CHAPTER VII

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India is witnessing a tremendous growth in stock markets due to the liberalisation, globalisation and privatisation policies of the Government of India. The principal factor influencing the trend seems to be the continuing flow of funds from overseas investors on the expectation of a reasonable economic growth. Fluctuation in stock prices is due to various factors both economic and non-economic. Share prices are sensitive even to an individual and isolated event. Generally the share prices are expected to fluctuate according to the performance of the companies. But most of the times the surge in share prices occur not on the basis of economic factors alone but on artificially created demand and supply for stocks.

Many studies have documented the behaviour of stock returns for testing market efficiency. Earlier studies in sixties accepted the Efficient Market Hypothesis (EMH). However later studies do not accept this hypothesis. The behaviour of stock returns has also been influenced by various seasonal anomalies. Seasonalities in stock returns have been tested widely in USA and other developed countries, but very limited studies are available in India. Hence this study is undertaken to test the seasonalities in stock returns under Indian conditions.
7.1. Summary:

The average daily share price data of 24 companies, which are common to both Bombay Stock Exchange Sensitive Index and National Stock Exchange Index are used in the study. For indices, daily data of Bombay Stock exchange both Sensitive and National and National Stock Exchange (NSE-50) were taken for analysis.

The study covers a period of six years from January 1990 to December 1995 for individual companies. For Bombay Stock Exchange Sensitive Index, daily closing data was used for a period of sixteen years from January 1980 to December 1995. The daily closing data of Bombay Stock Exchange National Index was used for a period of nearly twelve years from April 1984 to December 1995. National Stock Exchange daily Index data was also used for a period of nearly six years from July 1990 to December 1995. Actually, National Stock Exchange started its trading operation only in November 1994. But index was compiled retrospectively from July 5, 1990.

The study period has been divided into five sub-periods based on the movement of Bombay Stock Exchange Sensitive Index. The first period is an advancing market during January 1990 to December 31, 1991. Stock scam (boom) is the second period, which is from January 1 to April 27, 1992. During the scam period, share prices rose abnormally and as a result sensex touched a peak level of
4467 points. The third period (declining) covers the period from April 28, 1992 to July 1993. Sensitive index touched a low level of 2147.59 points during the third sub-period. But August 2, 1993 onwards the market rose again till September 12, 1994. During the fourth period (advancing market), sensitive index again reached a peak level of 4627.49 points. During the fifth period (declining market), the share prices again declined since September 13, 1994 to the end of the study period (i.e., December 31, 1995).

The data used in the study were collected from Bombay Stock Exchange Official Directory and various issues of The Hindu Business Line, The Hindu, The Indian Express and Financial Express. Necessary adjustments were made before analysing the data. Appropriate adjustments relating to bonus issues, changes in face value of the shares, and non-trading days were made.

Analysis of data

Returns on the individual companies and indices are calculated and used in the analysis. The first objective of the study is to examine the behaviour of stock returns. For this, summary statistical measures, frequency distribution, auto correlation and runs tests are used. Correlation analysis is also used to understand the association among stock returns at different periods under review.

Study of seasonal anomalies in stock return is the second objective of the study. For testing the presence of seasonal anomalies, which include day of the week
effect, fortnightly, monthly, size and budget effect statistical tools like regression on dummy variables, summary statistical measures and event study approaches were used. Finally, the event study approach is used to study the impact of settlement cycle on stock returns.

Results and Findings

Based on the objectives of the study, relevant hypotheses were framed and tested by using appropriate statistical techniques. In order to understand the behaviour of stock returns, various statistical tools were applied.

7.2. Behaviour of stock returns:

Using summary statistical measures, it is found that stock/index returns are not uniformly distributed across the sub-periods under study. Mean return of the companies and sensitive index is higher in the second (scam) period in which mean return exceeds more than one per cent in most of the cases. During the scam period, standard deviation, range, skewness and kurtosis are high as compared to other periods thereby suggesting there was high volatility of stock returns. There is a positive mean return in the first, fourth and entire periods. But the returns are negative during third and fifth periods. Average stock return is higher than index return for the first, second and fourth sub-periods and the entire period. Return on National Stock Exchange index is lesser than the sensitive index return. Thus it is observed that return is high in an upward market and low in a declining market.
Hence it is concluded that there are significant differences in stock returns during advancing and declining markets.

Frequency distribution shows the concentration of stock returns in different class intervals. It is found that stock returns are concentrated mostly in the class intervals -4 to -2 per cent and 2 to 4 per cent for individual companies and sensitive index for all the sub-periods and for the entire period. More specifically nearly 50 per cent of observations fall under -2 to 0 per cent in all the periods. It is concluded that stocks earn negative return both during advancing and declining markets. For National Stock Exchange Index, most of the returns are positive (53 per cent), mostly in the class interval 0 to 2 per cent, which constitutes 40 per cent.

There is no negative correlation coefficient in any of the sub-periods and the entire period. It is observed that the association among rates of return of companies is uniform in all phases of the market cycle (advancing and declining markets).

Auto correlation analysis is used to test the randomness and independence of stock returns. First order auto correlation coefficient is significant for 11 companies during the first period. During the second (scam) period, only two companies are having significant auto correlation coefficients in the first lag. Seven companies have significant auto correlation coefficients in the first lag during the third period. First order auto correlation coefficient is significant for 19 companies in the fourth period. During the fifth period, 21 companies have significant auto correlation coefficients in
the first lag. Auto correlation coefficients for all the 24 companies are significant in the first lag during the entire period. Thus the behaviour of stock returns is independent and random for the first, second and third sub-periods while return series are dependent and non-random for the remaining two sub-periods and entire period. On the other hand, sensitive index returns exhibit randomness for first and second sub-periods whereas index return is dependent and non-random for the remaining sub-periods. Data series of both sensitive and NSE indices exhibit non-randomness and dependence during the period of study.

Runs analysis is also used for testing randomness of stock returns. During the first period, the Z value is significant for only seven companies. Only one company has significant Z value during the second period. The Z value is significant for 15 companies each for the third and fourth periods. During the fifth period, 13 companies have significant Z values. During the entire period, the Z value is significant for 22 companies. Thus it is found that stock returns behaved randomly during the first and second sub-periods, but stock return is non-random and dependent for the remaining sub-periods (third, fourth and fifth sub-periods) and entire period. For indices, index return exhibits randomness and independence for second and third sub-periods, while all other sub-periods and entire period show non-randomness and independence. National stock exchange index also exhibits non-randomness and dependence.
Thus, stock return is random for the first, second and third sub-periods under auto correlation analysis and runs analysis confirms the result for first and second sub-periods only. Under both the analyses the behaviour of stock returns is dependent and non-random for fourth, fifth and entire period. On the other hand, the result of auto correlation indicates that the index return is random and independent while runs analysis does not prove this inference for the first sub-period. During the second sub-period, sensitive index behaved randomly under both the analyses. Under auto correlation analysis, data series reveal non-randomness of index return but runs analysis fails to support the auto correlation result. The result of both auto correlation and runs analyses indicates that the index return is dependent for third, fifth and entire period. National stock exchange index also exhibits non-randomness and dependence of index returns. Hence it may be concluded that there are significant difference in the behaviour of return during various phases of stock market cycle.

7.3. Stock market anomalies:

For the purpose of testing day of the week effect, regression on dummy variable was used. There is an existence of day of the week effect in the Indian stock market. It is observed that during the first period, Friday exhibits the highest stock return and low return on Wednesday. But in the second period, Monday exhibits high return and negative or low return on Friday. During the third period, Friday shows the highest return and low Tuesday returns. Friday has the highest stock returns while
lowest return is found on Wednesday for the fourth sub-period. High returns on Friday and low return on Monday and Tuesday as far as fifth period is concerned. During the entire period, Friday exhibits high return and Tuesday shows low return.

On the other hand, sensitive and national indices show the highest return on Friday and lowest return on Thursday during the first sub-period. Same pattern is shown in the third sub-period for national index. During the second sub-period, Monday shows high return and low return on Friday. Sensitive index has the highest return on Friday and lowest Monday returns during the third sub-period. Return is high on Friday and low on Tuesday for both the indices for the fifth sub-period. Similar result is observed for entire period also. Thus based on the above analyses the hypothesis that “there is no significant difference in stock returns across days of the week” is rejected. It is concluded that returns are not uniformly distributed across days of the week in all the sub-periods and entire period. In general, it is found that Friday exhibits the highest return. However the hypothesis “there is no size effect existence on stock returns behaviour” is accepted suggesting that there is no significant difference in rates of return for small and large stocks.

Summary statistical measures were used to test the hypothesis that “Return of first-half is not significantly different from the second-half”. This hypothesis is rejected because the return of second half is greater than first half for both month-
wise and year-wise analyses. It is also found that there is no size effect observed in analysing fortnightly effect.

Hypothesis that “there is no significant difference in stock returns across months of the calendar year” is also rejected. It is found that the highest positive return is found in July, lowest positive return in May and negative return in October, April and November. It is concluded that the highest return is found in July and lowest return in April for companies. For indices, highest return is found in August and lowest return is in October. It is also observed that the highest return is found in July and lowest is in October for both large and small stocks. Highest August return and lowest October return is found for large stocks.

Budgets in India invariably affect the stock prices and even the prices of essential commodities. For testing this, a hypothesis that “there is no significant difference in stock returns for pre- and post-budget period” was formulated. Analysis of budget effect indicates that the returns are high and positive immediately prior to the budget date for both the indices. Eventhough there are positive returns in both pre- and post-budget days’ average return is high immediately prior to budget date for Bombay stock exchange national index. Negative return is found on day +5 positive returns are found on other days. Hence the hypothesis that “there is no significant difference in stock returns across pre- and post-budget days” is rejected and it is observed that return in pre-budget is greater than post-budget days.
Beta is used to find the sensitivity of stock return in relation to market return. From beta analysis, it is found that no stock shows a negative beta. Again it is also found that high beta stocks do not have a higher rate of return and vice versa in almost all the periods except second period. The beta for large firms is greater than one in almost all the periods implying high volatility of stock returns. Interestingly the highest return is found in low beta stocks. No specific pattern is visible in almost all periods except scam period in which high beta stocks have higher returns. Beta analysis has not found size effect on stock returns. In general, it is found that return is high in second period but low in other periods. Hence the hypothesis that “there is no significant difference in stock returns at different phases of market cycle” is rejected. Hence it is concluded that stock return vary at different phases of stock market cycle.

7.4. Settlement Effect:

Settlement cycle effect is tested on BSE sensitive and national indices during badla and non-badla periods. For BSESI, during the badla period, average negative return is found in almost all the days except fifth day of the pre-settlement day, while positive returns are shown in the post-settlement days. On the other hand, during the non-badla period, more than 50% of the returns are negative for all the days in pre-settlement period. But the highest positive return is found on the first day of the post-settlement period. Like BSESI return on national index during the badla period is
high in the case of second day of the post-settlement period. On the other hand, the highest return during non-badla period is found immediately after the settlement date.

Thus overall inference is that the impact of settlement cycle on index returns of Bombay stock exchange both sensitive and national indices reveals that the share prices tend to increase in the post-settlement period. The return is especially high on the first day during non-badla period but second day in the case of badla period. Hence the hypothesis “there is no influence of settlement cycle on the behaviour of stock returns” is rejected thereby concluding that there is settlement cycle effect in Indian stock market.

7.5 Conclusion:

Generally, stock returns vary with the market trends. Again no stock moves in an opposite direction from other stocks in any of the sub-period and in the entire period. Stock returns behave randomly during the first and second sub-periods. However in the remaining sub-periods and entire period, the stock returns are non-random and dependent. For indices, sensitive index returns are random for the second sub-period while non-random behaviour is observed in the remaining periods. National Stock Exchange Index returns also exhibits non-randomness. Hence, there is a significant difference in the behaviour of stock/index returns in different phase of stock market cycle.
Analysis for anomalous effect reveals that Friday shows the highest stock/index returns in almost all the sub-periods except in the scam period where high Monday and low Friday returns are observed. High Friday and low Tuesday returns are observed during the entire period. Thus the returns are not uniformly distributed across days of the week in all the periods.

When analysing fortnightly effect, the return in second half is greater than the first half. As regards monthly effect higher stock returns in July and lower return in April are observed. For indices, higher returns in August and lower returns in October are seen. Return in pre-budget days is greater than post-budget days. Generally, high beta stocks should have a higher return and vice-versa. But no such pattern is found in almost all the periods except in the scam period. Again it is also observed that there is no difference of return for small and large stocks.

Finally, the index return is greater in the post-settlement period. Specifically high returns are seen on the first day during the non-badla period but second day as in the case of badla period. Hence it is concluded that there is presence of stock market anomalies indicating markets are inefficient.