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INTRODUCTION

Technical analysis refers to the analysis methodology of predicting the direction of stock prices using the past market data (primarily stock price and trading volume)[1].

TRENDS[2]

Trends are a way to represent the overall behavior demonstrated by the stock price curve. There are following types of trends: -

1. Uptrend
   It consists of a series of higher highs and higher lows.

2. Downtrend
   It consists of a series of lower highs and lower lows.

3. Sideways/ Horizontal trend
   It consists of roughly equal highs and equal lows or can also be identified as a trend which doesn't fit as a proper uptrend or a downtrend.

Trends can also be classified in terms of their time duration as short-term (less than a month), intermediate-term (1-3 months) and long-term (about a year). While short-term trends are best analyzed on a smaller time frame (i.e. minute or hourly basis), the long-term trends are best analyzed in longer time frames (i.e. daily or weekly).

TREND LINES[3]

Trend lines generally refers to those lines which are drawn on the stock price chart that help us predicting the trend of the stock price (i.e. finding entry points for trades). These can also be defined as the straight lines formed by connecting the higher lows or lower highs.

A trend line is generally drawn by connecting a minimum of two points (the more points that touch a trend line the better). These points can either be the candlestick bodies (opening or closing price) or their wicks (highest or the lowest price).

Figure 1 depicts two trend lines for the period – December 2018 to 15th January 2019.

CHANNEL

Corresponding to each trend lines a channel. The stock price lies bounded by the upper line (resistance) and lower line (support) for a certain duration of time.

Figure 1 depicts a channel that is identified by the region in between the support and resistance lines for the period - July 2018 to October 2018.

SUPPORT AND RESISTANCE[4]

Resistance refers to the horizontal line, which is made by joining two or more highs where there is a price reversal (in between the highs). Resistance also indicates the point when the sellers come into the market and there is a price reversal from high to low[5].

Support represents the situation when buyers came into the market to stop the stock price from falling further[5]. To draw support, we draw a horizontal line by joining two or more lows where there is a price reversal (in between the lows).

Support and resistance are usually interchanged in the event of a breakout. Often they are set in zones (i.e. there is not a single line for support and resistance but support and resistance zones).

Figure 1 depicts the support and resistance lines for the period - July 2018 to October 2018.

REVERSAL

Change in the direction of the stock price trend is a reversal. In Figure 1, we can see a major trend reversal (denoted by the change in the slope of the trend lines) around 24th December, 2018.

VOLUME

Volume can be defined as the numbers of shares that are traded over a given period usually a day. It is expressed as a bar chart below the stock price chart.

Combining price and volume helps us to see where the large institutions are putting their money.

Figure 1: Stock price chart showing resistance, support, channel, volume, trend line and reversal[11].

PRICE PATTERNS

Once the support and resistance levels for a stock price are drawn, they may resemble a certain shape. This shape is called a price pattern.

HEAD AND SHOULDERS PATTERN[6]

It is a reversal pattern i.e. the trend is likely to reverse once it is completed. It is characterized by three peaks, two lower almost equal peaks (left and right shoulders) around a central high peak (head). The line joining the lower ends of the two shoulders is called a neckline. This line is important because it acts as a support for the pattern and indicates the start of a breakout or reversal (with breakout lasting with a depth = height

difference between neckline and peak of the head). These patterns last from 2-8 months. Ideally, the trading volume during the advance of the left shoulder should be higher than the advance of the head. Also, volume increases down from peak of the head and decreases during advance of right shoulder. Finally, the volume should increase on the descent from the right shoulder's peak. An example of this pattern is shown in Figure 2.

Figure 2: Head and shoulders price pattern[6].

Double Top Pattern[7]

It is a type of reversal pattern where the pattern changes from a rising towards a downwards trend. It is recognized by two nearby almost equal peaks (i.e. the peaks lie between a single support and resistance line.). The time period between the peaks may vary from few weeks to several months. The trading volume is usually high at the

beginning of the first peak, is moderate until the second peak, and increases in the descent from the second peak. An example of this pattern is shown in Figure 3.

Figure 3: Double top price pattern[7].

TRIANGLE PATTERN[8]

These are usually formed when trend lines converge towards each other.

There are three types of triangles- Symmetrical, Ascending and Descending triangles. Their time frame ranges from 1-3 months. Identifying this pattern helps in the predicting a breakout (with magnitude equal to the height of the left vertical side of the triangle). For symmetrical triangle we can just say that a breakout is likely to occur but we cannot specify its direction. For ascending triangles (horizontal upper trend line) a breakout is generally associated with an upwards trend whereas for a descending triangle (horizontal lower trend line) it is the opposite. As the pattern develops the volume usually starts to

decrease from the start of the pattern towards its end. An example of this pattern is shown in Figure 4.

Figure 4: Ascending triangle price pattern[8].

Flag and Pennant[9]

Flags are the patterns that are represented by small rectangles sloping against the prevailing trend whereas pennants are small symmetrical triangles. These are usually short-term patterns lasting from 1-12 weeks. The trading volume is high during the beginning and end of the pattern which justifies the trend change at both of its ends. An

example of a flag pattern and a pennant pattern is shown in Figure 5 and Figure 6 respectively.

Figure 5: Flag price pattern[9].

Figure 6: Pennant price pattern[9].

TECHNICAL INDICATORS[10]

Technical indicators deal with the statistical approach to technical analysis. By taking into consideration a variety of parameters they provide an approximate measure for analyzing the price movements.

There are mainly two types of indicators: -

1. Leading indicators.
   They are used to predict the future price movement trends.

2. Lagging indicators.
   They are used for confirming a trend based upon its previous data.

Indicators are also classified as oscillators (bounded within a particular range) and non-bounded.

Accumulation/Distribution Line

It is a commonly used indicator that compares the buying and the selling ratio by taking into consideration the volume in a particular period. It is calculated using the formula: -

Acc/Dis=((Close-Low)-(High-Close)) / (High-Low) Period's volume*

An upward trend of this line indicates that there is greater buying than selling.

Figure 7 depicts an Accumulation/Distribution line for the period - May, 2017 to February 2019.

Aroon

Aroon is used for identifying a trend and quantifying its magnitude. There are two lines used to represent Aroon, an Aroon Up line and an Aroon Down line. The Aroon Up line keeps track of the elapsed time since the highest price (for a given time period) while the Aroon Down line keeps track of the elapsed time since the lowest price.

Figure 7 depicts an Aroon (with a period of 14 days) for the overall period - May, 2017 to February 2019.

Relative Strength Index

Relative strength indicator (RSI) is a momentum indicator, which is used to identify Overbought and Oversold conditions. It is indicated by a value between 0 and 100. Overbought condition occurs when the RSI is above 70 and oversold condition is indicated when it goes below 30. Both these conditions provide important information about sudden changes in the trend of a stock price.

Figure 7 depicts an RSI (with a period of 14 days) for the overall period - May, 2017 to February 2019.

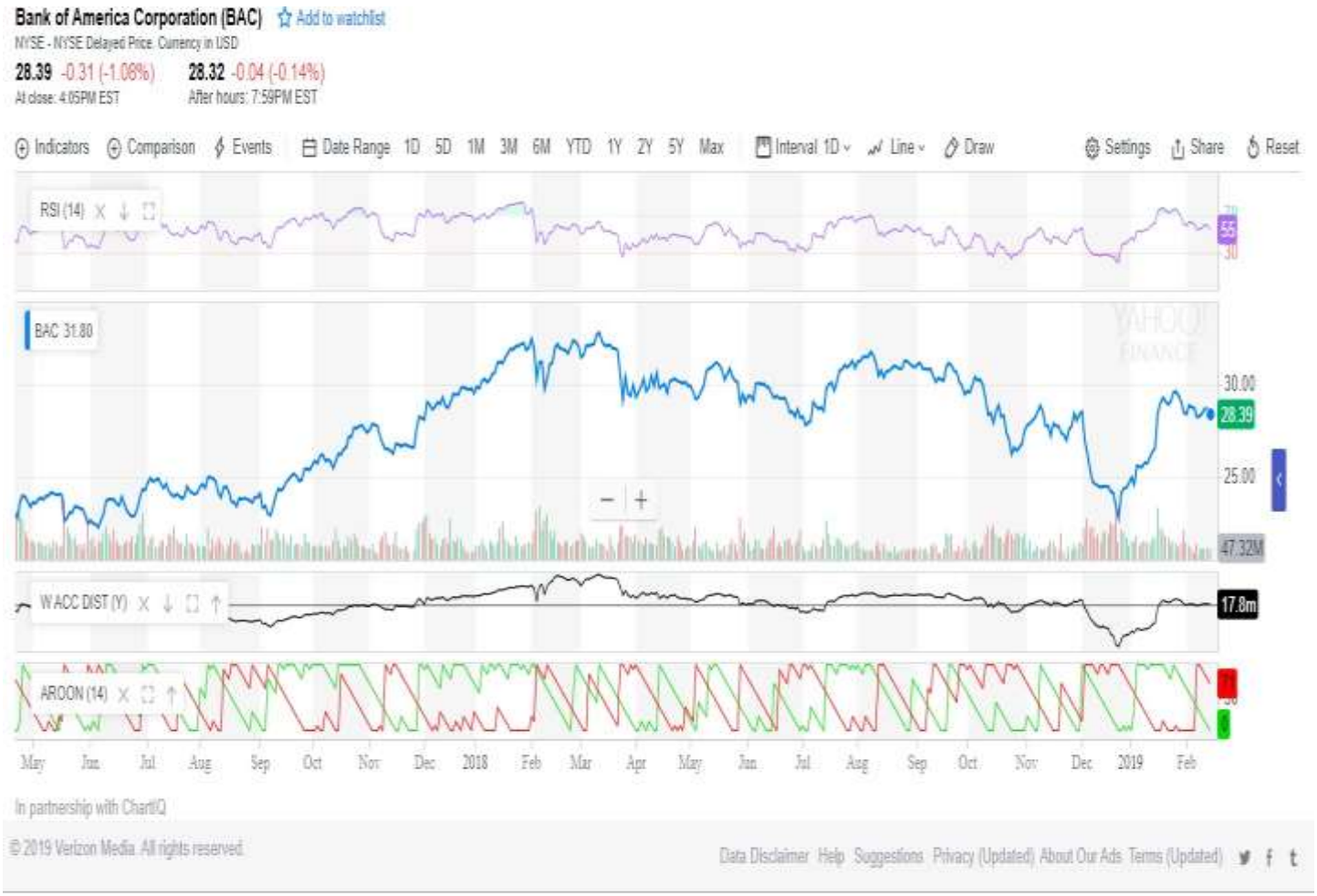

Figure 7: Stock price chart showing Accumulation/Distribution line, Aroon (for a period of 14 days) and RSI (for a period of 14 days)[11].

CONCLUSION

After understanding about the various techniques involved in a technical analysis, we can observe that they act as a very powerful tool to help us in predicting the future trend of a stock price. Also, some financial economists cite chaos theory (according to chaos theory seemingly random processes may have been generated by a deterministic function that is not random[12]) in support for predicting the future price trends.

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