CHAPTER-8
SUMMARY AND CONCLUSIONS

Capital market efficiency has been a core topic of research since decades. The credit goes to Fama (1970), who has introduced the theoretical analysis of market efficiency. Since then, a great deal of research work has been devoted to investigate the random nature of movements of stock prices to examine the efficiency of stock market. It is assumed that stock markets are efficient and prices fully reflect all information and price movements do not follow any patterns or trends. This means that past price movements cannot be used to predict future price movements. Rather, prices follow a random walk as an intrinsically unpredictable pattern.

Since then, a great deal of pioneer research work has been devoted to examine the random nature of movements of stock prices because individual or institutional investors are interested in finding an answer to the question of how securities are priced. To consider this, share prices appear to follow a random walk and a model of share price behaviour is required to explain the movement of share prices. As a result, the gap is filled by more general model based on the concept of efficiency of the markets in which shares are traded i.e., Efficient Market Hypothesis (EMH) and the term of EMH has been proclaimed by Fama (1970).

By virtue of this, if investors are using that information, then a market can be termed as efficient with respect to a particular set of information. As a result, they receive the expected return and make no consistent abnormal returns. Moreover, certain regularities in the common stocks have been discovered and some cross sectional differences among stock returns have been found to occur with regularity. The evidences in Review of Literature have indicated that future returns may be predicted from past returns, dividend yield and term structure variables. This apparent violation of the EMH is confounded by the joint hypothesis problems of whether there is a rational variation over time in expected returns or whether models used in the measurement suffer from systematic deviations from fundamental values.
One of the well established over-pricing model like Capital Asset Pricing Model (CAPM) explains a few regulations. This model asserts that different securities should have different trading returns because they have different betas. But a number of regularities not predicted or explained by any of the traditional asset pricing models are termed as Anomalies. The existence of stock market anomalies have proved a central challenge to the EMH is which they are proved reliable, widely known and inexplicable patterns in trading returns.

Empirical research suggests that excess return can be earned over time by ranking securities on certain variables (i.e., market value, price-earning ratio, standardized unexpected earnings etc.) and by using observed seasonalities in stock returns (i.e., Calendar anomalies) to construct trading rules. Evidence of empirical regularities in security returns, however leads to a rejection of the joint hypothesis that the asset pricing model used is adequate and that markets are efficient. These findings have stimulated many researchers to conduct research aimed at explaining the market anomalies (Saizar 1992).

In fact, Calendar anomalies may be defined as the tendency of financial assets returns to display systematic patterns at certain times of the day, week, month, year and around market closure to examine the stock market efficiency. Therefore, an investigation into the existence of Calendar anomalies in financial markets has been a subject of a considerable amount of recent academic research.

A well known objection to efficient markets in this nature seems from seasonality in stock market returns. Seasonal anomalies or Calendar effect in securities markets are much discussed phenomenon among academics and practitioners. In fact, stock returns anomalies are in existence in various forms i.e., large versus small firms, long-term compared to short-term, over and under reactions to information, seasonal effects and so on. The area of academic and practitioner research in financial economics that has generated the most excitement and attracted the utmost attention over the past four decades concerns persistent cross sectional and time series patterns that have been documented world-wide (Alagidede 2008).
According to Ziemba and Hensel (1994), there are some basic reasons, for which anomalies seem to yield higher short term equity returns. These reasons might be behavioral considerations such as investor’s sentiments leading to excess purchase or sale of equities in related but different securities, slow response of the market to the new information, increased cash flow just prior to and during the anomalous period, delay in reporting bad news, institutional constraints and policies such as pension funds made on last day of the month, market maker supply-demand balances and bid-ask spread preferences.

Moreover, seasonal anomalies in stock returns have indicated that investors can have different required rates of return on risky assets depending on the Calendar month or day, on which investments occurs. However, no peculiar pattern has been observed for the anomalous trading behavior of the Indian stock market. Therefore, it can be said that there is research gap between the work which has been done and the work should be done. To fill that research gap, present study under-takes the examination of Calendar anomalies in Indian stock market by analyzing the companies listed on Bombay Stock Exchange (BSE) and National Stock Exchange (NSE).

In recent years, several stock market anomalies are identified in the burgeoning literature and present study will contribute towards the examination of most commonly discussed Calendar anomalies i.e. Day-of-the-Week effect, January effect, Turn-of-the-Year effect, Monthly effect/Turn-of-the-Month effect and Holiday effect.

Even, these phenomena are extensively studied in foreign stock markets, but the research on stock market anomalies in India is still on nascent stage. The review of literature has revealed that a number of research studies have been conducted in this area in India and abroad and they have not provided sound theoretical and empirical explanations regarding the impact of Calendar anomalies on Indian stock market.

The present study could possibly help to understand and explain the typical and crucial nature of seasonality exists in Indian capital market. In addition, it undertakes anomalous aspect of Indian stock market. In such a way, the investors could understand various issues related to the Indian stock market and they can adjust their portfolios accordingly to reap the maximum benefits.
The main objective of the study is to test the Calendar anomalies in Indian stock market. Specific objectives of the study are:

- To examine the existence of Week-End/Day-of-the-Week effect in Indian stock market.
- To investigate the presence of January/Turn-of-the-Year effect in Indian stock market.
- To test the Monthly/Turn-of-the-Month effect in Indian stock market.
- To examine the existence of Holiday effect in Indian stock market.

The study is based on the period of fourteen years and three months i.e., from January 1, 1992 through March 31, 2006 to examine the presence of seasonality in Indian stock market for BSE. The data constitutes a sample of 3476 daily observations. The study period has been bifurcated as:

1. January 1, 1992 to March 31, 2006 (Aggregate time period),
2. January 1, 1992 to December 31, 1995 (Initial years of Post-Liberalization and Globalization era),
3. January 1, 1996 to June 21, 2001 (Pre-Rolling Settlement period),

The sample period for NSE is eleven years and four months i.e., from November 3, 1994 through March 31, 2006. The data constitutes a sample of 2810 daily observations for NSE. The study period has been bifurcated as:

1. November 3, 1994 to March 31, 2006 (Aggregate time period),
2. January 1, 1994 to December 31, 1995 (Initial years of Post-Liberalization and Globalization era),
3. January 1, 1996 to June 21, 2001 (Pre-Rolling Settlement period),

The data employed is based on secondary sources. The relevant data for the examination of Calendar anomalies have been taken from the websites of BSE and NSE, CD ROM on daily official list of BSE, Newspapers and Journals, CAPITALINE DATABASE and PROWESS DATABASE.
The selection of the companies has been done by considering the continuous trading of these companies during the study period and the availability of data. If any company has infrequent trading then that company has not taken for the analysis. The present study has selected the sample of companies, which have been listed in the period from January 1, 1992 through December 31, 1995 for BSE and from November 1, 1994 through December 31, 1995 for NSE.

Close-to-close data has been recommended and used by a number of researchers to detect the presence of seasonality in stock returns. Daily stock prices and monthly stock prices listed on BSE and NSE have been taken respectively to carry out the analysis. A list of six hundred and sixty two companies listed on BSE and two hundred and three companies selected for NSE have been examined. Daily closing prices of Sensex have been taken for the purpose to investigate Holiday effect in Indian stock market with reference to BSE. The study emphasizes exclusively on the impact of the Rolling-Settlement on trading on BSE and NSE to check the efficiency of the functioning of the Indian stock market. The examination of companies listed on both of these exchanges contributes towards examination of existence and persistence of stock market anomalies in the Indian stock market in the light of capital market reforms as well and it might be proved beneficial to investors, while dealing with securities time to time.

In consonance with the objectives of the study, descriptive statistics and (i.e., four moments i.e. Mean, Standard Deviation, Skewness and Kurtosis) have been calculated to confirm the variation in the stock prices on daily, monthly and yearly basis. Further, Augmented Dickey Fuller (ADF) test and Philips-Perron (PP) test have been used to examine whether the series under examination is containing unit roots. In order to test the seasonality in stock returns, Augmented Dickey Fuller (ADF) test has been applied.

**8.1 MAJOR RESEARCH FINDINGS**

Major research findings of the study are as follows:

**8.1.1 Day-of-the-Week Effect in Indian stock market**

According to EMH, security prices fully reflect all available information at any given time which implies that price movements do not follow any pattern or trends and
expected daily returns on stocks are same for all trading days of the week. Furthermore, it indicates that the expected return on a security is same for Monday as it is for Tuesday, as it is for Wednesday and so on. Thus, it can be said that the trading returns on a stock over different trading days of the week should be evenly distributed. However, the pioneer work done by a number of researchers has documented different trading returns on different trading days of the week all over the world known as Day-of-the-Week effect. The main objective of this section is to examine the behaviour considerations of investors in Indian stock market with different trading days.

**Day-of-the-Week Effect in BSE listed companies**

The empirical results of descriptive statistics for the *Aggregate* period and *Pre-Rolling Settlement* period have suggested that average trading returns are found highest on Monday. In this case, these results conform the *Reversal of Monday effect* (as Monday tends to be the worst day to be invested in stocks because average trading return on Monday are much lower than average trading return on other days of the week, but results have suggested the presence of highest Monday trading returns). The highest average trading returns are documented on *Friday* for the *Post-Liberalisation* period. Whereas highest average trading returns are found on *Tuesday* during the *Post-Rolling Settlement* period. The summary results of Day-of-the-Week effect have indicated that *Monday effect* is found during the *Aggregate period*. These results are consistent with the findings of *Post-Liberalization* and *Pre-Rolling Settlement* period. Whereas *Day-of-the-Week effect* is missing for the *Post-Rolling Settlement period*.

**Day-of-the-Week Effect in NSE listed companies**

The summary results of descriptive analysis of NSE demonstrate that *Wednesday* is causing the highest variability in the weekly distribution of mean returns during the Aggregate period. These results are consistent with the findings of *Post-Liberalisation* and *Pre-Rolling Settlement* period. However, average trading returns are highest for *Monday* during the *Post-Rolling Settlement period*, conforms the presence of *Reversal of Monday effect*. The Day-of-the-Week effect of NSE indicates that Day-of-the-Week effect is missing during the *Aggregate period*. *Monday effect* is significant during the
Post-Liberalisation period. Friday and Wednesday effect is documented during the Pre-Rolling Settlement and Post-Rolling Settlement periods respectively.

Thus, on the basis of empirical evidences, it can be stated that the traders can design their strategies by considering the significant profit booking days i.e., highest trading returns during the period before selling their securities. Even, positive trading returns towards end of the week i.e., Friday in the Pre-Rolling Settlement period implies that stock prices tend to move upwards from the beginning of the week.

It provides the opportunities to investors to frame their trading strategies as the anomaly suggests that market participants can predict the market well in advance and can be benefitted from the market through timing their plans for investment and sale of securities. But, some of the authors suggest that the strategy is suitable for short term period only. However, a number of explanations are provided in the literature for the occurrence of the particular effect such as previous week's market performance, window-dressing, imperfections of the stock market, measurement problems, lack of liquidity and information and informational efficiency, but no uniform conclusive evidences have been found yet.

8.1.2 January Effect in Indian Stock Market

The January effect is the phenomenon, where stocks exhibit higher trading returns during January compared to other months of the year. January effect or Turn-of-the-Year effect attracts significant interest among researchers and practitioners as it provides the prospect of making abnormal return for investors in a particular month i.e., January.

January effect in BSE listed companies

The analysis reveals that descriptive statistics for BSE listed companies indicate that trading returns are highest for the month of May during the Aggregate period. During the Post-Liberalisation period, trading returns are highest for the month of February. The results have provided that trading returns for the month of July are highest for the Pre-Rolling Settlement period. Whereas trading returns are highest for the month of April during the period of Post-Rolling Settlement period.
When the January effect in BSE is examined, it is observed that the January effect is confirmed during the Aggregate and Post-Liberalisation period. A weak January effect is found during the period of Pre-Rolling Settlement, however, the January effect is missing for the Post-Rolling Settlement period.

**January effect in NSE listed companies**

As far as the results of NSE listed companies are considered, the summary of descriptive statistics document the presence of the highest trading returns in the month of January during the entire and Pre-Rolling Settlement period, Whereas, trading returns are the highest for November for the Post-Liberalisation period.

The results of January effect in NSE listed companies suggest that November effect is found during the Aggregate period, whereas January effect is in the existence for Pre-Rolling Settlement period. In the Post-Rolling Settlement period, the results are documenting the presence of February effect. These results are well supported in the literature.

There are a number of plausible explanations for the existence of the January anomaly i.e., tax-loss selling hypothesis states that investors sell the stocks in which they have suffered losses in order to take advantage of accrued capital losses before the end of the year. This selling pressures depresses stock prices at the year-end and as a result, the prices rebound in January and thus, average trading returns in the month of January are highest. In addition, liquidity hypothesis is considered as the main cause for higher January trading returns which states that stock returns represent an upward trend in the month of January and vary inversely with stringency of monetary policy. However, window dressing hypothesis proposes that institutional investors use to purchase securities in the starting of the year and sell them before the year-end because they are evaluated on the basis of their performance and risk involved in the portfolios held by them.

The empirical findings in the present study exhibit that seasonal anomalies in the stock markets are not a phenomenon of recent times but of earlier periods and documented globally all over the world. Size effect, tax-loss selling hypothesis,
information hypothesis, role of institutional investors, parking the proceeds hypothesis, insider trading, role of individual investor, simulation causes such as outliers, concentration of listings, delisting and data base errors can be considered as the causes for the above-said effect.

When, institutional investors are considered as a cause for the effect, then it is reported that the institutional investors expect a tough year and divest from risky securities at the beginning of the year. As a result, it is expected that risky securities to experience might decline during January. That is why not every January is a positive one. Thus, it can be stated that January tends to be strong when things turn out well and bad when the year doesn't go well (Athanassakos 2006).

8.1.3 Turn-of-the-Year Effect in Indian stock market

The Turn-of-the-Year effect refers to the phenomenon that small stocks have abnormally high stock returns during the period beginning on the last trading day of December and continued through January, however, the situation is not so for other trading months of the year. During the month of January, stocks in general and small stocks in particular have generated abnormally higher trading returns historically as the effect is mainly attributable to higher stock returns during the first five trading days of January.

**Turn-of-the-Year Effect in BSE listed companies**

The results for BSE listed companies have revealed that average trading returns are highest for first five days of January for the Aggregate, Post-Liberalization and Post-Rolling Settlement period. However, the findings for the Pre-Rolling Settlement period are not supported by the literature, where it is found that average trading returns for last fifteen days of December are highest.

**Turn-of-the-Year Effect in NSE listed companies**

The results of companies listed on NSE reveal that during the Aggregate and Pre-Rolling Settlement period trading returns for the first five days of January are the highest, whereas, the Post-Rolling Settlements period provides the results that trading returns for
the last twenty days of December are the highest. Therefore, the results document the presence of seasonality in Indian stock market during the Aggregate and sub-period as well.

The results provide the empirical evidence for the existence of Turn-of-the-Year anomaly and suggest that if an investor has knowledge about arbitrage opportunities and stock market anomalies then he has at least some chances of getting compensated for the risk he is taking. Therefore, if stock returns document the presence of exploitable regularities, then it is observed that smart traders can earn super-normal profits by taking benefit of all those trading patterns.

Further, cause for January effect might be the institutional investors, who can be characterized as informed traders, who speed up the adjustment of stock prices to new information and thereby render the stock market more efficient. Even, institutions can obtain an informational advantage by exploiting economies of scale in information acquisition and processing. In fact, the institutional investor has to incur less cost of gathering and processing information than individual traders comparatively. In addition, institutional investors may be better trained and have better resources than individual investors.

8.1.4 Monthly Effect in Indian Stock Market

Monthly effect states that most of the positive and higher trading returns are realized on first fifteen trading days in a month in comparison with last fifteen trading days of the same month.

Monthly Effect in BSE listed companies

The results for Monthly effect for BSE listed companies document that trading returns for first half of the month are greater during the Aggregate period, consistent with the results from Post-Liberalization, Pre-Rolling Settlement and Post-Rolling Settlement period, thus rejecting the hypothesis of equality of mean returns for both the halves. Thus, the results confirm that trading returns for companies listed on BSE are not normally distributed and conform the presence of Monthly effect in BSE.
**Monthly Effect in NSE listed companies**

The results for companies listed on NSE have documented that trading returns are higher for the first fifteen trading days of all the months taken collectively for the Aggregate, Pre-Rolling Settlement and Post-Rolling Settlement period. It is implied that no individual seeking to capitalize on the monthly pattern in stock returns would hold stocks for only a single day. Since, the high return and low return days cluster in the first and second halves of trading months respectively constitute an economically measure of the monthly effect. Even, If the principle of working capital management is considered, it is believed that representative investor allocates a fixed proportion of investable wealth to cash, highly liquid securities (i.e., treasury securities) and less liquid investments (i.e. stocks). As a result, an investor will make additions to his stocks, only if it reduces transaction cost to his portfolio.

### 8.1.5 Turn-of-the-Month Effect in Indian Stock Market

Turn-of-the-month anomaly is a part of Monthly effect and the effect states that stocks consistently exhibit higher trading returns on the last day and the first four days of the month.

**Turn-of-the-Month Effect in BSE listed companies**

Turn-of-the-Month is well documented for the companies listed on BSE during the Aggregate and sub-period. When the results from BSE are considered, it is proved that trading returns are greater for the first half for the Aggregate, Post-Liberalization, Pre-Rolling Settlement and Post-Rolling Settlement period.

**Turn-of-the-Month Effect in NSE listed companies**

The results clearly depict that the average trading returns for the first half of some certain days of all the months together are greater than average trading returns for the second half of certain days in all the months together during the periods i.e. Aggregate period, Pre-Rolling Settlement period and Post-Rolling Settlement period.

The effect of Turn-of-the-Month can be either due to the temporal pattern of cash received by investors or the effect might be due to the psychology of investors to
postpone their investment decisions until the starting of the periods. The causes for Turn-of-the-Month effect can be the presence of abnormally high positive trading returns at the Turn-of-the-Month. Even, higher trading returns during the first half of the month are due to the increased liquidity and the clusterization of the earnings announcement releases.

The concentration of cash flows at the turn of each calendar month causes the standardization in the payment system. Therefore, investors realize substantial cash receipts at the Turn-of-the-Month. Therefore, it subsequently results in the documentation of high trading returns at Turn-of-the-Month. Thus, it can be concluded that the surge in the monetary funds has been caused by the presence of liquid cash and profits. As a result, these liquid profits are affected by monetary policy which is known as Turn-of-the-Month liquidity hypothesis.

Further, important macroeconomic news announcements are systematically clustered on particular days of each month. Moreover, it happens especially in the first half of the month. In general, macroeconomic news announcements released at the beginning of the month have sufficient and important information for the investors. In addition, increase in liquidity is positively associated with price changes, which is caused by the dissemination of information. In such a way, this information provides the basis for investors to increase their trading activities around these days.

However, market imperfections, costs of information and blocks to the free flow of information may stand in the way of free play of market forces and speculators. However, there are some chances that groups of interested parties or even brokers may manipulate the prices through cornering of shares and reducing the floating stock of the market.

### 8.1.6 Holiday Effect in Indian Stock market

The Holiday effect has been one of the most persistent and the well documented anomalies of EMH. Trading on the day before holidays has produced consistently high returns which have been measured for various time periods along many indices. The Holiday effect refers to the strong tendency for equities to experience abnormally large returns just prior to holidays.
Results from descriptive statistics clearly depict that average trading returns for *Pre-Holiday* are the highest for the *Aggregate, Post-Liberalisation, Pre-Rolling Settlement and Post-Holiday Settlement period*. To summarize the results obtained from the statistical analysis of Holiday effect, it is documented that *Pre-Holiday* effect is in existence and documented for the *Aggregate* and *Post-Liberalisation* period. However, *Post-Holiday* effect is found during the *Pre-Rolling Settlement period*. However, the Holiday effect is no more in the existence for the *Post-Rolling Settlement period*.

The results from the analysis reject the presence of EMH in all the periods and provide the opportunities to the investors to exploit them up to the full extent. The results depict that the daily trading returns of a substantial number of stocks do not follow random walk hypothesis and hence could be predicted as well in different trading categories on the basis of return.

Pre-Holiday strength could be attributed to short sellers, who desire to close short positions (but not long positions) before holidays or simply to some clientele, who preferably buys (or avoid selling) on Pre-Holidays. The Pre-Holiday returns are prevalent due to the movements from the bid-to-ask price. In addition, reluctant behavior of small investors to make their purchasing of securities on Pre-Holiday can be considered as an origin of the anomaly too. Therefore, the presence of Calendar anomalies implies that historical information of daily prices could be utilized to predict future stock returns. In a way, profitable trading strategies could be made on the basis of historical information of share prices.

Hence, it is proved that in an efficient market, the prices of securities will reflect the market’s best estimate of their expected return and risk. Therefore, there will be no undervalued securities offering higher than deserved expected returns. Thus, in an efficient market, an investment strategy concentrated on the overall risk and return characteristics of the portfolio can be proved sensible. If, however, markets are not efficient and excess returns can be made by correctly picking winners, then it will provide investors to spend time for finding undervalued securities.
8.2 IMPLICATIONS OF THE STUDY

The study has following implications:

1. If a market is considered efficient i.e. asset prices follow a random walk, then it becomes impossible for an investor to predict the future price movements of an asset. In other words, an investor is unable to consistently predict the stock market in advance and buy or sell mispriced assets at right time (i.e. prefers to buy underpriced securities and to sell overpriced securities). Then, it becomes the matter of chance to beat the market some of the times.

2. If any market is found efficient and it does not recognizes that there are no under priced and overpriced assets in the market even then sometimes the persistence of such mispriced securities might be for a very short duration. Thus, this study helps to detect the Calendar anomalies i.e. Day-of-the-Week effect, January/Turn-of-the-Year effect, Monthly effect/Turn-of-the-Month effect and Holiday effect. Investors should keep in mind the effects of these anomalies on stock market i.e. whether to buy or sell the securities on particular Day-of-the-Week, what should be the strategies to trade in particular month in the year, what will be the effect of decisions making to invest or sale of securities on monthly basis i.e. at the Turn-of-the-Year and at Turn-of-the-Month as well to make strategic decisions to exploit Holiday anomaly too.

3. The results emphasize on the fact that of Reversal of Monday effect is prevailing for the Aggregate and Pre-Rolling Settlement period for BSE and for NSE for the Post-Rolling Settlement period. This is providing an insight into the matter that Indian stock market is moving towards the efficiency due to the reason that average trading returns for Monday are highest during these periods, contradicting the existing of Monday effect.

4. During the Aggregate period, the average trading returns for the month of January are the highest, consistent with the Pre-Rolling Settlement period for the companies listed on NSE. Thus, one can take advantageous position in the stock market while making the investment or sale of investment decisions.
8.3 SCOPE FOR FURTHER RESEARCH

1. The intra-day stock price can be examined to investigate the behaviour of share prices.

2. The role of transaction costs to detect the Calendar anomalies will contribute a lot to examine the Indian stock market.

3. The inter-Day stock price changes can be examined in order to obtain further information in the context of behaviour of share prices.

4. Divided based anomalies might be examined for further research.

5. A comparative examination for the presence of Calendar anomalies can be done on international level.

6. Major indices on BSE and NSE can also be examined.