International Journal of Studies in Business Management, Economics and Strategies
Volume 4, Issue 5, May - 2025
ISSN (E): 2949-883X
Scholarsdigest.org

ANALYZING FOREX MARKET PRICES USING THE CIRCULAR SHAPE AND THE HEXAGONAL STAR FOR DIGITAL AND CHRONOLOGICAL ANALYSIS EXCHANGE RATE ANALYSIS (GBP/USD)

Prof. Dr. Hashim Jabbar Al-Husseini
haider.abbas@uokerbala.edu.iq

Prof. Dr. Haider Abbas Al-Janabi
Hashim.jabbar@uokerbala.edu.iq

Muhannad Rashid Sharqi Al-Majidi
Mohanad.r@s.uokerbala.edu.iq

University of Karbala/Faculty of Management and Economics/Department of Finance and Banking Sciences

Abstract
This research aims to study the behavior of the prices of the GBP/USD currency pair in the foreign exchange market, by applying unconventional tools for time technical analysis, by using specifically the pie shape and the six-point star, as tools that help to understand the role of time in determining price turning points. The theoretical framework of the study was built on the premise that the prices of the Forex market do not move randomly, but follow patterns and shapes that are affected by time and geometric factors. Therefore, the circular shape was used to draw complete time cycles, and the six-point star as a geometric model to determine time angles in order to identify possible reversal points in the market movement and entry and exit times and take profits in the market based on the GannZilla platform and the MetaTrader 4 platform. The results showed that time price angles can be an effective tool for identifying price movements in the market, such as reversal points, support and resistance levels, as well as their accuracy in predicting future trends when combined with other technical analysis tools such as the Relative Strength Index (RSI) or (MACD). The research ended with recommendations, the most important of which is to rely more on time price angles in stable markets or when trading on longer time frames. It is also recommended to use the hybrid analysis method, as price angles are combined with astronomical analysis. This will enable more accurate predictions based on multiple analytical methods. In the future, researchers also recommend expanding the study to other markets (such as stocks or commodities) to test the effectiveness of time price angles in different financial markets.

Keywords: Time analysis, forex market, time cycles, Gann theory.

Introduction

Money markets and especially the currency trading (forex) market are some of the most complex and changing markets in the world. They combine economic, political, and social factors that influence price movements in ways that can be difficult to predict. With this complexity, technical analysis has become one of the primary tools traders and investors rely on to understand future price movement and make informed investment decisions. Among the various technical analysis tools, digital technologies highlight time-price angles as an interesting tool with great potential.

Time price angles go back to concepts introduced by William Delbert Gann, who is considered one of the pioneers in the field of technical analysis. These angles are based on the relationship between time and price, and they aim to identify crucial time points that can lead to shifts in price trends. These angles go beyond traditional methods such as straight lines or fixed supports and resistances, as they seek to connect time to price movement in a precise mathematical way.

Although time-based price angles are a powerful tool, their use in the currency trading market requires in-depth study to accurately understand how they are applied, especially in light of the ongoing global and economic market fluctuations. In this thesis, we will explore how to incorporate time price angles into a predictive technical approach that can help improve the ability to predict future market movements.

The methods of digital and temporal analysis used, especially in the forex market, help to understand the price movement, which is one of the prominent tools in making trading decisions and trying to reach the right time to exit the market with the least losses. Therefore, this study clarifies the digital techniques and price angles in predicting the prices of the currency market. To achieve this goal, eleven forms of the most used time and price angles in the forex market were allocated and applied to the research sample of the US dollar pair against the British pound, and the allocation of trading platforms, including (Meta Trader4, Gannzilla, trading view,).

The first axis/research methodology

first ; The Problem of the Research:

The research problem revolves around the following main questions:

1. What is digital time analysis in the currency trading market?
2. What are the time and time price angles?
3. How to predict prices through price and time?

Second: The importance of research:

The importance of this topic lies in the quest to improve technical analysis tools in the forex market, which is witnessing unprecedented activity in terms of trading volume, diversity of trading categories, and high volatility. It is also of great importance in several areas, as it contributes to the provision of innovative analytical tools that contribute to improving trading strategies in volatile and complex forex markets. Traders may have difficulty determining the right time to enter or exit the market, especially when forecasting future trends is ambiguous, so time price angles appear as an innovative tool that may help improve investment decisions by providing accurate time signals to identify turning points in the market.

Third: Research Objectives

1. The research seeks to provide an additional tool for traders across time price angles that contributes to improving future predictions. These tools may provide accurate signals about critical time points at which major shifts in price trends may occur, increasing the chances of making a profit and reducing risk.
2. By integrating price time angles with other analytical tools, the research aims to enable traders to increase the accuracy of their investment decisions by improving the timing of entry and exit from the market.
3. By taking advantage of the time-price relationship that time-price angles provide, it will provide traders with accurate insights into when price volatility will occur, enabling them to make the best trading decision.

Research hypotheses:

Based on the research problem and how to predict the prices of the Forex market using digital technologies and time price angles, the research is based on the following hypotheses:

1. Time price angles contribute significantly to predicting price trends in the currency trading market.
2. The combination of time angles and other technical tools enhances predictability.
3. Time first and then price

Sources of Data Collection :

The research relied on sources represented by references from books, periodicals, scientific studies and websites related to the topic in order to build the theoretical framework of the research. As for the practical analytical aspect, the research relied on the most popular trading platforms and used them, including Meta Trader 4, trading view, investing ,GannZilla

Research limitations:

Limits and scope of the research include:

1. The search was limited to the currency exchange market as the US dollar currency against the British pound was selected as the sample for the search.
2. As for the time frame, it was limited to the geometric shapes witnessed by the exchange rate of the US dollar against the British pound in the years (2016-2018-2024).

The second axis/theoretical framework of the research

First: Digital analysis

A. Term

Digital analysis in financial markets refers to the use of digital tools and computing to analyze financial data in order to understand trends and models and make investment decisions. These tools rely on mathematics, statistics and programming to analyze large amounts of data quickly and effectively (Raymond, 2014,127). Therefore, digital technologies play an important role in improving the accuracy of analysis and increasing the efficiency of decision-making processes in financial markets. Historically, it is believed that trading using numbers (which can be called digital trading or digital analysis) had its roots in the Middle Ages in

Japan. Digital analysis methods have evolved in the Japanese market over time, which included the use of Japanese Candlesticks and other digital tools to understand trends and patterns in the financial markets. However, there is no specific trader or investor who can be named as a discoverer of trading using numbers in general, so it is a historical development that began hundreds of years ago and has evolved through the ages. This type of analysis is an essential part of the methods used in the financial markets at the present time and is based on concepts and methods that have evolved throughout history(Sankar, 2016,34).

Digital analysis is of great importance in the financial markets and offers many benefits and advantages to investors and traders, including(Sankar, 2023,12):

A. Making investment decisions: Digital analysis helps investors understand and analyze financial data accurately, enabling them to make investment decisions based on knowledge of markets and trends.

B. Investment guidance: Digital analysis can provide accurate guidance about different financial assets, whether it's by analyzing historical prices, or using mathematical models to predict future trends.

C. Risk Identification: By analyzing financial statements, investors can reduce and quantify the risks associated with investment decisions, thereby enhancing the performance of investment portfolios.

B. Principles and premises of digital analysis

A. Digital data is the basis of any digital analysis, as it begins to collect and analyze those accurate data in a way that reflects the picture on prices. (Finn Samxon, 2024,15).

B. The previous price movement is included in the calculations related to the targets, which links these targets to the nature of the main traders of the asset to be traded ((Fabio Oreste2011,92,

C. The numerical and temporal analysis focuses on mapping the price movement chronologically based on the cosmic laws present in the earth in addition to comparisons and analyses of historical price movement (Mt Helen, 2003,9).

C. Digital technologies used in financial markets

William Gann used many quadrants and numerical geometric shapes in the price chart, illusion of 9 squares, 52 squares, and 144 squares (George MacLean, 2005,162).

A. 19 The Square of Nine Excel Square

It is one of the technical analysis tools used in trading the financial markets, which was developed by the athlete and trader William Gann. Square 9 is an engineering model consisting of 81 cells arranged in 9 rows and 9 columns. Each cell in the box represents a certain number, as it starts from the middle with the number 5 and increases by 1 until it reaches the number 45 in the corners of the box. He added (Mt Helen, 2003,9) Square of Nine or Jan Square is the method of squaring price and time.

(Greenblatt, 2013,247) added that the nine square numbers are arranged around each other in a spiral arrangement starting with number (1) in the middle (the top of the pyramid) followed by number (2) to the left, where it starts from the numbers in the sequence spirally in a

clockwise direction until number (9), which ends with the first circle of numbers around number (1), and then the second circle starts from (10) to (25) in a clockwise direction as well, then the third circle from (26)to (49), then the fourth and so on. The square is divided into 8 sections between each corner section (45). The numbers that pass in the middle forming the shape of (+) are called base numbers, while the numbers that pass in the middle forming the shape of (x) are called corner numbers. In the first circle around the center, we find that there is one number that separates each corner (45). In the second circle (10-25), we find that there are (2) separate between each corner (45). In the third circle, too, there are (3) numbers that separate the angles of 45. Therefore, the circle (1000) must be a number that separates the angles of 45.

B. 52

It is an advanced numerical and time analysis tool developed by William Delbert Gann to identify support and resistance points in stock markets over a full year (Cornelius Luca, 2007,408).

Ross Beck, 2010,152 added that square (52) is one of Gann's trading tools, which is used to predict market movements and is part of a wide range of tools developed by Gann based on geometric and mathematical principles that were believed to govern market behavior. (52) is based on the number (52), which I consider important. It forms a square on the price chart and represents time and price in equal proportions. This tool is used to identify potential support and resistance levels, which helps traders predict future price movements.

He added(M. Protonotarios,2018,26)square (52)is part of a methodology in technical, numerical and temporal analysis of financial markets. This square is based on the fact that the year contains (52)weeks. It is used to predict support and resistance levels during a future period of time up to a year. This tool is used by drawing a square (52)from a specific top or bottom, and dividing this square into time cycles.

A square (52) consists of four quarters of time:

- Q1 (13)weeks
- Half Cycle (26)Weeks
- Three quarters of the cycle (39)weeks
- Full Cycle (52 weeks

These intervals help predict price and time trend reversals when a stock reaches one of these time periods a trend reversal is likely to occur.

The tool is based on the concept that markets move in predictable cycles where numbers can be used to identify important turning points in the market, so Square (52) is an important tool for investors and analysts to identify periods that are likely to witness significant price movements.

This tool relies on a deep understanding of temporal analysis and the application of mathematical and geometric rules to determine future price trends, square (52) janns is part of an integrated analysis system that includes several other tools such as square of nine, jann angles, and jann time cycles. The aim of these tools is to understand and analyze financial

markets through temporal and numerical relationships at the prices of various financial assets (Jeff Greenblatt, 2013,247). The square of (52)committees can be used through several steps

- Identify the top or bottom:

Start by drawing the square from a specific top or bottom of the stock or market being analyzed.

- chronology

The year is divided into (52)weeks, and each quarter of these (13 weeks) represents a point in time that could see a reversal in trend.

- Angles and Intersections:

The box also includes diagonal angles which are additional support and resistance points Jan's angles are used to identify time and price zones that may see reversals.

- Ageing Analysis:

Every quarter cycle (13 weeks), half cycle (26 weeks), three quarters cycle (39 weeks), and full cycle (52 weeks) are important time points that can indicate potential changes in trend.

D. 144

Another of Gann's tools used in technical analysis to predict price movements in the stock and commodity markets. Jan developed several geometric and numerical techniques based on time and price, 144 square being one of them. The number (144) is of great importance in Jean's methods because it represents a square of 12 (12×12), which Gann considered a basic course in the markets (Kaufman, 2019,668).

He added (Guy Cohen, 2013,113) The square (144) is part of the (natural squares), which are mathematical compositions believed to be continuously repeated in natural and market phenomena. The square is used to represent a fixed relationship between time and price, and to create a network where each point corresponds to specific price levels and time periods.

(Finn Samxon, 2024,19)squared (144) is a grid of 12 rows and 12 columns, forming (144) small squares representing each square a unit of time or a unit of price. The basic idea is to divide the main square (144 units long) into smaller squares in a way that balances price and time, helping to identify potential support and resistance points in price action.

(Constance M. Brown, 2012,213) mentioned five basic steps in using square 144 in trading:

- **Identify the Pivot Point:**

Choose an important price point that is considered the starting point. This point can be a bottom or a top in the price chart.

- **Draw or copy a square**

The 144 square is divided into 12 columns and 12 rows forming a grid of small squares each representing a price or time unit.

- **Apply rate**

Use the side length of the square (144 units) as a unit of time or price. This unit can be applied to different time frames (e.g. days, weeks, or months).

The box can also be further divided to apply smaller units (e.g. 12, 24, 36, 72, etc.

- **TIERING**

Use Gann Angles that represent the relationship between price and time The main angles are 1x1, 2x1, 3x1, 4x1, 8x1, etc. The 1x1 angle is the most famous angle and represents an ideal balance between price and time.

- **Interpretation of levels:**

When the price reaches one of the corner levels such as (1x1), it often faces resistance or support. These levels can be potential price reversal points. Additionally, these levels can help identify entry and exit points in trading based on the price's interaction with these lines.

Second: Time Analysis and Price Angles

1.Ageing Analysis:

In the world of trading stocks and other instruments in the financial markets, predicting prices is important for making successful trades. However, hedging against market fluctuations and the many factors that can affect the prices of stocks and currencies , predicting the direction of prices may be difficult. Here comes the role of price and time angles (Gann Angles) is a technical analysis tool used by traders to predict the future price movements of stocks by analyzing historical price data for the stock or currencies. According to William Gann, financial markets move simultaneously with time and price, and the balance between these two elements can be explained across geometric angles. The idea is that when the market moves, it follows fixed geometric shapes, and angles help to identify these shapes and also help to identify price and time levels that can witness turning points in the direction of prices if these levels represent support or resistance or to identify points where the trend may turn up or down. The theory of time analysis can be described as the study of the relationship between price and time in the technical form and how this relationship affects market prices. Jean's theory considers price and time as important key elements in predicting the future movement of the market, while each element has its own characteristics (Hyerczyk, 2009,17). Gann's theory focuses on finding the interlocking relationship between these binary fundamental indicators of changes in market direction in other words, in some cases the technical form has a significant influence on the market while at other times price and time exert their dominance. It is the balance between price and time that creates the best trading opportunities that can lead to more chances of success in the market. Gann's theory helps the trader to determine the best timeframe for starting successful trades. While trades can be triggered by each individual element, a trader who is more likely to signal one of these elements may face a large number of losses, while a trader who is patient enough to wait for the right balance between the technical form and what corresponds to price and time may witness more success.((Ahmed Alaa, 2023,5).

A. Time Theoretical Assumptions

Jean's theory of how financial markets work is based on three basic assumptions (Hyerczyk, 2009,19):

- Price, timeframe, and price range are the only factors to consider when trading.
- Markets are cyclical.
- The most controversial assumption is that markets depend on geometric models for their design and operation.

B. Time Cycles

The time cycle is defined as a price range associated with a specific time range in which prices move according to governing laws and behaviors that extend and are reflected according to the order of the cycle in the structure and location of time cycles. The variation between bullish and bearish cycles and the time base derives its main movement direction from the previous larger time cycle. In other words, the movement of historical prices is only a interrelated series of time cycles and each small cycle is only part of a larger cycle. For example, a week is a small cycle, but it is part of the month cycle and the month is also part of the quarter and the year is part of the contract (Ihab Saeed, 2023,469)

The contract, in turn, is part of the century cycle, and these parts are intertwined at the end to make what is called the full time cycle, as in the following figure:

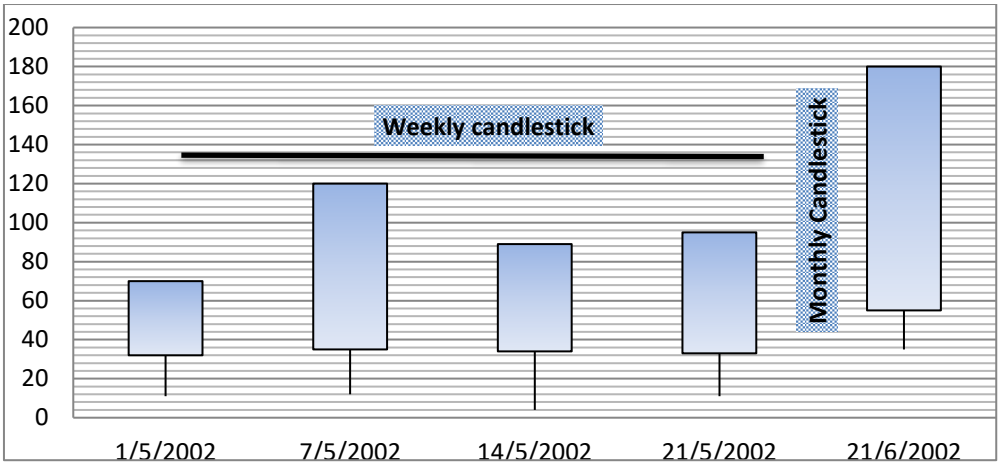


Figure (1-1) Time Cycle

Source: prepared by the researcher according to word

In the weekly form, we note that the laws of movement derive from the previous candle, and therefore the price goes to test the top, then the bottom or vice versa, then extends in the direction of the previous cycle and then reverses. Of course, this movement is governed by laws and mechanisms that we will address later.

C. Course Items

Any time cycle is only a specific period in which prices move, and three components of any time cycle have been observed. We found that any cycle must include in its details an upward price cycle, a downward price cycle, and a sideways cycle called the time base, which is a

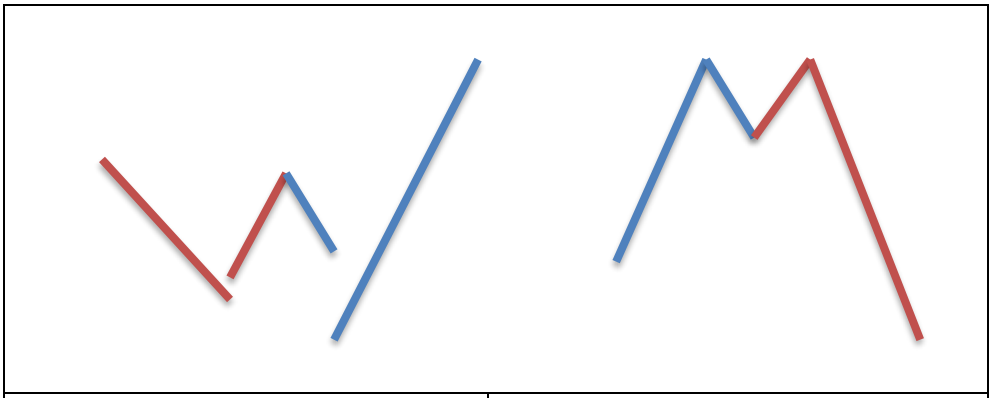
state of fluctuation that precedes a change or continuation in the trend (Majid Al-Omari, 2021,82).

- **Up Cycle:**

It is a specific time cycle in which the price moves in an upward direction and consists of a downward subcycle, a time base, and an upward subcycle that is longer than the downward cycle and the time base in time, price, or both.

- **Downward Cycle:**

It is a specific time cycle in which the price moves in the downward direction of the asset and consists of an upward subcycle, a time base, and a downward subcycle that is longer than the upward cycle and the time base in time, price, or both.



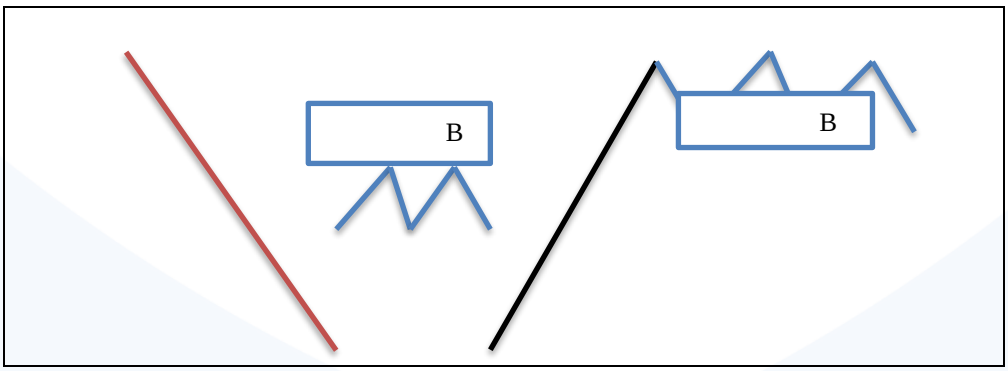
Down time cycle	Bullish time cycle

Figure (2-1) Bearish and bullish time cycle

Source: prepared by the researcher according to word

D. time base generator

It is a side cycle and called the time base because it forms a base for the start of a trend and the price moves through it in small upward and downward sub cycles that form a downward cycle and at least one internal upward cycle and it is possible to increase up to three upward cycles and three downward cycles and everyone falls under the time base (Deron Wagner, 2012,161)) as in the following figure:



Figure(3-1) Time base

Source: prepared by the researcher according to word

It should be noted that the time cycle, whether bullish or bearish, or a time base dominated by the larger trend, whether bullish or bearish, according to the order of the cycle. If the larger cycle is bullish, it is assumed that we find the bullish cycles larger in time and prices during the subwaves that make up them. For example, if the weekly cycle is bullish, it is expected that we find the bullish subcycles on the daily or four-hour time frames larger in time and price than the bearish cycles and time rules. The time cycle in the bullish trend is longer in price and time.

E. Real Moving and Phantom Moving

The real move is the actual net change in prices in a specific period, such as the difference between the opening price and the closing price, such as saying that the price opened the week at the price of 1.0000 and closed at 1.1000, as the actual change, which is the real move is (100) points during a specific period is the trading period, while the imaginary price is the difference between the highest and lowest price reached by the pair during the trading of the same time period. In the previous example, if we assume that the price reached the top at 1.3000 and the bottom at 0.9500, the imaginary move is(350) points, and the difference here between the imaginary move and the real move is the shadow of the candles in which the imaginary move is represented (101,2017, David. H

As for the real time and the imaginary time, andsince we are looking for the value of the real change in the price during a specific time cycle, then it is also worth looking for the real time of this change, we are not supposed to say, for example, that the price moved (1000) points during a trading week because the real trading week, for example, in the currency market, is only five days if the price moves in five days and not in seven days, as the trading week in the currency market is less than the normal week by 28.5 because the currency market works (24) hours for five days, but in the stock markets, the situation is different where the market works only 8 hours in five days a week with a total of (40) hours only a week .So, the real weekly time cycle in currencies is (120) hours, and the cycle in the stock markets is (40) hours only (Sankar, 2023.31).

2.Price angles

In 1908, William Gann presented a theory to describe price movements in financial markets, which he built on the basis that price moves in specific time cycles, like anything in the universe. For example, weather conditions go through four seasons: autumn, spring, etc., William Gann was the first person to describe prices based on a mathematical formula, and Gann succeeded in forming what is known as the square of nine, from which he derived several applications in the theory (Emilia Landa, 2024,1).

Time angles are a technical analysis tool that uses geometric angles to predict future stock price movements. These angles are plotted on a price chart and are based on historical data for any asset. The most commonly used angles are angles

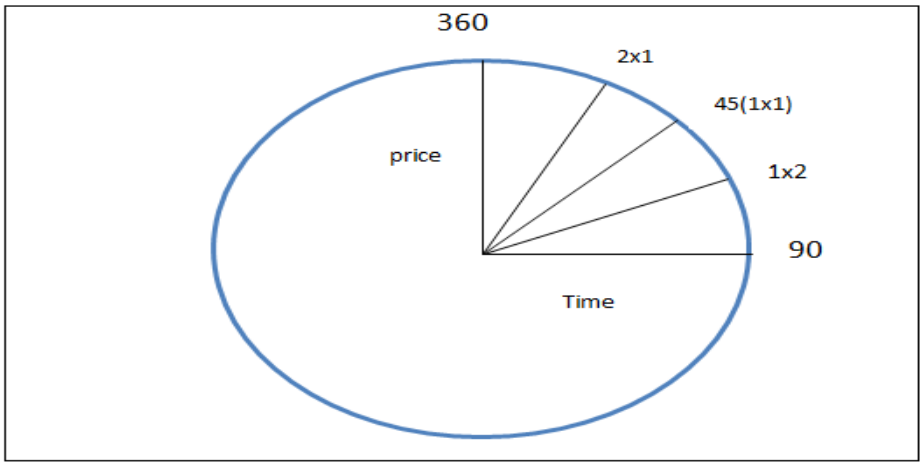
(1x1,1x2,1x3)

The angle (1x1) is drawn at an angle of (45) degrees and represents the movement of the price of one unit per unit of time. The angle (1x2) means the angle. One unit of price moves for

every two units of time and represents(1x3) the angle. One unit of price moves for every three units of time and vice versa. The angle(2x1) means that the angle moves two units of price per one unit of time. Using the same formula, the rest of the angles can be

Jan believes that the perfect balance between time and price is achieved when prices rise or fall at a 45-degree angle relative to the time axis. This is also called a 1x1 angle, meaning that prices rise by one price unit per unit of time (David Keller, 2007,108).

He added (Stephen Aikin, 2012,227)is a way in which the relationship between price and time can be clarified in order to predict upcoming movements, by identifying areas of support and resistance. The basic idea in using time price angles is that price moves in a specific range. These ranges can be measured by geometric angles. When determining the first angles, the place and time of the next angles can be predicted.



Figure(4-1) Price angles

Source: prepared by the researcher according to word

The basic idea of time price angles was extracted by the square of nine developed by Jean, the square of nine is built on the following numbers, which are 1,2,3,4,5,6,7,8,9, as these numbers rotate clockwise and start from 1 to 9 to complete a 360-degree rotation angle and then the square begins to form a new cycle beginning 10 and up to 25, as in the following figure (Artem,2023,67).

57	58	59	60	61	62	63	64	65
56	31	32	33	34	35	36	37	66
55	30	13	14	15	16	17	38	67
54	29	12	3	4	5	18	39	68
53	28	11	2	1	6	19	40	69
52	27	10	9	8	7	20	41	70
51	26	25	24	23	22	21	42	71
50	49	48	47	46	45	44	43	72
81	80	79	78	77	76	75	74	73

Figure(5-1) The Nine Square Cycle

Source: prepared by the researcher according to SPSS

In the previous figure, we will note that the square of nine consists of consecutive cycles, as each cycle represents an angle (360) degrees.

When determining the angle from which the price bounced, it is possible to determine the next angles at which the price will reach and a bounce occurs. Let's assume that the price was moving in the form of a square, that is, it was moving at a 90-degree angle and had a bounce at number (46) located in the square of nine, and it was moving in the upward direction, that is, clockwise. Through the previous figure, the price of the next bounce can be expected by rotating at an angle of (90) degrees from the first bounce point, that is, at number (53), a bounce will occur or the price will reach this level.

We apply this to the chart when figuring out how to get the numbers on the square of nine by price.

It can be obtained by taking the square root of the price, but without a comma, which is between the numbers. For example, if you know how much the price of the pound is equal to the US dollar at 1.59727 on the square of nine, you must first remove the comma to become the number 159727. Then take the square root of this number by the calculator, so that the next number 399.6586 appears, and then the number is rounded to become the whole number without fractions 399, which means that the price 1.59727 represents the number 399 on the square of nine.

1.Method of calculating Gann angles:

Angles are calculated using a complex mathematical formula that takes into account the price and time movements of any tradable asset in the market. There are several different ways to calculate Gann angles , including square of nine and square of four. The nine square method is the most commonly used method and involves drawing a series of concentric circles on a chart, where each circle represents a different price level. Traders then draw diagonal lines from the center of the chart to the outer edges, creating Gann angles that can be used to predict future price movements R. S. Tavares, 2023,48)).

Formula

1x1 (45 degrees)

Formula: X=Y

Here, Y represents the change in price, and X represents the change in time.

If the center point is at price P0 and time T0, the distance after time period t is:$T + P0 = \mathrm{P(T)}$

- **Angle 2x1 (26. 25 degrees)**

2x - y =

If the pivot point is at the price P0 and the time T0 the price after a time period t is:

2t +P0=P(t)

- **1x2 Angle (63.75°)**

$\frac{\mathrm{X}}{2}=Y$

If the pivot point is at the price P0 and the time T0 the price after a time period t is:

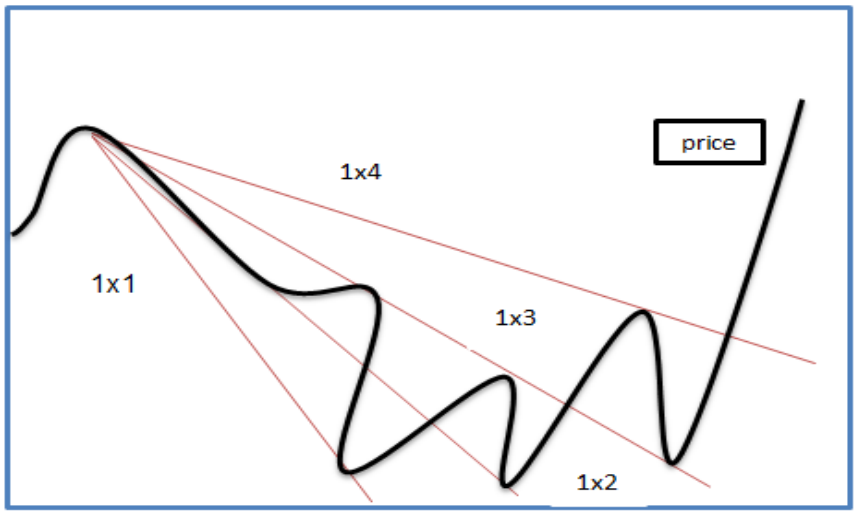
$$\frac{\mathrm{t}}{2} + \mathrm{P0} = \mathrm{P(t)}$$

2.Tools used in price and time angles Gann angles:

A. Gann Fan :

Another technical analysis tool developed by William Delbert Gann The Gann Fan consists of a series of lines that extend from a certain point on the chart, and helps identify support and resistance levels, as well as predict future price trends. Depending on the different angles of Jan that represent the relationship between price and time, fan lines can help identify potential turning points in the market. When the price reaches or approaches one of these lines, it can be a signal of a possible reversal or continuation of the trend(Market Technician's Association, 2017,69) . He added (CMT Association, 2022,74)that the Gann fan is a set of diagonal lines drawn from a specific pivot point on the chart, which represent different price and time angles. The fan usually consists of nine lines representing the main angles of William Delbert Gann and includes:

- 1x8 angle (7.5°)
- 15° angle
- 1x3 angle (18.75°)
- Angle 1x2 (26. 5 marks)
- ...a 45-degree angle.
- Angle 2x1 (63. 75 Degrees
- Angle 3x1 (71. 25 Marks
- 4x1 angle (75°)
- Angle 8x1 (5.82°)



Figure(6-1) Jan fan

Source: prepared by the researcher according to word

B. Gann Grid :

Another tool of time analysis tools that appears on the chart in the form of a set of 45-degree diagonal lines, or what is known as the Jan time wheel or called the beehive, each of the grid

lines indicates a long-term trend, whether in the upward or downward direction, when the price is above this line. This is evidence that the trend is upward, and if the price is below this line, this is evidence that the trend is downward(Mark Andrew Lim, 2015,969) .

The Gann grid represents an intersecting series of Gann lines placed on a price chart Gann's teachings emphasize the importance of a 45-degree line representing a 1:1 relationship between time and price (one unit of price to one unit of time). When the price is trading above the 45-degree line, it is an indication of a bullish market when the price is trading below the 45-degree line, it is an indication of a bearish trend of the market. The concept presented by Jean says that any line with a slope of (45) degrees will represent a long-term trend line. This can be either ascending or descending (Keung Wong, 2014,127).As for those prices that settle below the bullish line, the Gann concept says that this will predict the bullish trend within a limited period and vice versa. When there is another intersection of these lines, it is possible to show that a new trend will occur. However, it can show a perfectly balanced market when prices fall to the line during the bullish trend.

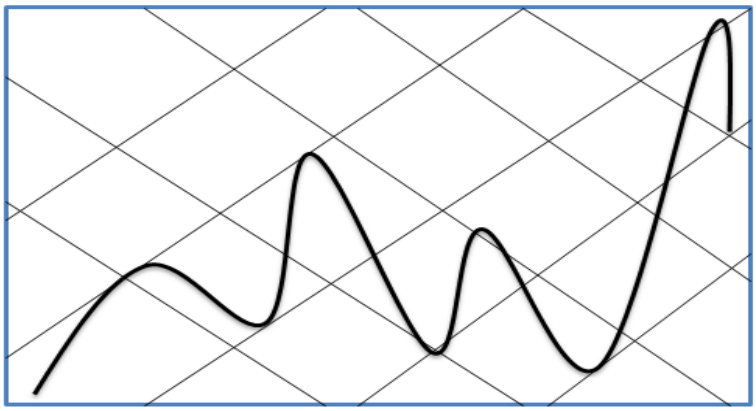


Figure 7.1

Source: prepared by the researcher according to word

C. Gann Box Corners:

WD Gann used innovative geometric and numerical relationships to create several technical analysis tools to help analyze the market. Gann Box is one of the powerful tools that can be used to measure and detect repetitive price cycles. Any trader can set the time and price range for the cycle that is expected to repeat. In this sense, Gann Box is like a market roadmap that can be used to search for the desired targets. Please note that the chart needs to be resized correctly to ensure that the market has a square correlation. The fund divides price and time into equal sections called price and time levels and they are drawn from a major axis (either low or high) (Ross Beck, 2010,73).He added (Omar Evren, 2016,42) Jan believes that price and time are interrelated and that some of the square relationships between price and time can predict future market movements. Jan's box is used to draw these relationships on the chart as follows:

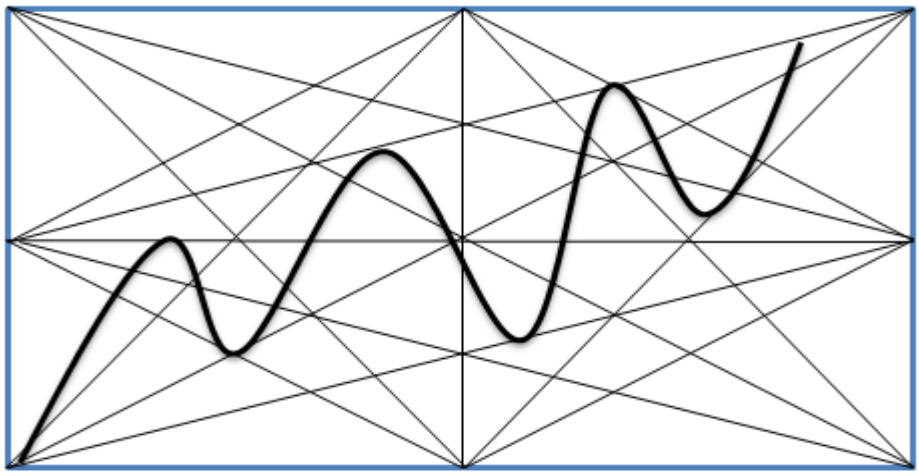


Figure
(8-1) Jan Box

Source: prepared by the researcher according to word

3.On the geometric shapes.

A. On the geometric shapes.

Prices move in the markets according to a purely mathematical system that determines the general framework for the movement of a security. The principle of geometric shapes in the markets depends on the geometric angles. The geometric shape is determined according to the first angle that returned the price by dividing (360) by the value of the angle to determine the number of sides. The expected time to move to a new part of the movement is the value of the angle or its multiples or divisions. The common information is that (if the time comes and the price does not come, the trend is completely reversed). The value of the angle is the difference between the bottom and the first high in the upward direction or between the top and the first low in the downward direction,so the geometry ends by breaking the equitable angle of the previous square if the price is late in reaching the next angle, meaning that a price explosion is expected unless it breaks the equitable angle of the previous angle (Reddy, 2013,29). Currency pairs and the rest of the assets go on specific price geometries that are known through the first angle of the price and the price must then bounce to half the distance (at least) and can bounce for more than 75% of the distance provided that it crosses the top or bottom from which the geometric shape is drawn. The geometric shape is drawn from tops or bottoms (main) and not subordinate in the sense that the top is not preceded by a previous high higher than 360 candles and the bottom is not preceded by a previous low lower than it is during 360 candles(Chelsea, 2007,152).

- **Circle Shape:** The first shape is characterized by the strength of the price movement and is often in long-term trends. The first angle of retracement within this shape is the angle of 360° or 270° and the retracement from it to 180- 135-90 before completing the trend, that is, the price moves a full cycle without any corrections during those movements, 2010,498) (Julie Dahlquist

Table(1-1) Circular shape

The first corner returns the price 360		
Shape Type	**Price Angle**	**Status**
Ring	**360**	**consummate**

Source: prepared by the researcher according to word

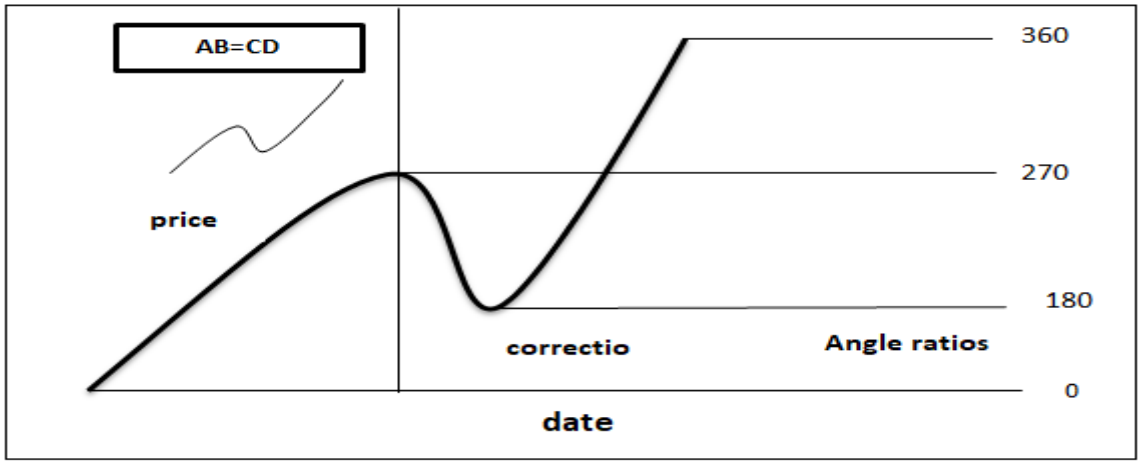
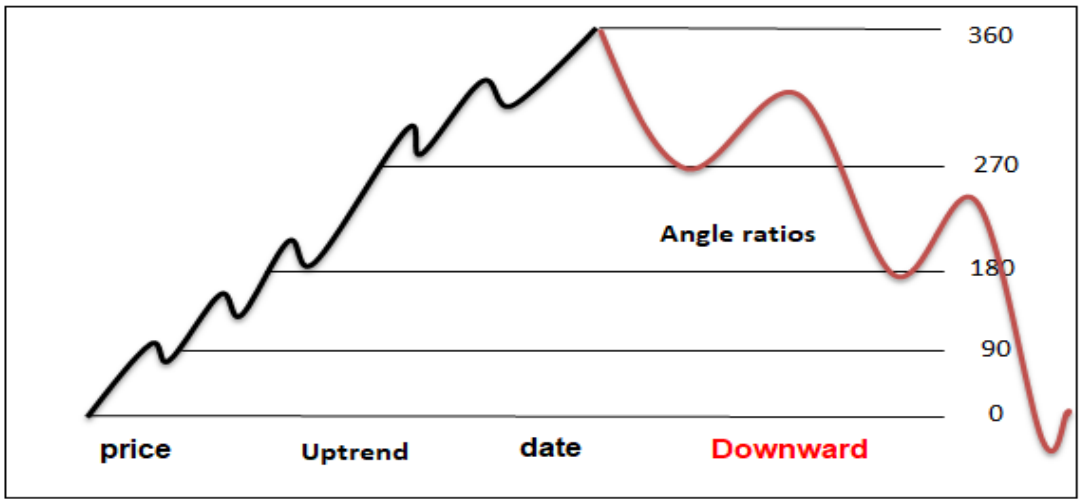


Figure (9-1) Circular shape - Correction status

Source: prepared by the researcher according to word

In the above figure, the price starts from angle zero and moves to angle 270 directly with a retracement of the angles below them at 180 degrees and then continues to 360 degrees.

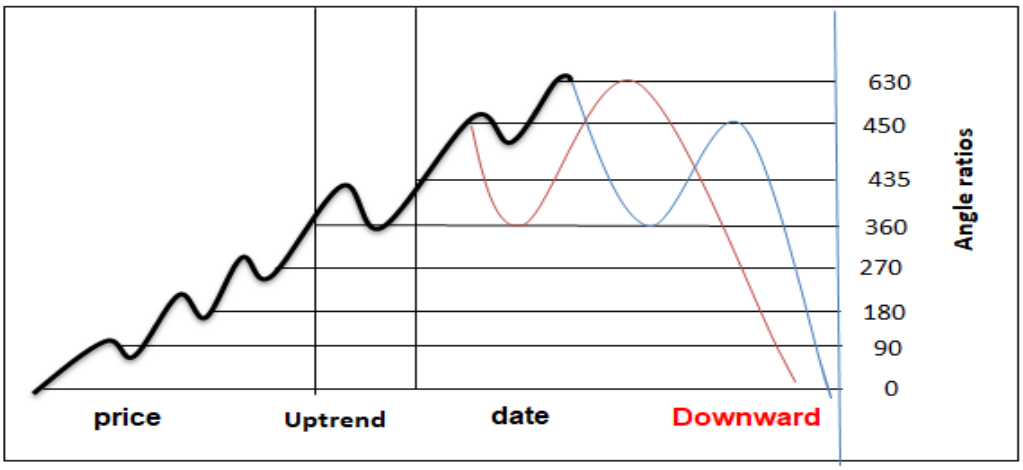


Figure(10-1) Circular shape - Null state Correction

Source: prepared by the researcher according to word

The circular shape is characterized by speed and strength of direction and shows economic events and is repeated in small and medium time periods. There is an anomaly that occurs when the price goes directly to the angle of 450 degrees and does not stop at the angles of 270

degrees or 360 degrees. There are two cases of reversion. The first case is the reversion from the angle of 450 to the angle of 360 degrees. The second case is the transition from the angle of 450 to the angle of 630 and then the correction to the angle of 360 degrees as in the following figure.



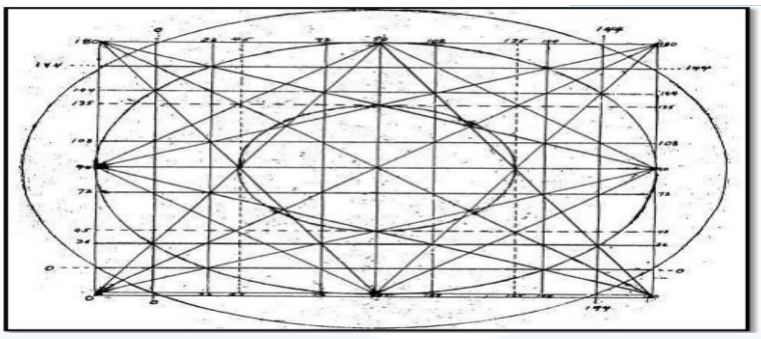
Figure(1-2) Circular shape - Anomaly

Source: prepared by the researcher according to word

- **Hexagram:**

The six-pointed star is one of the tools used in time analysis and price angles for stock prices and currencies. The six-pointed star, when drawn, uses a set of trends that connect the horizontal axes of angles and the vertical axes of time and can be linked to several different uses depending on the context, including angular geometry and price angles in the technical analysis of financial markets.

in technical analysis (Perry J. Kaufman, 2019,669). Price Angles are used to analyze trends and identify potential support and resistance points based on price movements and time. Although the six-pointed star is not a common term in this context, there are similar methods in geometric analysis such as the use of the Gann Grid and Gann Angles. The six-pointed star consists of the overlap of two equilateral triangles. This figure can be used to identify entry and exit points in technical analysis. A six-pointed star can help streamline the market analysis process and provide a clearer view of potential turning points. The star shape also provides a visual framework that can facilitate decision-making.



Figure(3-2) Hexagonal star geometry

SOURCE: WILLIAM JN

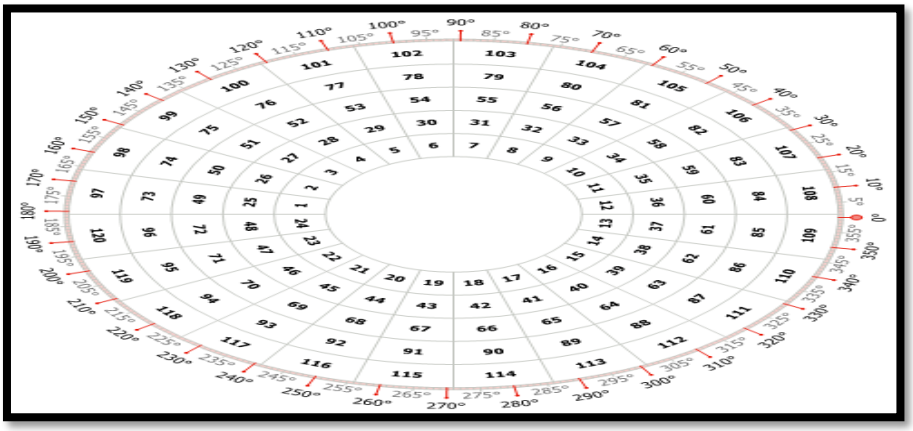
The basics of star trading:

1. If the price revolves around a specific angle, it automatically goes to its weakness: if the price revolves around the angle (90), it goes to (180), and if it revolves around the angle (180), it goes to (360), and if it revolves around (360), it goes to(720).
2. If the time comes and the price does not come, the trend changes.

The second axis/practical aspect

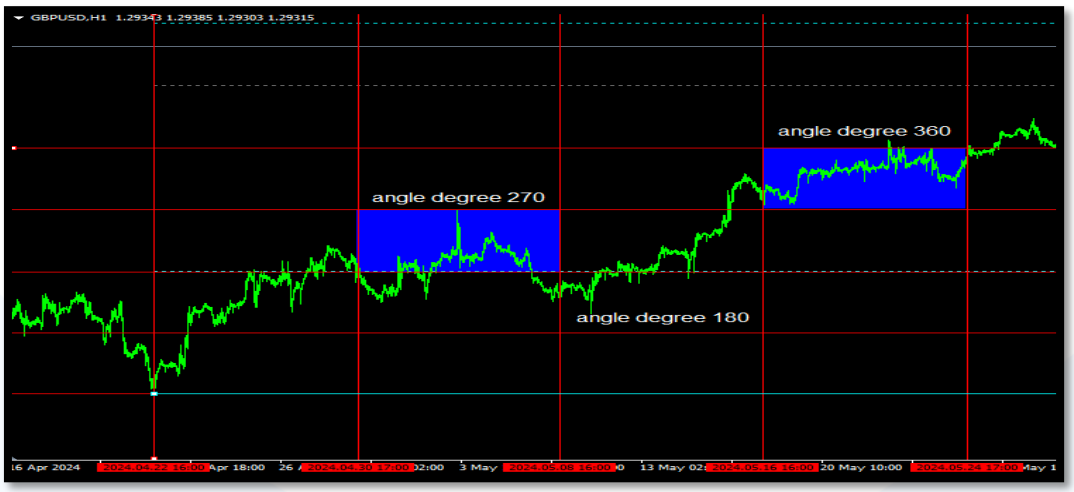
In line with the research topic and to analyze the prices of the Forex market, we will allocate this aspect to apply the circular shape and the six-pointed star at the future prices of the exchange rate of the research sample GBP/USD and thus the appropriate price and time levels for buying or selling in the currency market, and then make the rational decision.

First: Circular geometry



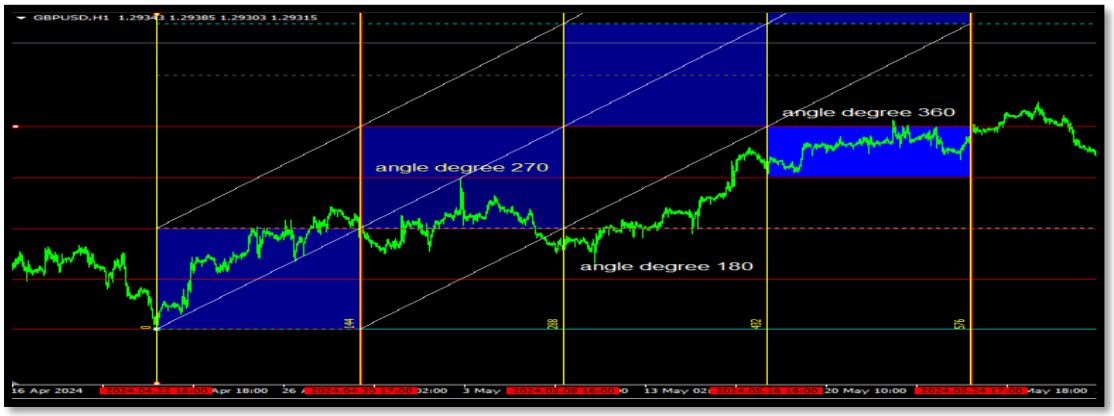
Figure(4-2) Circular geometry

Source: Gannzilla



Figure(5-2) Circular shape application for the price of (GPB/USD)

Source: **MT4 trading platform**



Figure(2-2) Geometric and temporal circular shape of the price of (GBP\USD)

Source: MT4 trading platform

time frame=1H		General trend (upward)				Shape type (circular)		
condition	Expected time for price angle	Expected target	cluster time	Cluster price	Decline rate	date	price	angle
Complete	2024-5-03 from 2024-5-16 To	1.27461	2024-5-08	1.26335	%65	2024-5-03	1.26335	270
Complete	2024-5-22 from 2024-5-24To	1.26335	2024-5-24	1.27461	%13	2024-5-22	1.27461	360

Technical indicators included with the figure (circular)							
Index value	angle	Levels		Period		Type	Index
Positive	270	(80-70-60-50-30-20)		26		momentum indicator	RSI
Positive	360						
Positive	270	Histogram	Signal Line	MACD Line		momentum indicator	MACD
Positive	360	V	9	12	26		
Positive	270	Apply to	MA method	Period		General trend	MA
Positive	360	Close	Simple	(14)			
The default settings of the indicator can be changed according to the nature of the analysis and the time series on which it is based, starting from the minute and ending in the month							

Source: prepared by the researcher according to Excel

Table (1-2) Results of the circular figure

Second: The six-pointed star

A hexagram is a geometric shape consisting of two overlapping triangles, and is used based on geometry and numerology as some believe that markets move according to certain ratios derived from nature and mathematics, such as Fibonacci ratios. So there are several ways to analyze the six-point star with the aim of extracting price and time levels as well as identifying entry and exit points based on correlation with Fibonacci ratios to confirm potential reversal points.The star is drawn from the first bottom or top by specifying the type of shape of the price angles as in Figure(3-2)

Figure (3-2) Quadrilateral cycle

Source: MT4 trading platform

After determining the quadrilateral shape of the price angles, considering that the first angle that returned the price is 90 degrees about 45 degrees (half of the angle), the remnants of the angles of the quadrilateral are neutralized in the hexagonal star.

Figure (4-2) Hexagonal star sides

Source: MT4 trading platform

By determining the geometric sides of the six-pointed star based on 360 degrees, we can see the time and price levels

Figure (5-2) Time and price levels of the hexagonal star

Source: MT4 trading platform

Figure (6-2) Time and price levels of the hexagonal star

Source: MT4 trading platform

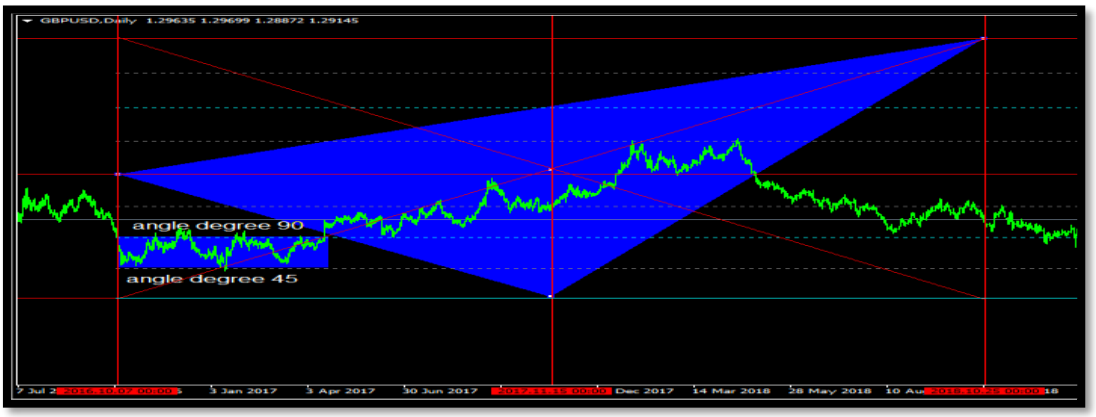


Figure (7-2) Time and price levels of the hexagonal star

Source: MT4 trading platform

By combining the three geometric shapes, we can see an integrated geometric shape of the six-pointed star

Figure (8-2) Hexagonal star geometry

Source: MT4 trading platform

After the shape is geometrically clear, the time interval for the price shift is determined based on the degree of each angle of the quadrilateral shape

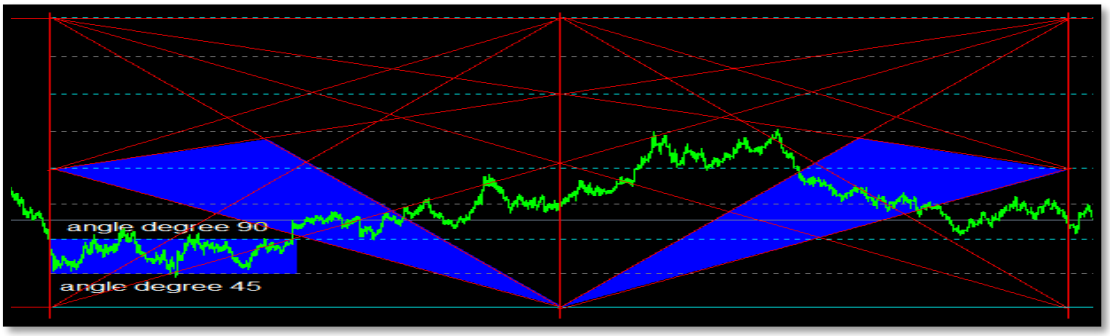


Figure (9-2) Time interval

Source: MT4 trading platform

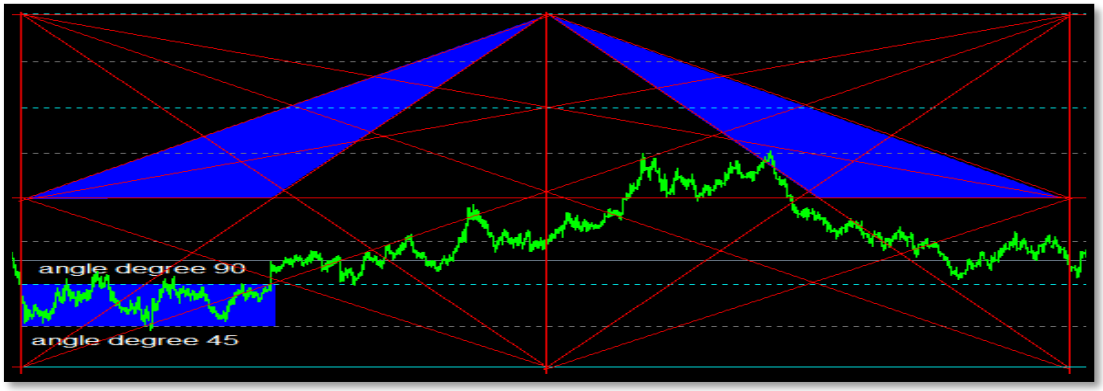


Figure (10-2) Time interval

Source: MT4 trading platform

By unifying the two shapes above, we can see the shape of the six-pointed star based on the degrees of the quadrilateral shape of the geometric angles

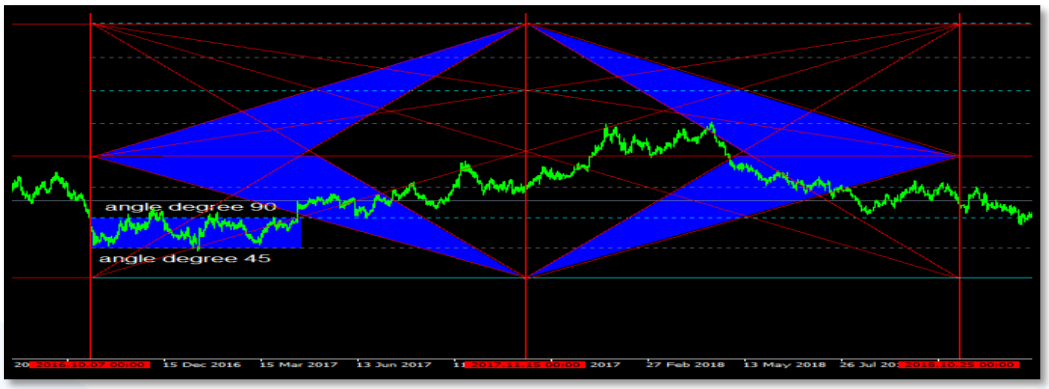


Figure (1-3) Hexagonal star

Source: MT4 trading platform

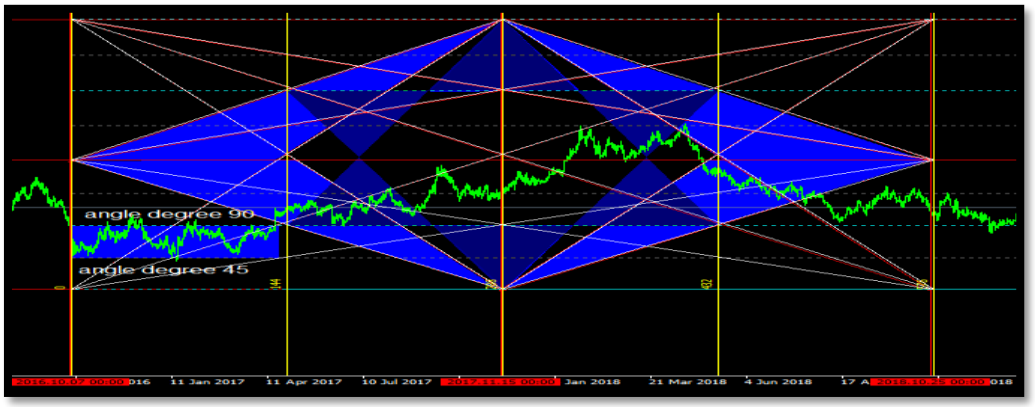


Figure (2-3) Hexagonal star

Source: MT4 trading platform

It is worth mentioning that each side of the sides acts as a support and resistance and a price axis, and the figure does not necessarily complete a full 360-degree cycle, but the most important thing is to find the price retracement levels of each geometric side in the hexagonal star.Through the geometric shape of the hexagonal star and based on the degrees of each corner of the quadrilateral shape, we employ the price data of the price pair (GPB\USD) and depending on the time period of one day according to the table below.

Source: prepared by the researcher according to Excel

Table (2-1) Hexagram-Square results

time frame=1D			General trend (upward)			Shape type (Hexagram - Square)		
condition	**Expected time for price angle**	**Expected target**	**cluster time**	**Cluster price**	**Decline rate**	**date**	**price**	**angle**
Complete	2016-11-11 from 2017-05-01 to	1.37507	2017-05-01	1.26068	50%	2016-11-11	1.26068	90
proactive	---------- from 11-05-2017 to	1.49406	2017-05-11	1.37507	0%	2018-01-11	1.37507	180
Incomplete	---------- from 2018-05-13 to	1.61791	2018-05-13	1.49406	Not achieved	Not achieved	1.49406	270
Incomplete	--------- from 2018-10-25 to	1.49406	2018-10-25	1.61791	Not achieved	Not achieved	1.61791	360

Technical indicators included with the figure (Hexagram - Square)							
Index value	**angle**	**Levels**			**Period**	**Type**	**Index**
Positive	90	(80-70-60-50-30-20)			26	momentum indicator	RSI
Positive	180						
Negative	270						
Negative	360						
Positive	90	Histogram	Signal Line	MACD Line		momentum indicator	MACD
Positive	180						
Negative	270						
Positive	360	v	9	12	26		
Positive	90	Apply to	MA method	Period		General trend	MA
Positive	180	Close	Simple	(14)			
Negative	270	The default settings of the indicator can be changed according to the nature of the analysis and the time series on which it is based, starting from the minute and ending in the month					
Negative	360						

Through the results that appeared in the price and time shapes, it was found that not all shapes completed their full cycle, as well as not necessarily 360 degrees, but the most important

thing is to find the angles that include the prediction of the trend reversal, for example, we can expect the price to reverse at the angle 270 and change the trend instead of reaching 360 degrees levels. In the event that the 270 degree angle is penetrated, the scenario changes and the prediction of the price reaches 360 degrees. In the table below, the performance of the two figures is compared

Table (3- 1) Comparing the performance of the forms of price and time angles

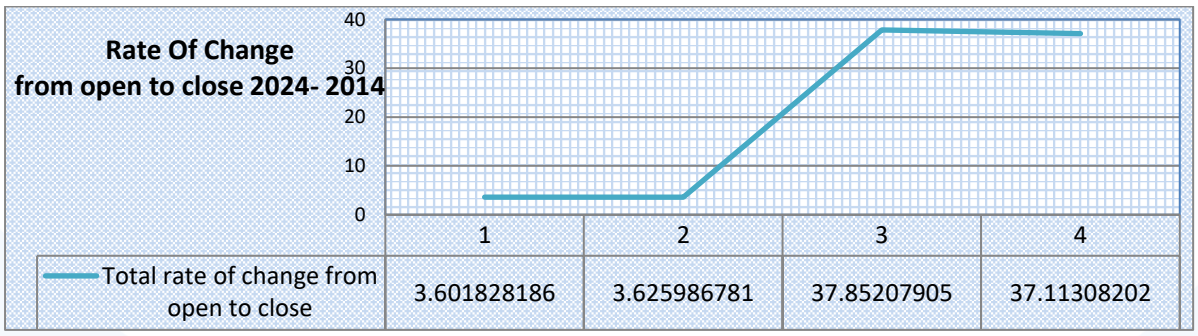
Circular No.			
Price cycle formation			
1.26335-1.27461			
Characteristics of the price cycle		price	date
Time Frame	Initial price	1.26335	5 March
1h	23000	1.27461	2024-05-22
Hexagram-Square			
Price cycle formation			
1.26068-1.61791			
Characteristics of the price cycle		price	date
Time Frame	Initial price	26068	2016-11
1D	1.15114	1.37507	2018/01/11

Source: prepared by the researcher according to Excel

Table(4-1)Change in the performance of each corner

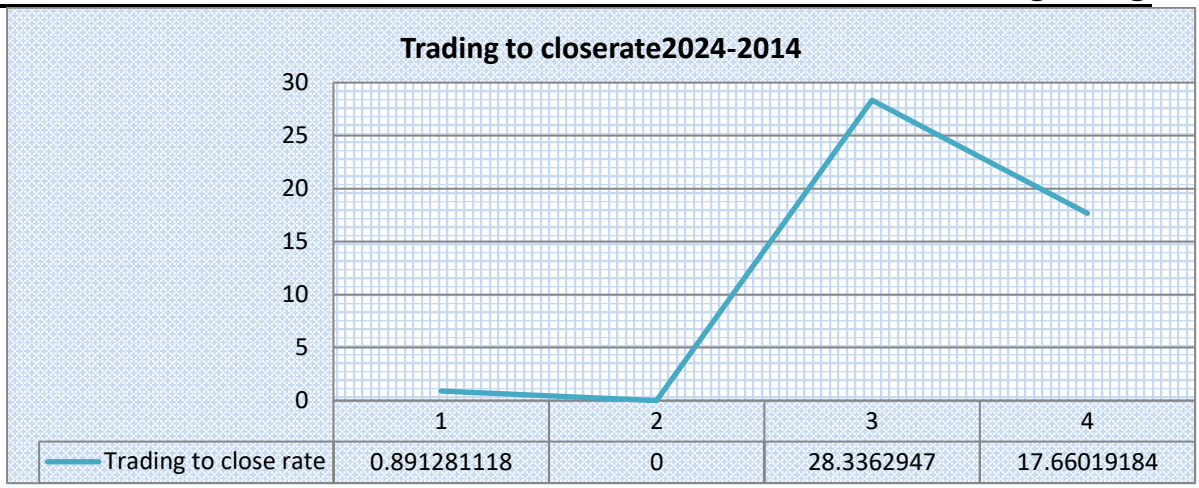
Initial price	Trading price	Final price for the price course 360	Total rate of change from open to close	Trading to close rate	Opening Price to Trading Ratio	SHAPE
1.23001	1.26335	1.27461	3.601828186	0.891281118	2.710547069	Circular No.
1.23001	1.27461	1.27461	3.625986781	0	3.625986781	Circular No.
1.15114	26068	1.61791	37.85207905	28.3362947	9.515784353	Hexagram-Square
1.15114	1.37507	1.61791	37.11308202	17.66019184	19.45289018	Hexagram-Square

Source: prepared by the researcher according to Excel



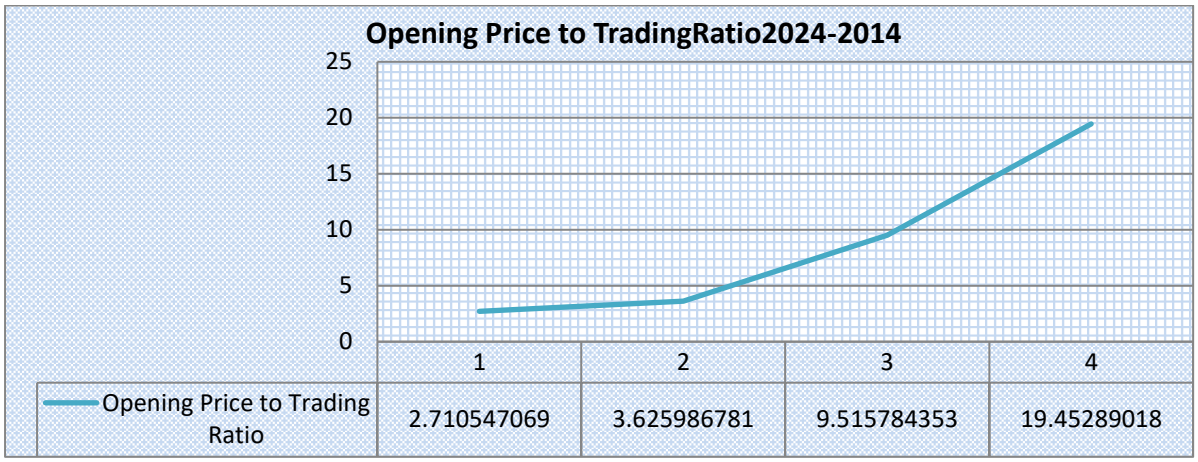
Figure(3-3) Total rate of change from opening to closing

Source: prepared by the researcher according to Excel



Figure(4-3) The rate of the closing trading price

Source: prepared by the researcher according to Excel



Figure(5-3) Ratio of the opening price to trading

Source: prepared by the researcher according to Excel

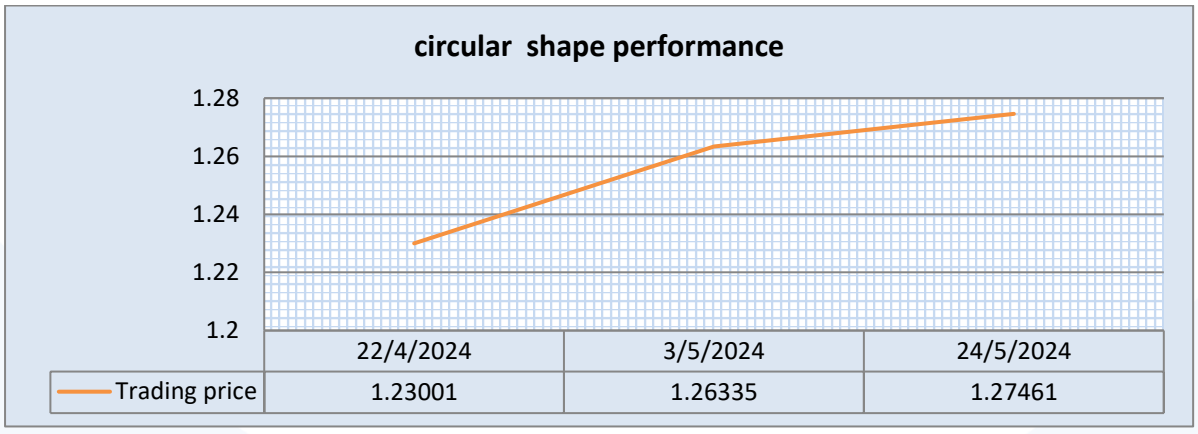
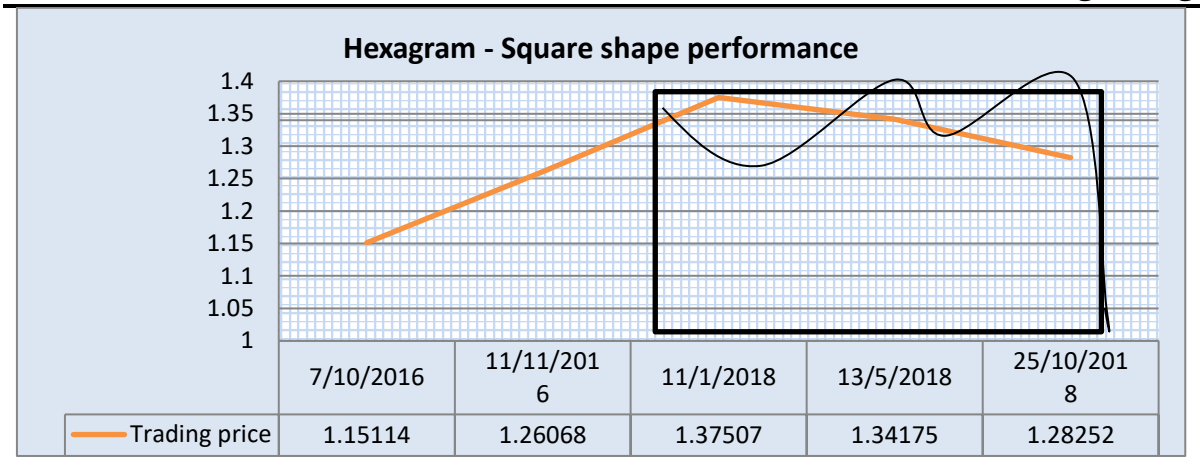


Figure (6-3) Circular shape performance

Source: prepared by the researcher according to Excel



Figure(7-3) **Hexagram-Square** performance

Source: prepared by the researcher according to Excel

The third axis: Conclusions and recommendations

First: - Conclusions

1. The study showed that time price angles can be an effective tool for determining the time movement of prices in the market movement, such as reversal points, support and resistance levels. When applying angles to major pairs in the currency market, such as EUR/USD and GBP/USD, it was found that these angles often intersect with sharp shifts in price trends.
2. Time price angles have proven to be accurate in predicting future trends when combined with other technical analysis tools such as the Relative Strength Index (RSI) or MACD. For example, cases where time angles were identified on some dates (such as interest rate decisions, employment rates, and inflation) showed that they were of higher predictive accuracy compared to using angles alone.
3. The study confirmed that the signals obtained across time price angles were more accurate in longer time periods (such as days, weeks or months) compared to short time frames (such as four hours, hour, text hour and minutes). This indicates that price angles are better at identifying major shifts in markets and not predicting small and volatile movements.
4. In some cases, price angles have been less accurate in predicting market movements in periods of high volatility due to sudden economic news or geopolitical events so care should be taken when using angles in market environments that are characterized by uncertainty or major events.

Second, recommendations:

1. The researcher recommends combining time price angles with other technical analysis tools such as moving averages and the Relative Strength Index (RSI) to provide more powerful and accurate signals. The combination of angles and technical tools contributes to providing more reliable trading signals

2. Time price angles should be employed in the context of risk management, by using them to identify accurate support and resistance points that can limit losses and enhance profit opportunities in the market.
3. Future researchers are advised to use machine learning techniques to improve prediction models using time price angles By training the models on historical data, the accuracy of predictions can be greatly improved by combining many variables and characteristics.
4. Future researchers could extend the study to other markets (such as stocks or commodities) to test the effectiveness of time price angles in different financial markets. This study will be useful for understanding the impact of this tool across diverse markets.

References

1. (Raymond Hon-fu Chan (Author), Alan Wing-keung Wong (Author), & 3 more)Technical Analysis And Financial Asset Forecasting: From Simple Tools To Advanced Techniques Kindle Edition by Raymond Hon-fu Chan (Author), Alan Wing-keung Wong (Author), & 3 more(2014).
2. (Sankar Srinivasan (Author), Paul Daniel)Gann Angle Theory: for Successful Intraday & Delivery Trading Kindle Edition,(2016)
3. Sankar Srinivasan)Gann Astro Method: An Introduction Kindle Edition,(2023)
4. Finn Samxon)Mastering W.D. Gann's Angles: Predicting Market Prices with Timeless Techniques Kindle Edition(2024)
5. (Fabio Oreste)Quantum Trading: Using Principles of Modern Physics to Forecast the Financial Markets (Wiley Trading Book 409) (2011)
6. (Mt Helen,)A Joint Review of Technical and Quantitative Analysis of Financial Markets Towards A Unified Science of Intel(2003).
7. (George MacLean)Fibonacci and Gann Applications in Financial Markets: Practical Applications of Natural and Synthetic Ratios in Technical Analysis First Edition,(2005).
8. (Jeff Greenblatt) Breakthrough Strategies for Predicting Any Market: Charting Elliott Wave, Lucas, Fibonacci, Gann, and Time for Profit (Wiley Trading) 2nd Edition, Kindle Edition by Jeff Greenblatt (Author), Dawn Bolton-Smith (Foreword) (2013).
9. (Cornelius Luca)Trading in the Global Currency Markets, 3rd Edition Updated Edition(2007).
10. (Ross Beck) The Gartley Trading Method: New Techniques To Profit from the Markets Most Powerful Formation First Edition(2010).
11. (George M. Protonotarios) Trading World Markets Using Phi and the Fibonacci Numbers: Complete Guide to Fibonacci Trading With Reference to Elliott Waves, Gann Numbers, and Harmonic Patterns Kindle Edition(2018)
12. (by Jeff Greenblatt (Author), Dawn Bolton-Smith (Foreword))Breakthrough Strategies for Predicting Any Market: Charting Elliott Wave, Lucas, Fibonacci, Gann, and Time for Profit (Wiley Trading) 2nd Edition, Kindle Edition(2013).
13. Perry J. Kaufman, Trading Systems and Methods (Wiley Trading), 6th Edition(2019).
14. (Guy Cohen) Options Made Easy: Your Guide to Profitable Trading Kindle Edition(2013).

15. (Finn Samxon)Mastering W.D. Gann's Angles: Predicting Market Prices with Timeless Techniques Kindle Edition(2024).
16. (Constance M. Brown) Technical Analysis for the Trading Professional (McGraw-Hill Trader's Edge Series) 1st Edition, Kindle Edition(2012).
17. (James A. Hyerczyk) Pattern, Price and Time Using Gann Theory in Technical Analysis, Publisher :Wiley,(2009).
18. (Ahmed Alaa, Sameer Alyara)FORECASTING stock prices using Gann model (analysis study for Microsoft Corporation)(2023).
19. (Ihab Saeed) Technical Guides to Financial Markets (2023)
20. (Majid Fahad Al Ameri) Cloud Maps: Cloud Index and Wave Theory (2021)
21. (Deron Wagner, Ed Balog) Advanced Technical Analysis of ETFs Strategies and Market Psychology for Serious Traders, Publisher:Wiley (2012).
22. (Richard W. Kidwell David S./ Blackwell, David W./ Whidbee, David A./ Sias) Financial Institutions, Markets, and Money(2017).
23. (Sankar Srinivasan)Gann Astro Method: An Introduction Kindle Edition,(2023).
24. (Emilia Landa) Analyzing the Gann Rule of Trading of Buying High and Selling Low using Pythagorean Theorem(2024).
25. (David Keller) B reakthroughs in Technical Analysis New Thinking From the World's Top Minds(2007).
26. Artem Kalashnikov(Gann Square of Nine Astronomical Economics and the Techniques of W.D. Gann, Publisher:Gannzilla,(2023).
27. (Vikrant Bhateja, Fiona Carroll,João Manuel R. S. Tavares)Intelligent Data Engineering and Analytics Proceedings of the 11th International Conference on Frontiers of Intelligent Computing: Theory and Applications (FICTA 2023)
28. (Market Technician's Association)CMT Level I: An Introduction to Technical Analysis(2nd Edition2017).
29. CMT Curriculum Level I An Introduction to Technical Analysis(2022)
30. (Mark Andrew Lim) The Handbook of Technical Analysis + Test Bank The Practitioner's Comprehensive Guide to Technical Analysis (2015).
31. (Raymond Hon-fu Chan, Alan Wing-keung Wong, Spike Tsz-ho Lee)Technical Analysis and Financial Asset Forecasting: From Simple Tools To Advanced Techniques, Publisher:World Scientific Publishing Company,(2014).
32. (Ömer Evren Tanyaş)Teknik Analizde Gann, Andrew ve Elliott(2016).
33. (Ross Beck) The Gartley Trading Method New Techniques To Profit from the Markets Most Powerful Formation(2010).
34. (Hima Reddy) The Trading Methodologies of W. D. Gann: A Guide to Building Your Technical Analysis Toolbox, FT Press Vice President, Publisher: Tim Moore,(2013)
35. (Chelsea Reid) Give Your Trading the Edge A Guide to Success on the Financial Markets ,Publisher:Wiley,(2007)
36. (Charles D. Kirkpatrick II, Julie Dahlquist) Technical Analysis The Complete Resource for Financial Market Technicians, Publisher: Pearson Education,(2011).
37. Perry J. KaufmanTrading Systems and Methods (Wiley Trading) 6th Edition(2019).