4.1 Summary of the work done

In this study an attempt is made to compute the rate of return available from the capital market and compare them with that of alternate forms of investments. Present study also attempted to test the EMH in weak form using a parametric test (serial correlation test) and a non-parametric test (runs test). These pure statistical tests were confirmed later by testing a popularly used but simple mechanical trading rule (moving average analysis). The test is repeated for the broker investors as well as for general investors.

The sample consisted of 130 "actively traded" shares listed in the BSE. The sample companies were selected on the basis of availability of continuous share price data (week end closing prices).

The work encompassed the latest 10 year period (84-93). The sample period is divided into two 5 year sub periods and analysed separately. This is to know whether the behaviour of capital market was same in both the sub periods. The analysis of the whole sample period is given in the respective chapters while the sub period analyses are given as appendices.

4.2 Main findings

The major findings of the study can be summarized as follows:

(1) The total annual rate of return available from the equity investment (based on the equally weighted portfolio of all the 130 sample companies) for the 10 year holding period (84-93)
is 28.67%. For the same period investments in only 3 companies have given negative return (loss) for the investors.

(2) The total annual rate of return available from the equity investment for the first 5 year holding period (84-88) is 29.26%. For the same period investments in 6 companies have given negative return for the investors.

(3) The total annual rate of return available from the equity investment for the last 5 year holding period (89-93) is 30.08%. For the same period investments in 15 companies have given negative return for the investors.

(4) The annual rate of return from the equity investment is positive for all the one year holding periods in the sample period. This disproves the general belief of the people that the equity investment is always risky and chance of making loss is very high irrespective of the length of holding period.

(5) The annual inflation adjusted rate of return available from the equity investment for the whole 10 year holding period (84-93) is 20.30%. For the same period, the number of companies which failed to protect the investors against the continuing inflation (where the annual rate of return is less than the inflation rate) is 15.

(6) The annual inflation adjusted rate of return available from the equity investment for the first 5 year holding period (84-88) is 22.96%. For the same period, the number of
companies which failed to protect the investors against the continuing inflation is only 13.

(7) The annual inflation adjusted rate of return available from the equity investment for the last 5 year holding period (89-93) is 19.60%. For the same period, the number of companies which failed to protect the investors against the continuing inflation is 29.

(8) Except for one year (i.e. 1987), the inflation adjusted rate of return on equity investment is positive for all one year holding periods in the sample period. This shows that the equity investment in India was able to provide hedge against inflation continuously.

(9) The total annual rate of return available from the GOI securities during the whole sample period is 8.19%. The corresponding value for the first 5 year period is 7.88% while for the last five year period, it is 8.51%.

(10) The annual inflation adjusted rate of return available from the GOI securities for the whole sample period is 0.17%. The corresponding value for the first 5 year period is 1.58% while for the last five year period, it is -1.97%. This shows that the GOI securities in India have failed to provide hedge against inflation especially in the last 5 year period when the rate of inflation was very high.

(11) The total annual rate of return available from the inter-bank call money market for the sample period is 12.33%. The
corresponding value for the first 5 year period is 10.34% while for the last five year period, it is 14.36%.

(12) The annual inflation adjusted rate of return available from the inter-bank call money market for the whole sample period is 3.96%. The corresponding value for the first 5 year period is 4.05% while for the last five year period, it is 3.88%. This shows that the inter-bank call money market in India was able to provide hedge against inflation.

(13) The annual rate of return available from investment in gold for the whole sample period is 9.51%. The corresponding value for the first 5 year period is 10.78% while for the last five year period, it is 8.25%.

(14) The annual inflation adjusted rate of return available from investment in gold for the whole sample period is 1.14%. The corresponding value for the first 5 year period is 4.48% while for the last five year period, it is -2.23%. This shows that the investment in gold in India was able to provide hedge against inflation for the whole 10 year holding period. But the gold investment was not able to provide hedge against inflation in the last 5 year holding period.

(15) The annual rate of return available from investment in silver for the sample period is 6.89%. The corresponding value for the first 5 year period is 13.46% while for the last five year period, it is only 0.69%. This shows the dismal performance of the silver investment in the last 5 year period.
(16) The annual inflation adjusted rate of return available from investment in silver for the whole sample period is -1.47%. The corresponding value for the first 5 year period is 7.17% while for the last five year period, it is -9.78%. This shows that the investment in silver in India was not able to provide hedge against inflation for the whole 10 year holding period. But the silver investment was able to provide hedge against inflation in the first 5 year holding period.

(17) The comparison of equity investment with the alternate forms of investments shows that the capital market return is well above the return available from other investments. For the 10 year sample period, the capital market return was 20.48% more than the return from the GOI bonds. The excess return over call money rate for the same period is 16.34%. The excess return over gold and silver is 19.17% and 21.78% respectively. This shows that capital market in India has rewarded the investors for bearing extra risk.

(18) As per the serial correlation analysis for testing the EMH in weak form in the whole sample period, there are 39 companies with serial correlation significantly different from zero at 5% level. The corresponding value for the first 5 year period is 34 while for the last 5 year period, it is 28. This shows that the share price movements in BSE is not purely random and there exists some trends in some share series.

(19) As per the runs test analysis for the whole sample period, the number of companies in which the observed total
run is significantly different from the expected total run at 5% level for the whole sample period is 23. The corresponding value for the first 5 year period is 29 while for the last 5 year period, it is 33. This also shows that the share price movements are not purely random but there exists some pattern in some share price series.

(20) The 13 week moving average analysis for broker investors shows that the number of companies in which the 13 week moving average out performed the buy and hold strategy for the whole sample period is 95. The corresponding value for the first 5 year period is 90 while for the last 5 year period, it is 92.

(21) The annual rate of return for the portfolio reshuffled using 13 week moving average for the whole 10 year period is 37.65% while for the buy and hold strategy it is only 28.67%, the difference being 8.98%. The extra return available for using the 13 week moving average for the first 5 year period is 6.45% while for the last 5 year period, it is 11.40%.

These findings (ie 20 and 21) not only show that the share price movements are not purely random and there exists some pattern but also reveal that this trend or pattern is beneficial for a technical analysts who use 13 week moving average for earning additional return provided there is no transaction cost.

(22) The 30 week moving average analysis for broker investors shows that the number of companies in which the 30 week moving
average strategy out performed the buy and hold strategy for the sample period is 77. The corresponding value for the first 5 year period is 73 while for the last 5 year period, it is 79.

(23) The annual rate of return for the portfolio reshuffled using 30 week moving average for the sample period is 30.77% while for the buy and hold strategy it is only 28.67%, the difference being 2.10%. The extra return available for using the 30 week moving average for the first 5 year period is 0.91% while for the last 5 year period, it is 2.60%.

These findings (ie 22 and 23) also show that the share price movements are not purely random but there exists some pattern and reveal that this trend or pattern can be used for earning additional return by reshuffling the portfolio using 30 week moving average provided there is no transaction cost.

(24) The 13 week moving average analysis for ordinary investors shows that the number of companies in which the 13 week moving average out performed the buy and hold strategy after deducting the transaction cost for the whole sample period is only 63. The corresponding value of the first 5 year period is only 52 while for the last 5 year period, it is 77.

(25) The annual rate of return for the portfolio reshuffled using 13 week moving average for the sample period after deducting the transaction cost is only 27.38% while for the buy and hold strategy it is 28.67%, the difference being -1.29%. The extra return available for using the 13 week
moving average for the first 5 year period is -3.90% while for the last 5 year period, it is 1.37%.

These findings (ie 24 and 25) show that the 13 week moving average analysis is not useful to earn additional return provided there is transaction cost. This means that ordinary investors cannot use this trading rule for extra return.

(26) The 30 week moving average analysis for the ordinary investors shows that the number of companies in which the 30 week moving average out performed the buy and hold strategy after deducting the transaction cost for the whole sample period is only 52. The corresponding value of the first 5 year period is 56 while for the last 5 year period, it is 62.

(27) The annual rate of return for the portfolio reshuffled using 30 week moving average for the sample period after deducting the transaction cost is only 26.12% while for the buy and hold strategy it is 28.67%, the difference being -2.55%. The extra return available for using the 30 week moving average for the first 5 year period is -3.47% while for the last 5 year period, it is -2.45%.

These findings (ie 27 and 27) show that the 30 week moving average is also not useful to earn additional return if there is transaction cost. This means that ordinary investors cannot use this trading rule also for extra return.
4.3 Answers to the Research Questions

As per the above mentioned findings, the answers to the research questions formulated in the first chapter are given below:

(1) The rate of return available from the equity investment in the sample period is 28.67% p.a..

(2) The equity investment in India provides hedge against inflation.

(3) The rate of return available from equity investment is more than the return available from risk free investments (GOI bonds) and short term interest rate (call money rate).

(4) The rate of return available from the equity investment is more than the rate of return available from the bullion market (i.e., investments in gold and silver).

(5) Technical analysis is useful for the broker investors to reshuffle the equity portfolio as there is no transaction cost for them. But it is advisable for the general investors to follow a simple buy and hold strategy as they have to pay brokerage for each transaction.

4.4 Conclusion

Capital Market has rewarded the investors handsomely in the sample period. Equity was able to provide hedge against inflation also. The rate of return available from the equity investment is much more than the return available from the
risk free return, short term interest rate and other risky investments. This clearly shows that the capital market in India is rewarding the investors for bearing the risk.

The analysis of the share price movements in BSE in the sample period shows that it is not purely random. But the magnitude of the trend is small. This fact is borne out by the serial correlation analysis as well as the runs test. The actual test of the moving average analysis also reveals this fact. It shows that there is a pattern and this pattern can be used to earn more return than the buy and hold strategy. But as the trend is small, the moving average trading strategy is not beneficial after deducting the transaction cost. So conclusion is that the BSE is efficient in weak form at "the level of transaction cost."

4.5 Implication of the Study

The present study reveals that the capital market in India is efficient and the return available from the capital market is as per the theory of risk premium. This disproves the general belief of the people that the equity investment is always risky and chance of making loss is very high irrespective of the length of holding period.

This study of the return available from the alternate forms of investments shows that only inter-bank call money market was able to provide hedge against inflation in a high inflation period (ie the last 5 year period). All other three forms of
investments (ie GOI bonds, gold and silver) failed to protect the investors from the continuing price rise. This disprove the common Indian belief that the investment in gold and silver is a best bet against inflation.

Present study reveals that the BSE is efficient in weak form but only at "transaction cost level". This means that the technical analysis is useful for the broker investors as they can design a mechanical trading strategy to out perform the buy and hold strategy. The usefulness of moving average analysis as a trading strategy for the general investors is however doubtful as they have to pay brokerage for every transaction.

Technical analysis has immense value to the ordinary investors even though the mechanical trading strategy does not out perform the simple buy and hold strategy after considering the transaction costs. This is because the technical analysis can be used to time the investment (ie purchase or sale as the case may be can be altered to earn an additional return).

4.6 Scope for further research

Of the capital market instruments, the present study covers only the equity shares. It will be worth while to see the return available and behaviour of the other instruments like debentures, preference shares etc.

The present study covers 130 comparatively big and actively traded shares. A study involving smaller and thinly traded
shares is required to confirm the results.

The return computed and presented here is pre-tax. It will be worthwhile to see the return available for investors in different tax slabs.

The return computed and presented here is the total return. It will be worth while to find out how much of it comes from dividend, how much from capital appreciation and also how much of the capital appreciation results from higher EPS and how much from higher P/E ratios.

The return available from the equity investment can be computed for a different sample period.

The present study tested only the independence hypothesis of the RWH. Further study is required to test the distribution hypothesis as such a study has not been done so far in India.

Of the statistical tests available to test the randomness of the share price movements only the serial correlation and runs tests are used here. The other tests like "spectral analysis" and "rescaled analysis" is tested in India only in share indices and not on actual share price series. This is also required.

Further test of the EMH in weak form involving the technical analysis is required as this area is almost left untouched by the Indian researchers. The present study deals with only one simple technical rule. The other more complicated technical rules and also the combination of these as being
widely used by the professional technical analysts also have to be tested to prove/disprove the efficiency of the Indian capital market in weak form.

The usefulness of the volume in the technical analysis remained outside the purview of the present study. A test of the technical rules based on volume will be worth doing.

Another interesting point is why the market is efficient only at the transaction cost level. It means substantial additional return is available to the broker investors using mechanical trading rule strategy. The reason seems to be the cost involved in the use of mechanical trading strategy which involves the continuous monitoring of the share prices. This aspect is also left out for future studies.