Chapter 1

Introduction

During the past several decades, the controversy surrounded two issues – (i) the extent to which the prices of stocks can be predicted and (ii) the process which determines the stocks prices. The economists, mathematicians, statisticians, financial analysts and teachers of finance have shown keen interest in the stock pricing mechanism and the behaviour of pricing in the capital market. This resulted in the development of models, techniques, empirical studies, evidences and explosive growth of literature on capital market.

Technical analysis and fundamental analysis are the two traditional approaches to describing and predicting stock price behaviour. Both the approaches have the same objective of buying stock at a low price and selling at a high price to get maximum return on investment. Fama (1965) asserted, “the basic assumption of technical analysis is that history tends to repeat itself, i.e., past patterns of price behaviour in an individual securities will tend to recur in the future” (p 55) Chartists believe that they could not only predict future movements in stock prices on the basis of past price movements pattern, but also be exploited profitability. Fama (1965) stated:

“The fundamental analysis approach assumes that at any point in time an individual security has an intrinsic value (or in terms of the economists, an equilibrium price) will depends on the earnings potential of the security. The earnings potential of the security depends in turn on such fundamental factors as quality of management, outlook for the industry and economy, etc.” (p 55)

When the two traditional approaches i.e., technical and fundamental analysis were dominating the market as tools for identifying, purchasing and selling of mispriced securities, it was challenged in 1960s by a counter theory called “Random Walk Theory.” The basic assumption of random walk theory is that stock price changes are “independent” of each other. According to Fama (1966) independent refers to past changes in the stock price, which cannot be used to predict future changes in stock prices. The proponent of random walk theory believes that it is not possible to beat the market consistently without taking additional risk. “The random walk theory has subsequently been referred to as the weak form of efficient market...
hypothesis" (Dyckman et al., 1975, p. 5). This theory cast serious doubt on technical and fundamental analysis as a tool of describing and predicting stock price behaviour. The proponents of efficient market theory challenged both the technical and fundamental analysis. They argued that if the market were weak form, or semi-strong form efficient, then technical or fundamental analysis would yield smaller or no abnormal returns. Thus, an interesting and extremely important debate started between technical, fundamental analysts, and proponents of efficient market hypothesis. In this context, it is appropriate to describe in brief the technical and fundamental analysis as a background to the efficient market hypothesis (EMH).

1.1 Technical Analysis

Technical analysis refers to trading rules based on price and return patterns. It involves studying the past prices and volume with an objective of predicting the future movement of stock prices. Technical analysts also called technicians claim that investors are not able to act immediately to new information, which leads to mispricing of securities. By buying or selling mispriced security, it is possible to earn abnormal returns or to outperform the market. Levy (1966) summarised the rational behind the technical analysis:

"The basic assumption of technical theorists is that history tends to repeat itself. In other words, past patterns of market behavior will recur in the future and can thus be used for predictive purposes. In statistical terminology, the stock market technician relies upon the dependence of successive price changes" (p. 83)

Technical analysts employ different techniques to assess the past prices and to predict future prices of the securities. These include bar charts, contrary opinion theories, confidence index, relative strength analysis, moving average analysis, trend lines, reversal patterns, oscillators, filter rules, the Dow theory, Elliot Waves, etc. Although most of these techniques are used in the U.S. stock market, a few techniques are popular in other countries including India.

1.1.1 Relative Strength analysis

Relative strength and filter rule are the two most widely used mechanical trading rules. The relative strength theory holds that stock, which had outperformed the market in the past, will continue to output the market in the future, and stock that
have done poorly will continue to perform poorly. If the relative strength is correct, it is possible to get useful information from past prices for predicting future prices. This situation will occur only when the market is not efficient in the semi-strong form.

Levy (1967a,b) tested whether relative strength measure can outperform the market. He studied weekly closing prices of 200 stocks from the New York Stock Exchange covering a 200 weeks period from 1960 to 1965. He found that it is possible to beat the market because the returns from relative strength rules were almost double than the returns produced by a simple buy-and-hold policy. Jensen (1967) pointed out that due to several errors, the results reported by Levy overstated the excess returns earned by the trading rules over the returns earned by buy-and-hold policy. Even after correction of these errors, Levy’s result indicated that some of the trading rules earned return substantially more than the buy-and-hold returns. Jensen argued that even these results were inconclusive because of selection bias. Jensen and Bennington (1970) also pointed out some errors in the methodology used by Levy (1967). Using the same sample, trading rules and transaction costs, the trading rules did not on the average earn significantly more returns than the buy-and-hold policy. After adjustment for the risk and transactions costs, the trading rules tested earned on average -0.31 percent and -2.36 percent less than an equivalent risk buy-and-hold policy.

Mahapatra (1995) tested relative strength theory in the Indian stock market. The rank correlation analysis has been employed to examine the relative strength in the performance of 26 major stocks traded in the Bombay Stock Exchange during the period January 1989 to December 1992. He found that dividend per share (DPS) positively and yields negatively are associated with the share price. But, size of the firm, return on investment (ROI), earnings per share (EPS) and book value per share (BVPS) are not significant determinants of share prices.

1.1.2 Filter Rules

It is any trading rule where decisions are based on price movements. An x percent filter is, defined by Fama (1965a) as follows:

"If the daily closing price of a particular security moves up at least x percent, buy and hold the security until its price moves down at least x percent from a subsequent high, at which time simultaneously sell and go short. The short position is maintained until the daily closing price raises at least x percent."
above a subsequent low at which time one covers and buys. Moves less than x percent in either direction are ignored" (p 81)

Alexander formulated the filter techniques to test the belief, widely held among market professionals, that prices adjust gradually to new information Alexander (1961) observed:

"The professional analysts operate in the belief that there exists certain trend generating facts, knowable today, which will guide a speculator to profit if only he can read them correctly. These facts are assumed to generate trends rather than instantaneous jumps because most of those trading in speculative markets have imperfect knowledge of these facts, and the future trend of price will result from a gradual spread of awareness of these facts throughout the market" (p 7).

Alexander (1961) tested filter techniques for filters ranging in size from 5 to 50 percent. The test covered different time period from 1897 to 1959 and he used two indices, the Dow-Jones Industrial Average (DJIA) from 1897 to 1929 and Standard and Poor's Industrial Average from 1929 to 1959. He found that filter of all different size and for all the different time periods yielded profits significantly more than buy-and-hold policy and he concluded that random walk model will not hold good in the market. However, Mandelbrot (1963) highlighted computational biases in Alexander's work, which led to overstatement of the profitability of the filters. Alexander (1964) retested his earlier (1961) results to incorporate biases suggested by Mandelbrot. In the retests the profitability of the filter technique was drastically reduced, but superior to simple buy-and-hold policy. Fama and Blume (1966) tested 24 different filters ranging from 0.5 percent to 50 percent by taking 30 samples with 1200 to 1700 observations per sample. They concluded that in the presence of transaction costs no filter rule earn excess return over the simple buy-and-hold policy. Fama (1965), Mandelbort (1966), and Jensen and Benigton (1970) tested usefulness of filter rules in outperforming the market. Using different ranged filters, they found that in the presence of transaction costs, no filter rule outperformed the buy-and-hold policy. Testing the filter strategy on UK data, O’Hanlon and Ward (1986) reported that filter rule was a successful strategy over the period 1919 to 1970 but it failed to produce excess returns during a later period 1971-1984. Hudson et al (1996) applied technical trading rules to UK share prices from 1935 to 1994 and concluded that although the technical trading rules examined do have predictive ability to beat the
market in terms of UK data, their use would not allow investors to make excess returns in the presence of costly transaction cost.

Krishna Rao (1988) employed serial correction analysis, runs test and filter rules to the weekly share price data of 10 blue chip companies for the period July 1982 to June 1987. He used three filters of 3 percent, 5 percent and 10 percent and showed that rate of return under filter technique is less than buy-and-hold strategy. Therefore, he concluded that stock market is weak form efficient.

Pruitt and White (1988) investigated the profitability performance of a multi-component technical trading rule, which is called 'CRISMA'. CRISMA had three technical indicators as its components viz Cumulative Volume, Relative Strength and Moving Average. They showed that CRISMA trading rule was capable of outperforming a simple buy-and-hold strategy over a significant period of time even after adjusting for trade timing, risk and transactions costs. In contrast, James (1968) and Van Horne and Praker (1967) have found that various trading rules based upon moving averages of past prices do not yield profits greater than those of a buy-and-hold policy.

Brock et al. (1992) demonstrated that simple technical trading rules have significant predictive ability for changes in the Dow Jones Industrial Average (DJIA) over the period 1897 to 1986. Sweeney (1986) and Neely et al. (1997) documented the success of similar technical rules for forecasting changes in currency exchange rates. But, Bessembinder and Chan (1998) found that return from using technical rules is very small compared to actual transactions costs.

1.2 Fundamental Analysis

Fundamental analysis uses accounting data, news about the firm and its industry, and forecasts of macro and microeconomic conditions to determine the prospects of the firm and its current value. A fundamental analyst seeks to detect mispriced securities through an analysis of the firm's business prospects. Research often focuses on earnings, dividend prospects, expectations for future interest rates, and risk evaluation of the firm. In macroeconomic analysis, information such as interest rates, a change in supply of money, GNP, inflation, unemployment and inventories is used to predict the direction of the economy, and therefore, the stock market. In microeconomic analysis, information such as balance sheet, income statement, quality of products, management and other aspects are used to forecast a
company’s immediate success or failure, and hence, the future movement of stock price. Fundamental analysts believe that market occasionally misprices the security and the investors who discover the discrepancy could earn abnormal profits. Hence, their strategy would be to buy undervalued and sell overvalued shares to earn profit.

Black (1986) mentioned that nobody knows a company’s intrinsic value. Under efficient market hypothesis, it is impossible to predict events that might change the intrinsic value. Shleifer and Vishny (1997) and Shleifer (1999) related fundamental analysts to arbitrageurs, who bet against the market. They suggested that this strategy might be dangerous to pursue, as the stock price might deviate from its intrinsic value for a long period of time. In effect, new information might change the intrinsic value before anomaly is restored. Therefore, fundamental analysis strategies would be relatively risky.

1.2.1 The Economic Analysis

Investment in securities is closely associated with the economic conditions. It is likely to be more profitable if economy is strong and prosperous. Economic situations affect company’s profitability and the industry to which it belongs, investors’ attitude, expectations and finally the stock prices. There are three types of economic indicators. They are (i) Leading indicators - the economic variables that are supposed to move ahead of the economy; (ii) Coincidental indicators - economic variables that are supposed to move with the economy; (iii) Lagging indicators - economic variables that are supposed to move behind the economy.

Stock price responses to macroeconomic events such as changes in money supply, interest rate, GNP, inflation, unemployment, tax policy, monsoon, agricultural output, etc have received considerable attention in the USA and other developed countries. Ghosh and Ortiz (1994) argued that financial markets were becoming more sensitive to fundamental factors on a worldwide basis due to increasing globalisation and declining barriers to investment and capital flows. In a major study covering the period 1927 to 1960, King (1966) found that more than 50 percent variation in the prices of stock could be attributed to market influence. Livingston (1977) showed that approximately 23 percent of the variability in stock returns were caused by the market effect. Studies by Homa and Jaffe (1971) and Hamburger and Kochin (1972) found that increase in the money supply led to increase in stock prices. Pearce and Roley (1983) using weekly data from September 20, 1977 to January 29, 1982 found that
stock price responded only to the unanticipated changes in the money supply. An unanticipated increase in the money supply decreases stock prices, while an unanticipated decrease in the money supply increases stock prices. He concluded that stock price responds immediately and it is completed early in the subsequent trading day confirming market efficiency. The implications of these works were that investors could earn excess returns by using a trading strategy based on the observed behaviour of the money stock. This contradicts the efficient market hypothesis, which asserts that stock prices reflect all available information. But Cooper (1974), Pesando (1974), Rozell (1974) and Rogalski and Vinso (1977) have shown that past money changes do not contain predictive information on stock prices. These results support the efficient market hypothesis.

When money supply rises faster and beyond expectation, investors revise upwards their expectations of future inflation, which in turn decreases stock prices. Feldstein (1980) found that increased inflation decreases real after tax profits because of the non-indexation of inventory and depreciation changes, and this will tend to decrease stock prices. An increase in expected inflation will also decrease stock prices if it raises the expected return on an alternative asset such as owner occupied house. Modigliani and Cohn (1979) showed that higher anticipated inflation would cause stock prices to fall, because investors mistakenly compare the nominal return on bonds, affected by inflation to the earning price ratios of stocks. Many empirical studies have found a negative relationship between inflation and stock prices. The results of empirical studies conducted by Bodie (1976), Jaffe and Mandelker (1976), Nelson (1976), and Fama and Schwert (1977) are in sharp contrast to the traditional view that stock prices are either affected by or positively related to expected inflation. Cox et al (1994) examined the stock price reaction to the Tax Reforms Act (TRA) of 1986 in the USA. They reported evidence of significant abnormal returns around the date of announcement of the TRA.

In India there are a few studies on economic analysis. Subramaniam (1989) examined the impact of inflation, money supply and political events on stock prices. He concluded that the market appears to respond more efficiently to events, which are simple and clear and inefficiently in the case of complex and unambiguous events.

Nageswara Rao (1997) showed that market is efficient in discounting information, which is direct in terms of its implications for the profitability of firms (e.g. decontrol of steel and fertilizer prices) while it is not efficient in discounting
complex information (e.g., decontrol of lending rates and drug prices) There was an arbitrage opportunity following the devaluation of rupee in July 1991 as the market took about four days to incorporate the information. Exporting companies earned +27 percent abnormal return, while importing firms experienced −8.2 percent returns following devaluation. Changes in industrial policy (de-licensing) and FERA did not seem to affect the market participants, whereas regulatory action (investigation by MRTPC) was associated with negative abnormal returns.

Murthy (1994) studied the relationship between stock prices and monetary variables in India. He found very slow stock prices reaction to monetary variables like RBI credit to government, index of industrial production, money stock, government expenditure, and bank advances. This contradicts efficient market hypothesis. Murthy (1996) found that money and monetary variables such as reserve money, reserve bank credit to government, bank advances, call money have strong links with stock prices in India during the period 1971-1988. He also found weak relationship between real economic activity and share prices. There was no strong relationship between share price and inflation. The stock market is not efficient in the semi-strong form of efficient market hypothesis (EMH) with respect to monetary variables. But stock prices exhibited no sign of inefficiency with respect to real economic variables.

Joshi (1996) examined the relationship between normal stock returns and inflation rates over 1971 to 1991 period. Using time series regression, on an aggregate basis, he found that a positive and significant relation between nominal stock returns and inflation. Results of the study indicated that in the long run positive nominal returns are being provided by the equities but in the short run it is negative.

1.2.2 The Industry Analysis

According to Francis (1991) “an industry may be viewed as a group of companies that compete with each other to market homogeneous products” (p 9). Fischer and Jordan (1995) observed:

“In an industry analysis, there is any number of key characteristics that should be considered at some point by the analyst. The important key characteristics are past sales and earnings performance, the permanence of the industry, the attitude of government towards the industry, labour conditions within the industry, the competitive conditions as reflected in any barriers to entry that
might exist, and stock prices of firms in the industry relative to their earnings” (p 163)

Empirical studies revealed a significant industry effect on the investment decisions. King (1966) showed that roughly 10 percent of the variations in stock returns are attributable to industry factors. However, he observed that industry effect varies from industry to industry at a given time and it varies within the industry overtime. Meyers (1973) in a study covering a period 1927 to 1967 using a different methodology found that King’s results overstated the role of industry factors. Livingston (1977) used a sample consisting of 734 firms covering 100 industries over the period January 1966 to June 1970. He concluded that approximately 18 percent of the total variations in stock prices are influenced by the industrial factors. Foster (1981) observed that early earnings release by the firm affect the stock prices of other firms in the same industry.

Sharma (1989) identified various factors that influenced share prices in the cotton textile industry in India. The study was based on a sample of 30 firms for the period 1976-1980. Using regression analysis, he identified six variables and these six variables explained more than 60 percent variations of price earnings ratios in cotton textile industry in India.

1.2.3 The Company Analysis

The economic and industry environment may influence the performance of a company for a given period of time. But, it is ultimately the firm’s own capabilities that will decide its performance in the long run. Because of this, the firms in the same industry are compared to one another to ascertain which is the best firm to invest funds. The company that outperforms its competitors attracts more funds. This may be due to low cost of production, technological superiority, efficient distribution channels, past financial performance, growth potential, rate of dividend declared, quality of the product, future investment opportunities, etc. Fischer and Jordan (1995) stated:

“Success in investment will largely depend on (i) discovering new and credible information rapidly and in more detail than others do, and (ii) applying superior judgment so as to ascertain the relevance of the information to the decision at hand. The true test of an analyst worth lies in his ability to develop a system of security analysis that couples original insight and unique
ways of forming expectations about the prospects for individual companies” (p.189)

An earnings per share (EPS) is the critical factor for company analysis. So, in company analysis analysts focus more on understanding and forecasting earnings per share. Morse (1981) investigated the price and volume activity surrounding the quarterly and annual earnings announcements by a sample of 50 firms over the period 1973-1976 and found a significant price change and increased trading volume prior to and on the day of the announcement of earnings. Benesh and Peterson (1986) observed that approximately 15 to 20 percent of the variations in individual security returns are explained by either actual or unexpected earnings changes. A number of other studies suggested that it is possible to earn excess returns by forecasting earnings prior to the announcement date. Piper and Fruhan (1981) used fundamental determinants viz. company’s future, long term profitability, and risk free interest rate. He confirmed that the fundamental analysis affects share prices and would lead a market into an efficient one. Fama et al. (1969), Charest (1978), Grunblatt et al. (1984), have found a favourable reaction of stock market to bonus issue in the USA.

In India there are a few empirical studies on stock markets pricing behaviour. Chandra (1978) tested the influence of dividend, price dividend multiplier growth in income, risk, leverage and size of firm on the market price of the shares with the help of log linear regression analysis in cotton textile and across the broad group. He found that returns, growth and size have positive influence on share price, while risk and leverage have no influence at all. Zahir (1982) employed five variables (dividend per share, earning per share, book value per share, cover and yield). He observed that dividend per share has a strong influence on stock prices. Krishan (1984) attempted to examine the relationship between equity price and five variables (DPS, EPS, BPS, yield and cover on average market price of the share) for two industry—general engineering and cotton textiles. He concluded that current dividend and book value are the more important determinants of market price. However, earnings per share and cover are not important determinants of market price of shares. Dixit (1986) examined the behaviour of equity share prices on the basis of 42 sample companies, and revealed that DPS, BPS, EPS, Size and ROI are significant determinants of share price. However, he found that factors like leverage and growth have no influence on share price. Ramachandran (1988) and Obaidullah (1992) have showed that market reacts favourably to bonus issue. Zahir (1992) classified selected shares into volatile...
and less volatile and factors determining share prices into two: (i) internal (fundamental) and (ii) external factors. By employing regression analysis, he concluded that fundamental variables explained about 61 percent of variation in equity shares prices, whereas external factors explained 39 percent of variation in prices of shares. He further observed that the fundamental analysis had become considerably important for volatile shares. Chandrashekar Rao and Manickaraj (1993) constructed eight principal components from accounting ratios (Overall efficiency, Financial structure, Profitability, Liquidity, Turnover, Fund management, Debtors management, and Preference capital intensiveness) from the said financial statements. They concluded that the stock price reaction to the release of company’s fundamentals was positive and sharp. However, the influence of financial variables was not found substantial and consistent in the formation of expectations on changing security prices. They expressed doubt on fundamental analysis and found no evidence on the superiority of fundamental analysis over simple buy-and-hold strategy. Mahapatra and Sahu (1993) studied with the sample of 19 companies over the period 1978 to 1990. He used log linear multiple regression equation for all the sample units individually for studying the influence of indicators like Size, ROI, Leverage, DPS, BPS, EPS, and Yield on the average market price of the share. He found that both DPS and Yield significantly explain the variations in the price of shares. Dividend Per Share is positively significant with share price, the yield as an investment indicator was found negatively but significantly associated with the share price. The results of their study do not support the view that in general Size, ROI, EPS, and BPS are significant determinants of equity share prices.

1.3 Efficient Market Hypothesis (EMH)

The term efficiency as it applies to securities market has three interpretations: (i) Operational efficiency, (ii) Allocation efficiency, and (iii) Informational efficiency. An operational efficient stock market is one in which buyers and sellers of securities can obtain transaction services at prices that are as low as possible given the costs associated with having these services. An allocation efficient market is one, which will direct the flow of capital to the place where it will contribute for the benefit of the community in a better way. An informational efficient market is one in which stock prices fully reflect available information. Informational efficiency deals with the
relationship between market prices and information. Unless otherwise stated, the term 'efficiency' in relation to stock market refers to informational efficiency.

Fama (1970) in his survey of empirical studies suggested that a market in which security prices always "fully reflect" available information is called "efficient." In an efficient market, security prices "instantaneously" reflect all information, and investors cannot use this information to obtain consistently superior returns than what is justified by an investment's risk except by chance. All those who argue that the capital markets are efficient agree that in order to have market efficiency there must be competent and well-informed investors who continuously evaluate the available information. Fuller and Farrell, Jr. (1987) stated, "it is the competition between these astute market participants, which results in securities being fairly, and correctly priced" (p. 96).

Gupta (1989) observed that "market efficiency has two dimensions (i) the type of information that the market is reacting to, and (ii) the speed and quality of adjustment of security prices to that information" (p. 4). There are three sources of information: (i) historical information, (ii) public information, and (iii) inside or private information, which is not yet known by the public. Researchers, who conduct research on efficient market hypothesis, interpret their results on the basis of speed and accuracy of stock price adjustment to new information.

Verrecchia (1979) stated thus:

"The expression "fully reflects," has become synonymous with empirical tests demonstrating that excess returns cannot be earned. That is, even before subtracting administrative and transaction costs, informed investors are unable to earn a return in excess of that predicted by the capital asset pricing model by trading on the information" (pp. 77-78).

However, Rubinstein (1975), Grossman (1977) and Beja (1976) criticised Fama (1970)'s discussion for its ambiguity, even though the views expressed by him is valid.

According to Fama (1970) conditions required for market efficiency are:

1. There are no transactions costs in trading securities,
2. All available information is costlessly available to all market participants,
3. All agree on the implications of current information for the current price and distributions of future prices of each security" (p 387)
In such a market, the current price of a security “fully reflects” all available information. But, the absence of above conditions are not necessarily source 5 of market inefficiency, they are potential sources. Measuring their effects on the process of price formation is the major objective of empirical work in the efficient market hypothesis (EMH).

The efficient market hypothesis (EMH) recognises three forms of market efficiency and each one deals with a different source of information.

1.3.1 Weak Form

In a weak form efficient market, the prices of securities fully reflect all historical information and no excess returns can be earned by utilising historical share prices.

1.3.2 Semi-strong Form

In a semi-strong form efficient market, securities prices adjust instantaneously to available new information, so that no excess returns can be earned by trading on that information.

1.3.3 Strong Form

In a strong form efficient market, securities prices fully reflect all information, including inside or private information, and therefore, no one can earn excess returns.

The above classification was attributed to Fama (1970). Fama (1991) renamed the above three categories as “Return Predictability”, “Event Studies” and “Test for Private Information” for weak form, semi-strong form and strong form of efficient market hypothesis respectively.

The first reported study examining market prices was by Bachelier (1900). He found that past, present and even discounted future events are reflected in market price, but often show no apparent relation to price changes. This indicated that commodity price changes on the French Bourse followed a random walk, although Bachelier did not use that term. Bachelier’s work, however, had little impact that time until it published in English by Cootner (1964), Wright (1934) in the USA and Kendall (1953) in the UK also found that the changes in market prices were random. By the beginning of 1950s there was scattered evidence in favour of random walk theory, though this term was not yet in use. Later these results were labeled as “Random Walk Theory” or “Random Walk Model.” The random walk theory has
subsequently been referred to as the weak form efficient market hypothesis” (Dyckman, 1975, p. 5) Roberts (1959) showed that a series of randomly generated numbers looked similar to series of stock prices. It implies that stock price movements are random. Osborne (1959) found that stock price changes were random in nature and that past prices changes have no predictive value.

After these studies and with the development of computerized databanks of security prices, a number of researchers in the USA and other developed countries studied pattern of stock price movement. In 1960s there was a realization that autocorrelation could be induced into returns series. Working (1960) and Alexander (1961) independently discovered this and showed that stock returns fluctuate randomly.

The mid 1960s was a turning point in research on the random character of stock prices. In 1964, Cootner edited and published his collection of papers entitled “The Random Character of Stock Market Prices.” Fama (1965)’s doctoral dissertation was published in the Journal of Business entitled “The Behaviour of Stock Market Prices.” Fama (1970) reviewed the existing literature on stock price behaviour, examined the distribution and serial dependence of stock market returns, and concluded:

“The evidence in support of the efficient market model is extensive, and (somewhat uniquely in economics) contradictory evidence is sparse. Nevertheless, we certainly do not want to leave the impression that all issues are closed. Much remains to be done” (p.416)

Samuelson (1965) began his article with the observation that “in competitive markets there is a buyer for every seller. If one could be sure that a price will rise, it would have already risen” (p.41) He provided proof that properly anticipated prices fluctuate randomly. Thus, the theory of random walk developed from the empirical studies, which analysed the pattern of stock price changes. The random walk model can be stated mathematically as

\[ f(r_{j,t+1} | x_t) = f(r_{j,t+1}) \]

Where, \( r_{j,t+1} \) denotes the probability distribution of returns for security \( j \) at time \( t+1 \) and \( [x_t] \) is the probability distribution of past returns of security \( j \). This implies that the distribution of stock returns is independent of the information set \( [x_t] \). Thus, the
distribution of past returns represented by the information set \([x_t]\) cannot be used to predict the distribution of future returns

In the 1950s researchers started using computers and computerised databank to study the behaviour of lengthy price series. This resulted in a flood of literature on weak form efficiency. Because of that, researcher developed interest on testing speed and accuracy of stock price adjustment to the arrival of new information, i.e., semi-strong form of efficient market hypothesis or event study. The first event study was published by Ball and Brown (1968) and Fama, Fisher, Jensen, and Roll (1969) published their article in 1969.

After semi-strong form of efficient market hypothesis, researchers took interest in studying whether insiders who trade on the basis of inside information can earn excess returns, which violates strong form of market efficiency. Jensen (1968) conducted detailed analysis of 115 mutual funds over the period 1955-1964 and concluded that on average the mutual funds were not successful in earning excess returns. But, Jaffe (1974) found that corporate insiders who have insider or private information would earn excess returns. Fama (1991) reviewed a number of subsequent studies on mutual funds and institutional portfolio manager's performance. Though some mutual funds have achieved minor abnormal gross returns before transaction cost, and other expenses, pension funds have under-performed.

To make concept practical, the concept of efficient market hypothesis (EMH) admitted minor market inefficiencies. The results of the studies conducted during 1960s and 1970s are consistent with this view. It was clear that markets cannot be completely efficient in the strong form, but there was support for the weak and semi-strong form of efficiency. However, at the end of 1970s a number of studies reported the results contrary to the efficient market hypothesis. The results of these studies are called 'anomalies' and will be discussed in detail in chapter 3.

The anomalies and the great October 19, 1987 crash, which was popularly called "Black Monday" reinforced that the capital markets are irrational in pricing and its movements at times influenced by psychological factors. Irrational behaviour of market indicates mispricing of securities and it provides an opportunity to earn abnormal profits.

With the introduction of computer and development of computerised databanks of security prices, there is some research on efficient market hypothesis. But, majority of research has been carried out in the U.S., the U.K. and other
developed countries. Some of the major studies conducted in the U.S., the U.K., and other countries will be discussed in chapter 3. In India, research on efficient market hypothesis, particularly semi-strong and strong form, is very limited. Stock price responses to earnings announcements, in general, and quarterly earnings announcement, in particular, are unexplored areas in the Indian stock market, even though it is an important factor in the valuation of stock. The present study attempts to contribute modestly, yet positively, in this direction.

1.4 Need for the Present Study

A major phenomenon of the last century has been large growth in the size of business units and growth in their financial requirements. As a part of liberalisation, the stock market in India has been assigned an important place in financing the corporate sector. Besides mobilising financial resources for investment, providing liquidity for the investors and monitoring company management are other important functions of the stock market. The decade of 1990s has seen remarkable reforms in the Indian stock market. India's Economic Survey 1992-93, observed that:

"The process of reforms in the stock market needs to be deepened to bring about speedier conclusion of transactions, greater transparency in operations, improved services to investors, and greater investor protection while at the same time encouraging corporate sectors to raise resources directly from the market on an increasing scale. Modernisation of the stock exchanges to bring them in line with world standards in terms of transparency and reliability is also necessary if foreign capital is to be attracted on any significant scale." (p 67)

Accordingly, Securities and Exchange Board of India (SEBI) has initiated a number of measures to increase the efficiency and transparency in the Indian stock market. The prominent policy initiatives of SEBI in this direction have been free pricing of issues, abolition of Controller of Capital Issue (CCI), mandatory listing of companies coming out with initial public offerings (IPO) to be listed on at least three stock exchanges, permission to companies to raise finances from international markets, compulsory announcement of quarterly earnings in leading financial press, dematerialisation, ban on badla and introduction of t+2 rolling settlement from April 1, 2003, simplification of documentation procedure to foreign institutional investors (FII) and reduction of registration fee for FII, book building, buyback and open offer,
withdrawal of restriction on short sales, implementation of corporate governance, allowing private sector mutual funds to invest in stock markets, etc. In 1998 SEBI made it mandatory on the part of the companies listed on the stock exchanges in India to publish quarterly earnings. With the gradual internationalisation of Indian stock market, India stock market has attracted domestic as well as global investors. A number of studies in the U.S., U.K., Australia, France, Germany, Sweden, and Norway stock markets have examined stock price responses to earnings announcements. But very few studies were conducted on the Indian stock market. Therefore, there is a need to examine stock price responses to quarterly earnings announcements, a semi-strong form of efficient market hypothesis (EMH), which is renamed by Fama (1991) as ‘event studies’.

1.5 Objectives of the Study

A number of researchers conducted empirical studies on the efficient market hypothesis. Many studies have investigated the weak form, a relatively less number of studies investigated the semi-strong form, and very few studies have investigated the strong form of efficient market hypothesis. The studies that have investigated semi-strong form of efficient market hypothesis have empirically tested the stock price responses to corporate announcements such as announcement of earnings, dividend, stock splits, bonus issue, right issue, etc. Although, there have been many studies which concluded that the stock markets of the U.S., the U.K., and other developed countries are semi-strong form efficient, there have been a number of contradictory findings also, which will be discussed in Chapter 3. Therefore, the controversy related to the semi-strong form of efficiency of the market is still continuing.

The studies on semi-strong form of efficient market hypothesis in Indian stock market yielded mixed results. Narayan Rao (1994) examined the stock price responses to some of the corporate financial policy announcements such as dividend increase, bonus issue and equity rights and found that Indian stock market is semi-strong form efficient. Srinivasan (1997) studied the impact of right related events on stock prices and concluded that the market is semi-strong form efficient. However, there are many studies, which found contradictory results. Obadullah (1991, 1992a), and Chaturvedi (2000b) found price/earnings ratio anomaly in the Indian stock market. Rao and Manickaraj (1993) investigated stock price reaction to financial statements and found that the stock market is inefficient. Chaturvedi (2000a, 2001a, b) found that
abnormal returns persist after the earnings announcements. Vipul (1998) studied the impact of dividend announcement on stock prices and found abnormal positive and negative returns. Kakati (2001) empirically tested price performance of bonus issue and found before bonus issue positive and after bonus issue negative impact. Lukose and Rao (2002) investigated market reaction to stock splits and found excess returns. Mohanty (2002) studied buyback of shares and found that stock yielded excess returns compared to market portfolio. Iqbal and Mallikarjunappa (2003) and Mallikarjunappa (2004 a,b) concluded that Indian market is semi-strong form inefficient. There are a few studies that found mixed results. Ramachandran (1985) examined responses of stock prices to bonus issue, Subramanian (1989) investigated impact of political and economic events on stock prices, Obaidulla (1992b) studied the adjustment of stock prices to bonus issue, and Nageswara Rao (1997) tested the responses of stock prices to macroeconomic events and all these studies found mixed results on semi-strong form of efficient market hypothesis.

The review of the empirical studies conducted in the Indian stock market showed that there is no conclusive evidence to accept that Indian stock market is semi-strong form efficient or inefficient. In this background this study is conducted with the following objectives:

1. To examine historical returns and risks of selected companies
2. To test whether the semi-strong form of efficient market hypothesis holds in the Indian stock market
3. To test the stock price responses to the quarterly earnings announcements

1.6 Hypotheses

Since this study examines the semi-strong form of efficient market hypothesis taking the quarterly earnings announcements as an event, the hypotheses being tested are:

1. That the responses of stock prices to the quarterly earnings announcements are complete on the day of the announcement
2. That the investors cannot earn abnormal returns by trading in the stocks after the quarterly earnings announcements
3. That the average abnormal returns and the cumulative average abnormal returns are close to zero
4. That the average abnormal returns occur randomly
That there is no significant difference between the number of positive and negative average abnormal returns

1.7 Scope of the Study

The scope of the study is restricted to analysis of stock price responses to quarterly earnings announcements of only those companies that are listed on BSE, have minimum 20 percent foreign holdings for the quarter ended March 30, 2004. Further criteria is that it should be traded for minimum 40 percent of trading days from January 1, 1997 or the date of listing the stock on the stock exchange. Further, we selected only those companies for which quarterly earnings data and other relevant information are available. Therefore, those companies that do not regularly announce quarterly earnings as per SEBI guidelines, in which foreign holding is less than 20 percent for the quarter ended March 30, 2004 and traded for less than 40 percent of trading days are not included in this study.

1.8 Chapter Scheme

This study is divided into and presented in eight chapters:

Chapter 1 – Introduction – deals with the background of efficient market hypothesis (EMH), technical and fundamental analysis, theoretical discussion on efficient market hypothesis (EMH). The need for and objectives of the present study, hypotheses being tested, scope of the study and the chapter scheme are also presented in this chapter.

Chapter 2 – Indian Stock Market: A Profile – deals with the origin and growth of stock market in India, trends in foreign institutional investors (FIIs) in the Indian stock market, weakness of Indian stock market, a brief discussion on securities scams of 1992 and 2001, and UTI scam of 1998. A brief discussion on various dimensions of reforms and developments in the Indian stock market, which are expected to have a bearing on market efficiency, is also given.

Chapter 3 – A Debate on Efficient Market Hypothesis Foreign – presents a detailed discussion on the efficient market hypothesis (EMH) and the review of empirical studies conducted around the world on different forms of efficient market hypothesis i.e. weak form, semi strong form and strong form. In order to provide a theoretical framework within which empirical studies are undertaken, Capital Asset
Pricing Model (CAPM), Arbitrage Pricing Theory (APT), Market Model, and beta (β) are discussed briefly.

Chapter 4 – A Debate on Efficient Market Hypothesis. India - is devoted to a detailed discussion on findings of many empirical studies on weak form, semi-strong form and strong form of efficient market hypothesis on Indian stock market.

Chapter 5 – Research Methodology – provides theoretical and practical dimensions of the research methodology used in this study. In this chapter method of investigation, procedure used for data collection, criteria for sample selection, data source, research design, selection of market index as a proxy to market portfolio, method used for classification of companies into portfolio, models used to calculate residuals, method used to overcome the problem of infrequent trading and choice of intervals are discussed in detail.

Chapter 6 – Stock Price Responses to Quarterly Earnings Quarter-by-Quarter Analysis – Using the models and estimation procedures (of Chapter 5) hypotheses are tested and the empirical results are presented in this chapter. The empirical results of the good news, bad news, and overall portfolio are discussed quarter by quarter.

Chapter 7 – Stock Price Responses to Quarterly Earnings: Seasonal Analysis – empirical results are presented on the seasonal basis and discussed in detail in this chapter.

Chapter 8 – Summary and Conclusions – presents a summary of the empirical investigations carried out in the study and the conclusions that emerge from empirical investigation. The major trends and implications as well as the emerging patterns in stock price responses to quarterly earnings announcements in the Indian stock market are highlighted. Suggesting potential areas for future study concludes the chapter.