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RESEARCH ARTICLE

Technical Analysis for Selected Companies of Indian IT Sector

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Abstract

Investing is one of the most crucial decisions that every earning individual has to make at one point of the time or the other. Best options available, is the investment in the shares and securities of the companies. The investment in share market is highly rewarding but highly risky. The concept of analysis comes into picture when decision has to be made on choosing a particular company's shares for investment. Analysis includes fundamental and technical analysis. A proper analysis helps in reducing the risk on investment in the share markets and in choosing a less risky and highly rewarding investment avenue. Technical analysis is a security analysis technique that claims the ability to forecast the future direction of prices through the study of past market data primarily price and volume. This paper aims at carrying out Technical Analysis of the securities of the selected companies from the Information Technology sector and to assist investment decisions in this sector, since IT sector is one of the most upcoming sectors in the Indian Market. It has proven to be one of the leading and fastest growing sectors of the Indian Economy. Secondary Data of the daily share prices of the last two financial years (from 1-4-2010 to 31-3-2012) is collected for five leading IT companies: HCL, INFOSYS, MPHASIS, WIPRO and TCS, for this study and their technical analysis is carried out using various tools and techniques of technical analysis. These companies are listed on both, NSE and BSE. 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).

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Introduction

Investing is one of the most crucial decisions that every earning individual has to make at one point of the time or the other. Best options available, is the investment in the shares and securities of the companies. The investment in share market is highly rewarding but highly risky. The concept of analysis comes into picture when decision has to be made on choosing a particular company's shares for investment. Analysis includes fundamental and technical analysis. A proper analysis helps in reducing the risk on investment in the share markets and in choosing a less risky and highly rewarding investment avenue. Technical analysis is a security analysis technique that claims the ability to forecast

the future direction of prices through the study of past market data primarily price and volume. In its purest form, technical analysis considers only the actual price and volume behaviour of the market or instrument. Technical analysts, sometimes called "chartists", may employ models and trading rules based on price and volume transformation, such as the relative strength index, moving averages, regressions, inter market and intra-market price correlations, cycles or , classically, through recognition of chart patterns.

Technical analysis stands in distraction to fundamental analysis. Technical analysis "ignores" the actual nature of the company, market, currency or

commodity and is based solely on “the charts”, that is to say price and volume information, whereas fundamental analysis does look at the actual facts of the company, market, currency or commodity. For example, any large brokerage, trading group, or financial institution will typically have both a technical analysis and fundamental analysis team. Technical analysis is widely used among traders and financial professionals, and is very often used by active day traders, market makers, and pit traders. In the foreign exchange markets, its use may be more widespread than fundamental analysis. Technical analysts (or technicians) seek to identify price patterns and trends in financial markets and attempt to exploit those patterns. While technicians use various methods and tools, the study of price charts is primary. Technicians especially search for archetypal patterns, such as the well-known head and shoulders or double top reversal patterns, study indicators such as moving averages, and look for forms such as lines of support, resistance, channels, and more obscure formations such as flags, pennants or balance days. Technical analysts also extensively use indicators, which are typically mathematical transformations of price or volume. These indicators are used to help determine whether an asset is trending, and if it is, its price direction. Technicians also look for relationships between prices, volume and, in the case of futures, open interest. Examples include the relative strength index, and MACD. Other avenues of study include correlations between changes in options (implied volatility) and put / call ratios with price. Some technicians include sentiment indicators, such as put / call ratios and implied volatility in their analysis. Technicians seek to forecast price movements such that large gains from successful trades exceed more numerous but smaller losing trades, producing positive returns in the long run through proper risk control and money management. There are several schools of technical analysis. Adherents of different schools (for example, candlestick charting, Dow theory, and Elliott wave theory) may ignore the other approaches, yet many traders combine elements from more than one school. Technical analysts use judgment gained from experience to decide which pattern a particular instrument reflects at a given time, and what the interpretation of that pattern should be.

Technical analysis is frequently contrasted with fundamental analysis, the study of economic factors markets. Technical analysis holds that prices in financial markets. Technical analysis holds that prices already reflect all such influences before investors are aware of them, hence the study of price action alone. Some traders use technical or fundamental analysis exclusively, while others use

both types to make trading decisions. Technical analysis mainly seeks to predict the short term price travels. Technical analysis does not attempt to measure a security's intrinsic value, but instead used charts and other tools to identified patterns that can suggest future activity.

The basic assumptions of technical analysis are:

- **The market discounts everything:**
Technical analysis assumes that, at any given time a stock's price reflect everything that has or could affect the company including fundamental factors. This only leaves the analysis of price movements for a particular stock in the market.
- **Price moves in trends:**
In technical analysis, price movements are believed to follow trends. This means that after a trend has been established, the future price movements is more likely to be in the same direction as the trend than to be against it. Most technical trading strategies are based on this assumption.
- **History tends to repeats itself:**

Another important idea in Technical analysis is that history tends to repeat itself, mainly in terms of price movement. The repetitive nature of price moments is attributed to market psychology; in other words, market participant tends to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart pattern to analyze the market movements and understand trends

Literature Review:

Several studies have been carried out to apply Technical Analysis in practice in various financial markets and check the validity of results for making rational investment choices. A few of them are quoted below:

- **Brown and Jennings (1989)** showed that technical analysis has value in a model in which prices are not fully revealing and traders have rational conjectures about the relation between prices and signals.
- **Frankel and Froot (1990)** showed evidence for the rising importance of chartists. Neftci (1991) showed that a few of the rules used in technical analysis generate well-defined techniques of forecasting, but even well-defined rules were shown to be useless in prediction if the economic time series is Gaussian. However, if the processes under consideration are non-linear, then the rules might capture some information. Tests showed that this may indeed be the case for the moving average rule.

- **Taylor and Allen (1992)** report the results of a survey among chief foreign exchange dealers based in London in November 1988 and found that at least 90 per cent of respondents placed some weight on technical analysis, and that there was a skew towards using technical, rather than fundamental, analysis at shorter time horizons.
- In a comprehensive and influential study **Brock, Lakonishok and LeBaron(1992)** analysed 26 technical trading rules using 90 years of daily stock prices from the Dow Jones Industrial Average up to 1987 and found that they all outperformed the market.
- **Blume, Easley and O'Hara (1994)** show that volume provides information on information quality that cannot be deduced from the price. They also show that traders who use information contained in market statistics do better than traders who do not.
- **Neely (1997)** explains and reviews technical analysis in the foreign exchange market.
- **Neely, Weller and Dittmar (1997)** use genetic programming to find technical trading rules in foreign exchange markets. The rules generated economically significant out-of-sample excess returns for each of six exchange rates, over the period 1981–1995.
- **Lui and Mole (1998)** report the results of a questionnaire survey conducted in February 1995 on the use by foreign exchange dealers in Hong Kong of fundamental and technical analyses. They found that over 85% of respondents rely on both methods and, again, technical analysis was more popular at shorter time horizons.
- **Neely (1998)** reconciles the fact that using technical trading rules to trade against US intervention in foreign exchange markets can be profitable, yet, long-term, the intervention tends to be profitable.
- **LeBaron (1999)** shows that, when using technical analysis in the foreign exchange market, after removing periods in which the Federal Reserve is active, exchange rate predictability is dramatically reduced.
- **Lo, Mamaysky and Wang (2000)** examines the effectiveness of technical analysis on US stocks from 1962 to 1996 and finds that over the 31-year sample period, several technical indicators do provide incremental information and may have some practical value.
- **Fernández-Rodríguez, González-Martel and Sosvilla-Rivero (2000)** apply an artificial neural network to the Madrid Stock Market and find that, in the absence of trading costs, the technical trading rule is always superior to a buy and-hold strategy for both 'bear' market and 'stable' market episodes, but not in a 'bull' market. One criticism I have is that beating the market in the absence of costs seems of little significance unless one is interested in finding a signal which will later be incorporated into a full system. Secondly, it is perhaps naïve to work on the premise that 'bull' and 'bear' markets exist.
- **Lee and Swaminathan (2000)** have demonstrated the importance of past trading volume.
- **Neely and Weller (2001)** have used genetic programming to show that technical trading rules can be profitable during US foreign exchange intervention.
- **Cesari and Cremonini (2003)** have made an extensive simulation comparison of popular dynamic strategies of asset allocation and find that technical analysis only performs well in Pacific markets.
- Cheol-Ho Park and Scott H. Irwin wrote 'The profitability of technical analysis: A review' **Park and Irwin (2004)**, an excellent review paper on technical analysis.
- **Kavajecz and Odders-White (2004)** show that support and resistance levels coincide with peaks in depth on the limit order book 1 and moving average forecasts reveal information about the relative position of depth on the book. They also show that these relationships stem from technical rules locating depth already in place on the limit order book.

This paper is aims at carrying out Technical Analysis of the securities of the selected companies from the Information Technology sector and to assist investment decisions in this sector, since IT sector is one of the most upcoming sectors in the Indian Market. It has proven to be one of the leading and fastest growing sectors of the Indian Economy.

Objectives:

- To analyze the performance of selected companies in IT sector and to predict the future trends in the share prices through Technical Analysis.
- To assist the investors in making investment decisions in Indian IT Sector.

Assumptions:

- The investors want to invest only in IT Sector.
- The prediction of the stocks is based on the moves of the last two years, so any news in future may affect trend of the stocks

Research Methodology:

Secondary Data of the daily share prices of the last two financial years (from 1-4-2010 to 31-3-2012) is collected for five leading IT companies for this study and their technical analysis is carried out using various tools and techniques of technical analysis. The main data sources are various business magazines, company websites and other websites containing information about technical indicators. The sample size of the research study is 5 IT companies selected on the basis of market capitalization. These companies are listed on both, NSE and BSE. The selected companies are:

- HCL
- INFOSYS
- MPHASIS
- WIPRO
- TCS

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)
- Rate of change (ROC)

Tools of Technical Analysis

➤ **LINE CHART:**

The line charts usually plot the daily closing prices of a share. A line joins these plots. Hence the name the line charts. When the share is not traded on a day, the chart displays a gap in the line. The line and volume chart displays the volume of traded shares on a separate scale below the line chart. In capital markets, a price rise is referred as a bullish time and a price fall is termed as bearish time.

➤ **COLUMN CHART:**

This chart shows the high and low, open and close position together in a chart. The daily column chart could be used for short term investment decisions, and is extremely useful for timing entry and exit points. The weekly and monthly charts are used for a long term perspective of markets, and are extremely useful for investment decisions. If market prices, as indicated on the monthly chart, are at historical lows, sale of shares should be delayed, while if prices were historically high, a sale should be considered by the investors.

➤ **STOCK CHART:**

Another name of Stock chart is Candle stick chart. It can be used to identify price patterns and are drawn from opening, high, low and closing data for a specific period such as an hour, day, or week. A candle consists of two parts or vertical extensions, the real body, i.e., the rectangle, the shadow or wick. The top and bottom of the rectangle are determined by the opening and closing prices. If the closing price is above the opening price, the rectangle is white; on the other hand if the closing price is below the opening, the rectangle is blackened. The high and low for the day are the wicks at the top and the bottom of the rectangle.

Technical Indicators:

Technical indicators are mathematical formulas that, when applied to security prices clearly flash either buy or sell signals. Price data includes any combination of the open, high, low, or close over a period of time and most of the indicators use only the closing prices.

For analysis purposes, technical indicators are usually shown in a graphical form above or below a security's price chart. Once shown in graphical form, an indicator can then be compared with the corresponding price chart of the security. Sometimes indicators are plotted on top of the price plot for a more direct comparison.

A technical Indicator offers a different perspective from which to analyze the price action. Some, such as moving averages, are derived from simple formulas and are relatively easy to understand while some such as MACD uses complex formulas and are difficult to understand.

Technical indicators offer many uses such as:

- (1) To confirm the trends
- (2) To generate buy/ sell signals
- (3) To predict the direction of future prices.

The technical indicators can be broadly classified into leading indicators and lagging indicators. The leading indicators are those indicators which are designed to lead price movements. The most common leading indicators are RSI and ROC. Lagging indicators are those indicators which follow price action and are commonly referred to as trend following indicators. Some of the most common lagging indicators are moving averages and MACD. Some of the most common technical indicators that are used in this project are:

- Moving averages
- Moving average convergence divergence (MACD)
- Relative strength index (RSI)
- Rate of change (ROC)

Moving Averages:-

The moving averages are the most common and widely used technical indicators because of their simplicity. Moving averages are formed by calculating the average price of a security over a period of time. Moving averages smooth the price data to form a trend following indicator. They do not predict price direction, but rather define the current direction with a lag. Moving averages form the building blocks for many other technical indicators including MACD.

The most popular moving averages are:

1. Simple moving average (SMA)
2. Exponential moving average (EMA)

(1) Simple Moving Average (SMA) :

A simple moving average is formed by computing the average price of a security over a specific number of periods. Most moving averages are based on the closing prices. A 3-day simple moving average is the three day sum of closing prices divided by three. As its name implies, a moving average is an average that moves. Old data is dropped as new data comes available. This causes the average to move along the time scale. The formula for an arithmetic moving average is:

$$MA_n = \frac{\sum_{i=1}^{x+n} P_i}{n}$$

Where,

Pi = price of the share

n = time period for computing the moving average;

x = the initial time for the moving average calculation, which takes the series formation 1,2,3,4,...t. 't' being the final time series data.

(2) Exponential Moving Average (EMA) :

Exponential moving average is the moving average that is formed by applying weight to the recent price changes. This reduces the time lag. This makes the EMA to respond faster to the price changes than SMA. There are three steps to calculating an exponential moving average. First, calculate the simple moving average. An EMA has to start somewhere so a simple moving average is used as the previous period's EMA in the first calculation. Second, calculate the weighting multiplier. Third, calculate the exponential moving average, the formula for calculating EMA is:

$$X = (K \times (C - PEMA)) + PEMA$$

Where,

X = current EMA

C = current price

PEMA = previous period's EMA*

K = smoothing constant

(* the first simple moving average itself is used for the first period's calculation)

The smoothing constant applies the appropriate weighting to the most recent price relative to the previous exponential moving average. The formula for the smoothing constant is:

$$K = 2 / (1 + N)$$

Where,

N = number of periods for EMA

Uses of Moving Average:

The direction of the moving average conveys important information about prices. A rising moving average shows that prices are generally increasing. A falling moving average indicates that prices, on average, are falling. A rising long-term moving average reflects a long-term uptrend. A falling long-term moving average reflects a long-term down trend.

Two moving averages can be used together to generate crossover signals. A bullish crossover occurs when the shorter moving average crosses above the longer moving average. This is also known as a golden cross. A bearish crossover occurs when the shorter moving average crosses below the longer moving average. This is known as a dead cross.

Moving average can also act as support in an uptrend and resistance in a down trend. A short-term uptrend might find support near the 20-day simple moving average. A long-term uptrend might find support near the 200-day simple moving average.

➤ Moving Average Convergence and Divergence (MACD) :-

Developed by Gerald Appel in the late seventies, moving average convergence divergence (MACD) is one of the simplest and most effective momentum indicators available. MACD turns two trends – following indicators, moving averages, into a momentum oscillator by subtracting the longer moving average from the shorter moving average. MACD fluctuates above and below the zero line (the centre line) as the moving averages converge, cross and diverge. Standard MACD is the 12-day exponential moving average (EMA) less the 26-day EMA. A 9-day EMA of MACD is plotted alongside to act as a signal line to identify turns in the indicator. The MACD histogram represents the difference between MACD and its 9-day EMA, the signal line.

▪ **Positive and Negative MACD:**

Positive MACD indicates that the 12-day EMA is above the 26-day EMA i.e. when the MACD histogram is positive. This means upside momentum is increasing. on the other hand, negative MACD indicates that the 12-day EMA is below the 26-day EMA i.e. when the MACD histogram is negative. This means down side momentum is increasing.

▪ **MACD Signals:**

MACD generates two kinds of signals. They are:

- **Signal Line Crossovers:** a bullish crossover occurs when MACD turns up and crosses above the signal line. A bearish crossover occurs when MACD turns down and crosses below the signal line.
- **Centre Line Crossovers:** a bullish centre line crossover occurs when MACD moves above the zero line to turn positive. At this time a BUY signal is generated. A bearish centre line crossover occurs when MACD moves below the zero line to turn negative. At this time a SELL signal is generated.

➤ **Relative Strength Index (RSI):**

J. Welles Wilder developed the relative strength index (RSI) and introduced it in the June 1978 article for commodities magazine. RSI is an extremely popular momentum indicator. RSI is a momentum oscillator that measures the speed and change of price movements. RSI oscillates between zero and 100. The most popular is the 14 days RSI where the RSI is calculated based on 14 days values. Traditionally the stock is

considered to be over bought when RSI is above 70 and over sold when RSI is below 30. Signals can also be generated by looking for divergences and central line crossovers. The RSI is a simple formula. Numerous variations of the same formula have been used in the computation of the RSI. The basic formula is:

$$RSI = 100 - [100/(1+RS)]$$

Where,

RS = average of upward price change over a select number of days/average of downward price change over the same number of days.

The other variation of computing RSI is as follows:

$$RSI = 100 * \left[1 - \frac{D}{D+U} \right]$$

$$RSI = 100 - \left[\frac{100}{1 + \left[\frac{U}{D} \right]} \right]$$

Where,

D = an average of downward price change;

U = an average of upward price change;

CALCULATION:

The very first calculations for average gain and average loss are simple 14 period averages.

- First Average gain = Total of gains during the past 14 periods/14.
- First Average loss = Total of Losses during the past 14 periods/14.

The second and subsequent calculations are based on the prior averages and the current gain loss:

- Average gain = [(previous average gain)*13 + current gain]/14.
- Average loss = [(previous average loss)*13 + current loss]/14.

RSI Signals:

- The stock is considered to be over bought if RSI goes above 70. Since the stock is overvalued, it is the right time to sell the stock and makes profit.

- Conversely, a stock is considered to be over sold if RSI falls below 30. Since the stock is undervalued, it is right time to buy the stock.
- A RSI reading above 50 is bullish as the average gains are more than the average losses. On the other hand a reading below 50 is considered to be bearish.
- A Bearish divergence occurs when stock makes a higher high and the RSI makes a lower high.
- A Bullish divergence occurs when stock makes a lower low and the RSI makes a higher low.

➤ **Rate of Change(ROC) :-**

The rate of change(ROC) indicator, which is also referred to as simply momentum, is a pure momentum oscillator that measures the percent change in price from one period to the next. The value of ROC oscillates around a central zero-point level. To calculate ROC a set period is used to compare with today's price. The most popular periods used are 10, 12 and 25 days.

CALCULATION:

$$ROC = [(close - close \ n \ periods \ ago) / (close \ n \ periods \ ago)] * 100.$$

When n= 10, 12 or 25 days.

ROC Indicators:

- ROC indicator which is at a high peak and starting to move down is an indication of a sell signal, whereas an ROC at a low peak, but starting to move upward, is a buy signal.
- A movement toward the zero line indicates that the existing trend is losing momentum.
- ROC moving from above zero to below zero level is an indication of sell while ROC moving from below zero to above zero level is an indication of buy.

Data Presentation and Data Analysis:

Initially, we have drawn Stock chart, Line chart and Column chart and interpreted all these charts for all the five selected companies as regards their price fluctuations and their implications to the investors.

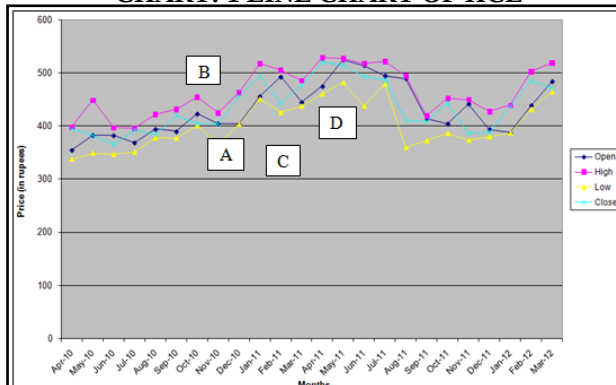
HCL STOCK PRICES

Charts of HCL represents the variation in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from 1st April 2010 to 31st March 2012.

General Trends:

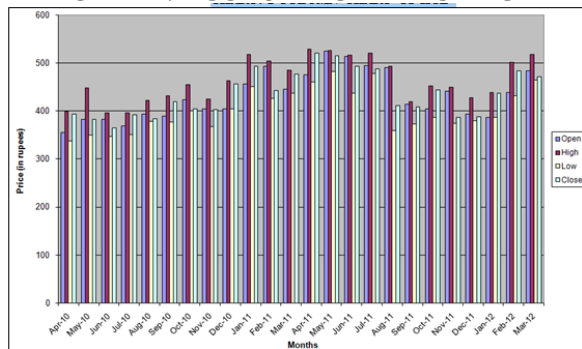
- First of all we consider the Open price which is Rs. 355 (in April 2010) and it increases to Rs.484.25 in March-2012 with a slight variation in prices. The highest open price is 514.5 and lowest price is Rs.355.
- Secondly we consider the High price which is Rs. 398.55 (in April 2010) and it increases to Rs.518.35 in March-2012 with a slight variation in prices. The highest in high price is Rs.528.4 and lowest price is Rs.396.
- Thirdly we consider the Low price which is Rs. 338 (in April 2010) and it increases to Rs.465 in March-2012 with a slight variation in prices. The highest open price in low prices is Rs.482.5 and lowest price is Rs.338.
- Fourthly we consider the Close price which is Rs. 394.25 (in April 2010) and it increases to Rs.471.7 in March-2012 with slight increment or decrement in prices. The highest open in close prices is Rs.520.4 and low price is Rs.364.9.

CHART: 1 LINE CHART OF HCL

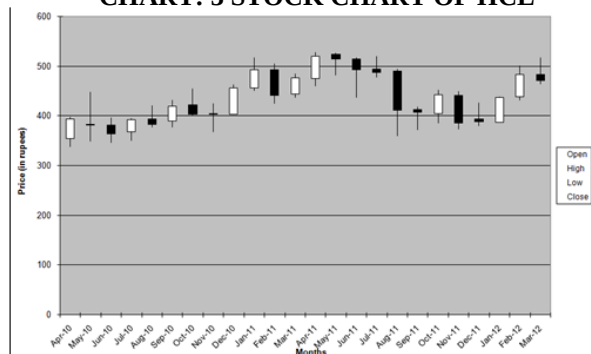


INTERPRETATION:

From the line chart of HCL we can spot the inverted head and shoulder position. In Nov. 2010 that is point 'A' is a peak point, above which we have point 'B' (Oct. 2010) and point 'C' (Dec.2010). The share price had reached a low of Rs.404.2 followed by a new low of Rs.403.8 and again had recovered at Rs.456.05. This pattern of recovery is an indicator that in future the share price will face a bullish run. Point 'D' (May 2011) shows the bullish push of the share price to RS.514.8.

CHART: 2 COLUMN CHART OF HCL**INTERPRETATION:**

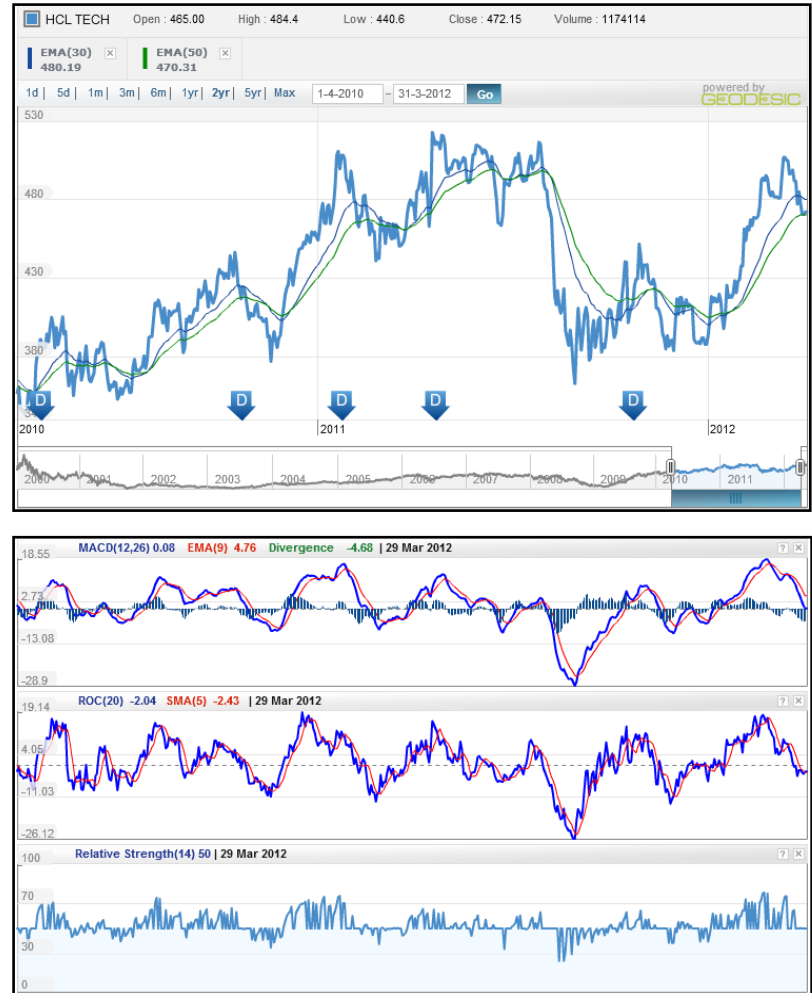
From the column chart of HCL we can spot the bowl like shape with the two saucer formations. In Jan. 2011 the share price of HCL was Rs.493.8 and it has decreased in Feb.2011 to Rs.442.15 which is low from the previous one. It also goes up further in March.2011 to Rs.476.5 which is high from the previous one. This shows the bowl shape of the share price of the HCL. Volume, which was high during the previous trend, decreases as expectations shift and traders become indecisive.

CHART: 3 STOCK CHART OF HCL**INTERPRETATION:**

From the stock chart of HCL we can spot higher high and higher low pattern. Here the share prices of HCL are rising quickly. In Nov. 2010 the share price was Rs.403.8 and it goes in upward direction and after some period it is found to be at the same level in Aug.2011 of Rs.411.2 and again after Nov. 2011, it has a rising trend. This creates a head and shoulder pattern. When the share prices are at the peak the investors are ready to sell. Because after reaching the peak, the prices are expected to decline and hence the investors make a sell signal.

Next we consider the Chart of four Technical Indicators for HCL:

- EMA
- MACD
- ROC
- RSI

CHART: 4 TECHNICAL INDICATORS OF HCL**INTERPRETATION:**

- **Exponential Moving Average (EMA):**

In the above chart two smoothing curves are drawn along with the price curve. EMA 30 represents the 30 day exponential moving average (fast moving average) while EMA 50 represents the 50 day exponential moving average (slow moving average). The purpose of this chart is to identify the price trend and to identify trading signals. A BUY signal is generated if the faster moving average crosses above the slower moving averages. A SELL signal is generated if the faster moving average crosses below the slower moving averages. From the above chart we can see that: Both the EMA 30 and EMA 50 are rising. The price is located above both the moving averages. The EMA 30 (fast moving average) is above the EMA 50 (slow moving average). Hence the trend of HCL is considered to be an Upward or Bullish trend.

- **MACD**

The above chart shows that the MACD line is above zero line and almost parallel with signal line, which indicates Bullish trend. But after 2008, in the next period MACD falls below zero line as well as signal line indicates a negative signal. But again after 2010 MACD is above the zero line with a declining trend in 2012. So the price may fall in future.

• ROC

Generally the ROC value above 10 is considered to be overbought and below 10 is considered to be oversold. An ROC value above zero or moving from below to above zero level is considered to be Bullish. It is considered Bearish when the ROC value goes below zero or when it moves from above zero to below zero level. Here, ROC fell below the zero line in 2008 due to economic recession and then rose above, which indicates an oversold position. ROC is above zero line after year 2010, which indicates Bullish trend and generates a Buying signal.

• RSI

In the above chart the price line and the 14 day RSI line are plotted. The RSI line shown at the bottom of the chart is used to identify the overbought and over sold situations. If RSI crosses “above 70” level the stock is considered to be overbought and so there are chances for trend reversal. If the RSI falls below 30 level the stock is considered to be oversold and hence undervalued. So there are chances for a trend reversal. After 2010 here, RSI is between 50 and 70, which is considered bullish. While near the end of the period, it is below 50, which indicates a bearish trend.

INFOSYS STOCK PRICES

The following interpretation is for all charts of INFOSYS which we had taken into consideration in this study i.e. Stock chart, Line chart and Column chart.

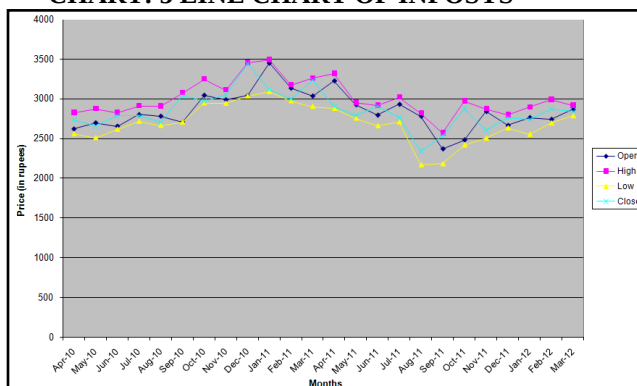
General Trends:

- Charts of INFOSYS represents the variation in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from 1st April 2010 to 31st March 2012.
- First of all we consider the open prices which is Rs. 2620 (in April) and it increase to Rs.2865 in March-2012 with slight variation in prices. The highest open price is Rs.3449 and lowest price is Rs.2370.
- Secondly we consider the high prices which is Rs. 2823.8 (in April) and it increase to Rs.2915.35 in March-2012 with slight updation

in prices. The highest in high price is Rs.3493.95 and low price is Rs.2567.9.

- Thirdly we consider the low prices which is Rs. 2560.4 (in April) and it increase to Rs.2787 in March-2012 with slight variation in prices. The highest open price in low prices is Rs.3091.55 and low price is Rs.2169.
- Fourthly we consider the close prices which is Rs. 2736.15 (in April) and it increase to Rs.2841.55 in March-2012 with slight increment or decrement in prices. The highest open in close prices is Rs.3445 and low price is Rs.2342.8.

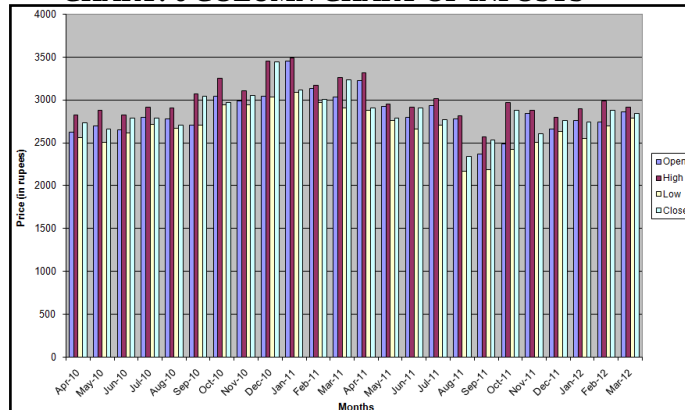
CHART: 5 LINE CHART OF INFOSYS



INTERPRETATION:-

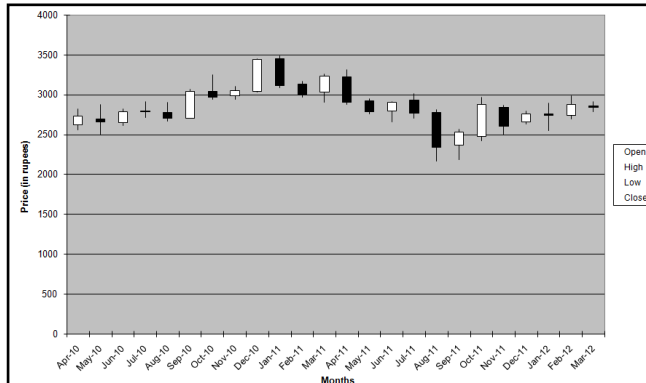
From the line chart of Infosys, we can spot continuation pattern. This pattern is leading to bullish market. In this at each stage when the price breaks, the above average volume indicates the rise in prices. These forecasts the bullish run in the price of the share. At the beginning the share price of Infosys was Rs.2736.15 (April 2010) and when the price breaks, the volume indicates the rise in prices. Thus is after one period the price goes up to Rs.2342.8 (Aug.2011) and it makes a continuation pattern. It is one of the most difficult chart patterns.

CHART: 6 COLUMN CHART OF INFOSYS



INTERPRETATION:

From the column chart of Infosys we can spot the bowl like shape during the “two saucer” formation. In the jun. 2011 the share of Infosys is Rs.2907.4 and which decreases in Aug.2011 to Rs.2342.8 which is low from the previous one. It also goes up in the Oct.2011 to Rs.2875.2 which is high from the previous one. This shows the bowl shape of the share prices of Infosys. Volume, which was high during the previous trend, decreases as expectations shift and traders become indecisive.

CHART: 7 STOCK CHART OF INFOSYS**INTERPRETATION:**

From the stock chart of INFOSYS we can spot head and shoulder formation. In Jan. 2011 that is point ‘A’ is a peak point, along with point ‘B’ (Aug. 2010) and point ‘C’ (May.2011) as the shoulders. The share price has reached a low of Rs. 2707.1 followed by a new high of Rs.3116.3 and again has recovered to Rs.2791.85. This pattern of recovery is an indicator that in future the share price will face a bullish run. Point ‘D’ (March 2012) shows the bullish push of the share price to Rs.2841.55.

Next we consider the Chart of four Technical Indicators for INFOSYS:

- EMA
- MACD
- ROC
- RSI

CHART: 8 TECHNICAL INDICATORS OF INFOSYS**INTERPRETATION:**

- **Exponential Moving average (EMA):**
From the above chart we can see that both the EMA 20 and EMA 50 are falling. The price is located above both the moving averages. The EMA 20 (fast moving average) is above the EMA 50 (slow moving average). Hence the trend of INFOSYS is considered down ward or bearish.
- **MACD:**
In the above chart it indicate that it make a buying signal because it just crossed the zero line. The investor may assume that the prices will be gone up in future because of these investor buy the share.
- **ROC:**
ROC fell below and then rose above, which indicates an oversold position. ROC is above zero line, which indicates bullish trend and generates a buying signal.
- **RSI:**
In the above chart the price line and the 14 day RSI line are plotted. At present RSI is between 50 and 70 which indicate that the prices may rise in future.

MPHASIS STOCK PRICES

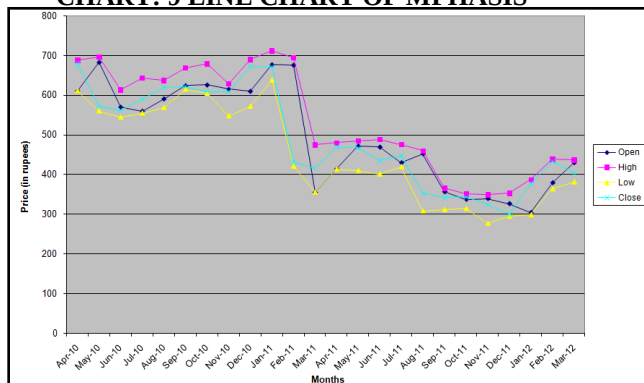
The following interpretation is for all charts of MPHASIS which we had taken into consideration in this study i.e. Stock chart, Line chart and Column chart.

General Trends:

- Charts of MPHASIS represent the variations in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from 1st April 2010 to 31st March 2012.
- First of all we consider the open price which is Rs. 611 (in April) and it increases to Rs.430.4 in March-2012 with slight variation in prices. The highest open price is Rs. 683 and lowest price is Rs.304.75.
- Secondly we consider the high price which is Rs. 678.8 (in April) and it increases to Rs.437.25 in March-2012 with slight updation in prices. The highest in high price is Rs.711.9 and low price is Rs.349.1.
- Thirdly we consider the low price which is Rs. 611 (in April) and it increases to Rs.381.55 in march-2012 with slight variation in prices. The highest open price in low prices is Rs.638.35 and low price is Rs.277.

Fourthly we consider the close price which is Rs. 680.55 (in April) and it increases to Rs.404.3 in March-2012 with slight increment or decrement in prices. The highest open in close prices is Rs.680.55 and low price is Rs.300.1.

CHART: 9 LINE CHART OF MPHASIS

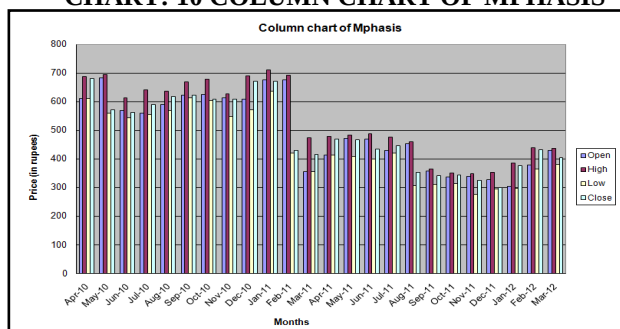


INTERPRETATION:

From the LINE chart of MPHASIS we can spot TRIPLE BOTTOM position in the share prices of MPHASIS. The triple bottom differs from the inverted head and shoulder (which we have seen in line chart of HCL) slightly since the neckline that can

be identified clearly in the inverted head and shoulder formation is not present in the triple bottom. The points 'A', 'B', and 'C' plot the triple bottom in the graph, that is in March -2011 it is Rs.415.55, in Aug-2011 it is Rs.353.45 and in Nov.2011 it is Rs.324.75. The triple bottom signals the end of the down trend. All the low prices tend to indicate resistance level and help in pushing the price to a bullish run in the market.

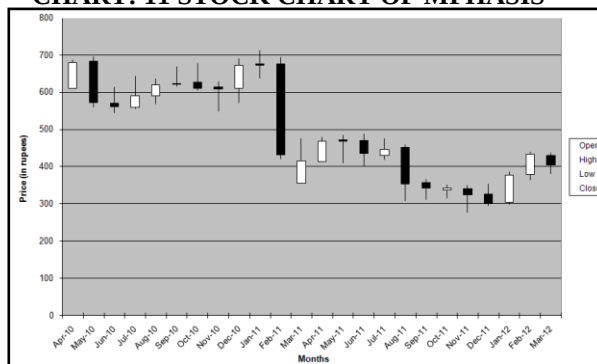
CHART: 10 COLUMN CHART OF MPHASIS



INTERPRETATION:

From the COLUMN chart of MPHASIS we can spot the share prices of MPHASIS are in down trend. The share price decreases because of profit making in this period. Jan.2011 it is Rs.672.05. and in this period the share prices of MPHASIS is continuously decreasing. This shows a decrease in the overall profit of the company. Decrease in the share price continues till March.2012 to Rs.404.3. From Jan.2011 to March-2012 it is on the down trend. On the basis of this investors make a decision about buy or sell.

CHART: 11 STOCK CHART OF MPHASIS



INTERPRETATION:

From the STOCK chart of MPHASIS we can spot TRIPLE BOTTOM position in the share prices of MPHASIS. The triple bottom differs from the inverted head and shoulder (which we have seen in line chart of HCL) slightly since the neckline that can be identified

clearly in the inverted head and shoulder formation is not present in the triple bottom. The points 'A', 'B', and 'C' plot the triple bottom in the graph, that is, in Feb -2011 it is Rs.431.25, in Aug-2011 it is Rs.353.45 and in Nov.2011 it is Rs.324.75. The triple bottom signals the end of the down trend. All the low prices tend to indicate the resistance level and help in pushing the price to a bullish run in the market.

Next we consider the Chart of four Technical Indicators for MPHASIS:

- EMA
- MACD
- ROC
- RSI



INTERPRETATION:

- **Exponential Moving Average (EMA):**
From the above chart we can see that: Both the EMA 20 and EMA 50 are falling. The price is located above both the moving averages. The EMA 20 (fast moving average) is above the EMA 50 (slow moving average). Hence the trend of MPHASIS is considered down ward or Bearish.
- **MACD:**
In the above chart it indicate that it make a buying signal because it just crossed the zero line. The investor may assume that the

prices will be gone up in future because of these investor buy the share or investor will also hold the securities.

- **ROC:**

The ROC fell below and then rose above, which indicates an oversold position. ROC is at one period will be very low because of these it will also make over bought position in future.

- **RSI:**

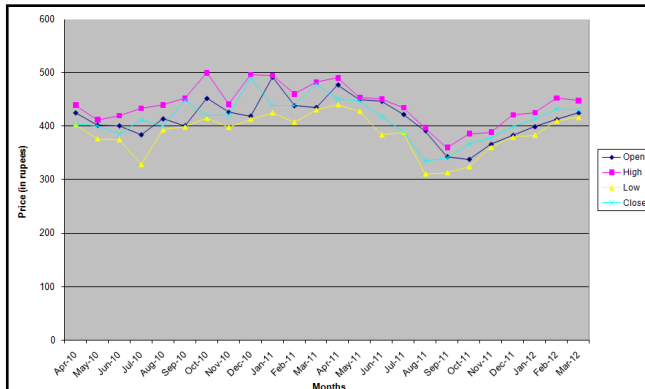
In the above chart the price line and the 14 day RSI line are plotted. At present RSI will be between 50 and 70 which indicate that the prices may rise in future.

WIPRO STOCK PRICES

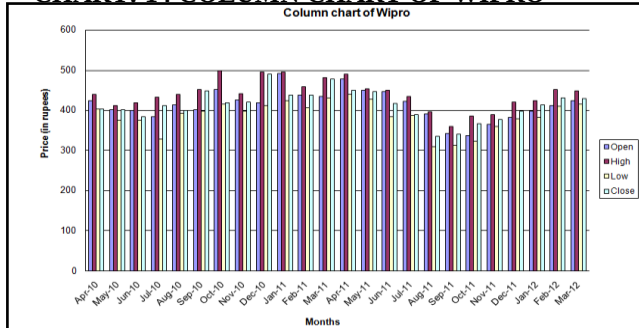
The following interpretation is for all charts of WIPRO which we had taken into consideration in this report i.e. Stock chart, Line chart and Column chart.

General Trends:

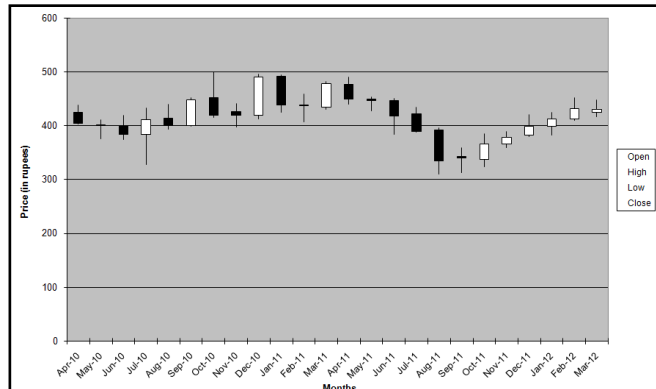
- Charts of WIPRO represents the variation in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from 1st April 2010 to 31st March 2012.
- First of all we consider the open prices which is Rs. 424.98 (in April) and it increase to Rs. 425 in March-2012 with slight variation in prices. The highest open price is Rs.492 and lowest price is Rs. 337.9.
- Secondly we considered the high prices which is Rs. 439.2 (in April) and it increase to Rs. 447.95 in March-2012 with slight updation in prices. The highest in high price is Rs.499.9 and low price is Rs.359.75.
- Thirdly we considered the low prices which is Rs. 403.2 (in April) and it increase to 416.4 in March-2012 with slight variation in prices. The highest open price in low prices is 440 and low price is 310.2.
- Fourthly we considered the close prices which is Rs. 404.1 (in April) and it increase to Rs. 429.95 in March-2012 with slight increment or decrement in prices. The highest open in close prices is Rs. 490.25 and low price is Rs.335.05.

CHART: 13 LINE CHART OF WIPRO**INTERPRETATION:**

From the line chart of Wipro we can spot from the period March-2011 it continuously decreases. It decreases up to the point Aug-2011. During this period the share of Wipro is continuous decreases. That is in March-2011 the price is Rs.478.3 and in the period of Aug-2011 the price is Rs.335.05 the prices are on down trend and after the one period it is on the uptrend. This shows the different variation in the profit margin of the Wipro.

CHART: 14 COLUMN CHART OF WIPRO**INTREPRETATION:**

From the COLUMN chart of WIPRO we can spot the share prices of Wipro are in down trend. The share price decreases because of declining profit from the period March-2011 where it is Rs.378.3 and after that period the share prices of Wipro continuously decreases. This shows the decrease in the overall profit of the company. Decrease in the share price continues till the Aug.2011 that is Rs.335.05 from March-2011 to Aug-2011 it is in the down trend. On the basis of this trend investor makes a decision about buy or sell. After that period the prices go up and it make a bowl pattern in the prices.

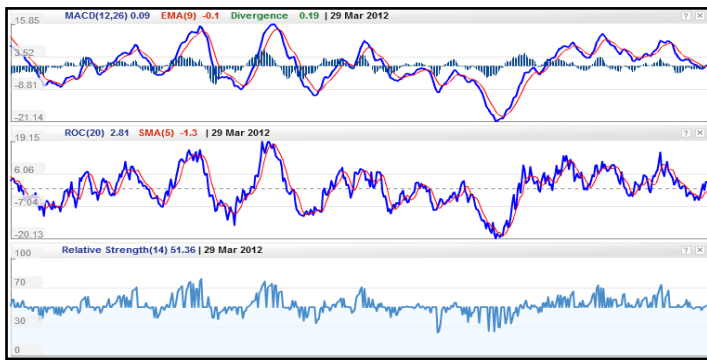
CHART: 15 STOCK CHART OF WIPRO**INTERPRETATION:**

From the stock chart of WIPRO we can spot head and shoulder formation. In Jan-2011 that is point 'A' is a peak point, above which we have points 'B' (Jun-2010) and point 'C' (Jun-2011) the share price had reached a low of Rs.384.75 followed by a new high of Rs.438.45 and again had recovered at Rs.417.6 this pattern of recovery is an indicator that in future the share price will face a bullish run. Point 'D' (March-2012) shows the bullish push of the share price to Rs.429.95.

Next we consider the Chart of four Technical Indicators for WIPRO:

- EMA
- MACD
- ROC
- RSI

CHART: 16 TECHNICAL INDICATORS OF WIPRO



INTERPRETATION:

- Exponential Moving Average (EMA):**
 From the above chart we can see that: Both the EMA 20 and EMA 50 are falling and rising. The price is located above both the moving averages. The EMA 20 (fast moving average) is above the EMA 50 (slow moving average). Hence the trend of Wipro is considered fluctuating.
- MACD:**
 In the above chart it indicate that it make a selling signal because it near the zero line. The investor may assume that the prices will be gone down in future because of these investor sell the share or investor will also hold the securities.
- ROC:**
 The ROC fell below and then rose above. ROC is at one period will be very low and very high. The ROC will be more fluctuating and it may not confirm the oversold position. The investor makes a decision on the basis of trend.
- RSI:**
 In the above chart the price line and the 14 day RSI line are plotted. At present RSI will be between 50 and 70 which indicate that the prices may rise in future.

TCS STOCK PRICES

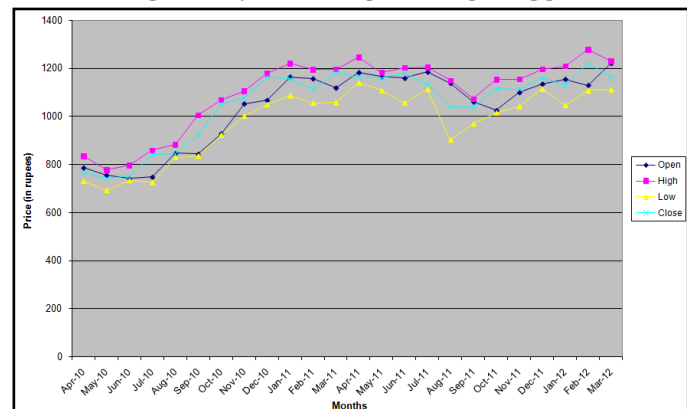
The following interpretation is for all charts of TCS which we had taken into consideration in this report i.e. Stock chart, Line chart and Column chart.

General Trends:

- Charts of TCS represents the variation in different prices such as open, high, low and close in respect of different months which we had taken into consideration i.e. from 1st April 2010 to 31st March 2012.
- First of all we consider the open prices which is Rs.786.9 (in April) and it increase to Rs.1221.05 in March-2012 with slight variation in prices. The highest open price is Rs.1221.05 and lowest price is Rs.742.

- Secondly we considered the high prices which is Rs. 834.9 (in April) and it increase to 1230 in March-2012 with a slight updation in prices. The highest in high price is Rs.1279.2 and low price is Rs.777.
- Thirdly we considered the low prices which is Rs. 730 (in April) and it increase to Rs.1112 in March-2012 with slight variation in prices. The highest open price in low prices is Rs.1141.15 and low price is Rs.725.5.
- Fourthly we considered the close prices which is Rs.766 (in April) and it increase to Rs.1163.15 in March-2012 with slight increment or decrement in prices. The highest open in close prices is Rs.1221.05 and low price is Rs.742.

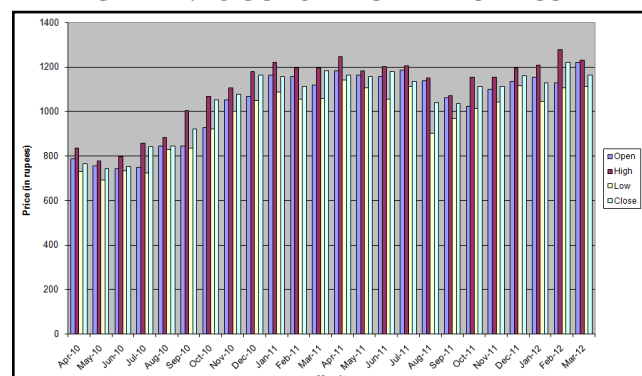
CHART: 17 LINE CHART OF TCS



INTERPRETATION:

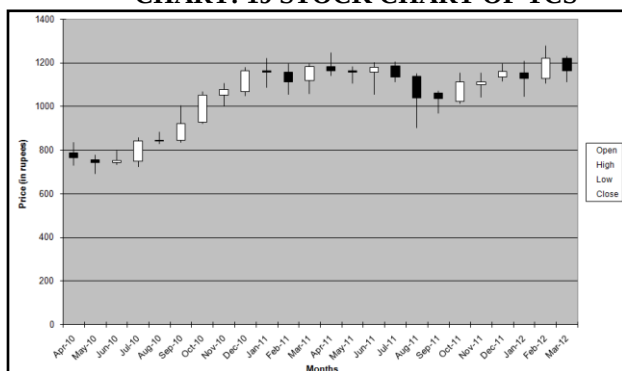
From the line chart of TCS we can spot a continuation pattern. Here, the prices of the share have a bullish trend. When the share prices are on peak the investor make a sell in the next position. And when the share prices are on troughs the investor make a buy signal to a share because the next period is of down trend. In April-2010 share price is Rs.766 and it goes in upward direction till March-2012 where the share price is Rs.1163.15. Hence the price is further expected to increase in future. On the basis of the trend investor makes a decision.

CHART: 18 COLUMN CHART OF TCS



INTERPRETATION:

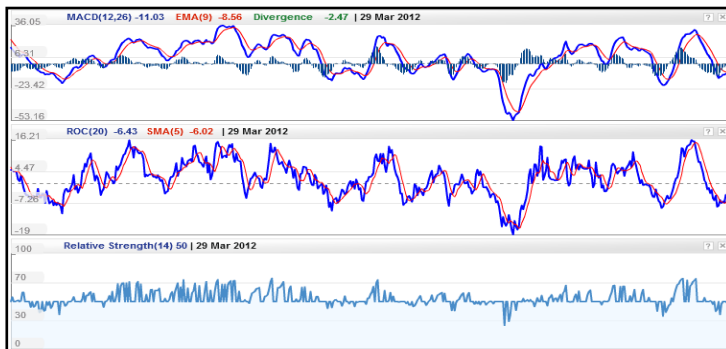
From the COLUMN chart of TCS we can spot uptrend position. The share price of TCS after one period it is continues to increase to Rs.1182.5 in March-2011. And after one period of down trend it increases in Feb-2012. That is Rs.1221.05 and after that it would be in uptrend. On the basis of these investor makes a decision. This pattern is different from the head and shoulder pattern. This shows the fluctuation in the overall profit of the company. Because of profit taking it will be increase or decrease. On these bases investor make a decision.

CHART: 19 STOCK CHART OF TCS**INTERPRETATION:**

From the STOCK chart of TCS we can spot bullish trend pattern. The share prices of TCS are rising after the profit taking. The investor makes a decision on the basis of market condition of the trend. The share prices of TCS increases from the period May.2010 the share price is Rs.742 and it will goes up till the March 2012 the share price is Rs.1163.15. It shows an upward pattern in the share prices of a TCS. On these patterns investor makes a decision of next period.

Next we consider the Chart of four Technical Indicators for TCS:

- EMA
- MACD
- ROC
- RSI

CHART: 20 TECHNICAL INDICATORS OF TCS**INTERPRETATION:**

- **Exponential Moving Average (EMA):**

From the above chart we can see that: Both the EMA 20 and EMA 50 are rising. The price is located above both the moving averages. The EMA 20 (fast moving average) is above the EMA 50 (slow moving average). Hence the trend of TCS is considered upward or it will be called bullish trend because it may continuous increase.

- **MACD:**

In the above chart it indicate that it make a selling signal because it near the zero line. The investor may assume that the prices will be gone down in future because of these investor sell the share or investor will also hold the securities.

- **ROC:**

ROC fell below and then rose above. ROC is at one period will be very low and very high. The ROC will be more fluctuating and it may not confirm the oversold position. The investor makes a decision on the basis of trend. Or investor makes an assumption of previous page.

- **RSI**

In the above chart the price line and the 14 day RSI line are plotted. At present RSI will be more above 50 which indicate that the prices may rise in future. But investor also makes a decision on the basis of the trend of shares.

The above results indicate that all the companies have performed well even in the recessionary period and have started recovering with an increasing trend towards the end of the period. Majority of the company prices are under the buyers' control. Thus the performance of the companies under Technical Analysis justifies the selection of these companies in the optimum portfolio.

Summary and Conclusions:

Technical analysis is a technique which gives an idea about future share prices of selected companies in which we invest. On the basis of the knowledge of technical analysis one can predict the perfect investment decision of the stock market. Technical analysis is based on published capital market data as opposed to fundamental data, such as earning, sales, growth rates, or government regulation. Market data include the price of a share or the level of a market index, volume (number of share traded). Technical analysis of stock prices of different companies gives an idea that after the analysis the market position of share of selected companies can be known and investor get a perfect knowledge of investment decision. The investment decision can be taken by proper technical analysis. By using the technical indicators the future market of securities would be known in which we invest. Technical analysis helps to predict future share prices of a selected company and also predict a trend of a selected company by which we make a perfect decision of investment in the stock market.

In this research we have selected stock prices of five IT companies for carrying out the technical analysis of these stock prices. Which the possibilities of getting a maximum benefit by investing in a IT companies and also Technical indicator that is EMA, MACD, ROC, RSI gives a perfect information about the stock prices of selected companies and in which direction the trend of share of selected company goes. For the more accurate prediction of stock prices of selected companies investor should also carry out fundamental analysis of stock prices, by which investor can make investment decision of future trend of stock prices. Thus Technical Analysis seeks to identify changes in the price movement and take a position in the share to take advantage of the trend.

- On the basis of prediction of five IT companies (i.e. HCL, INFOSYS, MPHASIS, WIPRO, TCS) we can predict a large growth of IT companies in future.
- In future the overall growth of these companies will be more. Because on the basis of the technical indicator the actual trend of the stock prices of these companies will be known which tells that the stock prices of these IT companies have less fluctuation in the trend and investment in these IT companies will be benefited.
- On the basis of the line chart, column chart and stock chart the investor can get a idea about the future share price trend of these IT companies

also get information about the growth of the IT sector in future.

- The technical analysis of selected top five IT companies tells that the growth of IT sector in the market.
- On the basis of the technical indicator these five IT companies overall result will be known of the stock market. This analysis tells that the future trend would be known by technical indicator. And the investment in these IT companies will be benefited.
- Different pattern of stock prices of these companies give a idea of future trend of these companies. And the position of these companies in the market and perfect knowledge on investment in these companies will be analyzed.
- The market technicians have a perfect knowledge of the pattern, trend by which the investment decision of stock prices of selected companies can be taken. The technical analysts believe that share prices show identifiable trade situation that can be exploited by investors.
- The technician also required a fundamental knowledge, which would clear an idea about the investment decision. Both Technical and Fundamental analysis helps in investment decision in the stock market and predict the future trend of the selected companies in which we have invested. Both the analysis gives a guidance to the investors.

Limitations:

- The analysis is fully based on secondary data and hence the accuracy of data is a major concern.
- Only five companies are selected for analysis because of time constraints.
- Analysis helps the investor in making investment decisions but not every investment is entirely dependent on the analysis alone.

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