



Trade in Share Market with Mathematical Models

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1. INTRODUCTION

The stock market broadly refers to the collection of exchanges and other venues where the buying, selling, and issuance of shares of publicly held companies take place. Such financial activities are conducted through institutionalized formal exchanges (whether physical or electronic) or via over-the-counter marketplaces that operate under a defined set of regulations [1]. Stock Market stocks exchange in India are National Stock Exchange, also known as NSE and Bombay Stock Exchange, also known as BSE. Though BSE is oldest Exchange of Asia, NSE is now more famous in India.

Shares are units of equity ownership in a corporation. For some companies, shares exist as a financial asset providing for an equal distribution of any residual profits, if any are declared, in the form of dividends. Shareholders of a stock that pays no dividends do not participate in a distribution of profits. Instead, they anticipate participating in the growth of the stock price as company profits increase [1]. Example –Suppose there are 100 tradable shares of company “ABC” available on stock exchange and you are holding 10 shares of this company. It means you hold 10% ownership of this company; you may have not founded this company or may not even be an employee of this company still you can become an owner of any publicly traded company.

2. BACKGROUND

Charles Dow conceived the concept of technical analysis for share market in the late 1800s. There are many other researchers viz. William P. Hamilton, Robert Rhea, Edson Gould, and John Magee further who contributed significantly to develop the Dow Theory concepts. Over a period of years of research, the technique of technical analysis has evolved to include hundreds of patterns and signals. Technical analysis is a tool to speculate price movement of any tradable instrument or securities. With the help of mathematics various traders have developed various type of technical analysis tool. It became popular in late 90s, even many Mathematicians have contributed a lot to this field of financial speculation. Traders with the help of technical analysis try to observe and trade various price patterns which forms due to different human emotions like greed and fear [2].

Like last year in 2020 there was corona crash in share market because of extreme fear among investors. While many sold all

their investment during the crash out of fear. While a lot of smart investors bought a lot of shares during the crash. Now in year 2021, market has recovered and even gone beyond previous high and all those smart investors are sitting with handsome profit in just a year time. Technical analysis uses a lot of tools like resistance, support, trend line, Fibonacci retracement and various patters like rectangle, cup handle, triangle, wedge, flag etc. Some analyst just relies on the macroeconomics model called demand and supply. It based on the very simple principal that when there is a lot of demand for any shares, its price increases. And when there is a lot of supply of a stock, its price goes down.

3. MATHEMATICAL MODEL

By simply observing price chart of a share, we periodically can see many simple geometric figures like Triangle, Rectangle, Flag, wedge, Tea cup and handle, Head and Shoulder. These figures are made due to Human emotions and emotions of a person living in India or USA is same. Main emotions which drive a market is fear, Greed, and fear of missing out, these basic emotions are the reason behind repetition of geometric figures mentioned above [3].

4. TRIANGLE

Triangle price patterns form with the help of two trend lines. An upper trend line and lower trend line, both converge on the right side with passage of time. Upper trend line is formed by joining all the new highs of price and lower trend line if formed by joining all the lows of price. In simple terms price of a share oscillates such that it forms a triangular structure, so traders who study and trade the market observe the triangle and trade the stock if it breaks the triangular structure in upward or downward direction. Here, upward direction means share price is going up and downward means share price is going down [1]. For example, Relaxo footwears is one of the best footwear companies in India.

Relaxo share price on 17th November 2020 was just around 740, you can see in the Figure 1, price of relaxo is oscillating between two lines which is converging on a single point thus forming a triangular structure.

Traders wait for decisive breaking of downward or upward sloping line. If price breaks in the direction of downward slope

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line, then it means there is good probability of stock going up and vice versa for upward slope line. So, trader buy just after breaking of the downward slope line and holds till their target price.

Many traders see the same pattern and most enter around same price after breaking of the structure. This much participation of so many traders provide a good momentum to the stock and stocks then moves toward the target price at fast pace.



Fig. 1. Share Price of relaxo, oscillating between two lines which is converging on a single point thus forming a triangular structure

Now, let's see the Relaxo Share price on 6th December 2021 exactly after one year and 18 days, as shown in Figure 2.



Fig. 2. Relaxo share price on December 06, 2021

On 6th December 2021, Relaxo current price is 1252 rupees. If a person had invested some amount in Relaxo last year, he will be getting 71% profit in 1 year.

This is the power of mathematical modelling of share prices, we can get unprecedented profit in relatively short period of time.

5. RECTANGLE

A rectangle is one of the simplest technical analysis price pattern that can form on chart. A rectangle represents confined range of price movement for a period of time. In this pattern, price forms an upper ceiling resistance line and a support line at lower-most part. This pattern is formed on the very basic concepts of

technical analysis i.e. Resistance and support. Resistance line is a line which provides resistance to price movement, above that line it is hard to sustain due to increased number of people selling the stock at that price.

A support line is a line which provides support to price movement, on this line there is increased number of values

buying of stock thus most often stock gives a bounce at support price. With the help of resistance line at top and a support line at bottom a rectangle form. For example, the price could break out of the rectangle to the upside and fall back into the rectangle shortly after. That is called a failed break [1].



Fig. 3. Share Price of State Bank of India following Rectangle pattern

Since the last Financial crisis in 2008 till 2020. Price of SBI bank share was confined between a rectangular shape, as shown in Figure 3, whose lowest part was 150 and upper most part was at 350. For last 12 years price of it was oscillating between high point of 350 rupees and low point of 150 rupees.

Future predicted price of SBI Bank on the basis of Rectangle

The target price of SBI Bank after breakout of 350 rupees level will be equal to the top level of rectangle minus the lower level of rectangle plus 350.

I.e. Target Price = $350 + (350 - 150) = 550$.

Where 350 level was top of rectangle and 150 level was lower most part of rectangle. Now, let's look at SBI Bank Price on 6th December 2021, as shown in Figure 4.



Fig. 4. Share Price of State Bank of India on December 06, 2021

SBI Bank had given breakout of upper range of 350 this year in April. Since then in 8 months it has given upmove of 35% which is great. Whereas a Fixed deposit in SBI Bank will fetch max 5-6% per annum and investment in it's share has given 35% that too in just 8 months. The difference is huge.

6. CONCLUSION

Trading on the basis of Mathematical models or say technical analysis is all based on probability and having an edge. There is no certainty that even after breakout of geometric figure a stock price will reach our desired price. Stock market is too random to predict exactly.

Still, with the help of these geometric figures our odds of being right and making profit increases. If we will implement the same model again and again say for 10 times and we exit at desired profit or loss. We just need to be right 6 out of 10 times to make an overall profit in our investment. With proper risk

management and these mathematical our chance of winning increases greatly against the people who are just buying and selling share randomly.

Mathematical modelling of Share Market provides us an edge against common people and with enough practice and observation we can implement this again and again to gain experience. With experience and building muscle memory we can make good money out of share market down the line in our life. Share market requires persistence, perseverance and most importantly mental toughness to make big money in the market.

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