Implications of Dow Theory in Indian Stock Market

Sameer Yadav
Research Scholar, Department of Commerce and Business Administration
University of Allahabad, Allahabad, Uttar Pradesh, India

ABSTRACT
Charles H. Dow (1896) has devised the theory of Industrial Average’s (later known as Dow Theory), to understand the implications of speculative stock market prices. In this paper, earlier evidence has been reviewed to understand how the theory is implied to forecast stock market changes and its effectiveness in determining stock market trends, specifically long–term trends. The study focuses on the estimation of moving averages of stock prices and how the stock market reacts on the dissemination of information. Empirical investigation has been made on NSE’s Nifty 50 Index, to understand and predict the implication of the Dow Theory in Indian Stock market. Monthly, weekly, daily and yearly data is compared to estimate the trend in the respective index and summarized the changes in the whole index with the trading effects and the trend line it follows. The investigation shows strong symmetry with earlier evidences, however, there exists asymmetrical relationship among the ways to predict future market trend.

KEY WORDS: ARIMA, CMAM, Dow Theory, MA, Nifty 50

INTRODUCTION
Securities markets play a significant role in the growth of the industry and economy of any country. Every major change in country and economy is reflected in the prices of shares and the rise or fall in the share prices indicates the boom or recession cycle of the economy. Due to this reason that the government, industry and even the central banks of the country keep a close watch on the happenings of the securities market.

The securities market provides a ready market for sale and purchase of securities. The investors can invest in long term investment projects without any hesitation, as because of stock exchange they can convert long term investment into short term and medium term. However there exists a dilemma, to ensure liquidity as well as demand and supply of securities and to permeate healthy speculation of securities in the stock market. For removing such dilemma technical analysis of securities is being done. It is based on the proposition that the securities prices and volume in the past suggest their future price behavior. This will in turn helps to draw a trend pattern determining the speculative market prices.

The basis on which technical analysis persist is the Dow Theory[1], which is said to be the father of technical analysis was devised by Charles H. Dow to understand and predict speculative stock market prices in the late 1890’s through the theory of industrial average’s (in 1896, later known as Dow Theory). Dow suggested this theory as a barometer for general business trends. In 1902, after Dow death William P. Hamilton took up Dow’s principles and formulated the Dow Theory as it is known today. the term Dow Theory has been given by A.C. Nelson The Dow Theory estimated is been made on the basis of three trend patterns i.e., Long-term Primary (Major) Trend, Secondary(Mid-Term) Trend and Minor(Short-Term) Trend which decides the market direction.

The Dow Theory has certain limitations too that can make it an ineffective tool for prediction of future market trends up to a certain extent like it reacts slow to the market changes and gives late predictions, also it requires large time frame to predict efficiently. Keeping in view of such limitations, the theory has been implied into Indian stock market. With the view to understand how Dow Theory can be implicated in the Indian Stock market, empirical investigation has been made on NSE’s Nifty 50 Index (earlier known as Nifty Junior)[2]. The index consists of 50 most liquid securities of the National Stock Exchange. Nifty 50 Index represents 50 companies from Nifty 100 after excluding the Nifty 50 companies. The Nifty 50 Index represents about 12% of the free float market capitalization of the securities listed on NSE as on March 31, 2016. The Nifty 50 constitutes of most liquid securities listed on the National Stock Exchange, so the volatility aspect will be higher than any other indices. The Nifty
50 has been taken for implication due to the reason that the index contains top gainers securities, which directs the flow of market.

REVIEW OF LITERATURE FINDING
Dow (1986) [3] devised the theory of industrial averages with its complimentary transport averages to devise a pattern to understand the speculative market. Hamilton (1902)[4] with his 255 editorial articles printed in Wall Street Journal, between 1902 to 1929 has comprehensively formulated the principles of market forecasting known as Dow theory.

Nelson coined the term Dow theory with his 5 year work on the earlier findings of Charles H. Dow, laid down the guidelines to understand how market moves.

Rhea(1932)[5] has reduced Dow theory as theorems with three hypotheses namely the primary trend is inviolate, the average discounts everything, and Dow Theory is not infallible. Cowles (1934)[6] article on stock market forecast was an important milestone in development of efficient market hypothesis and to check the forecasting methods of William Hamilton.

Goetzmann and Brown and Kumar (1998)[7], re-examined Hamilton editorial work on Dow Theory and found that investors followed the advices of Hamilton on Dow Theory have earned 90 percent profit, incurring to 30 percent risk exposure. They used neural networks to analyze the chart patterns, founded only one-third of the differences with the Hamilton’s chart predictions.

Ned Davis Research[8], an institutional research provider examined the consensus of various Dow Theory practitioners and found the gain per annum to be 8.9 percent since 1900 through 2008 for Dow Theory as compared it with buy and hold strategy with 5.4 percent gain. In the late 1990’s criticism was made, with only 30 stocks how can market and economy be predicted. With the changes in the list of securities of the index does the prediction is valid. On the basis of literary findings, hypothesis can be made that the theory cannot be implied to predict the short term trends.

OBJECTIVES OF THE STUDY
1. The main objective of the study is to determine the relevance of the Dow Theory in Indian Stock market and to predict the future market trend.
2. Secondly, to empirically verify the trend pattern of the index with statistical tools.

RESEARCH METHODOLOGY
Data Collection and Analysis
The daily data of adjusted prices and volume traded of Nifty 50 has been collected from capital market database and has been analyzed with the help of graphical exhibits. With a five years’ time frame, data period is from 1st April 2011 to 31st March, 2016.

• To measure the theoretical relevance, empirical investigation is made on the basis of moving averages[9] to find out the daily changes in the prices of the index. The moving average is estimated by

\[ z_t = \frac{1}{k+1} \sum_{j=0}^{k} Y_{t-j} \]

Where \( Z_t \) is moving average for time \( t \), \( Y_t \) is the time series for time \( t \) and \( j \) is the number of observations. The Centered Moving Average Method (CMAM) is then used to estimate the centered value so as to determine daily, weekly, monthly and yearly changes in the index prices. CMAM is calculated by averaging the centre value of moving averages.

• Auto Regressive Integrated Moving Average (ARIMA) (p,d,q) Model[10] has been implemented to predict the course of action and to verify the pattern generated by method of moving averages. This model is an effective tool to determine time series based forecasting. It is applied to cases having non stationary and stationary data. ARIMA is calculated by following formula.

\[ Y_t = M + Q1Y_{t-1} + \ldots \ldots + QpY_{t-p} - O1Et-1 \ldots \ldots - OqEt-q \]
Here, $p+q \leq 2$ and either $p=0$ and $q=0$. The ARIMA parameter $(0,1,1)$ is taken on the basis of Auto Correlated Function (ACF) and Partial Auto Correlated Function (PACF) residual patterns (refer Exhibit 7). The differencing is taken as $d=1$: $Y_t = y_t + Y_{t-1}$

- Trend Analysis [11] has been done to understand the reversal patterns of the Dow Theory, by predicting the movement of a stock prices based on past data. There are three main types of trends: short-term, mid-term and long-term has been found from the trading patterns. According to these patterns Bullish or Bearish market is predicted.

CLOSING PRICES TREND ANALYSIS

Exhibit 1: Moving Average’s Daily, Weekly, Monthly, Yearly closing prices trend of Nifty 50

With the help of centered moving averages daily, weekly, monthly and yearly closing prices have been graphically represented to understand the trend pattern. The daily closing prices shows two mid-term up trend with a short term up trend staring from the year 2012 to 2013, mid of 2013 to first quarter of 2015 and two mid-term down trend in the end of 2012 to starting of 2013 and at the mid of 2015-16 can be seen (refer Exhibit 1).

The six tenets of Dow theorems [12] are implied on the exhibit 1 to predict the Nifty 50 index future trend patterns. Market moves in summation of three trends, market trends have three phases, all news is discounted in the stock market, averages must confirm, volumes confirm trends, trends continue, unless definitive reversals come about.

Market moves in summation of three trends and market trends have three phases: Exhibit 1 shows the mid-term (secondary) up-trend twice with a mid-term (corrections) reversal and short-term up-trend (minor). The major (primary) trend shows a long-term summarized pattern for market to be bullish in near future.

All news is discounted in the stock market and averages must confirm: Exhibit 2, 3, 4, & 5 shows daily, weekly, monthly and yearly changes of market trends and averages of these time periods discounts the disseminated information effects on the market pattern, due to which the prescribed time period shows an average pattern of long-term up-trend.

Volumes confirm trends and trends continue, unless definitive reversals come about: Exhibit 6 shows volume price relationship, where an inverse relationship can be seen. As the price increases the volume falls and reacts very sharply with the price changing pattern. Exhibit 8 shows that the trend will be continued until and unless it falls very sharply with the dynamic prices of securities, as the trend
shows bullish nature, so, the trend will continue to be bullish in future also.

VOLUME TREND ANALYSIS

A relative comparison is made on the basis of ARIMA (0, 1, 1) Model to understand the price volume relationship. With the rise in prices volume tend to decrease and vice-versa. With a bullish market prediction and due to the trading effects, as the price falls number of buyers will rise who are willing to buy shares at low prices and the number of sellers will be more who are willing to sell high cost shares to buy more better yield shares.
Exhibit 7: Auto Correlation Function (ACF) and Partial Auto Correlation Function (PACF) for ARIMA(0,1,1) for Closing Prices

Closing Prices ACF shows regular negative ACF at the residuals end, which means auto regression part is adjusted and differencing is made on moving average part. Similarly, Closing Prices PACF shows similar residual patterns as ACF so the ARIMA model will be integrated as ARIMA (0,1,1) model.

Exhibit 8: Up-Trend of the Nifty 50 ARIMA(0,1,1) Forecast

With the comparison of daily closing prices and predicted closing price, there will be an expected upward trend in the closing prices in the near future.

CONCLUSION
The Dow Theory instead criticized for being “too late” to predict, but is relevant in future market prediction in the current scenario. The very beginning of the Bull market can be missed by the investor following Dow principles. The investigation shows symmetrical outcomes when comparing to earlier evidences, and trend pattern observed on the basis of empirical tools i.e., moving averages, and the ARIMA (0,1,1) Model has helped in verifying the market trend, however the trend may vary with the tools implicated. Short-term averages respond quickly to changes in the price of the securities, while long-term averages are slow to react. Due to which changing pattern can be predicted effectively by the long term pattern. Thus, the theory has immense relevance on the Nifty 50 market prediction and the market will show Bullish trend in near future.
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