Use of Opening Range Breakout in an Online Trading System

Neelansha Trivedi

Abstract— The goal is to build an online trading application for a global financial institution that invests in capital across multiple asset classes, where many a times challenges are faced in keeping track of all the investment decisions by various asset managers in the firm and also in maintaining accuracy of data which is shared by different users in the same office and also across geographies. For such an organization to earn significant profits, which deals in trading daily, it is important to make use of strategies in order to buy or sell securities. Thus, in order to help a trader to make transactions on the trading terminal we make use of a technique called Opening Range Breakout (ORB). Opening Range Breakout is a trading system which makes use of technical analysis for high accuracy results in the field of intraday trading as well as positional trading. ORB makes use of strict rules, indicators such as resistance, support, exponential moving averages etc. and good knowledge of the overall market in order to increase profit rates dramatically. Opening Range Breakout (ORB) is widely used by professionals and analysts who predict how the market will act for a particular day. However, in practice, for a global institution it is important to have their own thorough technical analysis to help portfolio managers and traders get profitable trading opportunities. In this project, we will try a novel approach which employs deep learning to tackle the problem.

Key words —Finance, Market Indicators, Online Trading System,Opening Range Breakout, Resistance, Stock Market, Support, Technical Analysis,Trade

1 INTRODUCTION

1.1. Theoretical Background

Opening Range Breakout is a form of trading system which uses technical analysis to build a point of view. A point of view refers to building a sense of direction on a stock in general. If one thinks that the stock will be going up, he has a bullish point of view and hence will buy the stock. If one thinks that a stock is going down, he has a bearish point of view and hence will sell the stock. It is very important to have different point of views of the market for it to be stable and functional. Thus, technical analysis is one of the ways to understand and predict the point of view of market participants.

Technical Analysis is a research technique which helps to identify trading opportunities in the market based on the actions of market participants i.e. sellers or buyers. Technical analysis can be applied on any historical time series data which in this case pertains to the price variables namely – open, high, close, low, volume and likewise.

With the help of technical analysis, the actions of traders can easily be visualized by means of a stock chart. As time passes, patterns can be visualised in charts with each pattern conveying a certain message. Technical analysis is mainly used to identify short term trades.

By finding out the Open, High, Low, Close one can draw a summary of a stock. The open is the first price on which the trader executes a trade, when the market opens for trading. The high stands for the highest price at which traders transacted for a given day. The low as the name suggests would be the lowest price for the given day. The close price is the final price at which the market closes for a day. It is a significant parameter for intraday trading. If the close for the day is higher than the open, it is said to be a positive day else a negative day. The closing day also serves as a reference for the next day.

1.2. Motivation

Transactions were traditionally handled manually, between brokers or counterparties. However, in the 1970s, a greater portion of transactions had migrated to electronic trading. Over the past 15 years with the popularity of the internet and discount brokerage firms, it has become increasingly luring for an average investor to partake in their own financial planning and direction of their future.

For a global financial institution that invests in capital across multiple asset classes and strategies, many a times challenges are faced in keeping track of all the trades and investment decisions by various asset managers in the firm and also in maintaining accuracy of data which is shared by different users in the same office and also across geographies. Through this web based Equity Trading Simulation system, the problems faced by such global financial institutions can be solved in which the trade life cycle is automated. However, this does not suffice unless the system does not have a mechanism which can help traders find ways to make to make constant profits in the trading world.

1.3. Aim of Proposed Work

The goal is to build an application, for a global financial institution, that not only provides a terminal to transact but also monitors the interaction between a portfolio manager and his/her traders. What makes this application all the more useful is that with the help of technical analysis, the portfolio managers or traders will be advised where to invest using the Opening Range Breakout technique.

1.4. Objective of Proposed Work

The objective of the proposed work is to provide an end-to-end application that will automate trade life cycle and also help traders invest in right stocks at the right time through Opening Range Breakout technique. Opening Range Breakout is a trading system which makes use of technical analysis for high accuracy results in the field of intraday trading as well as positional trading.

2 Literature Survey

Opening Range Breakout is a trading system which makes use of technical analysis for high accuracy results in the field of intraday trading as well as positional trading. ORB makes use of strict rules, indicators such as resistance, support, exponential moving averages etc. and good knowledge of the overall market in order to increase profit rates dramatically. Opening Range Breakout (ORB) is widely used by professionals and analysts who predict how the market will be for a particular day.

OHLC Open High Low Close are price parameters of a security that are used by technical analysts to spot trends and stock movements in a chart. Charts are a very useful way of visualization. There are various kinds of charts used for visualization, however, in trading as there are four parameters that need to be plotted simultaneously, conventional chart types are of less use. Line charts can be used for interpreting trends using closing price of a stock only. This can be seen in the graph below:

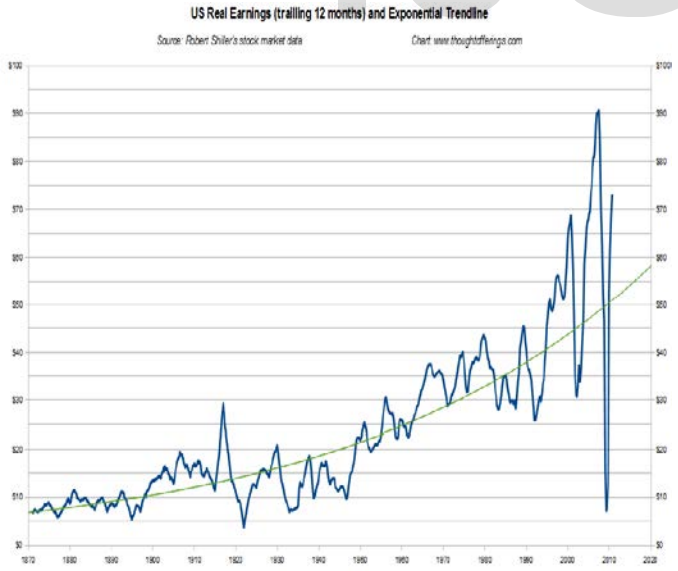

Figure 1Use of Line Chart to interpret trends

Bar charts are difficult to interpret and lack basic visual appeal which makes them not a good option for visualization. Thus, Japanese Candlesticks are majorly used in trading community. Candlesticks have been the oldest form of price analysis.

Figure 2Use of Bar Charts to interpret market

There are two types of candlesticks- bullish and bearish. When close > open, it is said to be a bullish candlestick. When open > close, it is said to be a bearish candlestick.

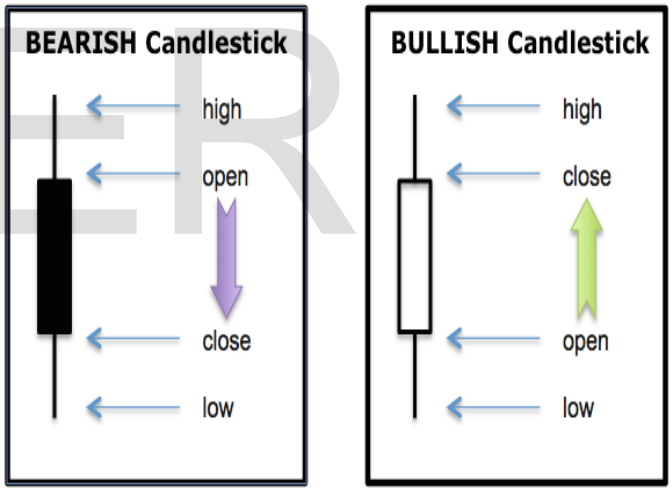

Figure 3 Types of Japanese Candlesticks

Resistance level is said to be a point on the chart where traders expect maximum supply (in terms of selling) for the stock. The resistance level is always above current market price. The resistance is one of the critical technical analysis tool which traders look at in a rising market.

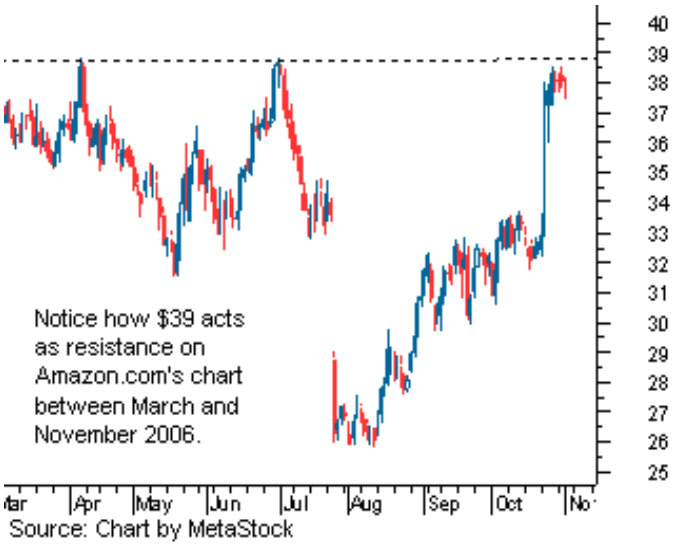

Figure 4 Example of Resistance

The terminology support refers to price that acts as a benchmark or floor by preventing the price of a stock from being pushed down. The level of support which is found can sometimes also coincide with a buying opportunity because this is the area where traders or market participants see a good value and then start to push prices higher again. Support level is said to be a point on the chart where the trader expects maximum demand (in terms of buying) coming into the stock. The support level is always below the current market price.

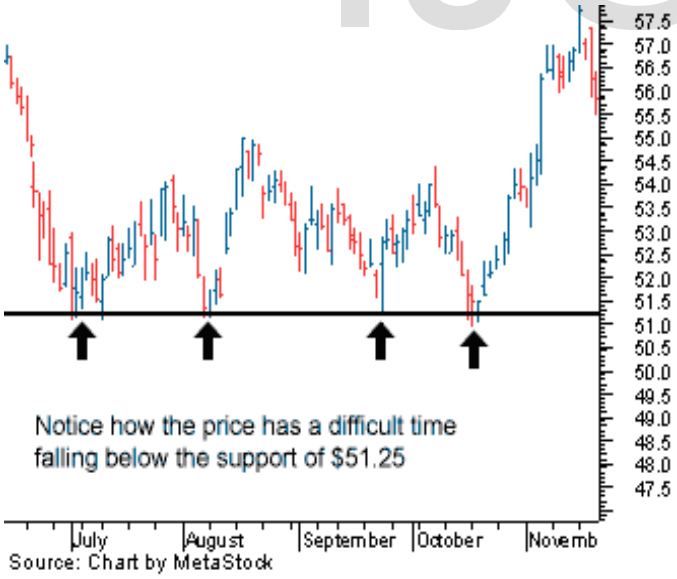

Figure 5 Example of Support

Moving averages is an important concept used in trading analysis. In moving averages, we include the latest day's price and exclude the oldest day points in calculating the average. However, a better concept is the exponential moving averages (EMA) in which the data is scaled according to the newness. This is because the market is expected to behave similar to the past day than previous other days. In a typical crossover system, two sets of EMAs are used. The shorter EMA reacts faster than the longer EMA. When the shorter EMA crosses the longer EMA, bullish conditions are generated.

3 Proposed System

The proposed system is an online trading system which uses Opening Range Breakout technique to find quick and easy ways to make windfall gain in the markets. The methodology being followed is:

3.1. Information Collection Phase

Stock information of past few days or months of the market according to the chosen pattern like 5 EMA and 20 EMA.

3.2. Learning Phase

The proposed system uses Opening Range Breakout. Opening range which is the range of a stock in the first 30 minutes (can be changed accordingly) of trading in a day has to be decided. The high and low of this range shall be used as resistance and support. Two EMAs are taken. The higher EMA (20 in this case) is used as trend indicator and also for initial stop loss.

3.3. System Design

The system design is illustrated through few examples. First, we consider the market trend of United Health Care.

Figure 6 Example of ORB long

5-minute candle chart has been used. Once the high and low of the first half hour of the market has been decided and marked, we look for a breakout either to the upside or the downside. As we can see in the graph, after half hour the prices started falling however it did not break through the low or the support. However around 13:00, the open range breaks out which gives a trader the opportunity to buy and hence earn profits.

Taking another example of Alcoa Corp.:

Figure 7 Example of ORB short

Price can also break below the range of first half hour. After half an hour, we can see a number of red candles in a row showing prices going down with conviction. Using stop loss profits could have been easily attained.
Greater volume and breakouts happening immediately after the opening range bring out the best results.

3.4. Business Rules

Rules for selling/short:

1. Stocks should be trading below the 20 (or the longer) EMA line before the breakout.
2. 5 (or the shorter) EMA line should be below the opening range at the time of breakout.
3. Buy when 5-minutes candle closes below the opening range.

Rules for buying/long:

1. Stocks should be trading above the 20 (or the longer) EMA line before the breakout.
2. 5 (or the shorter) EMA line should be above the opening range at the time of breakout.
3. Buy when 5-minutes candle closes above the opening range.

Figure 8 ORB Example, Buy and Sell Opportunities

Note: In the above graph 5 EMA is represented by blue whereas 20 EMA is represented by red.

4 RESULTS AND DISCUSSION

4.1. Discussion

With the growth of Internet in the past decades, electronic trading has emerged as a very popular field which has made transactions easier to complete, clear, monitor and settle. For a global financial institution that invests in capital across multiple asset classes and strategies, many a times challenges are faced in keeping track of all the trades and investment decisions by various asset managers in the firm and also in maintaining accuracy of data which is shared by different users in the same office and also across geographies. Through this web based Equity Trading Simulation system, the problems faced by such global financial institutions can be solved in which the trade life cycle is automated by providing investors and traders to place trades and monitors accounts without any commission fee. Not only this, with the help of technical analysis and study of the market, the application can guide the trader where to place the money through which a windfall gain is possible.

The biggest dilemma of a firm or an individual while trading is whether to invest in a particular stock or not? Will the stock bring the desired profits or will it result in a huge loss? Technical analysis till a great extent can be fruitful in answering these questions. Technical analysis is a way to earn easy and quick profits by developing a point of view of the markets and giving the trader entry and exit points of a stock. Opening Range Breakout mechanism can be used by studying parameters and indicators such as Open High Close Low (OHCL), resistance, support, volume and exponential moving averages (EMA). In technical

analysis of markets, once a set of factors that have panned out in past tend to repeat in future. It can be expected that the same outcomes will occur, provided the factors are the same.

4.2. Conclusion and Future Work

The plan is to apply the discussed techniques in the trading application system that has been built on React and Angular. Embedding these techniques will help a portfolio manager or trader trust the analysis and make wise decisions and transactions on the terminal rather than simply believing in rumours and going with the flow. The application will be a complete package for a financial institution which not only will keep a watch on the trades being carried out by its employees or traders but will also guide the trader to make the best choice.

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6 References

[1] Camillo Lento, Nikola Gradojevic, "The Profitability Of Technical Trading Rules: A Combined Signal Approach", Lakehead University United States, 2007

[2] Ulf Homberg, Carl Lonnbark, Christian Lundstorm "Assessing the profitability of intraday opening range breakout strategies" Department of Economics, Umeå School of Business and Economics, Umeå University, SE-901 87 Umeå, Sweden

[3] William Brock, Josef Lakonishok, Blake Lebaron "Simple Technical Trading Rules and the Stochastic Properties of Stock Returns", December 1992

[4] KirubakaranRajendran, Founder & CEO, SquareOff.in, "Simplest Intraday Trading Strategy", January 26,2017

[5] Justin Kuepper, "Technical Analysis: Support and Resistance" Investopedia

[6] Sowmya Kamath, Delhi, "Graphic Gains", January 2012

[7] David Moadel, M.Ed., "Opening range breakouts", Retrieved from https://davidmoadel.blogspot.com/

[8] "Chart Analysis", Retrieved from https://stockcharts.com

[9] "Technical Analysis", Retrieved from https://zerodha.