CHAPTER VIII

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The financial market is at present exciting and prone to drastic changes which are significant and more needed to enhance the investor confidence. Intervention of Government funds, private finance, hedge funds all lead to market changes. All these modifications and changes are transferred into innovation in the Indian capital market. The capital market of any country is one of the principal drivers of economic growth and development and the Indian capital market has witnessed a remarkable transformation both in qualitative and quantitative terms.

The market innovations contribute to the structural changes in the operations of the Indian capital market. It can expand the investor base, reduce the cost of transaction and increase the operational efficiency. For the development of an economy, security market development is essential. The security market is an important source of inputs to the economy. Out of different investment options available, equity investment is the most rewarding one. It offers maximum economic advantage to an investor in the form of rate of return, capital appreciation and easy marketability.

The concept of investment depends on investment policy, investment analysis, valuation of securities, portfolio construction and portfolio evaluation and revision. Evaluating the investment avenues is based upon the risk-return element in that particular investment.
8.1 Risk-Return Relationship

The basic premise regarding risk and return is that investors prefer returns to risk. People invest in riskier assets only if they expect to receive more than average returns. They analyze the opportunities that are available for them as far as returns are concerned and the involvement of risk thereof while investing in the equity of firms belonging to different sectors of the Indian economy. There is a direct relation between return and risk, so an investor always attempts to keep the risk associated with the return proportional. The risk-return relationship indicates how much an asset’s expected return should be given its relevant risk and how it should be priced. Hence, the risk-return relationship is also referred to as an asset pricing model.

Evaluating the investment avenues is based upon the rate of return, risk and uncertainty, capital appreciation, marketability and convenience of investing. It is necessary to ensure that securities market operations are more efficient, transparent and safe. Therefore, sustainable and pragmatic development of capital market is essential.

8.2 Indian Capital Market

An efficient, articulate and developed financial system is indispensable for the rapid economic growth of any country or economy. The Indian capital market is looking very promising in the present times. The policies regarding the capital market have been revised and the factor of transparency and investor's security is considered as the most important aspect of the market. The last decade (2000-'10) was probably one of the best for the Indian capital market, even a shade better than the 90’s decade which actually established the base for the ‘00s decade through economic liberalization. The 90’s got blemished and diluted due to the domestic scams, while the ‘00s had the global sub-prime crisis that brought the world to its knees. The last decade saw access to global capital becoming easier for the Indian
corporate sector and size multiplied through some of the largest global acquisitions by Indian conglomerates.

It is well known that share prices are affected by a large number of factors, some of which are economic in character while the others are non-economic ranging from weather to war. The influence of each factor is so small that it would be extremely difficult to single out one factor as the principal determinant of share prices though cumulatively they give rise to the observed movements in share prices.

Stock market research is essential to financial and investment decision making and it will be able to determine the market price and trading volume for the stock, the strengths and weaknesses of the underlying company, the high and low prices for the stock over both short and extended time frames, the profits and earnings for the company, and so much more. Moreover, it offers the right combination of assets an investor must hold and the level of risk that the stock carries. It will allow the investors to weigh the possible risks of a stock against the possible rewards the stock may offer. In this regard the study tries to establish the risk-return relationship in the Indian equity market.

8.3 Objectives of the Study

The present study is conducted with the following specific objectives:

(i) To examine whether distributional risk variables, namely, the variance of the return, the skewness of the return, the kurtosis of the return distribution have any significant relationship with average rate of return on equity shares;  
(ii) To examine whether the security-market return has any significant relation with average rate of return on equities;  
(iii) To test whether financial risk variables, namely, liquidity, leverage, dividend pay-out, growth related variable like, assets, sales, earnings, size and earnings per share have any significant role in determining the
average rates of return on equities; (iv) To identify whether market related risk, beta, is an appropriate measure of risk or it is proxying for CAPM by testing the stationarity over the period; and (v) To ascertain the informational efficiency of the Indian stock market in explaining the return behavior in weak form.

8.4 Hypotheses

The hypotheses assumed by the researcher in the present study are reiterated below:

1. There is an association between distributional risk variables and average rate of return on equities.
2. There is a positive relation between security-market return and average rate of return on equities.
3. The financial risk variables have significant relation with average rate of return on equities.
4. The market risk, beta, exhibits stationarity over time in the Indian stock market.
5. There is a positive relation between systematic risk and average rate of return in the Indian stock market.
6. There is randomness in the market returns in the Indian stock market.
7. There is randomness in the security returns in the Indian stock market.
8. The Indian stock market is efficient in weak form.

8.5 Period of Study

In order to conduct the study for finding answers to the objectives framed, a 14 year period from January 1996 to December 2009 has been selected.
8.6 Methodology and Data Base

In order to examine the explanatory power of different risk variables on average security returns, the constituents of BSE500 Index has been considered. This index covers a wide spectrum of industries and gives representation to companies of varying levels of size and trading activity. The BSE500 index represents 90 percent of BSE’s total market capitalization and 70 per cent of BSE’s total turnover. Based on the availability of monthly share prices for a continuous period of 14 years and without interruption, the financial statements for a continuous period of 16 years, a screening has been done to avoid the companies whose continuous data is not available. The remaining 120 companies have been listed in serial order and have selected 60 companies by simple random sampling (Random number table-remainder approach) for the study.

For the analysis, the data required are; monthly share prices, monthly market indice (BSE100 index is used as market proxy) and financial variables of companies.

The study has been conducted by using secondary data, collected from the leading Data Bank of CMIE, ‘PROWESS’. Monthend share prices (after adjustments), company financial variables, BSE100 index values during the period are obtained from the data bank.

To test the relation between distributional and financial risk variables with average rate of return, the study has used step-wise multiple regression equations. The significance of the equations are tested by ‘t’ tests and ‘R square’ value is considered for the impact of influence of independent variables on dependent variable.

The model used for testing the relation between the average rate of return and distributional risk variables- \( R_{it} = \alpha_0 + \beta_1 Var_{it} + \beta_2 Ske_{it} + \beta_3 Kur_{it} + \epsilon_{it} \)
Moreover, when analyzing the relation between the average rate of return and security-market return during the period of study, the best fit is given by their quadratic function: \( Y = A + Bx + Cx^2 + \varepsilon_{it} \)

The model used for testing the relation between the average rate of return and financial risk variables is:

\[
R_{it} = \alpha_0 + B_1 Liq_{it} + B_2 Lev_{it} + B_3 Div_{it} + B_4 Gas_{it} + B_5 Gea_{it} + B_6 Gs_{it} + B_7 Ge_{it} + B_8 Geps_{it} + \varepsilon_{it}
\]

In order to test the stationarity of beta over the study period, two regression equations are worked out. They are:

(i) Time as a Variable
\[
R_{it} = \alpha + \beta R_{mt} + CtR_{mt} + \varepsilon_{it} \quad t = 1, 2, 3, ..., 14
\]

(ii) Use of Dummy variables to measure the change of slope over time.
\[
R_{it} = \alpha + \beta R_{mt} + \gamma_1 D_1 R_{mt} + \gamma_2 D_2 R_{mt} + \gamma_3 D_3 R_{mt} + ... + \varepsilon_{it} \quad t = 1, 2, 3, ..., 14
\]

To analyze the weak form market efficiency, both monthly market return and monthly security returns have been considered. Here, Parametric Tests like Auto Correlation tests and Auto Regression tests and Non-Parametric Tests like Kolmogorov-Smirnov Goodness of Fit test and Run test are applied. To test the joint significance of auto correlation, Ljung-Box statistics are computed. For the entire statistical analysis the study has used SPSS Ver.13.0 package.

The risk-return relationship on equity shares in India is examined on the basis of distributional risk variables, security-market return correlation, financial risk variables and stationarity of beta. Test of weak form market efficiency has also been carried out in the study.
8.7 Chapter Summary

1. Chapter one illustrates an introduction to the Indian stock market. The current and past events and trends, trading, risk-return relation in the Indian stock market, the research problem, scope of the study, rationale of the study, objectives, methodology, data base, data analysis and tools used, variables used in the study, conceptual definition of the variables used, limitations of the study and presentation of the report are included.

2. Second chapter deals with the theoretical background of the topic under consideration. A detailed description of the Indian financial system, risk and return relationship, security analysis and portfolio management, risk and return in investment, both systematic and unsystematic, importance of systematic risk in security analysis, efficient market hypothesis and Fama’s division of market efficiency are included in this chapter.

3. The third chapter discloses a review of earlier studies relating to risk-return relationship, CAPM, importance and influence of beta in investment decision making and studies on capital market efficiency. Both Indian and foreign studies are included.

4. The fourth chapter states an analysis of the relationship between average rate of return and distributional risk variables, namely, variance, skewness and kurtosis of the return distribution. The relationship of average rate of return to security-market return correlation during the period of study is also analyzed in this chapter.

5. Fifth chapter relates to the testing of the relationship between average rate of return and financial risk variables, namely, liquidity ratio, leverage ratio, dividend payout ratio, growth in assets, sales, earnings, size and earnings per share.
6. The sixth chapter makes an analysis of testing the stationarity of beta during the sample period of study to ascertain whether the market related risk, beta, is an appropriate measure of risk.

7. Chapter seven deals with the testing of weak form market efficiency in the Indian stock market, taking monthly market return and monthly security return as base.

8. The last chapter, the present one, deals with the summary of the previous chapters, the results obtained and the conclusions of the present study, followed by recommendations.

8.8 FINDINGS OF THE STUDY

8.8.1 RISK-RETURN ANALYSIS: AVERAGE RATE OF RETURN AND DISTRIBUTIONAL RISK VARIABLES

The variables that are directly associated with the probability distribution of returns of a firm’s stock are identified as major risk variables. They are variance (second moment), skewness (third moment) and kurtosis (fourth moment) of the distribution of returns on equities.

The distributional risk variables considered in the analysis are calculated from the average rate of return on equities over the sample period. Firstly, the average rate of return for the sample securities are found out for the entire period and used as dependent variable in regression analysis. From the average rate of return on equity, the distributional properties are worked out and considered as independent variables.
It is found that the average return during the period of study shows a positive return in all periods except 2000 and 2008. In 1999, 2003 and at 2009, the average return was high when compared to other periods. The negative return in the year 2000 is -0.02 and it goes to -0.06 in 2008.

Step-wise multiple regression equations, worked out to establish the influence of different distributional risk variables on average rate of return on equity shares in India, have led to the following observations:

i) **Variance and Average Rate of Return**

(a) The regression results have shown that during the period from 1997 to 1999, 2001 to 2003 and from 2006 to 2007, the variable ‘variance’ is significantly related with average rate of return positively.

(b) Only in 2008, ‘variance’ showed a significant negative relation with average rate of return.


(d) The empirical results observe that the variability of returns of equity shares establish a significant positive relation with average rate of return in eight out of 14 years of study. A positive coefficient of ‘variance’ indicates that the variation in market prices and thereby the returns are under better consideration of equity shareholders in India.

ii) **Skewness and Average Rate of Return**

(a) During the period 1996, 1998, 2000, 2002 to 2005 and 2007, the variable ‘skewness’ is significantly related with average rate of return positively.

(b) In the year 1997, 1999, 2001, 2006 and from 2008 to 2009, the variable ‘skewness’ is not significantly related to average rate of return.
(c) It is empirically observed that the variable ‘skewness’ shows a significant positive relation with average rate of return on equities in eight out of 14 years of study. It is established that a well informed risk-averse investor should prefer investment with positively skewed distribution of return.

iii) Kurtosis and Average Rate of Return

(a) Kurtosis exhibits a significant negative relation with average rate of return during the period 1999, 2002, 2003, 2006 and 2007 at 1% level of significance.

(b) In the remaining nine years of study, the variable ‘kurtosis’ is not significantly related to average rate of return.

(c) The range of kurtosis value during the period of study is between -0.004 to -0.011.

(d) The present study observes that the variable ‘kurtosis’ possess a negative significant sign with average rate of return in five out of 14 years of study. The negative kurtosis suggests that the underlying return is platykurtic, which reduces the riskiness of return distribution.

During the testing period the explanatory power of the variables ranges from 0.119 to 0.745. The least $R^2$ value of 0.119 exhibited in 2009. A positive coefficient of ‘variance’ and ‘skewness’ in eight years under observation indicates that there is an association between distributional risk variables and the average rate of return on equities in India.
SECURITY-MARKET RETURN AND AVERAGE RATE OF RETURN

The variable to be considered for measurement of the extent of relation of return is the security-market return correlation. It is the co-movement of individual security return to market return and measures the sensitivity of the individual security return to its market return. It is measured as the volatility factor, commonly called ‘market beta’, an indication of securities return to its general direction.

The empirical results disclose that:

(a) The security-market return correlation coefficient ranges between 0.72 and 0.99, that is, a high degree of correlation. This is line with the general belief of risk-return parity.

(b) Over the study period, security-market return is positively related with average rate of return on equities.

(c) When analyzing the impact of this variable on the average rate of return, the best fit is obtained on a quadratic relation. The Quadratic relation obtained is

\[ Y = -1.4109 + 3.2952X -1.8808X^2 \]

(d) The \( R^2 \) value for the entire period obtained in quadratic relation is 0.111 and for linear relation it is 0.006.

Under the given hypothesis of positive risk-return relationship, the results of the study validate the CAPM. The coefficients of the regression results of ‘variance and skewness’ are positively significant, and lend support to the applicability of CAPM. The empirical results of the relation between the security-market return and average rate of return also supports the CAPM, as a positive and quadratic relation exhibited in the analysis.
8.8.2 RISK-RETURN ANALYSIS: AVERAGE RATE OF RETURN AND FINANCIAL RISK VARIABLES

The variables under consideration for the risk-return analysis are the current ratio (current asset to current liability) or liquidity ratio, leverage ratio (debt to equity), dividend payout ratio and growth in assets, sales, earnings, size and earnings per share (EPS). The current ratio is proxying for liquidity risk and the debt-equity ratio is proxying for the leverage risk and dividend payout ratio is proxying the expected payout. The growth variables like assets, sales, earnings and size expresses the strength and income generating capacity of the business. On the other hand earnings per share is expected to indicate the risk involved in the company’s prospects.

The empirical analysis conducted to test the relationship between the average rate of return and financial risk variables, reveals that:

i) Current Ratio
   (a) Current ratio of the sample companies shows that during the period up to 2000 it is above the level of 2:1, and after that it shows a declining trend.
   (b) The regression results disclose that, in the year 2003 only the current ratio shows a significant relation with average rate of return at 5% level of significance.
   (c) The empirical results posit no significant relation between liquidity ratio and average rate of return in 13 out of 14 years of study.

ii) Leverage Ratio
   (a) There is an increasing trend in the use of debt from 1996 to 2002, and thereafter it declined.
   (b) The empirical results show that the variable coefficient of leverage ratio finds no significant relation with average rate of return during the period of study.
iii) Dividend Payout Ratio
(a) The value of dividend payout ratio for the period under analysis shows a steep fall in 2008 but there seems an increasing trend in 2009.
(b) The empirical analysis exhibits that dividend payout ratio has a significant negative relation with average rate of return at 5 per cent level of significance in the years 1997 and 1999.
(c) In the remaining periods, dividend payout ratio shows no significant relation with average rate of return.

iv) Growth in Assets
(a) It is found from the analysis that, during the period of study the value of growth in assets shows an increasing trend.
(b) The regression coefficient of growth in assets shows a significant positive relation with average rate of return at 1 per cent level of significance only in the year 2005.
(c) The remaining 13 years under study shows that growth in asset is not significantly related with average rate of return.

v) Growth in Sales
(a) As an important indicator of performance, growth in sales during the period of study shows an increasing trend.
(b) The regression results of the coefficient of growth in sales, during the period of study, shows a negative significant relation at 10 per cent level of significance with average rate of return during the year 2004 only.
(c) In the remaining 13 years it is not significantly related with average rate of return.
vi) **Growth in Earnings**

(a) The analysis shows that there is a slow progress in the trend of corporate margins during the period of study from 1996-2009.

(b) The regression results clearly indicate that growth in earnings shows a significant negative relation with average rate of return at 10 per cent level of significance during the years 2001, 2002 and 2008.

(c) The remaining 11 years under observation shows no significant association with average rate of return.

vii) **Growth in Size**

(a) The value of size in terms of total assets during the period of study exhibits an increasing trend.

(b) The regression results of the coefficient of size as an independent variable, disclose that it is significantly related with average rate of return at 5 per cent level of significance only in the year 2008.

(c) There is no significant relationship with the dependent variable in the remaining 13 years of the study.

viii) **Growth in Earnings Per Share**

(a) The variable earnings per share during the period of study shows an upward trend up to the year 2008 and thereafter it declined in 2009.

(b) The regression results of the coefficients of earnings per share during the period of study from 1996 to 2009 reveal that there is a negative significant relation at 1 per cent level of significance with average rate of return only in 1999.

(c) Earnings per share is not a significant factor in the remaining years of study in explaining the average of return.
A step-wise regression model is arranged and passed on a Two Year period basis also where average rate of return on equity is the dependent variable and financial and growth variables are the independent. It is found from the analysis that, no variable is found statistically significant and there is no improvement in the $R^2$ values.

The results of the regression model for the entire fourteen year period, considering the average rate of return and financial risk variables, shows the $R^2$ value is the lowest of 0.008 and the ANOVA model is not significant at all, ‘F’ value is 0.874 and ‘P’ value is 0.538.

The findings of the risk-return analysis where financial and growth variables are considered independent, clearly establish that the 14 years of study, is not significant in explaining the dependent variable, average rate of return on equities in India. The test statistics throughout the study show a low explanatory power, $R^2$ values, ranging from 0.06 to 0.17, in explaining the risk-return relationship.

### 8.8.3 STATIONARITY OF BETA

The yearly beta values of each security during the period of study disclose that-

Over the 14 year study period, 36% of the stocks show a beta value of more than one and 58% of the securities under observation come under beta value in between zero and one, and 6% of the securities shows a negative beta value.

The study empirically analyses whether the beta of a stock exhibits stationarity over time. It is tested by two methods, where ‘time’ as a variable and use of ‘dummy’ variable in regression equations are used.
1. **Test of Beta Stationarity Over Time -1996 to 2009.**

(i) **Test 1- Use of time as a variable**

The stationarity of beta, or the slope term in a simple regression model during the period 1996 to 2009 reveals that-

(a) Of the sample selected, the coefficient is found significant in 13 cases, of which 7 regressions are at 1 per cent level of significance and in 6 regressions at 5 per cent level of significance during the period under study.

(b) Out of 60 companies, 47 regression coefficients are statistically insignificant. It implies that the beta values over the time (1996-2009) are stationary.

(c) It is observed that the values of $R^2$, a measure of goodness of fit varies from 0.005 to 0.509.

(ii) **Test 2- Use of dummy variable to measure the change in beta over time**

Another method to test the beta stationarity is to apply dummy variable in the regression model; it is found from the analysis that:

(a) In 23 out of 60 companies, at least one regression coefficient is significant at either 1 % or 5 % level of significance.

(b) Out of 60, 37 companies’ regression coefficients are insignificant, which favors stationarity of beta coefficients during the period 1996-2009.

(c) The $R^2$ value ranges from 0.106 to 0.557.

As a result of the above two test, it is found that:

(a) When applying both the equations, 1 & 2, only 9 companies out of 60 shows non-stationarity.
(b) There are 27 companies’, showing non-stationarity when at least one test is applied, that is, they are significant either at 1 per cent or at 5 per cent level of significance.

(c) The remaining 33 companies’ slope coefficient signals stationarity in explaining the return behavior in Indian scenario during the period from 1996 to 2009 where at least one test is applied.

2. Test of Beta Stationarity During Different Sub-Periods

2.1 Test of beta stationarity during 1996-2000.

Test 1- Use of time as a variable

(a) 10 out of 60 companies’ regression coefficients during the period 1996-2000 show significant ‘t’ values either at 1 per cent or 5 per cent level of significance and the remaining 50 companies’ results show insignificant regression coefficients.

Test 2- Use of dummy variable to measure the change in beta over time

(b) During the period from 1996 to 2000, 13 out of 60 regression coefficients are significant at either 1 per cent or 5 per cent level of significance. The remaining 47 companies’ regression coefficients are insignificant.

As a result of the above two tests, it is found that:

(a) During the sub-period 1996-2000, 8 companies’ beta values showed non-stationarity where both the tests are applied.

(b) 15 companies’ beta values are non-stationary where at least one test is applied, significant either at 1 per cent or 5 per cent level of significance.

(c) During the sub-period 1996-2000, 45 companies’ beta values are stationary where at least one test is applied.
2.2 Test of beta stationarity during 2001-2005.

Test 1- Use of time as a variable

(a) The second sub-period from 2001 to 2005, shows that there are 10 companies out of 60 showing significant coefficients either at 1 per cent or at 5 per cent level of significance. The remaining 50 companies’ regression coefficients are not significant.

Test 2- Use of dummy variable to measure the change in beta over time

(b) During the sub-period 2001-2005, 16 companies out of 60 are significant either at 1 per cent or at 5 per cent level of significance and the remaining 44 companies’ regression coefficients are insignificant.

As a result of the above two tests, it is found that:

(a) In the second sub-period (2001-2005), there are 9 companies (15 %) out of 60 showing non-stationarity when both the tests are applied.

(b) 17 companies (28 %) out of the sample selected reveal non-stationarity where at least one test is applied, either at 1 per cent or 5 per cent level of significance.

(c) During the second sub-period (2001-2005), majority of the companies’ regression coefficients are insignificant, that is in 43 cases beta values are stationary where at least one test is applied.

2.3 Test of beta stationarity during 2006-2009

Test 1- Use of time as a variable

(a) There are only 4 companies which are significant either at 1 per cent or at 5 per cent level of significance during the third sub-period. Remaining 56 companies regression coefficients are not significant.
Test 2- Use of dummy variable to measure the change in beta over time

(b) 11 companies beta values are significant either at 1 per cent or 5 per cent level of significance. Remaining 49 companies regression coefficients are not significant.

As a result of the above two test, it is found that:
(a) The third sub-period from 2006 to 2009, where 4 companies beta values are non-stationary when both the tests are applied.
(b) 11 companies beta values are non-stationary where at least one test is applied, significant either at 1 per cent or 5 per cent level of significance.
(c) 49 companies beta values are stationary during the third sub-period, 2006-2009, where at least one test is applied.

The two regression equations have been applied to test the stationarity of beta over the 14 year period (1996-2009) and three sub-periods (1996-2000; 2001-2005 and 2006-2009) of the study. The regression results of the present analysis clearly establish that beta coefficients are stationary where both the equations are used in the entire period and sub-periods; it indicates that the beta coefficients as a measure of market risk are relatively stationary over time.

The standard deviation of the beta values of sample companies over the study period discloses that:

(a) The stationarity of beta values increases where standard deviation decreases.
(b) The standard deviation of the beta values lies between 0.25 and 0.68 in majority of the cases. This result also validates the above findings of beta stationarity.
8.8.4 WEAK FORM MARKET EFFICIENCY TEST

The feasibility of stock market analysis primarily depends upon the extent of market efficiency. Therefore, the study attempts to test the behavior of movements in stock prices leading to the assessment of the market efficiency in the Indian stock market. It is done by testing the randomness of both monthly market return and monthly security return.

1. **Monthly Market Return- During the Period 1996-2009.**

The empirical results disclose that-

(a) One of the basic assumptions of random walk model is that the distribution of the return series should be normal. The descriptive statistics of the market return shows negative skewness (-.433) and negative kurtosis (-.034), but both values are near to zero.

(b) To confirm the distribution pattern of the market return series is normal, Kolmogorov-Smirnov Goodness of Fit test is used; the result shows an insignificant one and indicates that the frequency distribution of the monthly market return of Indian stock market follows normal distribution (Z value = .688, Sig. = .732).

(c) A normal Q-Q plot of market return during the period is also used to check the normality condition and found that the observed values are falling around the expected values, it is confirmed.

(d) The results of Run test show that the successive price changes are independent and the series is random (Z = -.397, Sig = .691) during the study period.

(e) The results of auto correlation tests of market return during the period disclose the presence of zero autocorrelation and indicate that the market return series follows a serial independence between the values. The Ljung-
Box statistics tests the joint significance of auto correlations at different lags, which shows the autocorrelations are not jointly significant at any stage.

(f) The Auto Correlation Function during the period shows that auto correlations at all lags are within the two standard error limits.

(g) The results of the Auto-Regression tests shows that auto regression coefficient AR1(-.001) during 1996-2009 is not significant (sig. = .989).


The empirical analysis conducted during different sub-periods discloses that-

**During the sub-period 1996-2000**
(a) The Auto Correlation Test of market return during the period shows that auto-correlations at all lags except lag no. 23 are within the two standard error limits. The Ljung-Box statistics test also shows that the autocorrelations are not jointly significant at any stage.

(b) The Auto Correlation Function of market return during this sub-period shows that all lags except lag no. 23 are within the two standard error limits.

(c) The results of the Auto-Regression tests during this period shows that the AR1(.157), Lag1(-.183) and lag2(.178) are not significant (Sig. are .101, .171, and .193 respectively).

**During the sub-period 2001-2005**
(a) During the second sub-period the auto correlations are not significant at any lag and the Ljung-Box statistics test also shows that the autocorrelations are not jointly significant at any stage.

(b) The Auto Correlation Function of the market return during the period shows that auto correlations at all lags are within the two standard error limits.
(c) The results of the Auto-Regression tests during this period shows that the AR1(-.020), Lag1(.090) and lag2(-.001) are not significant (Sig. are .832, .507, and .991 respectively).

**During the sub-period 2006-2009**

(a) During the third sub-period the auto correlations are not significant at any lag and the Ljung-Box statistics test also shows that the autocorrelations are not jointly significant at any stage.

(b) The Auto Correlation Function of the market return during the period shows that the auto correlations at all lags are within the two standard error limits.

(c) The results of the Auto-Regression tests during this period shows that the AR1(-.020), Lag1(.176) and lag2(-.077) are not significant (Sig. are .876, .316, and .656 respectively).

The application of parametric and non-parametric tests confirms that the monthly market return follows randomness during the whole and sub-periods of the analysis.

2. **Monthly Security Return- During the Period 1996-2009**

For a better clarity of the results obtained under the analysis of the monthly market return, the monthly security return of the sample companies are also analysed during the 14 year period together and disclose that-

(a) While applying the K-S Tests for each security, the results show that, 42 securities return out of the total sample of 60 securities follows normality (Sig .05). That is 18 securities (30%) show non-normality and the remaining 70% of securities follows normality in the market.
(b) Run Test reveals that only in three cases (5 per cent) the Z value is significant at 5 per cent level of significance, that is, the value is greater than + or -1.96. In all other cases it falls below the limit and is insignificant. It shows the serial independence of security returns in Indian stock market.

(c) The auto correlation tests show that the coefficients are significant with a positive or negative sign only at a few lags in some companies. The results of L-B statistics reveal that the auto correlation coefficients of all the 16 lags are jointly significant in two companies, and the continuous 13 lags are jointly significant in one company. It is found that there is no serial correlation of monthly security returns in majority of the lags during the period of study.

(d) The Auto Correlation Function during the study period for each of the security is also worked out and it validates the randomness of security return.

The application of parametric and non-parametric tests confirms that the monthly security return follows randomness during the period of study.

8.9 Conclusions

In an attempt to analyse the risk-return relationship on equities in India, the study reveals the following. Of all the different risk variables considered in the study, the distributional risk variables confirm the working of CAPM in Indian context. The coefficient of ‘variance’ and ‘skewness’ remains significant for a major part of the period of study. The security-market return correlation retains the expected sign throughout the study and a better relation is expressed as ‘quadratic’ with average rate of return on equities.

The financial risk and growth variables considered in the study expresses an insignificant relation in explaining the rate of return on equities in India over the period of study. The liquidity ratio, debt-equity ratio, dividend payout ratio, growth in assets, sales, earnings, size and earnings per share do not exhibit a significant
association with average rate of return. It shows a low explanatory power, represented by the R square values.

The CAPM assumes that investors consider only systematic risk, measured by beta. The model predicts a positive relation between stock returns and beta. As such, it can be concluded from the analysis that, over the study period as a whole and different sub-periods, the beta values of sample companies show a stationary position, which is a more suitable measure of risk in predicting the return on equities.

Market efficiency is a concept that explains how accurately stock prices reflect the information available to the public. The results of the study over the period based on monthly market return and monthly security return to test the weak form market efficiency in India confirms that the returns show randomness and the market is in weak form efficient.

It is noteworthy to express that the Indian stock market exhibits a positive risk-return relationship. Even though the investment in capital market is risky, a broad and long term object is behind it. The fluctuations in capital market transactions lead to variations in returns, as it can be measured by the deviations from their average. In this sphere of economic tremors, factors other than fundamental are the most important. As an investor, before making any investment decision, the risk premium contributed towards systematic risk can be used for potential investment opportunities. While return from equities are generally higher than that of other asset classes over a long period, it is wise to choose a multi portfolio approach to rationalize one’s return expectation.

8.10 Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations are made:
1. It is observed from the analysis that the ‘variance’ of the return distribution shows a significant positive association with average rate of return in majority of the years. Therefore it is recommended that the investors in India can consider for good ‘variance’ as a measure of risk in estimating the return on equities.

2. A positive and significant relation exhibited by ‘skewness’ with average rate of return on equities in India during the analysis period has been satisfactorily arrived at. It is therefore, recommended that the investors in India can take seriously the skewness statistics of return distribution while measuring the risk.

3. While considering the investment options and evaluating the parity between security return and market return, it is recommended that the investors in India can use the security-market return correlation coefficient as the study has brought it out positively.

4. It is recommended that an analysis of the risk-return relationship on equity shares in different time intervals, over short and long, is relevant for the investors, regulators and other stakeholders in framing their investment policy as it has been reasonably and amply proved by the study.

5. It is revealed from the analysis that the beta values over the entire period and in different sub-periods of study show a stationary position. So it is recommended that the regular income-seeker-investors can use the beta values in fixing and formulating portfolios.
6. A study on risk-return relation on equity shares and the tendency of beta in predicting the return will have important implications for investors. Hence, it is recommended that a proper estimation and analysis of beta can be reliably taken recourse to in understanding the risk involved and the return generated from equity shares.

7. It is disclosed from the analysis that there is a positive relation between risk and return in Indian equity market. Hence, the risk-return analysis can be used as a stable platform by the investors in establishing the tradeoff between portfolio risk and return.

8.11 Related Topics for Further Research

On the basis of the investigations made by the researcher, the following areas related to the topic are identified for further research.

1. A study on the risk-return relation based on the size of the investment.
2. A study on the impact of external factors on Indian capital market.
3. The impact of systematic risk on individual security returns in India.
4. A study on pricing of securities under conditions of market risk.