CHAPTER: II
REVIEW OF LITERATURE

Advances in Behavioural Finance over the last several decades appeared to have shifted the paradigm away from the theory of Efficient Market Hypothesis as proposed by Fama (1970). According to this hypothesis, securities are priced efficiently and therefore, they fully reflect all the relevant information. This implies that, the future path of asset prices in stock markets around the world is merely a series of random numbers, i.e. prices follow the random walk hypothesis. This normative statement came increasingly under fire with the discovery of a series of persistent anomalies that seem to defy rational and logical thinking. In the context of financial markets, calendar effects, and some other effects that contradict the EMH, have been documented over several years. Some of them include Day-of-the Week Effect, Intra-month Return Regularities, Month-of-the Year Effect/Turn-of-the Year Effect/Turn-of-the Tax Year Effect, Size Anomaly, Price-Earning Ratio Anomaly and Low Beta Anomaly whose brief review has been presented in the following pages.

Day-of-the-Week Effect

There can be little doubt that the day-of-the-week anomaly is one that has attracted considerable attention in the literature. It points to the negative (lowest) Monday returns and the highest positive returns on Friday. Laying the foundation of contrarian’s thinking, Fields (1931) was the first to document evidence for Monday effect in the US stock market. Fama (1965) used daily prices for each of the thirty stocks of the Dow-Jones Industrial Average. The time periods varied from stock to stock but usually run from about the end of 1957 to September 26, 1962. The final date was the same for all stocks, but the initial date varied from January, 1956 to April, 1958. Thus, there were thirty samples with about 1,200-1,700 observations per sample. He reported that Monday’s variance was 20 percent greater than other daily returns. He presented strong and voluminous evidence in favor of the random-walk hypothesis. Early research in this topic

Cross (1973) noted that the mean return on Friday was higher than the mean return on Monday of the S & P 500 Index during the period commencing from 1953 to 1970. His findings indicated that the mean return on Fridays was 0.12 percent, while mean return on Mondays was -0.18 percent. The study concluded that stock prices tended to decline over weekends in the three-day interval from Friday close to Monday close and hence named “Monday effect”.

French (1980) examined two alternative models of the process generating stock returns. Under the calendar time hypothesis, the process operates continuously and the expected return for Monday is three times the expected return for other days of the week. Under the trading time hypothesis, returns are generated only during active trading and the expected return is the same for each day of the week. During most of the period studied, from 1953 through 1977, the daily returns to the Standard and Poor's composite portfolio are inconsistent with both models. Although the average return for the other four days of the week was positive, the average for Monday was significantly negative during each of five-year sub periods.

A traditional distributional assumption regarding the returns on a financial asset specifies that the expected returns are identical for all days of the week. Contrary to this plausible assumption, Gibbons and Hess (1981) analyzed S & P 500 and value weighted and equally weighted portfolios of Centre for Research in Security Prices (CRSP) from July 1962 to December 1978. They discovered that the expected returns on common stocks and treasury bills were not constant across days of the week. The most notable evidence was for Monday's returns where the mean was unusually low or even negative. The study also found that settlement effect could not explain weekend effect. Aside from documenting significant day of the week effects, the implications of the results for tests of market efficiency were examined. While market-adjusted returns continued to
exhibit day of the week effects, these effects were no longer concentrated on Monday.

Lakonishok and Levi (1982) investigated Centre for Research in Security Prices (CRSP) over the period from July 1962 to December 1979. They argued that daily returns should depend on the day of the week. Their argument was based on the delay between trading and settlements in stocks and in clearing checks. Monday returns and Friday returns remained negative and positive respectively even after interest adjustment.

Rogalski (1984) examined trading and non-trading day returns in an attempt to better understand the Monday effect by decomposing the Friday close to Monday close return into two component parts: the Friday close to Monday open return and the Monday open to Monday close return. He employed opening and closing values of the Dow Jones Industrial Average Index (DJIA) for the period October 1974 to April 1984 as well as the opening and closing Standard and Poor’s Composite Index (S & P 500) values during the period December 1978 to December 1983 for analysis. The study found that the entire average negative Monday effect for stock market indexes documented by others was contained in the average Friday close to Monday open return i.e. non-trading weekend effect was discovered. In addition, average trading day returns (open to close) were found identical for all days of the week. The study further pointed out the interrelation between Januarys / firm size/ turn-of-the year anomalies and day-of-the-week returns.

To shed more light on the week-end effect, Jaffe and Westerfield (1985) empirically examined daily stock market returns in the U.K., Japan, Canada, US and Australia. The sample period was different for each country. The specific foreign indexes and time periods were: Japan- the Nikkei Dow from January 5, 1970 to April 30, 1983; Canada- the Toronto Stock Exchange Index from January 2, 1976 to November 30, 1983; Australia- the Statex Actuaries Index from January 2, 1976 to November 30, 1982; U.K.- the Financial Times Ordinary Share Index from January 2, 1950 to November 30, 1983 and US- the Standard and Poor’s 500 Composite Stock Price Index (S & P) from July 2, 1962 to
December 30, 1983. They found the existence of weekend effect in each country. In addition, the lowest mean returns for the Japanese and Australian stock markets occurred on Tuesday and not on Monday as in the U.S. The study further revealed that the seasonal found in foreign exchange do not offset the seasonal in the foreign stock market. Neither the “time zone” theory was found to be able to explain the Japanese seasonal nor could the settlement procedures across countries bias week-end effects.

Harris (1986) examined weekly and intra daily patterns in common stock prices using transaction data at New York Stock Exchange (NYSE) for the fourteen months between December 1, 1981 and January 31, 1983. For large firms, negative Monday returns accrued between the Friday close and the Monday open; for smaller firms they accrued primarily during the Monday trading day. For all firms, significant weekday differences in intra-day returns accrued during the first 45 minutes after the market opened. Prices dropped on Monday mornings, while they rose on the other weekday mornings. Otherwise the pattern of intra-day returns is similar on all weekdays. Most notable was an increase in prices on the last trade of the day.

Chaudhry (1991) studied closing prices of 93 shares listed on Bombay Stock Exchange and BSE Sensex from June 1988 to January 1990. Kruskal-Wallis test had been used for the purpose. The study found that Friday had the highest average return and Tuesday marked the lowest level of mean return. Monday exhibited the highest stock return volatility. The study also observed the existence of the day-of-the-week effect in Indian stock market.

Broca (1992) presented the evidence using daily closing values of BSE National Index (NATEX) from April 1, 1984 to December 31, 1989. The study found that the lowest mean returns occurred on Wednesdays in contrast to developed markets where Monday exhibited the lowest returns. Monday recorded the highest standard deviation of the mean daily returns. He presented unequivocal evidence as to the day-of-the-week effect but concluded that the trading strategy based on this evidence is ineffective when compared to a naïve ‘buy and hold’ strategy.
Agrawal and Tandon (1994) examined five seasonal patterns in stock markets of eighteen countries: the weekend, turn-of-the-month, end-of-December, monthly and Friday-the-thirteenth effects. The daily stock indices for twelve of the eighteen countries in the study were obtained from the London Financial Times for the period 1971 to 1987. The data for the remaining six countries were for varying time periods. The study found daily seasonal in nearly all the countries, but a weekend effect in only nine countries. Tuesday had the lowest average returns in eight countries. Interestingly, the daily seasonal largely disappeared in the 1980s. The last trading day of the month had large returns and low variance in most countries. Many countries had large December pre-holiday and inter-holiday returns. The January returns were large in most countries and a significant monthly seasonal existed in ten countries.

Another study was conducted by Poshawkale (1996) to find empirical evidence on weak form efficiency and the day of the week effect in Bombay Stock Exchange over a period 1987 to 1994. The results provided the evidence of day of the week effect. The returns achieved on Fridays were significantly higher compared to rest of the days of the week. The study further concluded that the investors can not adopt a ‘fair return for risk’ strategy by holding a well diversified portfolio while investing in the Indian stock market.

Kamara (1997) used data from CRSP files for the period July 3, 1962 to December 31, 1993. The seasonal in the Standard and Poor's 500 (S&P) declined significantly from the period 1962 to 1993. This decline was positively related to the ratio of institutional to individual trading volume. In contrast, the seasonal for small stocks did not decline and was unaffected by institutional versus individual trading. Higher trading costs sustained the seasonal in small stocks, and unlike the S&P, these costs were not lower for institutions than for individuals. Futures minus spot S&P returns exhibited a reverse seasonal. The study also found that equity derivatives and the institutionalization of equity markets affected the Monday seasonal.

Armugam (1999) had comprehensively investigated the ‘day-of-the-week effect’ in Sensex returns during 1979-1997. The selected period covered 18 years
and 3735 observations. The study period was further subdivided into three non-overlapping periods 1979-85, 1985-91 and 1991-97. Also, the two bull and two bear phases were considered. The study found that Monday returns were significantly positive during a bull market, significantly negative during the bear market, and insignificant otherwise. But no strong evidence for Monday seasonal was found. The study also depicted the possible causes and implications for stock market efficiency and trading strategies.

Employing daily logarithmic returns from the Financial Times Industrial Ordinary Shares Index (FT-30) for the period July 1935 through December 1994, Coutts (1999) found no evidence of Friday- the thirteenth effect. They found that returns were higher on Friday- the thirteenth than on other Fridays. By partitioning the sample into six subsamples each of ten years, he again concluded that there was no evidence of Friday- the thirteenth effect, and that once again returns on Friday the 13\textsuperscript{th} tended to be higher than on other Fridays. Finally, he concluded that his results supported the extremely limited evidence documented for the UK market concerning the Friday- the thirteenth effect.

Coutts, Kaplanidis, and Roberts (2000) investigated the existence of security price anomalies in the Athens Stock Exchange General Index, over an approximate ten year period - October 14, 1986 through August 14, 1996. Three major industry indices were considered: Banking, Insurance and Leasing. Some evidence for a weekend effect was offered in the findings, and it was suggested that the January effect was present for the indices, and became stronger through time. Evidence that the holiday effect was, by far, the most significant anomaly in the Athens Stock Exchange was also provided. It appeared that following major institutional changes in 1992, the patterns in securities returns began to mirror those of advanced financial markets. To conclude, however, the seasonalities documented would not be able to render potential investors profitable trading strategies net of transaction costs. The results were entirely consistent with the notion of market efficiency.

Brooks and Persand (2001) examined the evidence for a day-of-the-week effect in five Southeast Asian stock markets: South Korea, Malaysia, the
Philippines, Taiwan and Thailand. Daily returns for stock market indexes of South Korea, Malaysia, Thailand, Taiwan, and the Philippines over the period between December 1989 and January 1996 were used. The findings indicated significant seasonality for three of the five markets. Day-of-the-week effect existed in three of the five markets (Malaysia, Thailand and Taiwan): a positive Monday mean return in Thailand and Malaysia, and a negative Wednesday effect in Taiwan. Market risk, proxied by the return on the Financial Times -Actuaries (FTA) World Price Index, was not sufficient to explain this calendar anomaly.

The Friday: the thirteenth anomaly was revisited in an international context by Lucey (2001). Using the Financial Times Stock Exchange world indices over the period 1988-2000 for 19 countries, it was found that there was some evidence that returns on Friday: the thirteenth were statistically different from, and generally greater than, returns on other Fridays.

Coutts and Sheikh (2002) investigated the existence of Weekend, January and Pre-holiday effects in the All Gold Index on the Johannesburg Stock Exchange over an 11- year period; January 5, 1987 through May 15, 1997, and for three sub-samples of equal length. The results were in severe contrast to the overwhelming international evidence documented for the stock markets of many other countries, be they developed or emerging markets: there appeared to be no Weekend, January or Pre-Holiday effects, present in the All Gold Index.

Compton and Kunkel (2003) tried to identify day-of-the-week seasonality and a weekend effect by examining daily returns, non-trading returns and trading returns separately using stock market indices of eight European countries from January 1, 1998 to September 10, 2001. The study found no support for a weekend effect in those markets.

Chen and Singal (2003) used monthly short interest data for the period July 1962 to December 1999 to examine the relation between short selling and the weekend effect. The study found evidence that the behaviour of the speculative short sellers added to the weekend effect by closing out their positions on Friday and increasing selling pressure on Monday as they reopened
their positions. They further added that the weekend effect was less for stocks with tradable options.

Karmakar and Chakraborty (2004) focused on six stock market anomalies using “The Economic Times Index Number of Ordinary Share Prices” for a period of fifteen years from January 1981 to December 1995. The results indicated the presence of Friday effect, the turn-of-the month effect and holiday effect in Indian stock market. The study also documented for the absence of any persistent regularity across the months and also on Friday-the thirteenth.

Kaur (2004) attempted an analysis of the Day-of-the Week Effect or ‘the Weekend Effect’ and ‘January Effect’ in Sensex and Nifty stock returns and volatility with the help of asymmetrical GARCH models for a long period (1993-2003) of time and revealed no evidence for these anomalies in the Indian stock market. In addition, the findings depicted that for weekdays except Monday, the ‘higher (lower) the risk, higher (lower) the return’ doctrine did not hold consistently and Wednesday provided higher return with lower volatility making it a good day to invest.

Indian stock market’s efficiency in the ‘weak form’ in the context of calendar anomalies, especially in respect of the weekend effect was explored by Sarma (2004) using daily returns generated by the Sensex, Natex, and BSE 200 during January 1, 1996 to August 10, 2002. The study concluded that the Indian stock market does manifest seasonality in their returns pattern; thereby exploring the opportunity of exploiting the observed regularities.

Nath and Dalvi (2004) used high frequency data of S & P CNX Nifty and CNX Nifty Junior for the period 1999 through 2003 and analyzed the data with robust regression technique. After examining the impact of the introduction of rolling settlement, the study concluded that there were Monday and Friday effects before the introduction of rolling settlement; however, only Friday effect survived after the introduction of rolling settlement.

Kumar, Madhusoodanan, and Deo (2006) tested the presence of day of the week effect on stock returns and volatility in conditional variance framework
during the periods from January 1, 1997 to June 30, 2005. Having used BSE Sensex index for the study, the findings revealed that the day of the week effect was present in both volatility and returns equations. Further, the study suggested that the stock returns were not commensurate with the risk and hence, possible to establish some trading patterns by the investors. The findings also depicted the existence of an inter-exchange arbitrage opportunity between BSE/NSE during the study period.

Chander and Mehta (2007) used three market indices series viz., BSE Sensex, S & P CNX Nifty and S & P CNX 500 for the period April 1997 to March 2007. The study was conceptualized to scrutinize whether anomalous patterns yielded abnormal returns consistently for any specific day of the week even after the introduction of compulsory rolling settlement on Indian bourses. The study documented evidence on the subject that the market series behaved more rationally and there was withdrawal of weekend effect in the long run.

Badhani and Kavidayal (2008) examined weekly behaviour of stock prices, trading volume and price volatility at the NSE during the period of 10 years from 1995 to 2005. The study did not observe any day-of-the-week effect in stock prices after the introduction of rolling settlement and suggested that other reform measures along with the introduction of rolling settlement might have resulted in the improvement of market efficiency. But the study found a robust day-of-the-week effect on volume and volatility.

Alagidede (2008) investigated the day of the week anomaly in Africa's largest stock markets by looking at both the first and second moments of returns. He also incorporated market risk. The study did not find day of the week effect in Egypt, Kenya, Morocco and Tunisia. However, there were significant daily seasonality in Zimbabwe, Nigeria and South Africa. Friday average return was found to be consistently higher than other days in Zimbabwe. The Nigerian market tended to display more seasonality in volatility than in expected return. The reverse held for South Africa. Finally, the anomalies did not disappear even after accounting for risk.
The presence of seasonality in three major indices of NSE namely, S & P CNX Nifty, CNX Midcap, and S & P CNX 500 was further examined by Selvarani and Lakshmi Shree (2009). They employed the daily mean index value for the period from January 1, 2002 to December 31, 2007. This study confirmed the presence of higher variance on Mondays; month-end effect, and regularity of returns across the indices as well as in pharmaceutical industry. The results reported for evidence of no day-of-the-week effect.

Blau and Ness (2009) examined the relation between short selling and the weekend effect for New York Stock Exchange (NYSE) securities using short-sale transaction data. The sample period for the study was from January 2005 to December 2005. The study found evidence suggesting that short sellers executed more short-sales volume during the middle of the week. The short sellers were found to be contrarian in contemporaneous returns. In addition, the empirical study found that the positive correlation between daily short-selling activity and daily returns on Monday was greater, on an average than the other days of the week. The results exhibited larger weekend effects for subsamples of stocks and stocks without tradable options.

Chaudhuri (2009) tried to analyze day-of-the-week effect on the Bombay Stock Exchange Index, i.e., in the Sensex returns. The data had been taken for 11 years and 6 months, from July 1, 1997 to December 31, 2008 for analysis. The overall average Monday returns were highest with the highest volatility and that of the Fridays were lowest for the sample period. The randomness of the returns of stock was evident. The study found that Sensex returns were not guided by Day-of-the-Week (D-O-W) Effect.

A large 'day-of-the-week' literature showed abnormal losses on Mondays. For an out-of-sample test to the US market studies, Boynton, Oppenheimer, and Reid (2009) studied the Japanese stock market. Consistent with the US results, Japanese day-of-the-week patterns showed Monday losses and strong Monday losses predicted by Friday losses. However, they found no evidence that the type of investor influenced the Monday loss or Friday-to-Monday autocorrelation.
Mangala and Dhawan (2009) examined the existence of day of the week effect across stock markets of six countries- three developed (US, UK and Japan) and three emerging economies (Brazil, Hongkong and India). The study period commenced from January 1994 and ended on December 2008. A set of parametric and non-parametric tests had been employed to examine the daily returns. The findings revealed that developed stock markets were less volatile and more efficient than emerging stock markets. The study came to conclusion that there did not exist any day of the week anomaly in UK, US, Japan and Hongkong.

Mehla and Goyal (2010) investigated the day of the week effect in returns of Nifty and Nifty Junior Indices during the pre-crisis period (January 2002 to December 2007), the crisis (January 2008 to April 2009) and the entire period (January 2002 to April 2009). The data had been analyzed by using one sample t-test, ANOVA and the GARCH (1, 1) models on returns introducing dummies for the weekdays to examine the day of the week effect (D-O-W effect). The results of ANOVA suggested no evidence in favor of D-O-W effect. The results of the GARCH (1, 1) model of regression analysis had indicated that the D-O-W effect did exist during the pre-crisis period and the entire period in the case of both indices. However, no such effect was noted for the crisis period.

Garg and Chhabra (2010) made an attempt to detect the day-of-the-week effect on the trading pattern of the Foreign Institutional Investors (FIIs) and Indian Mutual Funds (IMFs) in the Indian stock markets. The study covered a period of nine years from January 2000 to January 2009. The findings of the study revealed that the net investment made by the FIIs followed Friday effect, while the investments made by the IMFs were equally distributed among the various days of the week. A set of parametric and econometric tests were employed for the purpose. From the findings, it was obvious that some seasonal anomalies tended to persist in Indian stock market and investment by institutional investors.
**Intra-Month Return Regularities**

Intra-month return regularities involve monthly and turn-of-the-month effect. Evidence of monthly effect in stock returns was first analyzed by Robert Ariel (1987). He first reported a monthly seasonal pattern in the returns of equally-weighted and value-weighted stock portfolios between 1963 and 1981, using data obtained from the Centre for Research in Security Prices (CRSP). In his study, he found that stock returns in the first half of the month, which he defined as the first nine trading days of the month plus the last trading day of the previous month, were considerably higher than stock returns in the second half of the month, identified as the last nine trading days of the month, exclusive of the last trading day. He also found that the mean returns during the last half were near zero. He also noted that the monthly anomaly was especially strong between the last trading day of the prior month and the first four days of the next month (trading days -1 to +4).

In a subsequent study, Lakonisok and Smidt (1988) did not find a significant monthly seasonal on the Dow Jones Industrial Average (DJIA) over a ninety year-period (between 1897 and 1987). Unlike Ariel (1987), they defined the first half of the month as days 1 to 15, and the last half as remaining days of the month. They concluded that the average difference (difference between the first half and last half of the month) for the entire period was 0.237 percent. The study revealed a strong turn-of-the-month (TOM) effect during trading days -1 to +3 (a 4-day variant of Ariel’s TOM). It appeared that daily stock returns did not exhibit a monthly effect but rather a TOM effect when looking at daily returns of the DJIA over a ninety year-period.

Cadsby and Ratner (1992) analyzed the daily historical closing prices of eleven stock market indices from ten different countries. Arithmetic mean returns were then calculated and compared for each index over various periods. In the United States, the returns from July 3, 1962 to December 31, 1987 for the CRSP equal-weighted and value-weighted indices were used. The Canadian data came from the Toronto Stock Exchange (TSE) equal-weighted index for the period
January 3, 1975 to December 31, 1987. The Nikkei index was used for Japan for the period January 5, 1979 through December 28, 1988. The Financial Times 500 Share Index was used for the UK over the period August 16, 1983 to June 13, 1988. The Hang Seng index was used for Hongkong, the All-Ordinaries Index for Australia, the Banca Commerciale Index for Italy, the Swiss Bank Commercial index for Switzerland, the Commerzbank Index for Germany, and the Compagnie des Agents de Change General Index for France. Daily returns in these six countries were looked at from January 2, 1980 to August 1, 1989. They defined TOM as the last and first three trading days of the month. They concluded that TOM effect was significant in some foreign countries.

Boudreaux (1995) investigated the existence of a monthly pattern in investment returns for seven different countries’ stock market indices. The countries being studied were Denmark, France, Germany, Norway, Singapore/Malaysia, Spain and Switzerland. The data was taken for the period March 1978 through December 1992. Three of the seven countries’ markets were found to have monthly effect. An inverted monthly effect was observed in Singapore/Malaysia markets. It was also determined that the January effect, although significant, was not capable of explaining the presence of monthly effects where they existed.

Hensel and Ziemba (1996) used another dataset for a period of 65 years of S & P 500 between 1928 and 1993. Their findings from this value-weighted index indicated significantly higher returns from trading days -2 to +3, another variant of the TOM from Ariel (1987), and that the majority of the monthly return occurred at the TOM. In a breakdown by decade (1930s–1990s), they revealed that trading days -1, +2 and +3 had significantly higher mean returns than the average, for 4 of the 6 decades, and for the entire 65 year-period.

Karmakar and Chakraborty (2000) tried to explain the monthly effect and turn-of-the-month effect in the Indian stock market by applying two different approaches: Calendar day approach and trading day approach. The research deployed the daily closing prices of ‘The Economic Times Index Number of Ordinary Share Price’ over the period January 1981 to December 1985. The
study came to conclusion that there was significantly higher return at the first-half of the month than that of the second half and abnormally high returns at the turn of the month. In addition, the study suggested certain trading strategies to exploit this anomaly profitably. The study also considered various explanations to the observed anomaly; like data mining, proxy of other anomalies etc. Also, the study reported that none could explain the observed empirical regularity.

Aydo and Booth (2003) investigated calendar anomalies in the Turkish foreign exchange markets during 1986-1994 periods. Changes in the free market and official daily exchange rates between the Turkish lira (TL) and US dollar (USD) and the German mark (DM) were examined for empirical regularities on different days of the week, around the turn of the month and before holidays. The findings revealed that free market rates exhibited day-of-the-week and week-of-month effects. In addition, free market DM returns displayed a holiday anomaly. These calendar anomalies were explained by cash disbursement patterns, together with currency substitution in the economy. The impact of treasury auctions and bank’s management of liquidity on day-of-the-week effect was also discussed.

Lucey and Whelan (2004) examined the monthly and semi-annual behaviour of the Irish equity market in the long term. The study found, over 1934-2000 periods, a strong and persistent monthly effect with a January peak, as well as evidence of April and half-year seasonality.

Another empirical work which studied the efficacy of Efficient Market Hypothesis in India was done by Mangala and Mittal (2005). The study used daily returns of 150 NSE listed stocks during the period January 1997 to March 2003. The analysis observed Indian stock market to be prone to Monthly effect. The mean daily returns of the first half of the month were higher than that of the second half. The analysis was performed using trading day approach. The study concluded saying that anomalous pattern was present in Indian market during the study period.

Dhankar and Chakravarty (2006) investigated four calendar anomalies viz. day of the week effect, monthly effect, turn of the month effect and month of
the year effect across five countries of South Asia. The study employed major
daily index of each country i.e. BSE Sensex for India, Milanka Index for
Srilanka, General Index for Bangladesh for the period January 1991 to December
2001 and KSE-100 Index for Pakistan from January 1996 to April 2002 and
Nepse Index for Nepal from July 1997 to December 2001. The results indicated
that day of the week effect existed in Srilanka and Bangladesh. Further, the
findings pointed to the advantage from investing at the turn of the month and
during the first half of the month in India. The month of the year effect was not
found to exist in any of the five countries.

Mangala and Sharma (2008) examined the existence of monthly effect
and turn-of-the-month effect in Indian stock market by using S & P CNX Nifty
Index over the period January 1994 to April 2005. They identified cross-
sectional differences in stock returns. The empirical findings showed that the
mean returns for the first half of a month were significantly higher than rest of
the month. The study concluded that in Indian stock market, Efficient Market
Hypothesis did not completely explain the price behaviour during the study
period. They further suggested for adopting a trading strategy of buying stocks in
the second half of the month and selling in the first half of the month, especially
during turn-of-the month to earn profits.

Month-of-the-Year Effect/Turn–of-the-Year Effect/Turn-of-the-tax
Year Effect

The Month-of-the Year Effect refers to those seasonal patterns in which
returns in some months are higher than other months. In the USA and some other
countries, the year-end month (December) is the tax month. It is argued that
investors sell shares, the values of which have declined in order to reduce their
taxes. This puts a downward pressure on the stock prices and thus lowers stock
returns. As soon as the tax year ends, investors start buying shares and stock
prices experience upward trend. This causes higher returns in the beginning of
the year, that is, in the month of January. A number of empirical studies have
found the ‘Year-end’ Effect and the ‘January Effect’ in stock returns consistent
with the ‘tax-loss-selling’ hypothesis. Along with the review of Month-of-the
Year Effect, the studies of other calendar anomalies like Turn-of-the Year Effect and Turn-of-the-Tax Year Effect have been presented here.

Wachtel (1942) first pointed out the seasonal effect in the US markets. He was the first economist to examine and document seasonality in the Dow Jones Industrial Average during the period 1927-1942. He observed frequent bullish tendencies from December to January in eleven of the fifteen years.

Rozell and Kinney (1976) reported evidence of a seasonal pattern in stock market returns using an equally-weighted index of New York Stock Exchange prices. From 1904-74, the average stock market return during the month of January was 3.48 percent, compared with a monthly return of 0.42 percent during the remaining 11 months of the year. Thus, January returns appeared to be more than eight times higher than returns during a typical month. Because the equally-weighted NYSE index represented a simple average of the stock prices for all listed companies, the Rozell and Kinney (1976) methodology gave smaller companies greater relative influence than would be true in value-weighted indices where large firms dominated. Subsequent research by Keim (1983), and Reinganum (1983), among others, confirmed the fact that this January effect was a small cap phenomenon.

Keim (1983) examined month-to-month mean returns of listed companies at New-York Stock Exchange or American Stock Exchange for the period ranging from 1963 to 1979. The study provided for the evidence that daily abnormal return distribution in January had large means relative to the remaining eleven months and the relation between abnormal returns and size was negative and more pronounced in January. The study further concluded that nearly fifty percent of the average annual size effect can be attributed to the month of January and more than half of January effect was observed in the first trading week of the calendar year. He attributed this effect to the ‘tax-loss-selling’ hypothesis and the ‘information’ hypothesis.

Reinganum (1983) arrived at similar conclusions found by Keim (1983), but he found that the tax-loss-selling hypothesis could not explain the entire seasonality effect. He studied the possible relation between the excess returns on
small firms in January and tax-loss-selling hypothesis. For this, he employed data from CRSP daily files for all securities traded on NYSE and AMEX for the period 1962 to 1980. The results revealed that small firms experienced large January returns and that too during the first few trading days of January.

Gultekin and Gultekin (1983) empirically investigated the existence of seasonality in international capital markets and the end of the tax year selling pressure as a possible explanation for Month-of-the-Year Effect. The study was conducted using indices reported by Capital International Perspective over the period December 1958 to December 1979 and stock market indices reported in International Financial Statistics (IFS) published by International Monetary Fund (IMF) since January 1947. For most countries, seasonality was found in the form of January returns. The study revealed a close association between the observed seasonality and the turn-of-the-tax year.

Givoly and Ovadia (1983) employed four portfolios of securities each month to test for the possibility of capital gain tax induced seasonality for the period January 1945 through December 1979. The findings suggested that, due to the tax induced sales; the price of many stocks over the last 35 years were depressed in December but recovered in the following January. The study documented the fact that the tax effect, rather than the firm-size effect, was the dominant factor in explaining the high January’s returns. The tax effect was found to be present in firms of all sizes but much more pronounced for small firms. The analysis also indicated that a more precise identification of the tax-switch candidates may prove to be more useful in reinforcing the tax-loss-selling hypothesis.

Berges, McConnell, and Schlarbaum (1984) tried to investigate the turn-of-the year effect in Canadian stocks over the period 1951-1980. The study confirmed that January effect in Canadian stock returns belonged to the firms with smaller values. They did not find statistically significant relationship between a measure of tax-loss-selling pressure and January returns. The study reported that January returns in Canada exceeded returns for other months of the year before and after the introduction of capital gains tax in 1973. Also, they
pointed out the fact that tax-loss-selling pressure hypothesis did not provide entire explanation for the turn-of-the-year effect in stock returns. Furthermore, by implication, the evidence did not support the tax-loss-selling pressure hypothesis as the complete explanation for the “small firm” effect in US stock returns.

The buying and selling behaviour of individual investors at the turn-of-the year was studied by Ritter (1988). The empirical analysis was performed on the fifteen annual values of the January, mid-January to mid-December, and December mean buy/sell ratios of individual investors at Merill Lynch. He found that during December, individuals apparently sold stocks that had declined in price to realize the tax losses. Also, he offered a “parking the proceeds” explanation as to why the January effect was largely confined to small-cap stocks, especially those which performed poorly during the prior year.

Lamoureux and Sanger (1989) examined a comprehensive data set of OTC/NASDAQ securities for seeking evidence of size effect and the turn-of-the-year effect over the period of thirteen years, i.e. from January 1973 through December 1985. The results strongly confirmed earlier studies based solely on listed stocks. The analysis was conducted on both raw returns as well as on returns adjusted for risk. The study revealed the existence of a significant size effect. They found that small firms tended to earn significant positive abnormal returns in January, and conversely for large firms.

Clark, McConnell, and Singh (1992) concentrated their efforts on examining monthly returns and month-end relative and absolute bid-ask spreads for a random sample of 540 stocks listed on the New York Stock Exchange over the period February 1982 to January 1987. The study documented seasonality in returns and bid-ask spreads for low priced stocks. Average January returns were found to be significantly higher than average returns during other months of the year. In addition, average bid-ask spreads were significantly lower at the end of January than at the end of December. However, cross-sectional regressions did not provide evidence of a significant correlation between changes in spreads at the turn of the year and January stock returns.
Another study worked out by Bhardwaj and Brooks (1992) was an attempt to demonstrate the January anomaly primarily a low-share price effect and less so a size effect. The study covered a twenty year period from January 1, 1967 to December 31, 1986. The study revealed that low share price stocks earned abnormal returns in January before transaction costs were considered. This effect appeared to be stable over the ten year period (1967-1976) and to subsume the result that small firm stocks earned abnormal returns in January. In the next 1977-1986 period, a reversal of this phenomenon occurred with high-price stocks dominating the low-price stocks due to considering transaction costs and the bid-ask bias in computed returns. The results provided the evidence that observed returns on low-price stocks were overstated due to a turn-of-the year bid-ask effect.

Turn-of-the-Year effect had been observed in many markets throughout the world and various explanations had been suggested for this anomaly in the markets. The 'tax-loss selling' hypothesis was one such explanation that had received some support. Raj and Thurston (1994) examined the validity of this hypothesis in the New Zealand context. The study found that there was neither a January effect nor an April effect in New Zealand. They suggested that the small size and the poor liquidity of the market might be factors influencing this observation.

Bhattacharya (1995) made an attempt to explain the source of seasonality in the monthly returns. The study covered a 30 year period from January 1960 to December 1989. Reserve Bank of India Index and The Economic Times Share Price Index were considered for the purpose. The research findings showed that the mean returns were not equal and monthly returns exhibited seasonality in the Indian stock market. The study supported the earlier empirical research work that the Indian market is fallible and exploitable.

Mills and Coutts (1995) investigated the presence of various anomalies, or 'calendar effects', in the FT-SE 100, Mid 250 and 350 indices, and the accompanying industry baskets, for the period January 1986 to October 1992. Their results broadly supported similar evidence found for many countries
concerning stock market anomalies, for the 'January', 'weekend', ‘half of the month’, and ‘holiday effects’ all appeared to be present in at least some of the indices.

Dahquist and Sellin (1996) examined two potential explanations of the January effect in the Swedish stock market for the period from January 1919 to December 1994; the tax-loss selling hypothesis and the omitted risk factor hypothesis. They documented significantly higher returns in both January and July over the sample period. In addition, there was a seasonal pattern in the variances of the monthly returns. There also seemed to be an interaction between the variance and the mean effects. However, they found no support for either of the proposed hypotheses.

Maxwell (1998) studied the strength and causes of the January effect in the US corporate bond market over the period of roughly ten years from 1987 to 1997. The data covered noninvestment-grade category and the lowest investment-grade category bond indices. He documented a statistically significant January effect for noninvestment-grade bond indices. He also found a positive excess return in January for the lowest investment grade category, but the results were not statistically significant. In addition he documented that the excess returns of the bonds in January increased as the credit quality decreased. Also, the results supported a strong relation between January effect and the small firm effect. The study further revealed individual investor psychology and window dressing to be accountable for the January effect in the market.

Choudhry (1998) investigated seasonal anomalies in the mean stock returns of Germany, the UK and the US during pre-World War I (WWI) period. The anomalies studied were month of the year effect and the January effect. The empirical research was conducted using a non-linear GARCH-t model, and monthly returns. The results obtained provided evidence of the January effect and the month of the year effect on the UK and the US returns. The German returns showed the month of the year effect but no January effect. Also, the results failed to provide merit to the tax-loss selling hypothesis of the January effect and the small firm effect.
Mittal (1998) investigated the existence and pattern of seasonality in the Indian stock market in his paper presented at Capital Market Conference. The study employed the monthly indices of RBI for ordinary share prices from December 1960 to December 1991 for all industries and for the five major Indian stock exchanges, namely, Bombay, Calcutta, Madras, Ahmedabad and Delhi. The results suggested that Indian stock market was more prone to January effect rather than to April effect during the study period. The non-existence of April effect signified that the tax-loss selling hypothesis did not work in the Indian situation.

Mishra (1998) carried out the research at two levels: the macro level and the micro level by using three BSE indices i.e. BSE Sensex, Natex and BSE 200 and 55 sample companies. The main purpose of the study was to find out the monthly seasonal pattern in Indian stock market. The results suggested that the use of Kruskal-Wallis non-parametric test confirmed the absence of any month-of-the-year effect in the Indian capital market.

Babra, Dhillon, and Ramirez (1999) documented the existence of a November effect and a stronger January seasonality following the Tax Reform Act of 1986. The study was based on CRSP New York Stock Exchange/American Stock Exchange monthly returns over the period January 1980 to December 1994. They examined a unique and significant relationship between excess returns and the potential for tax-loss selling. The study came to conclusion that the tax-loss selling was a dominant explanation for the seasonality of stock returns.

Cheung and Coutts (1999) employed a data set of logarithmic non-dividend adjusted daily returns from the Hang-Seng Index (Hong Kong Stock Exchange), over a thirteen and a half year period to investigate the presence of the January effect, or other monthly seasonalties. However, they could not find any evidence of a January effect or any other monthly seasonality. The mean return for December was less than that for January.

The presence of the seasonal or monthly effect in stock returns had been reported in several developed and emerging stock markets. Pandey (2002)
investigated the existence of seasonality in Indian stock market. It covered the post-reform period. The study used the monthly return data of the Bombay Stock Exchange’s Sensitivity Index for the period from April 1991 to March 2002 for analysis. After examining the stationarity of the return series, he specified an augmented autoregressive moving average model to find the monthly effect in stock returns in India. The results reported the existence of seasonality in stock returns in India and confirmed the January effect. The findings were also consistent with the ‘tax-loss selling’ hypothesis. The results of the study implied that the stock market in India is inefficient, and hence, investors could time their share investments to improve returns.

Seasonal effects were tested in stock returns for ‘January effect’ anomaly and ‘the tax-loss selling hypothesis’ using monthly stock returns in eighteen emerging stock markets for the period 1987-1995 by Fountas and Segredakis (2002). Even though considerable evidence for seasonal effects applied in several countries, very little evidence was found in favour of the January effect and the tax-loss selling hypothesis. The results provided some support to the informational efficiency aspect of the market efficiency hypothesis.

Mehdian and Perry (2002) investigated the January effect in US equity markets using three market indices from 1964-1998: Dow Jones Composite, NYSE Composite and the S & P 500. Chow tests for structural stability indicated that the estimated parameters in an equation testing for monthly seasonal effects in the stock market were not stable over time. During sample period (1964-1987), it was found that January returns were positive and significant in all three stock market indexes. After 1987, January returns were positive but not statistically different from zero. The results therefore provided no statistical support for the January effect in US equity markets in the post-1987 market crash period.

Al-saad and Moosa (2005) investigated the nature of seasonality in the monthly stock returns derived from a general index of the Kuwait Stock Exchange. A structural time series model incorporating stochastic dummies revealed that seasonality was present over the sample period from 1984 to 2000.
Moreover, seasonality was found to take the form of a July effect, as opposed to the better-recognized January effect. This finding was attributed to the 'summer holiday effect'.

Haug and Hirschey (2006) analyzed the 202 years data on CRSP value-weighted and 78 years of CRSP equal-weighted returns of US equities. They discovered abnormally high rates of return on small-capitalization stocks during the month of January, even during the period following passage of the Tax Reform Act of 1986. The research findings supported the anomalous pattern of monthly returns for portfolios based on Fama-French (1993) size and book-to-market equity (B/M) factors and showed that both factors contributed to a continuing January effect.

Ong and Mitchell (2006) examined returns in the Chinese A and B stock markets to get an evidence of calendar anomalies. They found that both cultural and structural (segmentation) factors played an important role in influencing the pricing of both A and B shares in China. There was some evidence of a February/turn-of-the-year effect, partly owing to the timing of the Chinese Lunar New Year (CNY); and the holiday effect around the CNY period was stronger and more persistent compared with the other public holidays. The segmentation between the two markets was apparent in the day-of-the-week effect, where B stock markets tended to post significant negative returns on Tuesdays, corresponding with overnight developments in the United States, while significant negative returns were observed on Mondays in the A stock markets. Investment strategies based on some of these calendar anomalies, and allowing for transaction costs, suggested that the A stock markets tended to offer more economically significant returns.

Chen, Jack, and Wood (2007) examined monthly seasonal returns for the UK during the period 1955 to 2003. They identified four distinct tax regimes during which both the incentive and ability to tax-loss sell varied. In support of the tax-loss selling hypothesis, they found that the relationship between past losses and both January and April returns was strongest during tax regimes in which the incentives to off-set tax was high and weakest during regimes in which
the incentive was low. Finally, neither the January nor April effect appeared to be driven by the size effect.

Singla (2007) attempted to explore the Indian stock market efficiency in ‘weak form’ in the context of January anomaly. The data consisted of monthly returns for 18 selected large-capitalization companies from the Sensex composition for a period January 1991 to December 2006 and 50 small-capitalization companies randomly selected from BSE Small Cap Index for the same period. The analysis reported for the “Mark Twain Effect”, i.e. poor performance in the month of October. The evidence suggested that large companies performed better than small companies for the test period in January month; the result contrary to the empirical test findings conducted previously. The study further added that large cap companies earned more abnormal average returns in January than small cap companies.

Financial anomalies in emerging markets can be caused by very different reasons than that in mature markets. In a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, Zhang, Sun and Wang (2008) examined financial anomalies in emerging markets from a new perspective, which focused on heavy political interventions. They indicated no evidence for the January effect in China, neither its mirror version, the Chinese New Year effect. Rather, returns abnormality was found to occur in March when China was in the political high season.

Dungore (2009) studied the implication of Efficient Market Hypothesis (EMH) on the selected auto ancillary stocks. The study was aimed at determining the January effect on large and small cap companies separately and to see the relation between January effect and market capitalization of companies over the eight year period. He tested EMH in the semi-strong form also. The study concluded no evidence of January effect for large cap companies as well as small cap companies separately. The results reported that small cap companies benefitted more from the January effect than large cap companies.

To explore the interplay between the Month-of-the-Year effect and market crash effects on monthly returns in Indian stock markets, Dash et al.
(2011) used dummy variable multiple linear regression to assess the seasonality of stock market returns and the impact of market crashes on the same. The data used for the study were the monthly closing Sensex values in the period April 1999 to March 2007. The results of the study provided evidence for a Month-of-the-Year effect in Indian stock markets, particularly positive November, August, and December effects, and a negative March effect. Further, the study suggested that the incidence of market crashes reduced the seasonal effects.

Anuradha and Rajendran (2012) made an attempt to investigate whether Foreign Institutional Investment (FII) in Indian capital market had any calendar effect in net FII and net FII in equity. The monthly data during March 1993 to August 2011 were considered for the analysis. Stationarity for the time series were checked using Augmented Dickey Fuller test. The series was tested as a whole and as well as considering the structural breaks in the years 2003 and 2007. Dummy variable technique was used for analyzing the data series. The test results showed that for the whole period there exist calendar effects in the months of July and September for the two series. After 2003, July, August and September effects were present in both the series in addition to January and May effect in net FII in equity. After 2007, September effect was present in both the series in addition to July effect in net FII but in a less significant way. Risk aversion hypothesis and Interim accounting information hypothesis could be the possible explanation for this behaviour. The diminishing of the effect could be because of efficient market.

Ray (2012) tried to investigate the existence of seasonality in stock returns in Bombay Stock Exchange (BSE) sensex by using monthly closing share price data of the Bombay Stock Exchange’s share price index from January 1991 to December 2010. The study employed a combined regression –time series model with dummy variables for months to test the existence of seasonality in stock returns. The results of the study provided evidence for a Month-of-the-Year effect in Indian stock markets confirming the seasonal effect in stock returns in India and also supported the ‘tax-loss selling’ hypothesis and ‘January effect’.
Size Anomaly

The size effect in finance literature refers to the observation that smaller firms have higher returns than larger firms, on average over long horizons. It also describes the contribution that firm size has in explaining stock returns. The well-documented tendency of small-capitalization stocks to generate higher returns than those warranted by the Capital Asset Pricing Model (Security Market Line) is called the ‘Size Effect’. Related research also finds that the size effect is seasonal. It occurs primarily during January in the US and has had little or no presence in the other 11 months, which confounds empirical research on risk-reward relationships.

The size effect was initially discovered by Banz (1981). The empirical relationship between the returns on common stocks and the total market value of NYSE common stocks was examined for the period 1926 through 1975. Monthly prices and return data were taken from monthly return file of CRSP of the University of Chicago. The results revealed that the CAPM is misspecified. The small firms listed on NYSE had significantly larger risk-adjusted returns than large NYSE firms over the sample period of forty years. He also argued that part of the small firm effect was due to the amount of the information that was not available for the firms. He reasoned that the lack of information about the small firms could cause certain investors to exclude them from their portfolios. This would then lead to higher risk-adjusted returns for the undesirable firms.

Roll (1981) tried to explain the small firm effect. He also contributed towards the existence of Size anomaly. He proved that small firms had larger average returns than large firms even after accounting for risk. He indicated that tests of the CAPM required ex-ante returns on all assets as well as the market portfolio. Due to the inability of meeting these requirements, proxy measures were used. The use of proxy variables resulted in two sources of errors. First, observed returns were used, which leaded to measurement errors in both asset and portfolio returns. Second, broad based market portfolios were used as proxies for the market portfolio. As a result, the market portfolio was
characterized by a second source of error. Roll further pointed out that the beta estimates, in general, tended to be biased downward when using these surrogate measures. Consequently, the estimates of abnormal returns using these betas were biased upward.

Reinganum (1981) analyzed the size effect in a sample of 566 NYSE and AMEX firms over the period 1963-1977. He found that the smallest size decile outperformed the largest by 1.77% per month. He documented empirical anomalies which suggested that either the CAPM was misspecified or the capital markets were inefficient.

The relationship between observed anomalies in security returns and the specification of the market model was examined by Brown and Barry (1984). They tested the hypothesis using residuals from the market model. The residuals were computed on a monthly basis for NYSE securities from January 1931 to December 1980. They found the association of misspecification of the market model with a systematic bias in measured beta.

Fama and French (1993) constructed mimicking portfolios for the underlying risk factors related to size (Small minus Big, i.e. SMB) and book-to-market (High minus Low, i.e. HML). The market, SMB, and HML portfolios captured a substantial part of the time-series variation in the returns on 25 stock portfolios formed on size and book-to-market over the period 1963-1991. Fama and French interpreted this as evidence that size and book-to-market proxy for sensitivity to common risk factors in stock returns.

Fama and French (1995) studied whether the behaviour of stock prices, in relation to size and book-to-market equity (BE/ME), reflected the behaviour of earnings. The study used all NYSE stocks available in the Centre for Research in Securities Prices (CRSP) database for the period 1963 to 1992. The results indicated that low book-to-market equity firms were more profitable than high BE/ME firms for at least five years after portfolios were formed on the basis of BE/ME. Further controlling for BE/ME, small stocks tended to have lower earnings on book equity than do big stocks.
Fama and French (1996) used all the NYSE stocks available in the CRSP database from 1963 to 1993. Many patterns in average stock returns, so-called anomalies of the CAPM, were captured by the earlier three factor model in FF (1993). The study confirmed the strong continuation of short term returns. The results reported that the explanatory returns of the model $\alpha_i = \beta_i \cdot \hat{R}_m - \beta_i \cdot \hat{R}_f$, SMB and HML were not unique. Also, the study documented that size and BE/ME (Book-to-Market Equity) based portfolios outperformed the portfolios based on earnings/price, cash flow/price, sales growth and long term past returns.

Huang (1997) examined size anomaly on the Taiwan Stock Exchange over the period 1971-93. Using a sample of all listed stocks, the study found that the smallest size quintile earned a significantly higher abnormal return than other four size portfolios over the whole sample period. Moreover, the size anomaly could not be attributed to the January effect. The smallest size quintile performed better than the average of the other four size quintiles in almost every month.

Kakati (1999) devoted his study to test the validity of Market-to-Book Value (M/B) ratio as a predictor of security return in the Indian capital market. The data were collected from the selected 250 companies representing 22 industries based on the elimination of the small-firm size and infrequent trading bias. He carried out the study for the period March 1993 to March 1997 using Sharpe Index, Treynor Index, and Jenson’s alpha performance measures model. The results reported that low M/B portfolios tended to outperform high M/B portfolios as well as the sample mean and the Sensex return, though it was not significant at 10% level. The study confirmed trading rules/strategies based on the M/B ratio not to be much appealing to many money managers.

Daniel, Titman and Wei (2001) studied Japanese stock returns from 1975 to 1997 period. They examined the return patterns of 25 size and book-to-market sorted portfolios from the universe of Tokyo Stock Exchange (TSE). They documented that Japanese stock returns were more closely related to their book-to-market ratios against their US counterparts. The findings indicated that the value premium in average stock returns was substantially stronger in Japan than
in US. The high book-to-market stocks beat the low quintiles stocks by 0.994 percent per month in Japan but only 0.347 percent in United States.

Mohanty (2002) documented the presence of a strong size effect in Indian stock market over the period 1991-2000 using market capitalization as the measure of firm size. He found size, market leverage, earning-price (E/P) ratio and price-to-book value ratio were related to returns. He stressed that the size effect was the most prominent. On splitting the sample period into pre-95 and post-95 sub-periods, he found that the small firm effect was predominant in post-1995 sub-period compared to pre-1995 one. He reported that small firms generated an annualized excess return of 70 percent over the large firms during the entire sample period.

Kim and Burnie (2002) studied the small firm effect in both the expansion and contraction phases of economic cycle. The sample data consisted of S & P 500 Index returns for the period January 1976 to December 1995. The results depicted that small firms had, on average, lower return on assets and higher leverage than do large firms. Small firm effect manifested in the expansion phase but not in the contraction phase of economic cycle.

Further, the study regarding size and BE/ME due to seasonal effects was done by Sehgal (2003). The study covered 364 companies of CRISIL-500 from June 1989 to March 1999. The study further supported the evidence that the three factor asset pricing model described average stock returns for the Indian market better than one factor CAPM. The out-of-sample evidence suggested the size and BE/ME factors to be a good proxy for common risk factors in returns.

Naughton and Veeraraghavan (2005) made an attempt to investigate the relationship between expected stock returns, overall market factor, firm size and book-to-market equity ratio in the three Asia-pacific markets. The study considered monthly stock returns and accounting data for Indonesia, Singapore, and Taiwan over the period December 1975 to December 1996. The results indicated that the size effect and book-to-market equity factor explained the variation in security returns in an economically meaningful pattern. Also, the
study rejected the claim that the multifactor model findings could be explained by the turn-of-the year effect.

Sehgal and Tripathi (2005) empirically tested size effect in Indian stock market for the period 1990-2003 by considering data of the top 482 Indian companies using six alternatives of company size viz. Market Capitalization, Enterprise Value, Net Fixed Assets, Net Annual Sales, Total Assets and Net Working Capital. The study revealed that the small firm effect was not due to any seasonality or business cycle factors. However, the results also showed that the frequent rebalancing of size based portfolio was undesirable.

Mangala and Mittal (2007) examined the existence of size anomaly in Indian stock market. Having used a sample of 240 listed companies over a period of six years i.e. September 1996 to September 2002, the empirical results indicated that the small sized firms outperformed the larger firms on the basis of the raw returns as well as risk adjusted performance measures given by Sharpe and Treynor.

The dependence of stock returns in India on beta and five company attributes was explored by Rohini Singh (2009). The study presented strong evidence towards size and book-to-market ratio effect. The study analyzed 158 stocks during the 12 year period (January 1991 to December 2002) using technique of panel data analysis. The study revealed size as a proxy for some underlying risks.

Sehgal et al. (2012) made an attempt to investigate the existence of various asset pricing anomalies, viz. size, value, momentum, accruals, liquidity, profitability and net stock issues in India which is an emerging market. The study used 493 companies from BSE 500 equity index for the period January 1996 to December 2010. BSE 200 index was used as a market proxy. Size effect was the strongest with a difference of 4.4 % per month between small and big stock returns. A positive relationship was reported between accruals, stock issues and returns and a negative relation between profitability and returns which is in contrast to prior research. CAPM was unable to explain these anomalies with the exception of net stock issues. The Fama French (FF) model was able to capture
value, profitability and accruals. While liquidity anomaly was explained by a liquid augmented FF model, the sector and earnings momentum factors did not contribute significantly towards explaining returns. Size and short term momentum were persistent and hence continued to pose challenge to rational asset pricing in India.

**Price-Earning Ratio Anomaly**

The academic literature searching for an answer to this central question has a long history, and indeed the P/E effect was the earliest described ‘anomaly’ even before CAPM itself was formulated by Sharpe in 1964. A large body of work has demonstrated the effect. For example: Nicholson (1960 & 1968), McWilliams (1966), Basu (1977 & 1983), Ball (1978 & 1992), Jaffe, Keim and Westerfield (1989), Fuller, Huberts and Levinson (1993), Lakonishok, Schleifer and Vishney (1994), and Dreman (1998) to mention just US studies. Gillan (1990) studied the existence of this anomaly in New Zealand Stock Exchange. A good number of researchers such as Sharma (1984), Obaidullah (1991), Tuli and Mittal (2001), and Sehgal et al.(2001) have reported observing the P/E effect in India also.

The very first work demonstrating the P/E effect was done by Nicholson (1960). He considered a sample of one hundred industrial issues of trust investment quality for the study purpose. The portfolio of lowest P/E quintile stocks, rebalanced every five years, would have delivered an investor 14.7 times his original investment at the end of the twenty years, as compared to 4.7 times for the highest P/E quintile. Thus, he concluded that the investors could outperform better by buying low P/E ratio stocks.

McWilliams (1966) used a sample of 390 industrial stocks to evaluate the usefulness of the P/E ratio as an analytical tool for investors. The study found that $10,000 originally invested in the highest P/E ratio decile had grown to $45,329 by April 1964 whereas the same amount invested in the lowest P/E ratio decile grew to $103,960 during the same period. He further concluded that for individual securities, good performance could be found among stocks selling at
almost any price-earnings ratio.

Nicholson (1968) extended his earlier work by looking at the earnings of 189 companies between 1937 and 1962. He arrived at the same conclusion that the low P/E quintile outperformed high P/E quintile consistently.

Basu (1977) examined the price performance of NYSE industrials between 1957 and 1971. The study aimed at determining empirically whether the investment performance of common stocks was related to their P/E ratios. At the start of each April over 14 years, stocks were ranked by P/E ratio based on the previous financial year’s results and divided into quintiles. Three criteria were used in selecting sample firms: (i) the fiscal year-end of the firm was December 31; (ii) the firms were actually traded on the NYSE as of the beginning of the portfolio holding period; (iii) the relevant investment return and financial statement were not missing. The study showed that the low P/E portfolios earned higher absolute and risk-adjusted rates of return than the high P/E securities. He opined that there was little apparent relationship between investment returns and the quintile’s beta value.

Ball (1978) conceded the apparent existence of P/E effects, but approached them from the point of view that they were statistical artifacts that had to be explained. Ball argued that information available in the public domain at little or zero cost should not be the basis for any strategy that produces abnormal returns. Ball looked at various possible explanations for this anomaly, including systematic experimental error, transaction and processing costs, and failure of Sharpe’s two parameter CAPM model.

The empirical relationship between earnings yield, market value and returns on the common stocks listed on NYSE was examined by Basu (1983) over the study period starting from 1963 to 1980. The stocks with high earnings to price ratio (E/P) earned, on an average, higher risk adjusted returns than the common stocks with low E/P ratio. Further, Basu concluded that the E/P effect was not entirely independent of firm’s size and the effect of both variables on expected returns was complicated.
Jaffe, Keim, and Westerfield (1989) tried to clarify the confused picture of the size and E/P effects resulting from the papers of Reinganum (1981), and Basu (1977 & 1983). They studied the empirical relationship among earnings yield, market value and stock returns. They used a long sample period of 1951-1986, and the results reported that the earnings yield effect was significant. Conversely, the size effect was negative in January. They also found evidences of consistently high returns for firms with negative earnings.

Another empirical work for the existence of both P/E effect and size effect was investigated by Gillan (1990) in the New Zealand Stock Exchange. Portfolios based on low P/E ratios did not earn significantly higher risk-adjusted returns than portfolios based on high P/E ratios during the period 1977 to 1984. There was a little support for the P/E effect but the size effect was strongly documented.

Obaidullah (1991) examined the existence of P/E ratio anomaly in Indian stock market. The study considered a sample of 118 companies for the period starting from January 1986 to September 1990. The results were consistent with the earlier findings. The return on the lowest P/E portfolio was consistently higher as compared to the return on highest P/E portfolios. The study employed three portfolio performance measures, namely, Sharpe’s measure, Treynor’s measure and market adjusted returns. He concluded that stock price adjustment to earnings information in the Indian stock market is biased and inaccurate.

Fuller, Huberts, and Levinson (1993) re-examined Ball’s argument by including a wide variety of possible explanatory factors for the out-performance of low P/E shares. The study considered a complex multi-factor model that allowed for systematic risk (beta), 55 industry classification factors and 13 other explanatory factors for ‘risk’ such as earnings variability, leverage and foreign income. Over the entire sample period (1973-1990), they found higher returns for low P/E stocks, but the factors included in the model did not account for the superior low P/E returns.

Lakonishok, Schleifer, and Vishney (1994) studied stock prices between 1963 and 1990 by dividing firms into ‘value’ and ‘glamour’ stocks on the basis
of past growth in sales and expected future growth as implied by the then-current P/E ratio. They defined value strategies as buying shares with low prices compared to some indicators of fundamental value such as earnings, book value, dividends or cash flow. They found that the differences in expected future growth rates between the two types of share, as shown by P/E ratios, were consistently overestimated by investors. Value strategies outperformed glamour strategies by an impressive 10-11% per year using both past low growth and low current multiples. Among the various measures of fundamental value, P/E did not produce as large an effect as price-to-book value or price-to-cash flow, possibly because stocks with temporarily depressed earnings are lumped together with well-performing glamour stocks in the high expected growth/low E/P category. Also, they found that value stocks outperformed glamour stocks quite consistently and did particularly well in ‘bad’ states of the world.

Although E/P ratios are very commonly used in practical investment decisions, the cross-sectional determinants of E/P ratios have reached only limited attention so far. Martikainen and Gunasekaran (1994) modelled the cross-sectional variation of earnings-price (E/P) ratios using Finnish data. The study showed that a substantial part of the cross-sectional variation of Finnish E/P ratios could be devoted to differences in securities systematic risk estimated by instrumental accounting variables, such as accounting betas, financial leverage, operating leverage and growth. After controlling the E/P ratios for the effects of these instrumental risk variables, the E/P anomaly became insignificant in the Finnish stock market. The findings suggested that the E/P anomaly generally observed in major financial markets may be largely due to the serious empirical problems in risk estimation.

Dreman (1998) examined both size and P/E effects by dividing companies on the Compustat tapes from 1970-1996 into both P/E and market capitalization quintiles. P/E effect was seemed to be more pronounced in the sample period than the size effect. Returns increased monotonically as the P/E decreased and as the size decreased.
Further, Tuli, and Mittal (2001) studied the determinants of Price-Earnings ratios of Indian equities over the period 1989 to 1993. The data was collected from the Bombay Stock Exchange Official Directory. Multiple Regression technique was adopted to examine the determinants of P/E ratio. Corporate size, variability in earnings per share, variability in market price, debt-equity ratio, dividend payout ratio and growth rate in market price were the main variables used to examine the influence on P/E ratio. The results indicated that the variability in market price and dividend payout ratio are the most important factors influencing the P/E ratios across industries.

Sehgal, Balakrishnan, and Basu (2001) made an attempt to forecast the P/E ratios for leading Indian companies. The P/E ratios of 98 BSE National Index companies for the period January 1995 to October 2000 had been used as sample companies for analysis purpose. They revealed that moving average and exponential smoothing methods provide better P/E forecast.

Mangala and Mittal (2005) took a sample of 240 companies listed on Bombay Stock Exchange for a period of ten years, i.e., from September 1996 to September 2006. The results reported in that paper were consistent with view that the P/E ratio information was not fully reflected in security prices as postulated by the semi-strong form of Efficient Market Hypothesis. The portfolios with negative and low P/E ratios had outperformed most of the other portfolios on the basis of raw returns as well as risk adjusted performance measures. They identified that the seasonality/patterns in the distribution of stock returns persist in the Indian stock market.

Dhankar and Kumar (2007) studied the monthly price-earning ratio of BSE 100 companies for the period June 1996 to May 2005 and three non-overlapping sub-periods (June 1996- December 1999, January 2000- December 2002, and January 2003-May 2005). The study showed that during sub-periods, the relationship between portfolio expected return and market risk was found to be positive and significant. The findings revealed that the stock market failed to reflect instantaneous response pertaining to earning information.
Pal, Sura, and Bodla (2009) attempted to analyze the returns of as many as 240 stocks listed at BSE by dividing them into ten portfolios based on the size of P/E ratios. The reference period for the study was four years from September 2004 to September 2008. The major findings of the study were that the portfolio returns increased with the decrease in P/E ratio and there was full consonance between portfolio return and portfolio risk.

**Low Beta Anomaly**

Across the world, in different markets there have been many instances of low-volatility stocks giving higher risk-adjusted returns. Roberts Haugen (1967) noted an abnormality—lower-risk portfolios provided superior returns to the supposedly efficient market portfolio. Nevertheless, this insight has had limited empirical support and was not verified until the last decade.

It was only recently that Roger Clarke, Harvin de Silva, and Steven Thorley (2006) carried out an interesting study on the characteristics of minimum-variance (MV) portfolios. These authors found that MV portfolios, based on the 1,000 largest U.S. stocks over the period 1968-2005 achieved a volatility reduction of about 25% while delivering comparable or even higher average returns than the broad market portfolio. They found that MV portfolios gave on average a 6.5% excess return above T-Bills with a volatility of 11.7% whereas the market index gave average excess return of 5.6% with a volatility of 15.4%.

Blitz and Vliet (2007) presented that portfolios of stocks with the lowest historical volatility are associated with Sharpe-ratio improvements that are even greater than those documented by Clarke et al. (2006), and have a statistically significant positive alpha. Blitz et al. (2007) found that low volatility stocks have superior risk-adjusted returns relative to the FTSE World Development Index. They also found that low beta stocks had higher returns than predicted while the reverse held for high beta stocks.

State Street (2009) used the monthly returns for Russell 3000 Universe from December 1986 to October 2007 to note that low beta stocks outperform
high beta stocks. According to this study, lowest beta stocks do not necessarily produce the highest returns, thus implying that some success can be attributed to portfolio construction.

Pandey and Prachetas (2012) tried to examine the Risk Anomaly on the scrips traded in National Stock Exchange. The study was limited to those 51 stocks whose derivatives were traded in National Stock Exchange. Data for twelve years, for a period between May 2000 and April 2012 was considered for research purpose. CNX Nifty was used as a market proxy. The findings established high risk-high returns paradigm is a fallacy in capital markets. The analysis gave higher average monthly rate of returns for low volatility stocks when compared with high volatility and market portfolios. The probability distribution function was asymmetric and left skewed with a fat tail indicated by kurtosis of less than three. The cumulative histogram of VaR also established increased downside risks with higher probability for HV and market portfolio when compared with LV portfolio.

The above literature reflects a somewhat controversial picture of stock markets over the years, may be due to statistical misgivings. Or perhaps we could presume the disappearance of these anomalies over time, on the basis that rational traders exploit the documented anomalous behaviour, hence leading to more efficient markets. In other words, the anomalies are arbitraged away. This empirical study is an attempt to lend further support to earlier findings. Also, much evidence of research on the said anomalies is available for international markets but in India, there is a limited work covering all the selected anomalies has been done. Hence, the main objective of the present study is to find out the existence of above-mentioned anomalies in Indian stock market.
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