Gann Theory Overview

The methods of analysis employed by Gann can best be described as the study of pattern, price and time and how their relationships affect the market. Gann treated these as the most important aspects which influenced the future movements of any market.

The main focus of Gann theory is to understand that at various times, different aspects will influence the market. For example, a pattern may have a large influence on the market while at another time it will be price and time that will provide a dominating force on the market. Understanding these relationships is the key to trading with more success using Gann theory.

Gann theory tries to identify the best combinations of price, pattern and time to initiate successful trades. It is true that trades may be signaled by each element individually. A trader who places too much emphasis on only a single aspect may experience less success than a trader who patiently waits for the best combination of all three aspects, being price, pattern and time.

THE BASICS OF GANN THEORY

Mathematics
Gann was an outstanding mathematician, he had a love of numbers and number theory. It is often said that Gann theory revolves around natural law and mathematics.

Gann used various numbers throughout his trading analysis, these numbers had a dominant place amongst his trading methods. For example the square of numbers was a very important set of numbers for Gann, in particular the numbers 16, 25, 36, 49, 64, 121 and 144. He believed that the market moved in patterns which were sensitive to the price movement of these squares. As an application example he would have used these numbers to determine that a specific rally may find resistance 64 cents or 64 days from the bottom.

Key Numbers
Gann also liked certain key numbers. The numbers which Gann favored had significance in other areas. For example Gann liked the number 12 which also has biblical (12 disciples) and astrological (12 houses of the zodiac) merit. Other numbers which Gann liked included 3.5, 144 and 365.

Charts
As mentioned earlier, the method of analysis employed by Gann involved price, pattern and time. Central to this is special charts called "swing-charts". The construction of a swing-chart is central to Gann analysis as it uses a correct scale between price and time which allows the analyst to properly calculate angles and thus make accurate predictions.

It is vitally important that the scale between price and time is set correctly. Price and time in a Gann-format chart needs to be in 1:1 scale, or an equal number of squares in the grid up and to the right. A line drawn diagonally from one corner of the grid to the other will produce a perfect 45 degree angle.
CONSTRUCTING A GANN CHART

Gann used special charts called swing-charts to perform his analysis. The first part of the Gann chart is the construction of the price plot.

You can see from the picture above the way Gann plotted price data on a swing-chart. This price plot includes all the parameters of price (open, high, low and close) and is the traditional method which Gann plotted price action on his charts.

This forms the foundation for Gann charts. It is advisable to plot charts in multiple time frames (daily, monthly etc) as markets can display swings in various time frames, an analyst needs to be able to identify these swings by using the correct time frame chart.

Following on from the price plot, Gann constructed a swing-chart by drawing additional lines on the chart which represented the up and down movement of the security. The swing-chart lines are drawn over the top of the existing price plot and are used to remove undue noise from the securities price movement.

Construction of the Swing-Chart
The first type of swing-chart that can be constructed is the one-bar swing-chart, this chart is also known as the minor swing-chart. The technique is simple, a trend line is drawn from each individual price plot to indicate the trend of the security, this is shown in the picture below.
As shown in the picture above is a minor swing-chart. A trend line is drawn from each price bar to the next, the destination of the trend line is significant if the price makes a higher high or a lower low. If the price bar does not make a new high or low the trend line continues in the same direction terminating at the same point of the next bar.

A higher high will result in a green trend line being drawn to the high of the bar and a lower low result in a red trend line being drawn to the low of the bar. This is the basis of the swing-chart as constructed by Gann.

Swing-charts can be drawn for all time scales, what has been shown here is the simplest form of swing-chart.

**Applying a Few Gann Techniques to the Forex Markets**

Gann Theory can be described as the study of pattern, price, and time relationships and how these relationships affect the market. Gann Theory looks at pattern, price, and time as the key important elements in forecasting the future movement of the market. While each element has its own characteristics, each also has a unique, overlapping quality.

The focus of Gann Theory is to find the interlocking relationship between these three primary indicators of changes in trend and market direction. In other words,
in certain instances a pattern has a large influence on the market, while at other times; price and time exert their dominance. It is the balance of these three elements, especially price and time that creates the best trading opportunities that can lead to more success in the market.

Gann Theory helps the trader to determine the best combinations of pattern, price and time to initiate successful trades. While trades can be triggered by each element individually, a trader who weights his signal too much toward one of these elements may experience a large number of losses, whereas a trader who is patient enough to wait for a proper balancing of pattern, price and time may experience more success.

Pattern study consists of the proper construction of minor, intermediate, and main trend-indicator swing charts and closing-price reversal patterns. Price study consists of Gann angle analysis and percentage retracements. Time study looks at swing timing, cycle timing, and historical dates. The combination of these three time factors helps the trader decide when and where to buy or sell. In this article, I describe techniques that help the trader determine how to discover these elements through proper chart construction and how they are related in trading activity.

**PATTERN**

In Gann Theory, pattern is defined as the study of market swings. Swing charts determine trend changes. For example, a trend changes to up when the market crosses swing tops and it changes to down when the market crosses swing bottoms. The trader can also gain information from swing charts about the size and duration of market movements. This how price, which is size, and time, which is duration, are linked to a pattern. In addition, the trader can learn about specific characteristics of a market by analyzing the patterns formed by the swing charts. For example, the charts delineate a market's tendency to form double tops and bottoms, signal tops and bottoms, and the tendency to balance previous moves.

Chart 1: Main Swing Indicator
PRICE

In Gann Theory, price analysis consists of swing-chart price targets, angles, and percentage retracement points.

Swing-chart Price Targets

After constructing a swing chart, the trader creates important price information that can be used to forecast future tops and bottoms. These prices can be referred to as price balance points. For example, if the swing chart shows the market has had a recent tendency to rally 100 - 150 pips before forming a top, then from the next bottom, the forecast will be for a subsequent 100 - 150 pip rally. Conversely, if the market has shown a tendency to break 100 - 150 pips from a top, then following the next top, the trader can forecast a break of 100 - 150 pips. If the swings equal previous swings, then the market is balanced.

Chart 2: Main Swing Indicator with Movement
Angles

Geometric angles are another important part of the Gann trading method. The markets are geometric in design and function, so it follows that they will follow geometric laws when charted. Gann insisted on the use of the proper scale for each market when charting to maintain a harmonic relationship. He therefore chose a price scale that was in agreement with a geometric design or formula. He mainly relied on a 45-degree angle to divide a chart into important price and time zones. This angle is usually referred to as the "1X1" angle, because it represents one unit of price with one unit of time. He also used other proportional geometric angles to divide price and time. These angles are known as 1X2 and 2X1 angles because they represent one unit of price with two units of time and two units of price with one unit of time, respectively. All of the angles are important because they indicate support and resistance. They also have predictive value for future direction and price activity. All of which is necessary to know in order to forecast where the market can be in the future and when it is likely to be there.

Chart 3: Gann Angles
Just as Gann angles offer the trader price levels that move with time, percentage retracement points provide support and resistance that remain fixed as long as a market remains in a price range. Gann is commonly acknowledged to have formulated the percentage retracement rule, which states that most price moves will correct to 50%. Other percentage divisions are 25% and 75%, with the 50% level occurring the most frequently.

Gann believed traders would become successful if they used price indicators such as swing-chart balance points, angles, and percentage retracement points to find support and resistance. In essence, however, the combination of the two price indicators provides the trader with the best support and resistance with which to work. For example, while the uptrending 1X1 angle from a major bottom and a 50% price level provide strong support individually, the point where these two cross provides the trader with the strongest support on the chart.

Chart 4: Percentage Retracements
TIME

According to Gann, time had the strongest influence on the market because when time is up, the trend changes. Gann used swing charts, anniversary dates, cycles, and the square of price to measure time.

Swing-Chart Timing

A properly constructed swing chart is expected to yield valuable information about the duration of price swings. This information is used to project both the duration of future up moves from a current bottom and the duration of future down moves from current tops. The basic premise behind swing-chart timing is that market patterns repeat: this is why it is necessary to keep records of past rallies and breaks. As a swing bottom or top is being formed, the trader must utilize the information from previous swings to project the minimum and maximum duration of the currently developing swing. The basic premise is that price swings balance time with previous price swings. However, in strong up moves the duration of a rally is greater than the duration of a break, and subsequent upswings are equal to or greater than previous up moves. Conversely, in strong down moves the duration of a break is greater than the duration of a rally, and subsequent downswings are equal to or greater than previous down moves.
Anniversary Dates

Among the timing tools Gann used is a concept he referred to as "anniversary dates." This term refers to the historical dates the market made major tops and bottoms. The information collected in effect reflects the seasonality of the market because often an anniversary date repeats in the future. A cluster of anniversary dates indicates the strong tendency of a market to post a major top and bottom each year at the same time. For example, in order to predict future tops and bottoms in wheat, Gann claimed to have studied prices back to the twelfth century, noting not only the prices, but the anniversary dates - top to top, top to bottom, bottom to bottom, and bottom to top - were fundamental factors in this thinking. This information he learned from the research was very important to his analysis, and these dates gave obvious clues to another of his approaches to the market: time cycles.

Cycles

As mentioned earlier, Gann tried to build analysis tools that were geometric in design. When looking at anniversary dates he saw a series of one-year cycles. In geometric terms, the one-year cycle represented a circle or 360 degrees. Building on the geometric relationship of the market, Gann also considered the quarterly divisions of the year to be important timing periods. These quarterly divisions are the 90-day cycle, the 180-day cycle, and the 270-day cycle. In using the one-year cycle and the divisions of this cycle, you will find a date where a number of these cycles line up (preferably three or more) on a single point in time in the future. A date where a number of cycles line up is called a time cluster. This time cluster is used to predict major tops and bottoms. Time cycles are a major part of Gann analysis, and should be combined with price indicators to develop a valid market forecast.

SQUARING THE PRICE RANGE WITH TIME

The squaring of price and time was one of the most important and valuable discoveries that Gann ever made. In his trading course he stated "if you stick strictly to the rule, and always watch when price is squared by time, or when time and price come together, you will be able to forecast the important changes in trend with greater accuracy."

The squaring of price with time means an equal number of points up or down, balancing an equal number of time periods - either days, weeks, or months. Gann suggested traders square the range, low prices, and high prices.

Squaring the Range

When Gann angles are drawn inside a range, the angles provide the trader with a graphical representation of the squaring of the range. For example, if a market
has a range of 100 and the scale is 1 point, a Gann angle moving up from the bottom of the range at 1 point per time period will reach the top of the range in 100 time periods. A top, bottom, or change in trend is expected during the time period when this occurs. This cycle repeats as long as the market remains inside the range.

**Squaring a Low**

Squaring a low means an equal amount of time has passed since the low was formed. This occurs when a Gann angle moving up from a bottom reaches the time period equal to the low. For example, if the low price is 100 and the scale is 1, then at the end of 100 time periods an up trending Gann angle will reach the square of itself. Watch for a top, bottom, or change in trend at this point. The market will continue to square the low as long as the low holds. A graphical representation of squaring a low price can be seen on a chart Gann called a zero-angle chart. This chart starts an up trending angle from price 0 at the time the low occurred and brings it up at one unit per time period. When this angle reaches the original low price, a top, bottom, or change in trend is expected.

**Squaring a High**

Squaring a high means an equal amount of time has passed since the high was formed. This occurs when a Gann angle moving down from a top reaches the time period equal to the high. For example, if the high price is 500 and the scale is 5, then at the end of 100 time periods a Downtrending Gann angle will reach the square of itself. Watch for a top, bottom, or change in trend at this point. The market will continue to square the high as long as the high holds. A graphical representation of squaring a high price can be seen on a zero-angle chart. This chart starts an up trending angle from price 0 at the time the high occurred and brings it up at one unit per time period. When this angle reaches the original high price, a top, bottom, or change in trend is expected. Time analysis in Gann Theory requires the trader to study market swings, anniversary dates, cycles, and the squaring of price and time to help determine future top, bottom, and change in trend points.

**GANN THEORY AND ITS APPLICATION TO TRADING**

Gann Theory is based on the principles that price and time must balance. Markets are constantly in a position of change and subject to movement, sometimes with great volatility. Gann Theory states that there is order to this movement. By using the proper tools to analyze this movement, an accurate forecast for future direction can be made.

Finding the balancing points is necessary to predict future prices and movement. Gann developed a number of methods to help determine these balance points. The first method uses patterns created by swing charts to find the balance points.
The second method uses angles and the squaring of price and time to find the balance points. The third method uses time.

While the perfect market remains balanced all the time, it also proves to be uninteresting, because major moves occur when price is ahead of time or time is ahead of price. The proper use of the various Gann analysis tools will help you to determine when these major moves are most likely to occur.

Now that the theory has been explained, how can it be applied to trading?

The first step is to create the charts that properly demonstrate the concepts of pattern, price and time analysis. The second step is to create the swing charts or trend indicator charts that provide the trader with a way to analyze the size and duration from the swing chart to forecast future price and time targets. In addition to forecasting, this chart is also used to determine the trend of the market.

After the pattern has been analyzed in the form of the swing chart, the trader moves to the fourth step, which is the creation of Gann angle charts. Using the tops and bottoms discovered with the swing chart, the trader draws, properly scaled geometric angles up from bottoms and down from tops. Since these angles move at uniform rates of speed, the trader uses the angles as support and resistance, and attempts to forecast the future direction and price potential of the market.

Chart 5: All Gann Techniques.
Percentage retracement levels are also created using the information derived from the swing charts. Each paired top and bottom on the swing chart forms a range. Inside of each range are the percentage retracement levels, the strongest being the 50% price level. The fifth step is to draw the percentage retracement level inside of each range. At this point the trader can judge the strength and weakness of the market by relating the current market price with the percentage levels. For example, a strong market will be trading above the 50% price and a weak market will be trading below the 50% price.

Time studies are then applied to the market in the sixth step. Traders should use historical charts to search for anniversary dates and cycles that could indicate the dates of future tops and bottoms. The swing chart is used to forecast the future dates of tops and bottoms based on the duration of previous rallies and breaks. Gann angle charts are used to predict when the market will be squaring price and time. Now the percentage retracement chart indicates the major time divisions of the current range, with 50% in time being the most important.

In the seventh step, the information obtained from the pattern, price and time charts is combined to create a trading strategy. This is the most important step because it demonstrates where the three charts are linked. For example, the swing chart tells the trader when the trend changes. If the trend changes to up, the trader uses the previous rallies to forecast how far and how long the rally can be expected to last. The Gann angles drawn from the swing chart bottom show the trader uptrending support that is moving at a uniform rate of speed. In addition, the Gann angle chart shows the trader the time that will be required to reach the swing chart objective based on the speed of the Gann angle. The 50% price level acts as support when the market is above it and as resistance when it is below it. The strongest point on the chart will occur at the intersection of the uptrending Gann angle and the 50% price. Finally, time indicators are used to prove to the trader that the upside target is possible because anniversary dates and cycles can verify the existence of similar market movement in the past.

Combining pattern, price, and time, the trader creates a trading strategy. This trading strategy is based on the principle of price and time balancing at certain points on the chart. The three methods of analysis draw this information out of the chart. Without the proper application of the three analysis tools, valuable information would be lost to the trader. This is the essence of Gann Theory, which states that there is order to the market if the proper tools are used to read the charts.

*James A. Hyerczyk* is a registered Commodity Trading Advisor with the National Futures Association. Mr. Hyerczyk has been actively involved in the futures markets since 1982 and has worked in various capacities from technical analyst to commodity trading advisor. Using W. D. Gann Theory as his core methodology, Mr. Hyerczyk incorporates combinations of pattern, price and time to develop his daily, weekly and monthly analysis.
His published works include articles for Futures Magazine, Trader’s World, SFO Magazine, Forex Journal, and Commodity Perspectives (Commodity Research Bureau), and his book Pattern, Price & Time published by John Wiley & Sons, Inc. in 1998.