dow Award, Charles D. Kirkpatrick II, CMT, is the only individual to win the award twice. Throughout his 45 years in the investment field, the national media and his peers have recognized Charles D. Kirkpatrick II. He has been featured on Wall Street Week, CNBC, and in the magazine Technical Analysis of Stocks and Commodities, has been quoted in such publications as The Wall Street Journal, BusinessWeek, Forbes, Futures magazine, Money magazine and The New York Times, and has written articles for Barron's and the Market Technicians Journal. He is the only person to win the annual Charles H. Dow Award twice, for articles on technical analysis in 1993 and 2001. In 2008, he won the Market Technicians Association Annual Award for "outstanding contributions to the field of technical analysis."

He has been a featured speaker before such professional organizations as the New York Society of Security Analysts, Financial Analysts Federation, Market Technicians Association, the Foundation for the Study of Cycles, and numerous colleges and universities. He is a Chartered Market Technician, a past elected and former Board Member of the Market Technicians Association, former Board Member of the Market Technicians Association Educational Foundation, former editor of the Journal of Technical Analysis and Chairman of the MTAEF's Academic Liaison Committee, responsible for the development of courses in technical analysis at major business schools.

After serving as a combat-decorated officer with the 1st Cavalry Division in Vietnam, Mr. Kirkpatrick began his career with the investment advisory division of Brown Brothers Harriman & Co. in New York, managing the Harriman family accounts. He later moved to the Tabell Group at Walston & Co. in New York, where he assisted in the origination of an extensive historical database on the stock market and in the creation of one of Wall Street’s first block trading desks. He then joined the Arthur Lipper Corporation in New York, where he originated a number of notable studies on individual stock price patterns, relative price strength and earnings growth.

In 1970 Mr. Kirkpatrick co-founded the Market Forecasting division of Lynch, Jones & Ryan and in 1978 his own market forecasting and brokerage firm, Kirkpatrick & Company, Inc., which published an investment-strategy letter, provided computerized stock-selection methods to institutional portfolio managers, managed a hedge fund, and traded options on the PHLX and CBOE. While currently retired from the investment management, brokerage and trading businesses, he continues to publish his Market Strategist letter, calculate his award-winning stock-selection lists, write books and articles on trading and investing, and as an Adjunct Professor of Finance, teach technical analysis at Brandeis University International Business School. A graduate of Phillips Exeter Academy, Harvard College (AB), and the Wharton School at the University of Pennsylvania (MBA), Mr. Kirkpatrick lives in Kittery, Maine.
In 2009, the MTA Educational Foundation established an annual award in memory of our late colleague, Mike Epstein. Each year, the award is presented to the person who best exemplifies Mike’s goals for long-term sponsorship of technical analysis in academia and in practice.

The original mission of the MTA Educational Foundation was to create and fund educational programs in the field of technical analysis. Throughout the years, this mission has expanded to include the creation and support of a complete Technical Analysis curriculum that is now being taught in colleges and universities for college credit.

Fulfilling these goals would not be possible without dedicated partners from academia. Advocates on the university side are critical for not only teaching what we already know about technical analysis but forging new ground in the field that we can pass on to the next generation to put into practice.

The MTA Educational Foundation is honored that Professor Blake LeBaron of Brandeis University will accept the 2014 Mike Epstein award. Prof. LeBaron is the Abram L. and Thelma Sachar Professor of International Economics at Brandeis University. His work goes beyond the indicators that most of us use to the core of how markets operate and how strategies for dealing with them evolve over time.

For most of us, the world of non-linear analysis and simulated markets is beyond our day to day activities of trying to make money for ourselves or for our clients. Indeed, most of the time "regular" analysis does quite nicely. It is the outliers, the unusual and the black swans, that have the potential to drastically change our results and Prof. LeBaron's work seeks to understand them.

For those people who have only heard of technical analysis, it is a somewhat mysterious endeavor. After all, forecasts are made without considering how a company's business is doing or how international trade is flowing. What they don’t realize is that the sum wisdom of the crowd - that thing we call the market - is indeed considering those factors and just about everything else professionals and amateurs worldwide track. But instead of making rational guesses directly from the data about what might happen to future stock, bond and other prices they take the indirect route of measuring what everyone has done and is doing about it right now.

In other words, it tracks where people are putting their money rather than their talk. I’ll spare you the colloquialisms about what talks and what walks.
Technical analysis is a pure play on market forecasting and money management. Its input - price - is what actually happened and it is never revised later as a government report usually is. And it is objective. Price is what it is. It is not subject to individual interpretation.

Of course, this is the simplest way to look at it. There are many derivatives of price, such as momentum indicators, commonly in use today. Other market generated data such as volume and sentiment indicators round out the second level of analytical inputs.

The next level is where Professor LeBaron and his colleagues do their work. His research has concentrated on the issue of nonlinear behavior of financial and other macroeconomic data but he is also interested in understanding some of the observed behavioral characteristics of traders. This includes strategies such as technical analysis and portfolio optimization.

It sounds like an earful for most of us, especially considering his many publications with titles such as "Heterogeneous Gain Learning and Long Swings in Asset Prices" and "Chaos and Nonlinear Forecastability in Economics and Finance."

We've heard the phrase "publish or perish" in the university world and with tongue planted firmly in cheek these impressive titles are well above my pay grade. But then consider a few of LeBaron's other publications: "Wealth Dynamics and a Bias Toward Momentum Trading" and "Foreign Exchange Market Trading Volume and Federal Reserve Intervention." Those are of direct interest to most of us.

For the less informed, this writer included, the jargon masks the value in the research.

Blake LeBaron was born in Boston so Brandeis is a coming home of sorts for him. But before that, he was a computer science and engineering major at Rensselaer Polytechnic Institute. He developed his interest in economics there and given his chosen fields of study he knew it was going to be from a data driven, computational approach.

His graduate work at the University of Chicago, where he earned his PhD, was focused on non-linear aspects of finance and his thesis was on nonlinear dynamic chaos, tested on stock returns. What was most interesting to him was finding the deeper meaning in the many the wiggles we see every day in the stock market. What he found was that they are not really as random as they seem. And chaos is not just the absence of identifiable trends but something that hides that meaning.

This led to direct testing of technical analysis in the 1990s.
Today, he is juggling several investigations. One is on minimum variance portfolios and how they are related to trend following. Another compares and contrasts the carry trade with trend following in the foreign exchange markets. And a third is trying to understand how trend following strategies come together to become correlated, and therefore a common factor. Quoting, "This is the 'when alpha becomes beta' dynamic that many people talk about."

I'll give you a moment to let all that sink in.

LeBaron sees changes in the investment world, especially since the financial crisis of 2008. Persistently low interest rates, high frequency trading and exchange-traded funds are making their mark. More significantly, they have changed the overall body of market data over time. That is important to note when attempting to explain market movements because the data a decade ago was simpler and trader intentions were more easily determined. Today, one can express a bullish or bearish opinion with complex strategies including multiple instruments.

He also suspects that investors and traders themselves are changing. Whether it is the rise of passive or semi-passive investing through ETFs or lingering shock over two bear markets in just a few years, something is different. But as all of us in the technical analysis world believe, so, too, does LeBaron believe that that technical analysis can still smoke out market changes early.

He says that students at Brandeis have a great interest in the field. While he is not teaching a direct technical analysis course this semester, he reports that there are enthusiastic students with dual interest in behavioral finance. The students have even formed the Brandeis Technical Trader’s Society to educate members on the subject and on related topics.

From his office located in the middle of the woods off to the side of the Brandeis campus, Blake LeBaron is indeed fostering interest by students in technical analysis. He is also proving that technical analysis is a viable strategy for not only understanding how markets evolve but in putting strategies to work in the real world today.
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For implementation, a client might have 5 big strategies with 20 sub strategies. They are end of day strategies and need to be updated daily. A report needs to be sent out as well to some signal generating service distributor. We develop the tools to make this possible with as few clicks as necessary. The data gets updated, the strategies update, the report gets generated with just a few clicks.

Everything is quantified and developed in-house. Our main workhorse is Amibroker which we might extend with various scripts, plug-ins and the occasional excel.

My background as an analyst and a trader is a tremendous help in understanding the possibilities and workflow to execute this. InStat Research is my own firm. I also train new people - mainly in concepts of finance and TA, run everyday operations and talk with clients.

What led you to look at the particular markets you specialize in?

I have worked in various parts of the industry. There are opportunities and constraints everywhere. Often it is the regulatory environment which dictates the markets for investors. For instance, a US based RIA needs to pass FINRA or SEC compliance. This firm's strategies for retirees with $150k portfolios will have different objectives than the firm whose clientele are mainly accredited investors. They will need a certain percentage of bonds in the portfolio as well as less trading activity and possibly less drawdown. Their main objective might not be annual returns, it might be stability and k-ratios.

A European investor might receive tax free dividends by investing in their domestic market, but be slapped with a 30% US withholding tax as well as additional local taxes by investing in the US. Knowing this helps tremendously when developing a trading strategy as to not suggest something irrelevant to the client.

Do you look at any fundamental or economic inputs to develop your opinions?
When I was a full time analyst - of course. Anything which has numbers and can be plotted should be looked at, turned upside down, correlated, inputted into your preferred testing platform in order to develop a proper analysis. Currently, there is little demand from my clients - so I do not study it very much.

**What advice would you have for someone starting in the business today?**

Study as much as you can. Don't believe anything. Hearsay and assumptions are just that - hearsay. Learn to test it yourself with whatever platform you are comfortable with. There are lots of myths out there. Learn a computer language. TA is only valid if you can prove it, first with a track record, second with math - or vice versa. Quantify, quantify, quantify.

**What is the most interesting piece of work you've seen in technical analysis recently?**

Intermarket analysis is very interesting. Domino effects, symbiotic relationships, seasonalities. They are easy to implement.

Strategy development and optimization - at what point are we overfitting whatever we are using. Pardo's "The Evaluation and Optimization of Trading Strategies" is a healthy study.

Wrong position size and incomplete strategy development (inability to recognize strategy failure) are the main reasons I see people stopping to trade.

**What research area do you think offers the greatest potential in technical analysis at this time (something like an indicator, charting technique or trading tool)?**

There are so many research possibilities.

There is a lot of data out there. Any data not easily available is frontier country and holds great potential. Detailed COT data after 2006, sentiment data, twitter tweets analysis, new combinations for intermarket analysis.

Also, real time strategy probabilities. The indicator is overbought? How often was this true/not true? In what kind of market? How far did the market move afterwards? Given those conditions, how much should be invested? This is easy to implement. No new wheel needs to be invented - existing tools are just being used better.

How about combining strategies - just like real life - and quantifying it. What does the combined equity curve look like? How about plotting the equity curve as candlesticks and develop a position sizing algo based on it? How will that improve my sharp ratio? All these 3 points are up and coming and show lots of room for further study. We are excited to be part of it.
Anthony Abry, MBA, CMT is the owner and co-founder of Instat Research, a firm which helps institutional and retail clients develop trading strategies. Current internal R&D is focused on development and implementation of trading strategies tools, such as automated optimization routines, portfolio level position sizing algorithms, and automated trading tools.

He made his first investments in the late 80s and later taught fundamental analysis in college before discovering technical analysis. He has worked since as a consultant, trader, financial advisor and system's developer in Japan, Austria and the US. He holds a BA in anthropology from Long Island University and an MBA from the Ecole Nationale des Ponts et Chaussees in Paris, France. Anthony can be contacted at abry@instatresearch.com.

Charles H. Dow Award

“Writing a research paper did something which few of us willfully desire - it challenged me. But this challenge is what I needed to grow professionally”
— Buff Pelz Dormeier, Charles H. Dow Award Winner (2007)

“Our education is never complete, we are constantly learning and adapting to changing markets and the field is ever expanding”

The Charles H. Dow Award highlights outstanding research in technical analysis. The Award embodies excellence and creativity in the field of Technical Analysis. Winning papers have created successful trading systems, insights into theories of how markets function and have represented the richness and depth of technical analysis.

Information on the Standards of Judgment is included within the Guidelines for Submissions. For the 2015 cycle we are accepting previously published non-commercial work.

Final Papers due January 5, 2015
Repeatedly in both the gambling and trading communities the expected growth optimal fraction is employed, often referred to as the Kelly Criterion, and referring to the 1956 paper of John L. Kelly [2]. Though applicable in many gaming situations (though not all, blackjack being a prime example [15]) where the most that can be lost is the amount wagered, the Kelly Criterion solution is not directly applicable to trading situations which are more complicated.

Take for example a short sale. Clearly what can be lost is not the same as the price of the stock. Forex transactions incur a different analysis as one is long a currency specified in another currency (and thus vice-versa in effect, short that other currency against the long currency). Commodity futures represent a different problem than simply being long an equity in terms of a floor price (what, specifically, is the lowest, say, wheat can go? Clearly it has value and thus a price of zero may not be realistic, the risk on a long wheat futures transaction therefore actually less than the immediately priced contract amount), and they too are represented in a base currency. CD swaps, complicated strategies involving options, warrants, leaps, trades in volatility where the limiting function of zero as a price and maximum loss is distorted, interest rate products and derivatives all create a situation where the Kelly Criterion solution does not result in the expected growth-optimal fraction to risk, and, in fact, to do so is often to risk more than the actual expected growth-optimal fraction would call for [13]. Capital market situations. Given their inherent complexity, are not the same as gambling situations and the Kelly Criterion cannot be applied directly in determining proper expected growth-optimal fractions.

Further, as pointed out by Samuelson [8] (though he does not provide a computational solution), the Kelly Criterion solution (in those cases where it is applicable, i.e. wagering situations where what can be lost is equivalent to what is put up) seeks the asymptotic expected growth-optimal fraction as the number of trials approaches infinity. For example, in a single proposition where the probability-weighted expected outcome is greater than 0, the expected growth for a participant whose horizon is one trial is \( f = 1.0 \), or to risk his entire equity. If his horizon were longer (but necessarily finite) the expected growth optimal fraction would be greater than the Kelly Criterion solution but less than one. The handicapper who goes to the track for a ten-race card day, seeking to maximize his return for the day employs a horizon, \( Q \), of ten. The portfolio manager, depending on his criteria, has a similarly finite number of periods. The Kelly Criterion solution (when applicable) is only an asymptote; it is never the expected growth-optimal fraction, but rather approached asymptotically as the number of trials approaches infinity. The Kelly Criterion solution, as well as closed-form formulations that seek to solve it, are asymptotic and always less than what is the actual, expected-growth optimal fraction.
As Hirashita [1] points out (referring to the asymptotic case), unless the payoff occurs immediately, the cost of assuming the risk is germane to the calculation of the expected growth-optimal fraction. Since we are discussing the finite case here, with a specific horizon, we must include the cost of the wager to the specific horizon as is expressed in our equation. Finally, the actual expected growth-optimal fraction formula should incorporate multiple, simultaneous propositions. The Kelly Criterion solution is therefore merely a subset of this more generalized formula, and represents only the asymptote to the special case where it is applicable.

Presented here is the formulation for N multiple, simultaneous propositions at a horizon of Q trials, for all potential propositions. The solution is presented in the context of the N+1 dimensional leverage space manifold where for each of the N components, a surface bound between f{0,1} along each axis represents the fraction allocated to that individual proposition.

\[
G(f_1, \ldots, f_N)^Q = 1 + \sum_{z=0}^{n^Q-1} \left( \prod_{q=1}^{Q} (1 + \sum_{i=1}^{N} f_i (-a_{i,k} - C_i)/w_i)) - 1 \right) \prod_{q=1}^{Q} p_k \right) \right)
\]  

where:

- \( Q \) = the horizon.
- \( N \) = the number of components in the portfolio.
- \( n \) = the number of possible outcomes in the outcomes copula.
- \( k = \text{int}(x/(n^{Q-q})) \% n \).
- \( a_{N,n} \) = the N x n matrix of outcomes in the outcomes copula.
- \( p_n \) = the n-lengthed vector of probabilities associated with each n in the outcomes copula.
- \( w_N \) = the worst case outcome of the all discrete outcomes associated with each of the N components.
- \( C_i \) = the one period opportunity-cost of the risk in component i, per [13]. This is explained further, below.

Note \( k \) is a function of the iterators \( x \) and \( q \), returning a specific zero'th-based row in the outcomes copula.

The drawdown constraint or other risk constraint as proposed in [11, 12] for a given Q can be employed upon the surface mapped by this equation in the leverage space manifold.

To compute the amount to allocate to replicate the percentage to allocation to a given individual proposition, i for a given \( f_i \):
Then for a given equity amount, the number of units to assume of component $i$ to represent wagering $f_i\%$:

$$f_i = w_i/f_i \quad (1.2)$$

The one period opportunity-cost of the risk in component $i$, used in (1.1) as $C_i$, is given in [13]:

$$C_i = \exp(rt)S_i - S_i - d_i \quad (1.4)$$

where:

- $r$ = the current risk-free rate.
- $t$ = the percentage of a year for one period to transpire.
- $d_i$ = dividends, disbursements or costs (negative) associated over one period with one unit of the $i$th component
- $S_i$ = the maximum of $\{fSi, \text{regulatory (i.e. margin) requirement of the } i\text{th component}\}$

where:

- $fSi$ = the amount to allocate to replicate the percentage to allocation to a given individual proposition, $i$ for a given $f_i$ as given in (1.2)

We examine how to collect the data for determining the surface in leverage space at a given $Q$. Assume we have two separate propositions we wish to engage in simultaneously. For the sake of simplicity, suppose one is a coin toss paying 2:1, where we win with a probability of .5, and the other, a flawed coin paying 1:1 where we win with a probability of .6.

We create the copula to use as input from this data:
We note here that the number of components, $N$, is two since we have two separate, simultaneous propositions. The number of rows, $n$ representing the space of what can happen for each discrete interval, is 4. $w$, the worst-case outcome for each $N$, each column, is $-1$ for both Coin 1 and Coin 2.

To see the equation graphically, consider that for the first interval, the possible outcomes are represented by the table. For the second interval, each node from the first interval now further branches by the number of rows in the table such that at a given period, $q$ toward a horizon, $Q$, we have $n^q$ nodes. The formula can thus account for dependency by permitting the probabilities for the various rows in the copula to change at each subsequent interval based on the previous outcome(s) along a given branch being traversed.

The equation represents the surface in the leverage space manifold for given $Q$, $f_1, \ldots, f_N$. This surface represents what one would expect in terms of return, as a multiple on equity, after $Q$ trials (hence, $G(f_1, \ldots, f_N)$ represents what one would expect in terms of a multiple on equity, on average, per trial). The maximum of this surface (i.e. the greatest $G(f_1, \ldots, f_N)^Q$ or $G(f_1, \ldots, f_N)$), provides the expected growth-optimal fractions. The equation represents the actual (i.e. non-asymptotic) fractions to risk of $N$ components ($N \geq 1$) for all possible propositions; thus, all other expected growth-optimal solutions tend to be subsets of the asymptote (i.e. $Q \to \infty$) of this more generalized equation, which is expressed here as

$$
\lim_{Q \to +\infty} G(f_1, \ldots, f_N)^Q = \left( \prod_{j=1}^{n} (1 + \sum_{i=1}^{N} f_i (-a_{i,j} - C_i) / w_i)) \right)^Q
$$

Equation (1.5) represents the asymptotic manifestation of equation (1.1). The proof of this is found in [14] and [4]. Since (1.1) yields the surface in the leverage space manifold after $Q$ trials, (1.5) represents what this surface tends to asymptotically as $Q \to +\infty$. Since (1.5) is far less computationally expensive than (1.1) we can use (1.5) as a reasonable proxy of (1.1) after even a relatively small $Q$, thus for many calculations, including the expected risk-adjusted maximizing loci on this surface, $\nu$ and $\zeta$ as proposed in [4, 14, 15]as well as $\psi$ proposed in [4] can be reasonably determined from (1.5).

References


Ralph Vince started in the trading business as a margin clerk and later worked as a consultant programmer to large futures traders and fund managers. He is the author of five books on investing in his field of expertise, portfolio management and portfolio/trade optimization, including The Handbook of Portfolio Mathematics, The Leverage Space Trading Model and Risk-Opportunity Analysis. He is the president of LSP Partners, LLC, and can be reached at ralph@ralphvince.com.
OIL PRICES: SMART MONEY SKEPTICAL AT $103 PER BARREL
BY JOHN KOSAR, CMT

Editor’s note: this was originally posted at Asbury Research on June 4, 2014 and is reposted here with permission.

One of several investor asset-flow based investor sentiment metrics that we track is the weekly Commitments of Traders (CoT) data.

The CoT data, compiled and published by the Commodity Futures Trading Commission (CFTC), breaks down futures open interest to determine and disclose how several different types of investor are positioned in the marketplace.

One COT data series that has caught our attention recently is the current positioning of the Commercial Hedger and Large Speculator categories in crude oil futures.

First, a little background information. Commercial hedgers are large traders who also deal in the commodity on a cash basis, which in this case would include oil producers. These entities typically accumulate a net position against the trend, to hedge their physical interest in the commodity. Think of them as value barometers. More specifically, this group indicates, via their positioning in the futures market, when the smart money thinks (and, more importantly, is betting) that an asset is either over-or under-valued.

Large Speculators are non-commercial large traders who have no dealings in the underlying commodity. They are typically commodity funds who accumulate a net position with the trend.

The chart below shows that Commercial Hedgers are currently hovering near a record net short (bearish) extreme of 445,492 crude oil contracts (red line, upper panel) while the trend following Large Speculators are coincidentally holding a near record net long (bullish) position of 423,136 contracts (blue line, middle panel).
This indicates that the smart money, who is in the oil business, is aggressively betting that crude oil is currently over-priced at $103 per barrel. If they are correct, and they almost always are, this means that any decline that pushes oil back below $100 per barrel will probably send these very aggressively net long commodity funds heading for the exits, and that forced selling could fuel the decline that the smart money is betting on.

The pink highlights between all 3 panels show that the previous two similar net positioning extremes by the Commercials and Large Speculators, back in April 2011 and again in February 2012, immediately preceded two 30% declines in oil prices as in each instance they dove back below $100 per barrel.

Crude oil prices have historically been an economic barometer that can indirectly indicate, and sometimes lead, upcoming direction in other financial asset prices. This can be seen in the periodic positive correlation between oil prices and the S&P 500 during the past decade.
John Kosar, CMT, is Director of Research and founder of Asbury Research. John has more than 30 years of experience and insight in analyzing and forecasting global financial markets. John spent the first half of his career on the trading floor of the Chicago futures exchanges, where he had the opportunity to learn how the US financial markets work from the inside out. This experience, early in his career, became the foundation for his unique analysis, insight, and perspective. During his career he has been an analyst and trader for Shearson American Express, NatWest Markets, Greenwich Capital Markets, and Deutsche Bank. Prior to founding Asbury Research in 2005, John was Senior Research Analyst for Bianco Research in Chicago.

John served as Vice President of the Market Technicians Association (MTA) from 2004 to 2006, and was a member of its Board of Directors from 2002-2006. For additional information, please visit the Asbury Research web site.
Overview

In last month’s Technically Speaking, I showed a yearly log chart of the Dow demonstrated the market’s attempt at a potential breakout of resistance for 2014 which, if successful, would indicate a continued major bull market. In addition, I offered evidence that unless November signaled a false breakout by closing below monthly geometric resistance, the markets would embark on the continued large rally, and offered two price/time targets in the short-term for the Dow.

Part Two offers long-term targets for the Dow, and the S&P 500. I will present and implement a square root support line technique which explains the two preceding major top areas of 2000 and 2007 in both price and time, and is thus continued forward and combined for speculative top areas.

I have decided to offer the geometric and parabolic work originally intended for this month’s article in a third installment. This will include sequential geometric analysis that indicates every successive major top from its respective low, utilizing the same geometric method as in last month’s article. This set-up is then applied to the current market, and combinational analysis of both techniques will then be applied to find any areas of confluence.

Square Root Support Lines from Zero on the S&P 500

In deriving the next potential top area for the Dow and S&P, I would like to present a simple yet highly effective technique inspired by both W.D. Gann’s zero price fan and Michael Jenkins’s use of square the root of a high or low. (Disclosure: I highly doubt that I am the first person to do this, but am unaware of it existing so far.)

On the S&P, the square root of the low of December 1994 at 442.88 is used to identify the end of its resulting massive up trend. By simply going up 21.0447 points per month from zero directly beneath identifies the next bear market, as the S&P finally breaks below. Note that the low used is where the market strongly went up from, not the lowest low of that small triangular correction in 1994. Carrying this set-up forward dictates using the like-wise low of March 2003 at 788.90, and then the low of March 2009 at 666.79. So far, so good:
The market top of October 2007 is called as well by November’s drop through support. Notice the parallel square root line drawn from the 2009 low identifies the beginning of the 2011 correction, but since the market is not anywhere near the major support line, only a smaller correction occurs.

Naturally, a future break below the next support line (from zero under the 2009 low) should be monitored very carefully, as an indication of the next large bear market. But when?

Now to apply time: the square root of each of the lows is given as a monthly cycle count. Note the results!

The major high of March 2000 is exactly 63 months from its preceding major low of December 1994. This amount is also 3 times the square root of that low, as 21.0447 x 3 = 63.1341. Note the drop below support occurs on the 70th month.
from the low, in October 2000. This point in time is also related to the square root of the low, by one of my favorite numbers, 3.33... (3\(\sqrt{3}\), or 1/3 of 10), as 21.0447 x 3.33 = 70.149.

The next major high of October 2007 is identified one month later, as November opens just below support and drops down, exactly 56 months from its preceding major low of March 2003. This month is exactly two times the square root of the low, as 28.0874 x 2 = 56.1748.

Interesting to note that the price levels of the respective cycle points (integer) on the support line are multiples of the low itself, which is a standard approach in Gann practice, in the ‘the Square of the Low’ technique. And although the 2007 top occurred less than 2 points from the 2\(^{nd}\) point, however, the first high and its secondary high (September 2000) occurred over 200 points above. Therefore, the technique presented here was more effective in identifying the first major reversal area, while they were both effective in the second top.

To sum up, both preceding major top areas were perfectly identified by relating them to the preceding major low, via its square root in both a support line from zero, and in time, proving that in both cases, the end of the trend was mathematically related to the square root of the initial low.

Therefore, by extending this analysis to the current uptrend, price/time targets can be obtained by combining time counts with its support line, all derived from the square root of the low of March 2009 at 666.79.

The following are potential areas for the next major reversal area, which increase by 666.79 points (about 2/3 of 1000!? every 25.8223 months:

3) August 2015 at 2000.37

4) October 2017 at 2667.16

5) November/December 2019 at 3333.95 (about 1/3 of 10,000!?)

6) January/February 2022 at 4000.74

7) March 2024 at 4667.53

I am looking for either a drop from support or a highest high near a drop of support for a major bear market signal.

**Square Root Support Lines from Zero on the Dow**
Here’s the same set-up on the Dow, using the related lows of November 1994 at 3638.97, March 2003 at 7416.64 and March 2009 at 6469.95. Note the support lines used are the respective square root of the lows, since the market is nowhere near the initial support line:

Again, both major market tops are identified, albeit with some slight variations in time. The first top occurred with a two candle reversal on December 1999 and January 2000, just one month after the cycle month of November 1999. Notice that the Crash of 1998 (October) occurred at exactly 3/4ths of this cycle, but luckily the market then immediately closed above October’s low/close of 7539.07 and quickly proceeded back up above the support line.

Unfortunately for the Dow, this activity could not be repeated in late 2007. The 5/8ths cycle point of August and September saw the market climbing back up the support line (now resistance) after closing below 1 month before in July. Then the market touched it for the last time in October and couldn’t hold, producing the next bear market. Interesting to note that the subsequent major low in March 2009 reversed right above the initial square root line (86.1199/M)

In observing the current up trend, the recent drop in October found support at this line, and is shooting up accordingly. (I REALLY wish I came up with this chart 2 months ago!?! Live and learn...). The chart features some related 8ths points as well (3/4 and 5/8 from the previous tops) as well as 1/2, which is the sequentially lower 8th. (Naturally any 8th cycle point is game, but the points listed are the closest in resembling the previous activity.)

Here are the cycle point and support line price targets:

Cycle point 1: November 2015 at 19,406.85

1/2 point: March 2019 at 29.114.78
Combining Cycles

The following chart shows both square root cycles from the 2009 low, with 8ths added to the Dow, as indicated by previous activity as noted:

On first glance, the markets did not reverse at the first proximity of cycles (red arrow), but instead broke resistance and continued their prolonged up trend. (Granted, the markets were not at their respective support lines). The alignment on cycle points 3 (S&P/blue) and 1 (Dow/brown) is at the current market.

Certainly all of the given S&P cycle points are contenders for a major reversal, but the following points are noticeably farther away from the Dow points, which would indicate a top similar in dynamic to the 2000 top, where there was a 4 month discrepancy between the two cycle points with the Dow first, as opposed to the sharp top of 2007, where they were closer, again with the Dow first.

The small circle colors denote which cycle is first in the grouping, with green denoting a perfect alignment, such as April 2024, where the 7th cycle point of the S&P meets the 2 1/4 cycle point, however, 43,000 Dow and 4500 S&P seems rather ambitious!?

Considering the two previous major top areas had the Dow first, the brown circled areas are more likely contenders.
Conclusion

Both major top areas of 2000 and 2007 are revealed as related to the square root of the preceding low, for both the S&P 500 and the Dow, in both price and time. These relationships, when carried forward, present logical areas for the next major reversal.

Scott Hathaway is a free-lance technical analyst/chartist, and developer of new methods and techniques, including 'Relative Charting', an alternative geometric environment with unique applications. He has published over 14 articles of his ideas, as featured in Stocks & Commodities magazine, trader planet.com, TSAASF Quarterly, and numerous series in 'Technically Speaking'. His tool kit featuring some of his proprietary techniques is available on Market Analyst software. Last year, Scott had the privilege of presenting some of his work in the 'Innovations in TA' section of the 2013 IFTA conference in San Francisco. He can be contacted through hathawayanalysis.com.