SECURITY ANALYSIS

LEARNING OUTCOMES

After going through the chapter student shall be able to understand:

❑ Fundamental Analysis

❑ Technical Analysis

    (a) Meaning

    (b) Assumptions

    (c) Theories and Principles

    (d) Charting Techniques

❑ Efficient Market Hypothesis (EMH) Analysis

❑ Equity Research and tools available

INTRODUCTION

Investment decision depends on securities to be bought, held or sold. Buying security is based on highest return per unit of risk or lowest risk per unit of return. Selling security does not depend on any such requirement. A security considered for buying today may not be attractive tomorrow due to management policy changes in the company or economic policy changes adopted by the government. The reverse is also true. Therefore, analysis of the security on a continuous basis is a must.

Security Analysis involves a systematic analysis of the risk return profiles of various securities which is to help a rational investor to estimate a value for a company from all the price sensitive information/data so that he can make purchases when the market under-prices some of them and thereby earn a reasonable rate of return.

Two approaches viz. fundamental analysis and technical analysis are in vogue for carrying out Security Analysis. In fundamental analysis, factors affecting risk-return characteristics of securities are looked into while in technical analysis, demand/ supply position of the securities along with prevalent share price trends are examined.

1. FUNDAMENTAL ANALYSIS

Fundamental Analysis is based on the assumption that the share prices depend upon the future dividends expected by the shareholders. The present value of the future dividends can be calculated by discounting the cash flows at an appropriate discount rate and is known as the *'intrinsic value of the share'*. The intrinsic value of a share, according to a fundamental analyst, depicts the true value of a share. A share that is priced below the intrinsic value must be bought, while a share quoting above the intrinsic value must be sold.

Thus, it can be said that the price the shareholders are prepared to pay for a share is nothing but the present value of the dividends they expect to receive on the share and this is the price at which they expect to sell it in the future.

As a first step, to arrive at a compact expression, let us make a simple assumption, that the company is expected to pay a uniform dividend of ₹ D per share every year, i.e.,

$$D(1) = D(2) = D(3) = \ldots = D, \hspace{4cm} (1)$$

The Eq., would then become:

$$P(0) = \frac{D}{(1+k)} + \frac{D}{(1+k)^2} + \frac{D}{(1+k)^3} + ... + ... \qquad (2)$$

and $\quad P(0) = \dfrac{D}{k} \qquad\qquad (3)$

But it is unrealistic to assume that dividends remain constant over time. In case of most shares, the dividends per share (DPS) grow because of the growth in the earnings of the firm. Most companies, as they identify new investment opportunities for growth, tend to increase their DPS over a period of time.

Let us assume that on an average the DPS of the company grows at the compounded rate of g per annum, so that dividend $D(1)$ at the end of the first period grows to $D(1)(1+g)$, $D(1)(1+g)^2$, etc, at the end of second period, third period, etc. respectively. So we must have:

$$P(0) = \frac{D(1)}{(1+k)} + \frac{D(1)(1+g)}{(1+k)^2} + \frac{D(1)(1+g)^2}{(1+k)^3} + ... + ... \qquad (4)$$

which is a perpetual geometric series.

If growth rate in dividends, g, is less than the desired rate of return on share, k, we must have:

$$P(0) = \frac{D(1)}{(k-g)} \qquad\qquad (5)$$

or

$$P(0) = \frac{D(0)(1+g)}{(k-g)} \qquad\qquad (6)$$

Since $D(1)$ may be approximated as $D(0)(1+g)$, $D(0)$ being the DPS in the current period (0).

When growth rate in dividends, g, is equal to or greater than the desired rate of return on share, k, the above model is not valid, since the geometric series leads to an infinite price. The condition that g be less than k is not very restrictive, since the long-term growth in dividends is unlikely to exceed the rate of return expected by the market on the share.

The above result [Eq.(5)] is also known as Gordon's dividend growth model for stock valuation, named after the model's originator, Myron J. Gordon. This is one of the most well-known models in the genre of fundamental analysis.

In equation (6), if "g" is set at zero, we get back equation (3).

1.1   Dividend Growth Model and the PE Multiple

Financial analysts tend to relate price to earnings via the P/E multiples (the ratio between the market price and earnings per share).

If a company is assumed to pay out a fraction b of its earnings as dividends on an average (i.e. the Dividend Payout Ratio = b), D(1) may be expressed as b E(1), where E(1) is the earning per share (EPS) of the company at the end of the first period. Equation (5) then becomes:

$$P(0) = \frac{bE(1)}{(k-g)} \tag{7}$$

or

$$P(0) = \frac{bE(0)\ (1+g)}{(k-g)} \tag{8}$$

The fundamental analysts use the above models or some of their variations, for estimating the fundamental or intrinsic price or the fundamental price-earnings multiple of a security. Towards this end, they devote considerable effort in assessing the impact of various kinds of information on a company's future profitability and the expected return of the shareholders. If the prevailing price or the P/E multiple of a security is higher than the estimated fundamental value (i.e. if the security appears to be overpriced), they recommend a selling stance with respect to that security, since once the information becomes common knowledge, the price of the security may be expected to fall. On the other hand, if the security is underpriced in the market, the prevailing price (or the P/E multiple) of the security being lower than the estimated fundamental value, they recommend buying the security, counting upon a price rise.

Because of these inherent complex interrelationships in the production processes, the fortunes of each industry are closely tied to those of other industries and to the performance of the economy as a whole. Within an industry, the prospects of a specific company depend not only on the prospects of the industry to which it belongs, but also on its operating and competitive position within that industry. The key variables that an investor must monitor in order to carry out his fundamental analysis are economy wide factors, industry wide factors and company specific factors. In other words, fundamental analysis encompasses economic, industrial and company analyses. They are depicted by three concentric circles and constitute the different stages in an investment decision making process.

Economy Analysis

Industry Analysis

Company Analysis
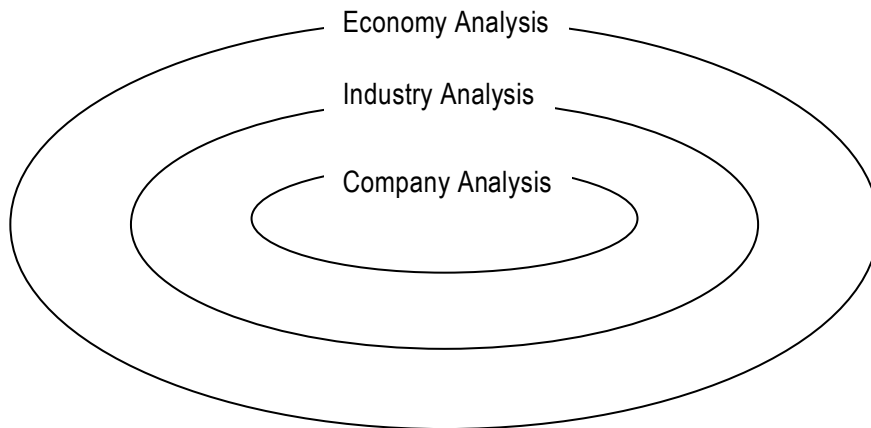
1.2 Economic Analysis

Macro-economic factors e.g. historical performance of the economy in the past/ present and expectations in future, growth of different sectors of the economy in future with signs of stagnation/degradation at present to be assessed while analyzing the overall economy. Trends in peoples' income and expenditure reflect the growth of a particular industry/company in future. Consumption affects corporate profits, dividends and share prices in the market.

1.2.1 Factors Affecting Economic Analysis

Some of the economy wide factors are discussed as under:

(a) **Growth Rates of National Income and Related Measures***:* For most purposes, what is important is the difference between the nominal growth rate quoted by GDP and the 'real' growth after taking inflation into account. The estimated growth rate of the economy would be a pointer to the prospects for the industrial sector, and therefore to the returns investors can expect from investment in shares.

(b) **Growth Rates of Industrial Sector***:* This can be further broken down into growth rates of various industries or groups of industries if required. The growth rates in various industries are estimated based on the estimated demand for its products.

(c) **Inflation***:* Inflation is measured in terms of either wholesale prices (the Wholesale Price Index or WPI) or retail prices (Consumer Price Index or CPI). The demand in some industries, particularly the consumer products industries, is significantly influenced by the inflation rate. Therefore, firms in these industries make continuous assessment about inflation rates likely to prevail in the near future so as to fine-tune their pricing, distribution and promotion policies to the anticipated impact of inflation on demand for their products.

(d) **Monsoon***:* Because of the strong forward and backward linkages, monsoon is of great concern to investors in the stock market too.

1.2.2 Techniques Used in Economic Analysis

Economic analysis is used to forecast national income with its various components that have a bearing on the concerned industry and the company in particular. Gross National Product (GNP) is used to measure national income as it reflects the growth rate in economic activities and has been regarded as a forecasting tool for analyzing the overall economy along with its various components during a particular period.

Some of the techniques used for economic analysis are:

(a) **Anticipatory Surveys***:* They help investors to form an opinion about the future state of the economy. It incorporates expert opinion on construction activities, expenditure on plant and machinery, levels of inventory – all having a definite bearing on economic activities. Also future spending habits of consumers are taken into account.

In spite of valuable inputs available through this method, it has certain drawbacks:

(i)   Survey results do not guarantee that intentions surveyed would materialize.

(ii)   They are not regarded as forecasts per se, as there can be a consensus approach by the investor for exercising his opinion.

Continuous monitoring of this practice is called for to make this technique popular.

(b) **Barometer/Indicator Approach***:* Various indicators are used to find out how the economy shall perform in the future. The indicators have been classified as under:

(i)   *Leading Indicators*: They lead the economic activity in terms of their outcome. They relate to the time series data of the variables that reach high/low points in advance of economic activity.

(ii)   *Roughly Coincidental Indicators:* They reach their peaks and troughs at approximately the same in the economy.

(iii)   *Lagging Indicators:* They are time series data of variables that lag behind in their consequences vis-a- vis the economy. They reach their turning points after the economy has reached its own already.

All these approaches suggest direction of change in the aggregate economic activity but nothing about its magnitude. The various measures obtained form such indicators may give conflicting

signals about the future direction of the economy. To avoid this limitation, use of diffusion/composite index is suggested whereby combining several indicators into one index to measure the strength/weaknesses in the movement of a particular set of indicators. Computation of diffusion indices is no doubt difficult notwithstanding the fact it does not eliminate irregular movements.

Money supply in the economy also affects investment decisions. Rate of change in money supply in the economy affects GNP, corporate profits, interest rates and stock prices. Increase in money supply fuels inflation. As investment in stocks is considered as a hedge against inflation, stock prices go up during inflationary period.

(c)   Economic Model Building Approach*:* In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework. The steps used are as follows:

(i)   Hypothesize total economic demand by measuring total income (GNP) based on political stability, rate of inflation, changes in economic levels.

(ii)   Forecasting the GNP by estimating levels of various components viz. consumption expenditure, gross private domestic investment, government purchases of goods/services, net exports.

(iii)   After forecasting individual components of GNP, add them up to obtain the forecasted GNP.

(iv)   Comparison is made of total GNP thus arrived at with that from an independent agency for the forecast of GNP and then the overall forecast is tested for consistency. This is carried out for ensuring that both the total forecast and the component wise forecast fit together in a reasonable manner.

1.3   Industry Analysis

When an economy grows, it is very unlikely that all industries in the economy would grow at the same rate. So it is necessary to examine industry specific factors, in addition to economy-wide factors.

First of all, an assessment has to be made regarding all the conditions and factors relating to demand of the particular product, cost structure of the industry and other economic and Government constraints on the same. Since the basic profitability of any company depends upon the economic prospects of the industry to which it belongs, an appraisal of the particular industry's prospects is essential.

1.3.1 Factors Affecting Industry Analysis

The following factors may particularly be kept in mind while assessing the factors relating to an industry.

(a) **Product Life-Cycle***:* An industry usually exhibits high profitability in the initial and growth stages, medium but steady profitability in the maturity stage and a sharp decline in profitability in the last stage of growth.

(b) **Demand Supply Gap***:* Excess supply reduces the profitability of the industry because of the decline in the unit price realization, while insufficient supply tends to improve the profitability because of higher unit price realization.

(c) **Barriers to Entry***:* Any industry with high profitability would attract fresh investments. The potential entrants to the industry, however, face different types of barriers to entry. Some of these barriers are innate to the product and the technology of production, while other barriers are created by existing firms in the industry.

(d) **Government Attitude***:* The attitude of the government towards an industry is a crucial determinant of its prospects.

(e) **State of Competition in the Industry***:* Factors to be noted are- firms with leadership capability and the nature of competition amongst them in foreign and domestic market, type of products manufactured viz. homogeneous or highly differentiated, demand prospects through classification viz customer-wise/area-wise, changes in demand patterns in the long/immediate/ short run, type of industry the firm is placed viz. growth, cyclical, defensive or decline.

(f) **Cost Conditions and Profitability***:* The price of a share depends on its return, which in turn depends on profitability of the firm. Profitability depends on the state of competition in the industry, cost control measures adopted by its units and growth in demand for its products.

Factors to be considered are:

(i)   Cost allocation among various heads e.g. raw material, labours and overheads and their controllability. Overhead cost for some may be higher while for others labour may be so. Labour cost which depends on wage level and productivity needs close scrutiny.

(ii)   Product price.

(iii)   Production capacity in terms of installation, idle and operating.

(iv)   Level of capital expenditure required for maintenance / increase in productive efficiency.

Investors are required to make a thorough analysis of profitability. This is carried out by the study of certain ratios such as G.P. Ratio, Operating Profit Margin Ratio, R.O.E., Return on Total Capital etc.

(g)   Technology and Research*:* They play a vital role in the growth and survival of a particular industry. Technology is subject to change very fast leading to obsolescence. Industries which update themselves have a competitive advantage over others in terms of quality, price etc.

Things to be probed in this regard are:

(i)   Nature and type of technology used.

(ii)   Expected changes in technology for new products leading to increase in sales.

(iii)   Relationship of capital expenditure and sales over time. More capital expenditure means increase in sales.

(iv)   Money spent in research and development. Whether this amount relates to redundancy or not?

(v)   Assessment of industry in terms of sales and profitability in short, immediate and long run.

1.3.2 Techniques Used in Industry Analysis

The techniques used for analyzing the industry wide factors are:

(a)   Regression Analysis*:* Investor diagnoses the factors determining the demand for output of the industry through product demand analysis. Factors to be considered are GNP, disposable income, per capita consumption / income, price elasticity of demand. For identifying factors affecting demand, statistical techniques like regression analysis and correlation are used.

(b)   Input – Output Analysis*:* It reflects the flow of goods and services through the economy, intermediate steps in production process as goods proceed from raw material stage through final consumption. This is carried out to detect changing patterns/trends indicating growth/decline of industries.

1.4 Company Analysis

Economic and industry framework provides the investor with proper background against which shares of a particular company are purchased. This requires careful examination of the company's quantitative and qualitative fundamentals.

(a) **Net Worth and Book Value***:* Net Worth is sum of equity share capital, preference share capital and free reserves less intangible assets and any carry forward of losses. The total net worth divided by the number of shares is the much talked about book value of a share. Though the book value is often seen as an indication of the intrinsic worth of the share, this may not be so for two major reasons. First, the market price of the share reflects the future earnings potential of the firm which may have no relationship with the value of its assets. Second, the book value is based upon the historical costs of the assets of the firm and these may be gross underestimates of the cost of the replacement or resale values of these assets.

(b) **Sources and Uses of Funds***:* The identification of sources and uses of funds is known as Funds Flow Analysis. One of the major uses of funds flow analysis is to find out whether the firm has used short-term sources of funds to finance long-term investments. Such methods of financing increases the risk of liquidity crunch for the firm, as long-term investments, because of the gestation period involved may not generate enough surpluses in time to meet the short-term liabilities incurred by the firm. Many a firm has come to grief because of this mismatch between the maturity periods of sources and uses of funds.

(c) **Cross-Sectional and Time Series Analysis***:* One of the main purposes of examining financial statements is to compare two firms, compare a firm against some benchmark figures for its industry and to analyze the performance of a firm over time. The techniques that are used to do such proper comparative analysis are: common-sized statement, and financial ratio analysis.

(d) **Size and Ranking***:* A rough idea regarding the size and ranking of the company within the economy, in general, and the industry, in particular, would help the investment manager in assessing the risk associated with the company. In this regard the net capital employed, the net profits, the return on investment and the sales figures of the company under consideration may be compared with similar data of other companies in the same industry group. It may also be useful to assess the position of the company in terms of technical know-how, research and development activity and price leadership.

(e) **Growth Record***:* The growth in sales, net income, net capital employed and earnings per share of the company in the past few years should be examined. The following three growth

indicators may be particularly looked into: (a) Price earnings ratio, (b) Percentage growth rate of earnings per annum, and (c) Percentage growth rate of net block.

The price earnings ratio is an important indicator for the investment manager since it shows the number of times the earnings per share are covered by the market price of a share. Theoretically, this ratio should be the same for two companies with similar features. However, this is not so in practice due to many factors. Hence, by a comparison of this ratio pertaining to different companies the investment manager can have an idea about the image of the company and can determine whether the share is under-priced or over-priced.

Consider the following example:

		Company A	*Company B*
(a)	Market price of share of ₹ 100	150	250
(b)	Earnings per share	25	25
(c)	Price earnings ratio [(a) ÷ (b)]	6	10

It is obvious that the purchaser of company A's shares pays 6 times its annual earnings while the purchaser of company B's shares pays 10 times. If other factors (intrinsic value of share, growth potential, etc.) are quite similar, it is obvious that the shares of company A are preferable. In practice, however, the other factors are never similar in the case of two companies. The investment manager must try to ascertain why the EPS in company B is comparatively low – may be some factors are not apparent. EPS calculation cannot be the sole basis of deciding about an investment. Yet it is one of the most important factors on the basis of which the investment manager takes a decision to purchase the shares. This is because it relates the market price of the shares and the earnings per share.

The percentage growth rate of net blocks shows how the company has been developing its capacity levels. Obviously, a dynamic company will keep on expanding its capacities and diversify its business. This will enable it to enter new and profitable lines and avoid stagnation in its growth.

In this context, an evaluation of future growth prospects of the company should be carefully made. This requires an analysis of existing capacities and their utilisation, proposed expansion and diversification plans and the nature of the company's technology. The existing capacity utilisation levels can be known from the quantitative information given in the published profit and loss accounts of the company. The plans of the company, in terms of expansion or diversification, can be known from the Directors' Reports, the Chairman's statements and from the future capital commitments as shown by way of notes in the balance sheets. The nature of technology of a company should be seen with reference to technological developments in the concerned fields, the possibility of its

product being superseded or the possibility of emergence of a more effective method of manufacturing.

Growth is the single most important factor in company analysis for the purpose of investment management. A company may have a good record of profits and performance in the past; but if it does not have growth potential, its shares cannot be rated high from the investment point of view.

(f)   Financial Analysis*:* An analysis of its financial statements for the past few years would help the investment manager in understanding the financial solvency and liquidity, the efficiency with which the funds are used, the profitability, the operating efficiency and the financial and operating leverages of the company. For this purpose, certain fundamental ratios have to be calculated.

From the investment point of view, the most important figures are earnings per share, price earning ratios, yield, book value and the intrinsic value of the share. These five elements may be calculated for the past 10 years or so and compared with similar ratios computed from the financial accounts of other companies in the industry and with the average ratios for the industry as a whole. The yield and the asset backing of a share are important considerations in a decision regarding whether the particular market price of the share is proper or not.

Various other ratios to measure profitability, operating efficiency and turnover efficiency of the company may also be calculated. The return on owners' investment, capital turnover ratio and the cost structure ratios may also be worked out.

To examine the financial solvency or liquidity of the company, the investment manager may work out current ratio, liquidity ratio, debt-equity ratio, etc. These ratios will provide an overall view of the company to the investment analyst. He can analyse its strengths and weaknesses and see whether it is worth the risk or not.

(g)   Competitive Advantage: Another business consideration for investors is competitive advantage. A company's long-term success is driven largely by its ability to maintain its competitive advantage. Powerful competitive advantages, such as Apple's brand name and Samsung's domination of the mobile market, create a shield around a business that allows it to keep competitors at a distance.

(h)   Quality of Management*:* This is an intangible factor. Yet it has a very important bearing on the value of the shares. Every investment manager knows that the shares of certain business houses command a higher premium than those of similar companies managed by other business houses. This is because of the quality of management, the confidence that investors have in a particular business house, its policy vis-a-vis its relationship with the investors, dividend and financial performance record of other companies in the same group, etc. This is perhaps the reason that an

investment manager always gives a close look to the management of a company in whose shares he is to invest. Quality of management has to be seen with reference to the experience, skills and integrity of the persons at the helm of affairs of the company. The policy of the management regarding relationship with the shareholders is an important factor since certain business houses believe in very generous dividend and bonus distributions while others are rather conservative.

However, an average investor is at a disadvantage when compared with a large investor. They do not get the facility to meet the top executives of the company, but the fund managers interested in investing huge amount of money generally get to meet the top brasses of an organization.

It is true that every listed company give detailed information about its management. But, the information they give is always positive. This is because; no company will host any negative information about itself. So, the question is how to find the dirt inside the management. The remedy is to have a look out for the conference calls hosted by the company's CEO and CFO. After reading the company's financial results, they take question and answers session from the investors. That's where one can pick something that can indicate about the true position about the company.

Some other ways to judge the management of the company is to read the Management Discussion and Analysis Report. Further, it helps when top management people are also the shareholders. If the large scale unloading of their shares are taking place and something else is communicated to the media, then it is a sign that something is wrong. Another way to judge the effectiveness of the management is to see the past performance of the executives, say, for five years.

(i)   Corporate Governance: Following factors are to be kept in mind while judging the effectiveness of corporate governance of an organization:

- Whether company is complying with all aspects of SEBI (LODR) Regulations 2015?

- How well corporate governance policies serve stakeholders?

- Quality and timeliness of company financial disclosures.

- Whether quality independent directors are inducted?

(j)   Regulation: Regulations plays an important role in maintaining the sanctity of the corporate form of organization. In Indian listed companies, Companies Act, Securities Contract and Regulation Act and SEBI Act basically look after regulatory aspects of a company. A listed company is also continuously monitored by SEBI which through its guidelines and regulations protect the interest of investors.

Further, a company which is dealing with companies outside India, needs to comply with Foreign Exchange Management Act (FEMA) also. In this scenario, the Reserve Bank of India (RBI) does a continuous monitoring.

(k)   Location and Labour-Management Relations*:* The locations of the company's manufacturing facilities determines its economic viability which depends on the availability of crucial inputs like power, skilled labour and raw-materials, etc. Nearness to markets is also a factor to be considered.

In the past few years, the investment manager has begun looking into the state of labour-management relations in the company under consideration and the area where it is located.

(l)   Pattern of Existing Stock Holding*:* An analysis of the pattern of existing stock holdings of the company would also be relevant. This would show the stake of various parties in the company. An interesting case in this regard is that of the Punjab National Bank in which the Life Insurance Corporation and other financial institutions had substantial holdings. When the bank was nationalised, the residual company proposed a scheme whereby those shareholders, who wish to opt out, could receive a certain amount as compensation in cash. It was only at the instance and the bargaining strength, of institutional investors that the compensation offered to the shareholders, who wished to opt out of the company, was raised considerably.

(m)   Marketability of the Shares: Another important consideration for an investment manager is the marketability of the shares of the company. Mere listing of a share on the stock exchange does not automatically mean that the share can be sold or purchased at will. There are many shares which remain inactive for long periods with no transactions being affected. To purchase or sell such scrips is a difficult task. In this regard, dispersal of shareholding with special reference to the extent of public holding should be seen. The other relevant factors are the speculative interest in the particular scrip, the particular stock exchange where it is traded and the volume of trading.

Techniques Used in Company Analysis

Through the use of statistical techniques the company wide factors can be analyzed. Some of the techniques are discussed as under:

(a)   Correlation & Regression Analysis*:* Simple regression is used when inter relationship covers two variables. For more than two variables, multiple regression analysis is followed. Here the inter relationship between variables belonging to economy, industry and company are found out. The main advantage in such analysis is the determination of the forecasted values along with testing the reliability of the estimates.

(b) **Trend Analysis***:* The relationship of one variable is tested over time using regression analysis. It gives an insight to the historical behavior of the variable.

(c) **Decision Tree Analysis:** Information relating to the probability of occurrence of the forecasted value is considered useful. A range of values of the variable with probabilities of occurrence of each value is taken up. The limitations are reduced through decision tree analysis and use of simulation techniques.

In decision tree analysis, the decision is taken sequentially with probabilities attached to each sequence. To obtain the probability of final outcome, various sequential decisions given along with probabilities, the probabilities of each sequence is to be multiplied and them summed up.

Thus, fundamental analysis is basically an examination of the economic and financial aspects of a company with the aim of estimating future earnings and dividend prospects. It includes an analysis of the macro-economic and political factors which will have an impact on the performance of the company. After having analysed all the relevant information about the company and its relative strength vis-a-vis other companies in the industry, the investor is expected to decide whether he should buy or sell the securities.

Apart from these, the Group Analysis has also become an important factor. SEBI, in particular, emphasizes the need for disclosure, in public offer documents, of all relevant parameters – especially the financial health and promise versus performance of the group companies. RBI has also been focusing more and more on the Group Exposure Norms of commercial Banks.

2. TECHNICAL ANALYSIS

2.1 Meaning

Technical Analysis is a method of share price movements based on a study of price graphs or charts on the assumption that share price trends are repetitive, that since investor psychology follows a certain pattern, what is seen to have happened before is likely to be repeated. The technical analyst is concerned with the fundamental strength or weakness of a company or an industry; he studies investor and price behaviour.

A technical analyst attempts to answer two basic questions:

(i) Is there a discernible trend in the prices?

(ii) If there is, then are there indications that the trend would reverse?

The methods used to answer these questions are visual and statistical. The visual methods are based on examination of a variety of charts to make out patterns, while the statistical procedures analyse price and return data to make trading decisions.

2.2 Assumptions

Technical Analysis is based on the following assumptions:

(i)   The market value of stock depends on the supply and demand for a security.

(ii)   The supply and demand are actually governed by several factors which can be rational or irrational. For instance, recent initiatives taken by the Government to reduce the Non-Performing Assets (NPA) burden of banks may result in the demand for banking stocks.

(iii)   Stock prices generally move in trends which continue for a substantial period of time. Therefore, if there is a bull market going on, there is every possibility that there will soon be a substantial correction which will provide an opportunity to the investors to buy shares at that time.

(iv)   Technical analysis relies upon chart analysis which shows the past trends in stock prices rather than the information in the financial statements like balance sheet or profit and loss account.

2.3 Principles of Technical Analysis

Technical analysis is based on the following three principals:

a.   The market discounts everything.

b.   Price moves in trends.

c.   History tends to repeat itself.

a.   The Market Discounts Everything: Although many experts criticize technical analysis because it only considers price movements and ignores fundamental factors but the Efficient Market Hypothesis (discussed later in detail) contradicts it according to which a company's share price already reflects everything that has or could affect a company and it includes fundamental factors. So, technical analysts generally have the view that a company's share price includes everything including the fundamentals of a company.

b.   Price Moves in Trends: Technical analysts believe that prices move in trends. In other words, a stock price is more likely to continue a past trend than move in a different direction.

c. **History Tends to Repeat Itself:** Technical analysts believe that history tends to repeat itself. Technical analysis uses chart patterns to analyze subsequent market movements to understand trends. While many form of technical analysis have been used for many years, they are still considered to be significant because they illustrate patterns in price movements that often repeat themselves.

2.4 Theories of Technical Analysis

2.4.1 The Dow Theory

The Dow Theory is one of the oldest and most famous technical theories. It was originated by Charles Dow, the founder of Dow Jones Company in late nineteenth century. It is a helpful tool for determining the relative strength of the stock market. It can also be used as a barometer of business.

The Dow Theory is based upon the movements of two indices, constructed by Charles Dow, Dow Jones Industrial Average (DJIA) and Dow Jones Transportation Average (DJTA). These averages reflect the aggregate impact of all kinds of information on the market. The movements of the market are divided into three classifications, all going at the same time; the primary movement, the secondary movement, and the daily fluctuations. The primary movement is the main trend of the market, which lasts from one year to 36 months or longer. This trend is commonly called bear or bull market. The secondary movement of the market is shorter in duration than the primary movement, and is opposite in direction. It lasts from two weeks to a month or more. The daily fluctuations are the narrow movements from day-to-day. These fluctuations are not part of the Dow Theory interpretation of the stock market. However, daily movements must be carefully studied, along with primary and secondary movements, as they go to make up the longer movement in the market.

Thus, the Dow Theory's purpose is to determine where the market is and where is it going, although not how far or high. The theory, in practice, states that if the cyclical swings of the stock market averages are successively higher and the successive lows are higher, then the market trend is up and a bullish market exists. Contrarily, if the successive highs and successive lows are lower, then the direction of the market is down and a bearish market exists.

Charles Dow proposed that the primary uptrend would have three moves up, the *first* one being caused by accumulation of shares by the far-sighted, knowledgeable investors, the *second* move would be caused by the arrival of the first reports of good earnings by corporations, and the last move up would be caused by widespread report of financial well-being of corporations. The *third* stage would also see rampant speculation in the market. Towards the end of the third stage, the far-sighted investors, realizing that the high earnings levels may not be sustained, would start selling, starting the first move down of a downtrend, and as the non-sustainability of high earnings is

confirmed, the second move down would be initiated and then the third move down would result from distress selling in the market.

2.4.2 Elliot Wave Theory

Inspired by the Dow Theory and by observations found throughout nature, Ralph Elliot formulated Elliot Wave Theory in 1934. This theory was based on analysis of 75 years stock price movements and charts. From his studies, he defined price movements in terms of waves. Accordingly, this theory was named Elliot Wave Theory. Elliot found that the markets exhibited certain repeated patterns or waves. As per this theory wave is a movement of the market price from one change in the direction to the next change in the same direction. These waves are resulted from buying and selling impulses emerging from the demand and supply pressures on the market. Depending on the demand and supply pressures, waves are generated in the prices.

As per this theory, waves can be classified into two parts:-

- Impulsive patterns

- Corrective patters

Let us discuss each of these patterns.

(a) **Impulsive Patterns-(Basic Waves) -** In this pattern there will be 3 or 5 waves in a given direction (going upward or downward). These waves shall move in the direction of the basic movement. This movement can indicate bull phase or bear phase.

(b) **Corrective Patterns-** (**Reaction Waves) -** These 3 waves are against the basic direction of the basic movement. Correction involves correcting the earlier rise in case of bull market and fall in case of bear market.

As shown in the following diagram waves 1, 3 and 5 are directional movements, which are separated or corrected by wave 2 & 4, termed as corrective movements.

Source: http://elliotwave.net/
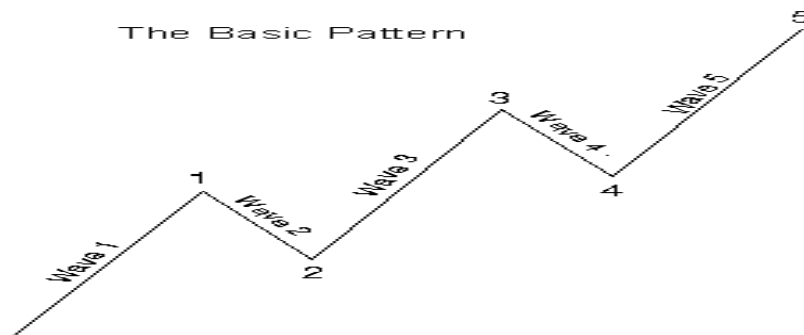
Complete Cycle -As shown in following figure five-wave impulses is following by a three-wave correction (a,b & c) to form a complete cycle of eight waves.

Source: http://elliotwave.net/
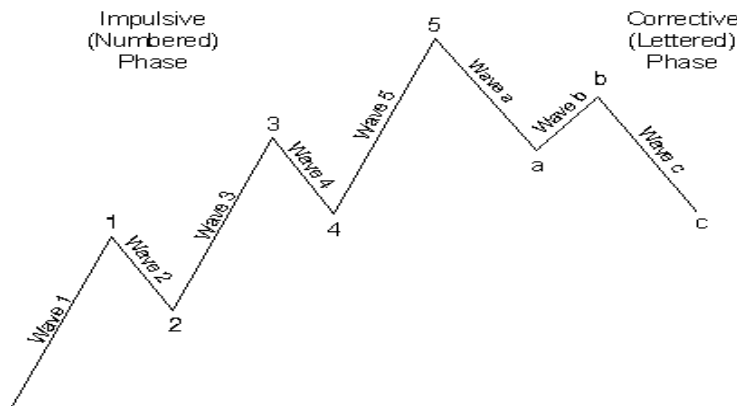
One complete cycle consists of waves made up of two distinct phases, bullish and bearish. On completion of full one cycle i.e. termination of 8 waves movement, the fresh cycle starts with similar impulses arising out of market trading.

2.4.3 Random Walk Theory

While discussing the Dow Jones theory, we have seen that the theory is based on the assumption that the behaviour of stock market itself contains trends which give clues to the future behaviour of stock market prices. Thus, supporters of the theory argue that market prices can be predicted if their patterns can be properly understood. *Such analysis of stock market patterns is called technical analysis.* Apart from this theory there are many approaches to technical analysis. Most of them, however, involve a good deal of subjective judgment.

Many investment managers and stock market analysts believe that stock market prices can never be predicted because they are not a result of any underlying factors but are mere statistical ups and downs. This hypothesis is known as Random Walk hypothesis which states that the behaviour of stock market prices is unpredictable and that there is no relationship between the present prices of the shares and their future prices. Proponents of this hypothesis argue that stock market prices are independent. A British statistician, M. G. Kendell, found that changes in security prices behave nearly as if they are generated by a suitably designed roulette wheel for which each outcome is statistically independent of the past history. In other words, the fact that there are peaks and troughs in stock exchange prices is a mere statistical happening – successive peaks and troughs are unconnected. In the layman's language it may be said that prices on the stock exchange behave exactly the way a drunk would behave while walking in a blind lane, i.e., up and down, with an

unsteady way going in any direction he likes, bending on the side once and on the other side the second time.

The supporters of this theory put out a simple argument. It follows that:

(a)   Prices of shares in stock market can never be predicted.

(b)   The reason is that the price trends are not the result of any underlying factors, but that they represent a statistical expression of past data.

(c)   There may be periodical ups or downs in share prices, but no connection can be established between two successive peaks (high price of stocks) and troughs (low price of stocks).

2.5   Charting Techniques

Broadly technical analysts use four types of charts for analyzing data. They are as follows:

(i)   Line Chart: In a line chart, lines are used to connect successive day's prices. The closing price for each period is plotted as a point. These points are joined by a line to form the chart. The period may be a day, a week or a month.
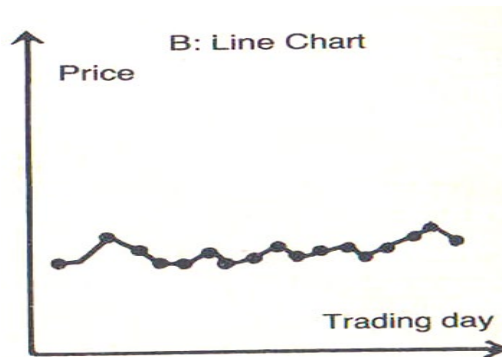

(ii)   Bar Chart: In a bar chart, a vertical line (Bar) represents the lowest to the highest price, with a short horizontal line protruding from the bar representing both the opening and closing prices for the period. For example, the prices of share of A Ltd. for 6 days are as follows:

Days	Opening Price (₹)	High Price (₹)	Low Price (₹)	Closing Price (₹)
01-Jan	58	72	52	68
02-Jan	71	73	58	64.30
03-Jan	66	67	56	57
04-Jan	58.50	75.50	55	72

| 05-Jan | 73.50 | 75 | 58 | 71 |
| 06-Jan | 74.50 | 76 | 55 | 74.50 |

The above-mentioned prices shall be depicted in Bar Chart as follows:
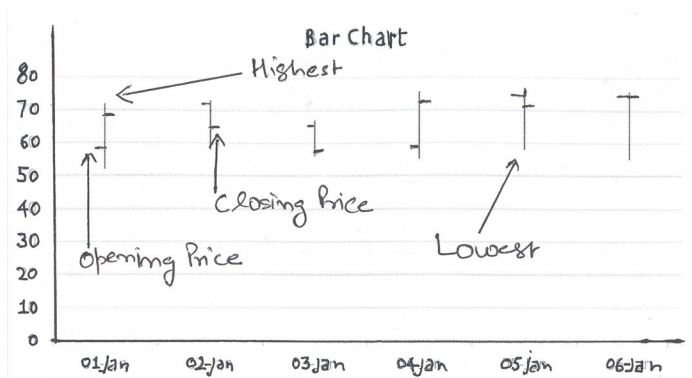
(iii) Japanese Candlestick Chat: Like Bar chart this chart also shows the same information i.e. Opening, Closing, Highest and Lowest prices of any stock on any day but this chart more visualizes the trend as change in the opening and closing prices is indicated by the color of the candlestick.

While Black candlestick indicates closing price is lower than the opening price the white candlestick indicates its opposite i.e. closing price is higher than the opening price. Another possibility of no change in opening and closing prices or very near is shown by 'Doji Candlestick'.

Thus, a white Candlestick indicates a Bullish trend and a black Candlestick indicates a bearish trend.

The lowest and highest prices are indicated by vertical bar and opening and closing prices are shown in the form of rectangular (as per above-mentioned color scheme) placed in between this bar. In case of Doji Candlestick it is indicated by a simple bar.

Continuing the above example the prices of share of A Ltd. as per Candlestick chart is shown below:
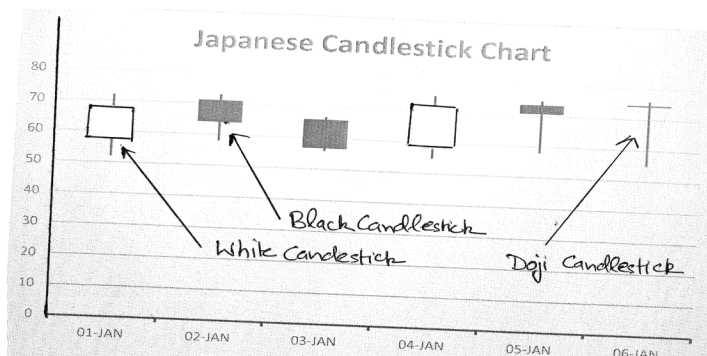
(iv) **Point and Figure Chart:** Point and Figure charts are more complex than line or bar charts. They are used to detect reversals in a trend. For plotting a point and figure chart, we have to first decide the box size and the reversal criterion. The box size is the value of each box on the chart, for example each box could be ₹ 1, ₹ 2 or ₹ 0.50. The smaller the box size, the more sensitive would the chart be to price change. The reversal criterion is the number of boxes required to be retraced to record prices in the next column in the opposite direction.

Period	Price
1	24
2	26
3	27
4	26
5	28
6	27
7	26
8	25
9	26
10	23

30								
29								
28	X							
27	X							
26	X							
25	X	O						
24	X	O						
23		O						
22								

2.6 Market Indicators

(i) **Breadth Index:** It is an index that covers all securities traded. It is computed by dividing the net advances or declines in the market by the number of issues traded. The breadth index either supports or contradicts the movement of the Dow Jones Averages. If it supports the movement of the Dow Jones Averages, this is considered sign of technical strength and if it does not support the averages, it is a sign of technical weakness i.e. a sign that the market will move in a direction opposite to the Dow Jones Averages. The breadth index is an addition to the Dow Theory and the movement of the Dow Jones Averages.

(ii) **Volume of Transactions:** The volume of shares traded in the market provides useful clues on how the market would behave in the near future. A rising index/price with increasing volume would signal buy behaviour because the situation reflects an unsatisfied demand in the market. Similarly, a falling market with increasing volume signals a bear market and the prices would be expected to fall further. A rising market with decreasing volume indicates a bull market while a falling

market with dwindling volume indicates a bear market. Thus, the volume concept is best used with another market indicator, such as the Dow Theory.

(iii)   Confidence Index*:* It is supposed to reveal how willing the investors are to take a chance in the market. It is the ratio of high-grade bond yields to low-grade bond yields. It is used by market analysts as a method of trading or timing the purchase and sale of stock, and also, as a forecasting device to determine the turning points of the market. A rising confidence index is expected to precede a rising stock market, and a fall in the index is expected to precede a drop in stock prices. A fall in the confidence index represents the fact that low-grade bond yields are rising faster or falling more slowly than high grade yields. The confidence index is usually, but not always a leading indicator of the market. Therefore, it should be used in conjunction with other market indicators.

(iv)   Relative Strength Analysis: The relative strength concept suggests that the prices of some securities rise relatively faster in a bull market or decline more slowly in a bear market than other securities i.e. some securities exhibit relative strength. Investors will earn higher returns by investing in securities which have demonstrated relative strength in the past because the relative strength of a security tends to remain undiminished over time.

Relative strength can be measured in several ways. Calculating rates of return and classifying those securities with historically high average returns as securities with high relative strength is one of them. Even ratios like security relative to its industry and security relative to the entire market can also be used to detect relative strength in a security or an industry.

(v)   Odd - Lot Theory*:* This theory is a contrary - opinion theory. It assumes that the average person is usually wrong and that a wise course of action is to pursue strategies contrary to popular opinion. The odd-lot theory is used primarily to predict tops in bull markets, but also to predict reversals in individual securities.

2.7   Support and Resistance Levels

When the index/price goes down from a peak, the peak becomes the resistance level. When the index/price rebounds after reaching a trough subsequently, the lowest value reached becomes the support level. The price is then expected to move between these two levels. Whenever the price approaches the resistance level, there is a selling pressure because all investors who failed to sell at the high would be keen to liquidate, while whenever the price approaches the support level, there is a buying pressure as all those investors who failed to buy at the lowest price would like to purchase the share. A breach of these levels indicates a distinct departure from status quo, and an attempt to set newer levels. Let us get a better understanding about these levels by using price data for about two months for shares of companies A and B given in the following Table:

| Date	A	B
Dec. 1, 2005	177	177
5	171	171.50
7	172	175.50
12	174	177
13	177.50	181
14	181	184
15	180	186.50
18	163	176
19	142	162.50
20	127	156
22	123	147
25	124	147
Jan. 3, 2006	107.50	137.50
4	97.50	140
8	105	145
10	102.50	143.75
12	108.75	150
15	100	142.50
25	95	135
26	91.25	133.75
Feb. 1	97.50	138.75
2	106.25	147.50
5	113.75	152.50
6	120	155
7	120	152.50
8	113.75	150
9	113.75	147.50

The line charts for Company A and Company B shares are shown in the graph below. From the charts, it appears that the support level and resistance level for Company A at that time were about ₹ 100 and ₹ 125, while these levels for Company B were ₹ 140 and ₹ 160.


Line Chart
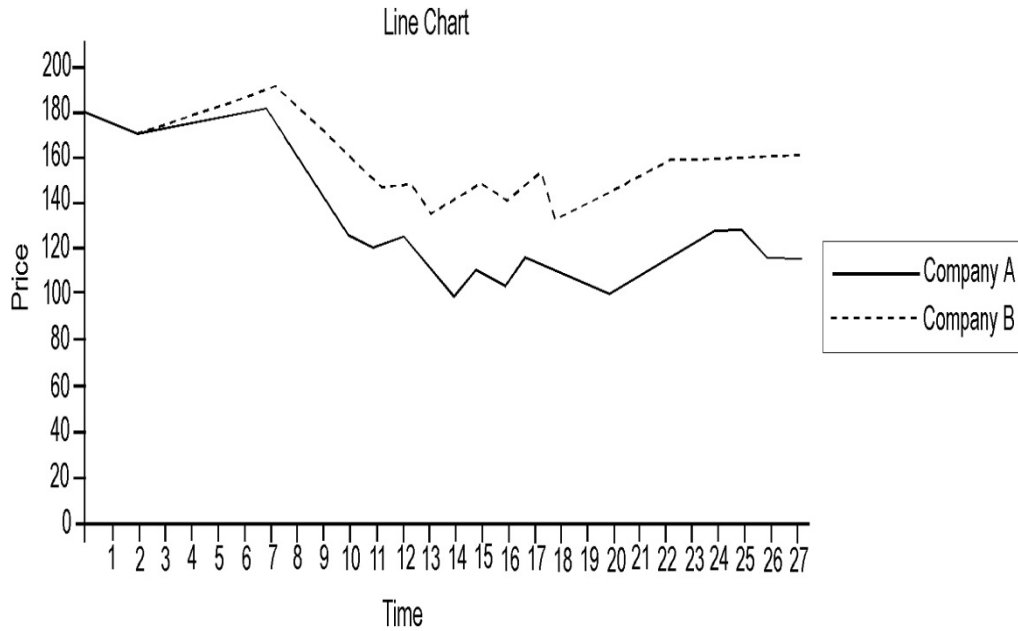
2.8 Interpreting Price Patterns

There are numerous price patterns documented by technical analysts but only a few and important of them have been discussed here:

(a) **Channel:** A series of uniformly changing tops and bottoms gives rise to a channel formation. A downward sloping channel would indicate declining prices and an upward sloping channel would imply rising prices.


Channel
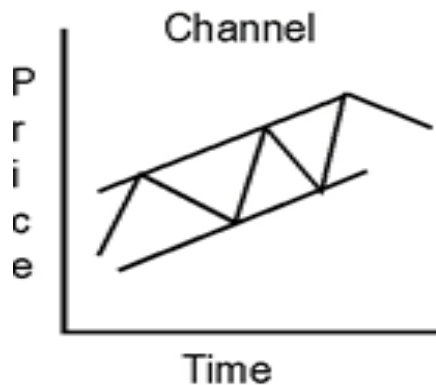
(b) **Wedge:** A wedge is formed when the tops (resistance levels) and bottoms (support levels) change in opposite direction (that is, if the tops, are decreasing then the bottoms are increasing and vice versa), or when they are changing in the same direction at different rates over time.
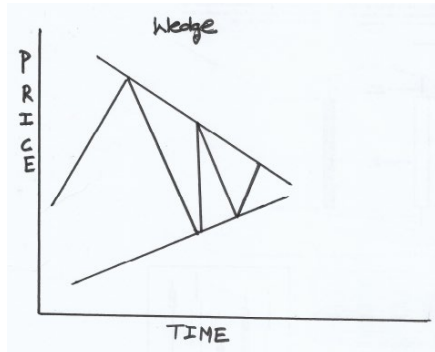
(c) **Head and Shoulders:** It is a distorted drawing of a human form, with a large lump (for head) in the middle of two smaller humps (for shoulders). This is perhaps the single most important pattern to indicate a reversal of price trend. The neckline of the pattern is formed by joining points where the head and the shoulders meet. The price movement after the formation of the second shoulder is crucial. If the price goes below the neckline, then a drop in price is indicated, with the drop expected to be equal to the distance between the top of the head and the neckline.
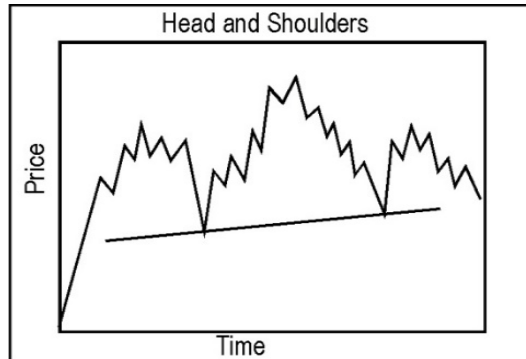

(i)   *Head and Shoulder Top Pattern*: This has a left shoulder, a head and a right shoulder. Such formation represents bearish development. If the price falls below the neck line (line drawn tangentially to the left and right shoulders) a price decline is expected. Hence it's a signal to sell.

(ii) *Inverse Head and Shoulder Pattern*: As the name indicates this formation, it is an inverse of head and shoulder top formation. Hence it reflects a bullish development. The price rise to above the neck line suggests price rise is imminent and a signal to purchase.
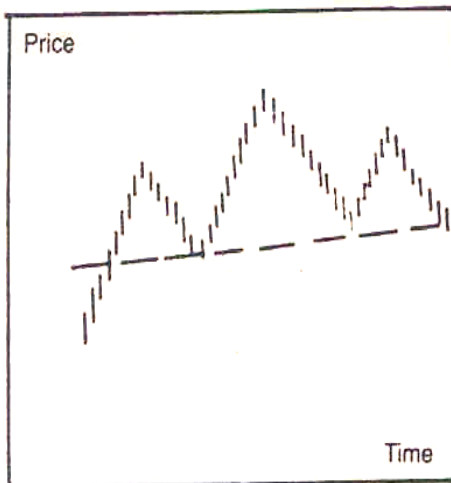
HEAD & SHOULDERS
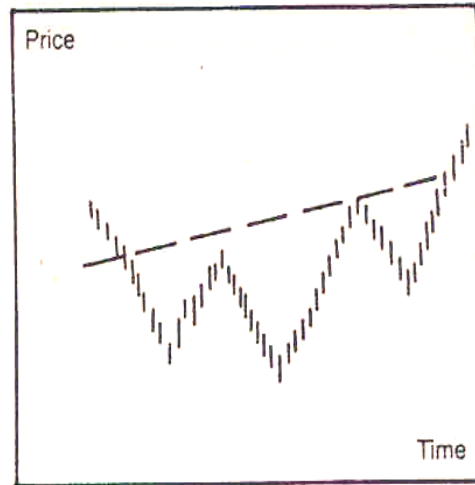
INVERSE HEAD & SHOULDERS

(d)   Triangle or Coil Formation: This formation represents a pattern of uncertainty and is difficult to predict which way the price will break out.

(e)   Flags and Pennants Form: This form signifies a phase after which the previous price trend is likely to continue.
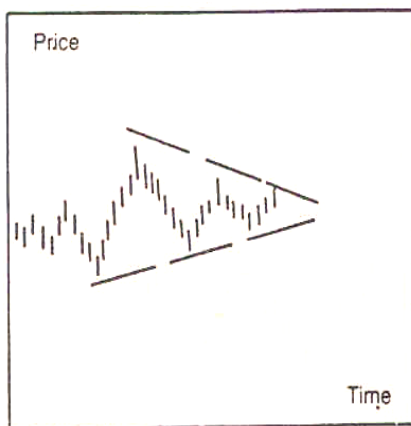
TRIANGLE OR COIL
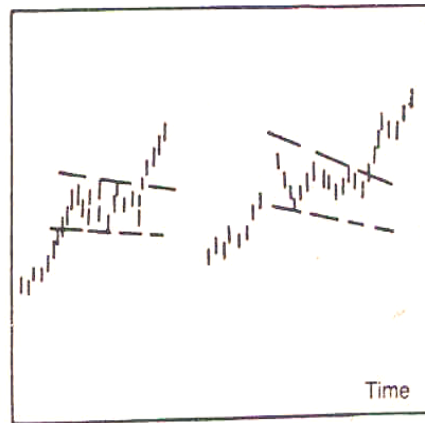
FLAG & PENNANT

(f)   Double Top Form: This form represents a bearish development signaling that price is expected to fall.

(g)   Double Bottom Form: This form represents bullish development signaling price is expected to rise.
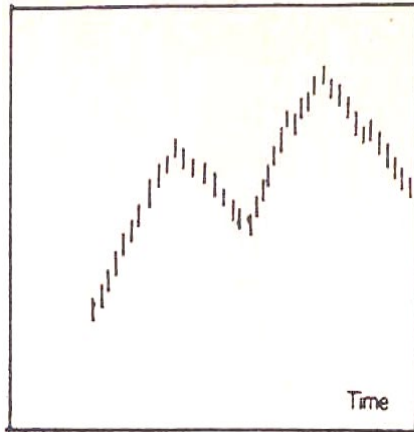
DOUBLE TOP   **DOUBLE BOTTOM**

(h)   Gap*:* A gap is the difference between the opening price on a trading day and the closing price of the previous trading day. The wider the gap the stronger the signal for a continuation of the observed trend. On a rising market, if the opening price is considerably higher than the previou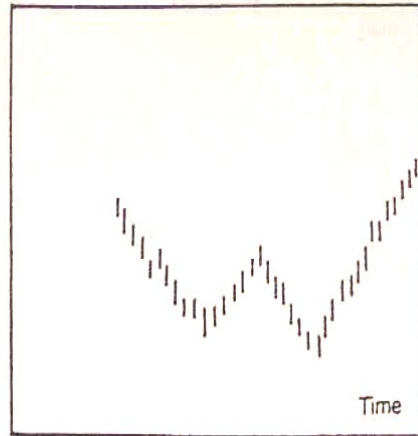s closing price, it indicates that investors are willing to pay a much higher price to acquire the scrip. Similarly, a lower gap in a falling market is an indicator of extreme selling pressure.

2.9   Decision Using Data Analysis

Technical analysts have developed rules based on simple statistical analysis of price data. Moving Averages is one of the more popular methods of data analysis for decision making.

Moving averages are frequently plotted with prices to make buy and sell decisions. The two types of moving averages used by chartists are as follows:

(a) Arithmetic Moving Average (AMA): An *n*-period AMA, at period *t*, is nothing but the simple average of the last *n* period prices.

$$AMA_{n,t} = 1/n[P_t + P_{t-1} + \dots + P_{t-(n-1)}]$$

To identify trend, technical analysts use moving average analysis:

(i)   A 200 day's moving average of daily prices or a 30 week moving of weekly price for identifying a long term trend.

(ii)   A 60 day's moving average of daily price to discern an intermediate term trend.

(iii)   A 10 day's moving average of daily price to detect a short term trend.

For example, Moving Average is calculated by considering the most recent observation for which the closing price of a stock on '10' successive trading days are taken into account for the calculation of a 5 -day moving average of daily closing prices.

Trading day	Closing prices	Sum of 5 most recent closing price	Two-item Centered Total	Moving Average
1	25.00			
2	26.00			
3	25.50			
4	24.50			
5	26.00	127.00		
6	26.00	128.00	255.00	25.50
7	26.50	128.50	256.50	25.65
8	26.50	129.50	258.00	25.80
9	26.00	131.00	260.50	26.05
10	27.00	132.00	263.00	26.30

Buy and Sell Signals Provided by Moving Average Analysis

Buy Signal	Sell Signal
(a) Stock price line rise through the moving average line when graph of the moving average line is flattering out.	(a) Stock price line falls through moving average line when graph of the moving average line is flattering out.
(b) Stock price line falls below moving average line which is rising.	(b) Stock price line rises above moving average line which is falling.
(c) Stock price line which is above moving average line falls but begins to rise again before reaching the moving average line	(c) Stock price line which is slow moving average line rises but begins to fall again before reaching the moving average line.

(b) **Exponential Moving Average:** Unlike the AMA, which assigns equal weight of $1/n$ to each of the n prices used for computing the average, the Exponential Moving Average (EMA) assigns decreasing weights, with the highest weight being assigned to the latest price. The weights decrease

exponentially, according to a scheme specified by the exponential smoothing constant, also known as the exponent, a.

$$EMA_t = aP_t + (1-a)(EMA_{t-1})$$

Where, a (exponent) = $\dfrac{2}{n+1}$

P_t = Price of today

EMA_{t-1} = Previous day's EMA

Or

EMA_t = (Closing Price of the day – EMA of Previous Day) x Exponent + Previous day EMA

n = Number of days for which average is to be calculated.

2.10 Evaluation of Technical Analysis

Technical Analysis has several supporters as well several critics. The advocates of technical analysis offer the following interrelated argument in their favour:

(a)   Under influence of crowd psychology trend persist for some time. Tools of technical analysis help in identifying these trends early and help in investment decision making.

(b)   Shift in demand and supply are gradual rather then instantaneous. Technical analysis helps in detecting this shift rather early and hence provides clues to future price movements.

(c)   Fundamental information about a company is observed and assimilated by the market over a period of time. Hence price movement tends to continue more or less in same direction till the information is fully assimilated in the stock price.

Detractors of technical analysis believe that it is an useless exercise; their arguments are as follows:

(a)   Most technical analysts are not able to offer a convincing explanation for the tools employed by them.

(b)   Empirical evidence in support of random walk hypothesis cast its shadow over the usefulness of technical analysis.

(c)   By the time an uptrend and down trend may have been signalled by technical analysis it may already have taken place.

(d)   Ultimately technical analysis must be a self-defeating proposition. With more and more people employing it, the value of such analysis tends to decline.

In a nutshell, it may be concluded that in a rational, well ordered and efficient market, technical analysis may not work very well. However, with imperfection, inefficiency and irrationalities that characterizes the real-world market, technical analysis may be helpful. If technical analysis is used in conjunction with fundamental analysis, it might be useful in providing proper guidance to investment decision makers.

3. DIFFERENCES BETWEEN FUNDAMENTAL ANALYSIS AND TECHNICAL ANALYSIS

Although a successful investor uses both Fundamental and Technical Analysis but following are some major differences between them:

S. No.	Basis	Fundamental Analysis	Technical Analysis
1	Method	Prospects are measured by analyzing economy's macro factors such as Country's GDP, Inflation Rate, Interest Rate, Growth Rate etc. and company's micro factors like its Sales, Profitability, Solvency, Asset & Liabilities and Cash position etc.	Predicts future prices and their direction using purely historical market data and information such as their Price Movements, Volume, Open Interest etc.
2	Rule	Prices of a share discounts everything.	Price captures everything
3	Usefulness	For Long-Term Investing	For Short-term Investing

4. EFFICIENT MARKET THEORY (EFFICIENT MARKET HYPOTHESIS)

Efficient Market Theory was developed by University of Chicago professor Eugen Fama in the 1960s. As per this theory, at any given time, all available price sensitive information is fully reflected in securities' prices. Thus, this theory implies that no investor can consistently outperform the market as every stock is appropriately priced based on available information.

Stating otherwise this theory states that no one can "beat the market" hence making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices as stocks are always traded at their fair value on stock exchanges. Hence it is impossible to outperform the overall market through expert stock selection or market timing and that the only way an investor can possibly obtain higher returns is by purchasing risky investments.

4.1 Search for Theory

When empirical evidence in favour of Random walk hypothesis seemed overwhelming, researchers wanted to know about the Economic processes that produced a Random walk. They concluded that randomness of stock price was a result of efficient market that led to the following view points:

- Information is freely and instantaneously available to all market participants.

- Keen competition among the market participants more or less ensures that market will reflect intrinsic values. This means that they will fully impound all available information.

- Price change only response to new information that is unrelated to previous information and therefore unpredictable.

4.2 Misconception about Efficient Market Theory

Efficient Market Theory implies that market prices factor in all available information and as such it is not possible for any investor to earn consistent long term returns from market operations.

Although price tends to fluctuate they cannot reflect fair value. This is because the future is uncertain. The market springs surprises continually and as prices reflect the surprises they fluctuate.

Inability of institutional portfolio managers to achieve superior investment performance implies that they lack competence in an efficient market. It is not possible to achieve superior investment performance since market efficiency exists due to portfolio mangers doing this job well in a competitive setting.

The random movement of stock prices suggests that stock market is irrational. Randomness and irrationality are two different things, if investors are rational and competitive, price changes are bound to be random.

4.3 Level of Market Efficiency

That price reflects all available information, the highest order of market efficiency. According to Eugene Fama, there exist three levels of market efficiency:-

(i) *Weak form efficiency* – Price reflects all information found in the record of past prices and volumes.

(ii) *Semi – Strong efficiency* – Price reflects not only all information found in the record of past prices and volumes but also all other publicly available information.

(iii) *Strong form efficiency* – Price reflects all available information public as well as private.

4.4 Empirical Evidence on Weak form of Efficient Market Theory

According to the Weak form Efficient Market Theory current price of a stock reflect all information found in the record of past prices and volumes. This means that there is no relationship between the past and future price movements.

Three types of tests can be employed to empirically verify the weak form of Efficient Market Theory- Serial Correlation Test, Run Test and Filter Rule Test.

(a) *Serial Correlation Test*: To test for randomness in stock price changes, one has to look at serial correlation. For this purpose, price change in one period has to be correlated with price change in some other period. Price changes are considered to be serially independent. Serial correlation studies employing different stocks, different time lags and different time period have been conducted to detect serial correlation but no significant serial correlation could be discovered. These studies were carried on short term trends viz. daily, weekly, fortnightly and monthly and not in long term trends in stock prices as in such cases. Stock prices tend to move upwards.

(b) *Run Test*: Given a series of stock price changes each price change is designated + if it represents an increase and – if it represents a decrease. The resulting series may be -,+, - , -, - , +, +.

A run occurs when there is no difference between the sign of two changes. When the sign of change differs, the run ends and new run begins.

$$\frac{+\,+}{1}\,/\,\frac{-\,-\,-}{2}\,/\,\frac{+}{3}\,/\,\frac{-}{4}\,/\,\frac{+}{5}\,/\,\frac{-\,-}{6}\quad\frac{+\,+}{1}\,/\,\frac{-\,-\,-}{2}\,/\,\frac{+}{3}\,/\,\frac{-}{4}\,/\,\frac{+}{5}\,/\,\frac{-\,-}{6}$$

To test a series of price change for independence, the number of runs in that series is compared with a number of runs in a purely random series of the size and in the process determines whether it is statistically different. By and large, the result of these studies strongly supports the Random Walk Model.

(c) *Filter Rules Test*: If the price of stock increases by at least N% buy and hold it until its price decreases by at least N% from a subsequent high. When the price decreases at least N% or more, sell it. If the behaviour of stock price changes is random, filter rules should not apply in such a buy and hold strategy. By and large, studies suggest that filter rules do not out perform a single buy and hold strategy particular after considering commission on transaction.

4.5 Empirical Evidence on Semi-strong Efficient Market Theory

Semi-strong form efficient market theory holds that stock prices adjust rapidly to all publicly available information. By using publicly available information, investors will not be able to earn above normal rates of return after considering the risk factor. To test semi-strong form efficient market theory, a

number of studies was conducted which lead to the following queries: Whether it was possible to earn on the above normal rate of return after adjustment for risk, using only publicly available information and how rapidly prices adjust to public announcement with regard to earnings, dividends, mergers, acquisitions, stock-splits?

Several studies support the Semi-strong form Efficient Market Theory. Fama, Fisher, Jensen and Roll in their adjustment of stock prices to new information examined the effect of stock split on return of 940 stock splits in New York Stock Exchange during the period 1957-1959 They found that prior to the split, stock earns higher returns than predicted by any market model.

Boll and Brown in an empirical evaluation of accounting income numbers studied the effect of annual earnings announcements. They divided the firms into two groups. First group consists of firms whose earnings increased in relation to the average corporate earnings while second group consists of firms whose earnings decreased in relation to the average corporate earnings. They found that before the announcement of earnings, stock in the first group earned positive abnormal returns while stock in the second group earned negative abnormal returns after the announcement of earnings. Stock in both the groups earned normal returns.

There have been studies which have been empirically documented showing the following inefficiencies and anomalies:

- Stock price adjust gradually not rapidly to announcements of unanticipated changes in quarterly earnings.
- Small firms' portfolio seemed to outperform large firms' portfolio.
- Low price earning multiple stock tend to outperform high price earning multiple stock.
- Monday's return is lower than return for the other days of the week.

4.6 Empirical Evidence on Strong form of Efficient Market Theory

According to the Efficient Market Theory, all available information, public or private, is reflected in the stock prices. This represents an extreme hypothesis.

To test this theory, the researcher analysed returns earned by certain groups viz. corporate insiders, specialists on stock exchanges, mutual fund managers who have access to internal information (not publicly available), or possess greater resource or ability to intensively analyse information in the public domain. They suggested that corporate insiders (having access to internal information) and stock exchange specialists (having monopolistic exposure) earn superior rate of return after adjustment of risk.

Mutual Fund managers do not on an average earn a superior rate of return. No scientific evidence has been formulated to indicate that investment performance of professionally managed portfolios as a group has been any better than that of randomly selected portfolios. This was the finding of Burton Malkiel in his Random Walk Down Wall Street, New York.

4.7 Challenges to the Efficient Market Theory

(a)   Information inadequacy – Information is neither freely available nor rapidly transmitted to all participants in the stock market. There is a calculated attempt by many companies to circulate misinformation.

(b)   Limited information processing capabilities – Human information processing capabilities are sharply limited. According to Herbert Simon every human organism lives in an environment which generates millions of new bits of information every second but the bottlenecks of the perceptual apparatus does not admit more than thousand bits per seconds and possibly much less.

David Dreman maintained that under conditions of anxiety and uncertainty, with a vast interacting information grid, the market can become a giant.

(c)   Irrational Behaviour – It is generally believed that investors' rationality will ensure a close correspondence between market prices and intrinsic values. But in practice this is not true. J. M. Keynes argued that all sorts of consideration enter into the market valuation which is in no way relevant to the prospective yield. This was confirmed by L. C. Gupta who found that the market evaluation processes work haphazardly almost like a blind man firing a gun. The market seems to function largely on hit or miss tactics rather than on the basis of informed beliefs about the long term prospects of individual enterprises.

(d)   Monopolistic Influence – A market is regarded as highly competitive. No single buyer or seller is supposed to have undue influence over prices. In practice, powerful institutions and big operators wield great influence over the market. The monopolistic power enjoyed by them diminishes the competitiveness of the market.

5.   EQUITY RESEARCH AND TOOLS AVAILABLE

Equity Research is that area of finance or Investment Banking that involves the analysis of company's financial performance and other factors to determine whether the equity share of the same company should be bought, sold or continued to be hold. This research can also be applied in any merger and acquisition to decide about the swap or exchange ratio.

People involved in performing equity research are called Equity Research Analysts. Earlier equity research used to be paper based, and analysts needed to refer various reports, data, and graphs etc. However, with the advent of internet now a days most analysts use various tools available online.

Some of the Equity Research tool available on internet are as follows:

S. No.	Name	Founded in	Website
1	Bloomberg Terminal	1981	https://www.bloomberg.com/professional/solution/bloomberg-terminal/
2	Benzinga Pro	2010	https://pro.benzinga.com
3	Refinitiv EIKON	2010	https://www.refinitiv.com
4	MarketXLS	2015	https://marketxls.com
5	Stockopedia	2010	https://www.stockopedia.com
6	Koyfin	2016	https://www.koyfin.com
7	Finbox.io	2014	https://finbox.com
8	GuruFocus	2004	https://www.gurufocus.com
9	Business Quant	2014	https://businessquant.com
10	Ycharts	2009	https://get.ycharts.com

Note: Students are advised to refer basic details of the tools available by referring the respective websites without subscribing and making any type of payment.

TEST YOUR KNOWLEDGE

Theoretical Questions

1. Explain the Efficient Market Theory in and what is major misconception about this theory?

2. Explain Dow theory.

3. Explain the Elliot Wave Theory of technical analysis.

4. Explain the various indicators that can be used to assess the performance of an economy.

Practical Questions

1. Closing values of NSE Nifty from 6th to 17th day of the month of January of the year 2020

were as follows:

Days	Date	Day	Sensex
1	6	THU	14522
2	7	FRI	14925
3	8	SAT	No Trading
4	9	SUN	No Trading
5	10	MON	15222
6	11	TUE	16000
7	12	WED	16400
8	13	THU	17000
9	14	FRI	No Trading
10	15	SAT	No Trading
11	16	SUN	No Trading
12	17	MON	18000

Calculate Exponential Moving Average (EMA) of Sensex during the above period. The previous day exponential moving average of Sensex can be assumed as 15,000. The value of exponent for 31 days EMA is 0.062.

Give detailed analysis on the basis of your calculations.

2. The closing value of a Stock Market Index for the month of October, 2007 is given below:

Date Closing	Index Value
1.10.07	2800
3.10.07	2780
4.10.07	2795
5.10.07	2830
8.10.07	2760
9.10.07	2790
10.10.07	2880
11.10.07	2960
12.10.07	2990
15.10.07	3200
16.10.07	3300

17.10.07	3450
19.10.07	3360
22.10.07	3290
23.10.07	3360
24.10.07	3340
25.10.07	3290
29.10.07	3240
30.10.07	3140
31.10.07	3260

You are required to test the weak form of efficient market hypothesis by applying the run test at 5% and 10% level of significance.

Following values can be used:

Value of t at 5% is 2.101 at 18 degrees of freedom

Value of t at 10% is 1.734 at 18 degrees of freedom

Answers to Theoretical Questions

1.　　Please refer paragraph 4.

2.　　Please refer paragraph 2.4.1.

3.　　Please refer paragraph 2.4.2.

4.　　Please refer paragraph 1.2.2.

Answers to the Practical Questions

1.

Date	1 Sensex	2 EMA for Previous day	3 1-2	4 3×0.062	5 EMA 2 ± 4
6	14522	15000	(478)	(29.636)	14970.364
7	14925	14970.364	(45.364)	(2.812)	14967.55
10	15222	14967.55	254.45	15.776	14983.32

11	16000	14983.32	1016.68	63.034	15046.354
12	16400	15046.354	1353.646	83.926	15130.28
13	17000	15130.28	1869.72	115.922	15246.202
17	18000	15246.202	2753.798	170.735	15416.937

Conclusion – The market is bullish. The market is likely to remain bullish for short term to medium term if other factors remain the same. On the basis of this indicator (EMA) the investors/brokers can take long position.

2.

Date	Closing Index	Sign of Price Charge
1.10.07	2800	
3.10.07	2780	-
4.10.07	2795	+
5.10.07	2830	+
8.10.07	2760	-
9.10.07	2790	+
10.10.07	2880	+
11.10.07	2960	+
12.10.07	2990	+
15.10.07	3200	+
16.10.07	3300	+
17.10.07	3450	+
19.10.07	3360	-
22.10.07	3290	-
23.10.07	3360	+
24.10.07	3340	-
25.10.07	3290	-
29.10.07	3240	-
30.10.07	3140	-
31.10.07	3260	+

Total of sign of price changes (r) = 8

No of Positive changes = n_1 = 11

No. of Negative changes = n_2 = 8

$$\mu_r = \frac{2n_1n_2}{n_1+n_2}+1$$

$$\mu = \frac{2\times11\times8}{11+8}+1 = 176/19 + 1 = 10.26$$

$$\hat{\sigma}_r = \sqrt{\frac{2n_1n_2(2n_1n_2-n_1-n_2)}{(n_1+n_2)^2(n_1+n_2-1)}}$$

$$\hat{\sigma}_r = \sqrt{\frac{(2\times11\times8)(2\times11\times8-11-8)}{(11+8)^2(11+8-1)}} = \sqrt{\frac{176\times157}{(19)^2(18)}} = \sqrt{4.252} = 2.06$$

Since too few runs in the case would indicate that the movement of prices is not random. We employ a two- tailed test the randomness of prices.

Test at 5% level of significance at 18 degrees of freedom using t- table

The lower limit

$$= \mu - t \times \hat{\sigma}_r = 10.26 - 2.101 \times 2.06 = 5.932$$

Upper limit

$$= \mu + t \times \hat{\sigma}_r = 10.26 + 2.101 \times 2.06 = 14.588$$

At 10% level of significance at 18 degrees of freedom

Lower limit

= 10.26 – 1.734 × 2.06 = 6.688

Upper limit

= 10.26 + 1.734 × 2.06 = 13.832

As seen r lies between these limits. Hence, the market exhibits weak form of efficiency.

*For a sample of size n, the t distribution will have n-1 degrees of freedom.