TECHNICAL ANALYSIS OF SELECTED PHARMACEUTICAL COMPANIES OF INDIA

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ABSTRACT

Technical analysis is the study of forecasting stock prices for future and is aimed to generate returns. Financial analyst decides the time of entry and exit in the security market. Technical analysis relates to factors affecting the supply and demand of stocks. It helps us in understanding the true value of shares and in knowing whether the shares are undervalued or overvalued. Technical analysis market indicators would help the investor to identify major market turning points.

Although the academicians were uncertain about the practicality of technical analysis, this method was widely used by practitioners in the industry owing to the increasing applicability in forecasting price trends. Many researchers point towards the importance of technical analysis coupled with fundamental analysis for the industry and the company in predicting price trends effectively.

The current research study was carried out on the top 6 pharmaceutical companies stock prices (based on market capitalization) taken on a daily basis for the last five years (April 2010 to March 2015). Moving Average Convergence and Divergence (MACD), Rate of Change (ROC) and Relative Strength Index (RSI) were some of the technical tools used for analyzing daily closing price and Sensex (BSE 100). Mix trends were obtained from the study. Results suggest that investing in the current period for long-term purpose requires fundamental analysis along with technical analysis.

KEYWORDS

Technical Analysis, Pharmaceutical Companies, Moving Average Convergence and Divergence (MACD), Rate of Change (ROC), Relative Strength Index (RSI) etc.

INTRODUCTION

In the world of stock analysis, fundamental and technical analysis is akin to opposite sides of a coin. These two techniques are used for researching and forecasting future prices of stocks. Fundamental analysis is valuation of stock through financial and economic information to predict stock price movements. Financial and economic information include company's financial reports, and non-financial information such as demand for products manufactured by the company, industry comparisons, economic condition of the country, changes in government policies, etc. On the other hand, technical analysis is the method of forecasting future prices of stocks based on past price movements. These decisions are made by applying simple rules to historical price information. For example, technical trading rule might suggest buying a currency if its exchange rate price increases more than one percent from its value five days earlier. Such rules are being much used by traders in stock, commodity and foreign exchange markets. Technical methods came into existence back in 1700 but Dow Theory proposed by Wall Street Journal editors Charles Dow and William Peter Hamilton popularized them in the late nineteenth and the early twentieth centuries.

Technical analysis was widely used by practitioners but academicians have been uncertain about the practicality of technical analysis. This behavior could be explained due to firstly, the lack of theoretical basis, secondly, the ruling out of profitability from technical trading by assumption of random walk model by earlier theoretical studies, and thirdly, the mixed and inconclusive nature of earlier empirical findings, such as of Cowles (1933) and Fama and Blume (1966). Recently, however, Brock et al (1992) and Lo et al (2000) found strong evidence of profitability in technical trading based on large amount of data and much elaborate strategies.

Fundamental analysis was the prominent investment method that was used in the past. Analysts are now using technical analysis as an investment method by the arrival of high-speed computers has made technical analysis easier. Many large investment firms use black box trading, or computer modeling, to determine their entry and exit points.

In technical analysis, top seven tools which are in practice are, on-balance volume indicator (OBV), accumulation/distribution line (A/D line), average directional index (ADX), Aroon Indicator, moving average convergence divergence (MACD), relative strength index (RSI) and stochastic oscillator. These tools are used to get a vision of supply and demand of securities in the market.

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LITERATURE REVIEW

Technical analysis and fundamental analysis are the two main schools of thought in the financial markets. Technical analysis uses statistics generated by market activities like stock’s past prices or volume to predict future price movements. Conversely, fundamental analysis looks at economic factors to forecast price movements of stocks in future. Suresh A.S. (2015) tried to emphasize the importance of fundamental and technical analysis in Indian stock market. In fundamental analysis, author stressed investors to known about macro-economic environment and development of the country, future prospects of the industry to which the firm belongs and projected performance of the company. As far as technical analysis is concerned, author advised few tools like line chart, bar chart, point and figure chart, trend chart, moving average analysis, relative strength, resistance and support levels, break-out theory, head and shoulders pattern, double top and bottom formation to predict future stock prices.

Fundamental analysis was the only investment method that was given any sincerity in the past. Now that has changed as the arrival of high-speed computing has made technical analysis easier. Many large investment firms use black box trading, or computer modeling, to determine their entry and exit points. However, it was found that financial managers are not able to use right tools to analyze future market trends. Shirur S. (2013) stated the reason why finance managers arrive at wrong decisions like the subprime crisis. The reason explained by author was, investors are dealing with the fundamental analysis issues while the tools used are applicable for technical analysis. The author also suggested that instead of segregating risk into systematic and unsystematic risk, it should be segregated into bankruptcy and liquidity risk, to determine the true value of the company, which helps investors to determine in which security to invest.

Lo A. W., Mamaysky H. and Wang J. (2000) tried to assess the effectiveness of technical analysis by studying U.S. stocks from 1962 to 1996. Authors proposed new approaches to evaluating the efficacy of technical analysis such as nonparametric kernel regression. They found that technical analysis provide incredible information about the stocks over the time period, but technical analysis can be improved by using automated algorithms such as head-and-shoulders and rectangles chart patterns.

Several studies are conducted by researchers based on the technical analysis to predict price movements of securities of different sectors in Indian stock market. Upadhyay, A., Bandyopadhyay, G., Dutta, A. (2012) tried to find out those stocks which are outperforming in Indian Stock Market with the help of Multinomial Logistic Regression (MLR). The securities were categorize into three, good, average and poor by using seven financial ratios, book value (BV), PBDT/Sales (PBDTS), earnings per share (EPS), percentage change in operating profit (OP), percentage change in net sales (NS), price to cash earnings per share (PECEPS), price to book value (PEBV) as selection criteria to determine the performance of securities in stock market. Sample study was of top 30 companies in terms of market capitalization of four years, which are actively traded at Indian Stock Exchange, and it was found 17 companies were categorize as good.

In another study, Franklin N. R. B. (2012) talked about buying and selling decisions of stocks of few selected Indian Banks. Study is based on secondary data for the year 2010 for five banks, Axis Bank, State Bank of India, ICICI Bank, HDFC Bank and Punjab National Bank. Author used 2 technical analysis tools, moving average, support and resistance level for predicting future prices of these banks. Author analyzed that all these five banks must perform well in next two coming years in Indian stock market. As Information Technology was one of the fast growing sectors in India, Pandya H. (2013) tried to analyze few IT companies with the support of technical analysis. Data was collected for five leading IT companies: HCL, INFOSYS, MPHASIS, WIPRO and TCS, which were listed in both BSE and NSE for two financial years, April, 2010 to March, 2012. The major tools and techniques used in this study are: line chart, column chart, stock (candlestick) chart, exponential moving average (EMA), moving average convergence divergence (MACD), relative strength index (RSI) and rate of change (ROC). After analyzing the data collected it was found that these five IT companies have less fluctuations in stock prices as compared to other IT companies so invest in these companies will be more beneficial.

Chordia T., Sarkar A. and Subrahmanyam A. (2005) tried to determine common factors, which drives liquidity and volatility in stock and bond market over the period 1991 through 1998 in New York Stock Exchange (NYSE). It was suggested that past volatility and liquidity were the most important variables in forecasting future liquidity. Other two factors, which explained the forecasting of both stock and bond market liquidity were unexpected loosening of monetary policy and innovations to bond fund flows. It was found that Friday is the lowest-liquidity day of the week for both markets and liquidity tends to be higher during the months from July to September.

RESEARCH METHODOLOGY

This is a descriptive research based study carried out using on secondary data. Top 6 pharmaceutical companies were selected based on market capitalization namely, Sun Pharmaceutical Inds. Ltd., Lupin Ltd., Dr. Reddy’s Laboratories Ltd., Cipla Ltd., Aurobindo Pharma Ltd. and Cadila Healthcare Ltd. Daily closing price of stock for a time of 5 years from April 2010 to March 2015 was collected from Prowess 4.15 database of CMIE. Moving Average Convergence and Divergence (MACD), Rate of Change (ROC) and Relative Strength Index (RSI) were used as technical tools to analyze the collected data.
MACD is one of the most renowned indicators in technical analysis specifying both trends and momentum behind a security. The indicator comprises of two exponential moving averages (EMA), covering two different times, which help to measure momentum in the security. Short-term momentum is compared with long-term momentum to determine future movements of security to get an idea about the security’s performance. MACD in the study is 5-day exponential moving averages less 10-day exponential moving averages. Positive MACD indicates that the 5-day EMA is above the 10-day EMA. Positive values of MACD increase as the shorter EMA diverges further from the longer EMA.

Calculating MACD

(i) Calculate a 5 day EMA of closing prices
(ii) Calculate a 10 day EMA of closing prices
(iii) Subtract the longer EMA in (ii) from the shorter EMA in (i)

\[ EMA_n = Closing\ Price_n \frac{2}{\text{Time Period} + 1} + EMA_{n-1} \left(1 - \frac{2}{\text{Time Period} + 1}\right) \]

ROC measures percentage price change over a given time period which fluctuates above and below zero. In this study, 5-day percentage price change is measured over five year time. The bigger the difference between the current price and the price 5 days ago, the higher the value of the ROC. When percentage price change is positive (bullish), the indicator is above 0, and when percentage price change is negative (bearish), the indicator is below 0. RSI is used to understand velocity and magnitude of directional price movements of stocks. The index computes momentum as the ratio of higher closes to lower closes. It further illustrates that a higher RSI relates to stronger positive changes while a lower RSI to stronger negative changes in stocks. RSI calculation is based on 5 days period.

\[ RSI = 100 - \frac{100}{1 + RS} \]

\[ RS = \frac{\text{Average Gain}}{\text{Average Loss}} \]

Where, \( RS \) = relative strength

\[ \text{Average Gain} = \frac{\left(\text{Previous Average Gain} \times 4 + \text{Current Gain}\right)}{5} \]

\[ \text{Average Loss} = \frac{\left(\text{Previous Average Loss} \times 4 + \text{Current Loss}\right)}{5} \]

**INTERPRETATION AND ANALYSIS**

**MACD and Closing Price Analysis**

![Figure-1: MACD and Closing Price Curves based on Calculations](image)

Sources: Authors Compilation

Initially, MACD line of Cadila Healthcare Ltd. showed upward trend from April 2010 to January 2011 but afterward it showed bearish trend for next 21 months. Again, from November 2013 to November 2014, it showed upward trend and reached its highest
value in November 2014. However, after November 2014, MACD line again showed downward trend and it touched its lowest point in February 2015. Overall MACD line shows upward trend. In comparison to MACD, Close price showed higher degree of upward trend and it was not following the MACD completely, although there were some occasions when closing price showed upward trend but MACD was at downward trend and vice-versa. MACD curve of Sun Pharmaceutical Inds. is quite stable, except in November 2010 and July 2013 where it showed downward trend. In case of Lupin Ltd. also, it showed downward trend in the months August 2010 and September 2010, except that it has steady MACD curve. Dr. Reddy's Laboratories Ltd. and Cipla Ltd. showed fluctuations in MACD curve from August 2014 to February 2015, while Aurobindo Pharma Ltd. displayed downward trend in January 2011 and February 2011.

ROC and Sensex Analysis

Figure-2: ROC and Sensex Curves Based on Calculations

ROC curve of Cadila Healthcare Ltd. revealed upward trend at the beginning but depicted downward trend after January 2011 remaining in the same state for 22 months. It showed some bearish and bullish trend during this time and reached close to its top most point in July 2012. Then it started moving up at the end of 2013 and reached its highest point in November 2014 however, slipped downward in December 2014 and then touched its lowest point in February 2015. Many up down fluctuations were observed in Sensex, and then it went upward in next years. From the starting Sensex curve was upward to MACD curve and reached its utmost point in January 2015.

Sun Pharmaceutical Inds Ltd. ROC curve was quite stable throughout 5 years, gaining highest point on September 2013 and lowest point at August 2011. Lupin Ltd. followed similar pattern as Sun Pharmaceutical Inds. Ltd. but there was a steep fall in ROC curve in August 2011. Dr. Reddy's Laboratories Ltd. showed upward trend in the year 2010 but it the next year it had downward trend. After 2011, it showed upward trend in next three years except a sharp fall in ROC curve on May 2014. Cipla Ltd. had high fluctuations in its ROC curve (unstable) having several unexpected difficulties. Aurobindo Pharma Ltd. trailed similar pattern as that of Lupin Ltd. but it had a steep decline in February 2010 in ROC curve.

RSI and Sensex Analysis

Figure-3: RSI and Sensex Curves based on Calculations

Sources: Authors Compilation
Initially RSI line of Cadila Healthcare Ltd. showed downward trend from April 2010 to February 2012. After a month, it showed upward trend for 12 months from March 2012 to February 2013 and it attained its peak in July 2012. It started declining and moved down to its lowest point in March 2013 and after that, RSI could not gain any upward trend. Sun Pharmaceutical Inds Ltd. showed downward trend in RSI curve throughout five-year time, similar pattern was followed by Lupin Ltd., and Aurobindo Pharma Ltd. Dr. Reddy's Laboratories Ltd. showed high fluctuation in RSI curve and reached its highest and lowest point on May 2014 and July 2014 respectively. Cipla Ltd. indicated upward trend in contrast with Sun Pharmaceutical Inds. Ltd., Lupin Ltd. and Aurobindo Pharma Ltd., which showed downward trend throughout five year.

CONCLUSION

Technical analysis of top 6 pharmaceutical companies reflect mix trends and guide investors about the future trends. MACD and closing price curves follow each other throughout the 5-year period in all 6 companies. Curve is stable throughout the time except few down trends. As charts of Relative Strength Index and Sensex are compared, it is found that Sun Pharmaceutical Inds. Ltd., Dr. Reddy's Laboratories Ltd., Cipla Ltd. and Cadila Healthcare Ltd. show opposite characteristics. Most of the time, in a period of 5 years there is an opposite trend and high level of volatility is seen in Relative Strength Index curve, which point towards downward trend in the market.

ROC of Sun Pharmaceutical Inds. Ltd., Lupin Ltd., Cadila Healthcare Ltd. and Aurobindo Pharma Ltd. display high level of volatility. Mostly, this curve shows positive intent, which means it, is bullish in nature. ROC curve for other two companies found to be stable, this clearly in
correction in the prices. Investing at th

REFERENCES