CHAPTER - 3
RESEARCH METHODOLOGY

A sound and scientific methodology is a basic foundation of the research study. The accuracy and availability of the data and then their compilation hinges on the methodology followed to conduct the study. Reviews of past studies guide the researcher in developing better methods and techniques to accomplish objectives of the research study. This chapter is, therefore, devoted to research methodology, covering the following aspects:

- Introductory description
- Need of the study
- Statement of the problem
- Objectives of the study
- Hypotheses framework
- Scope of the study
- Sample selection
- Collection of data
- Interpretation and tools of analysis
- Sources of data
- Limitations of the study

3.1 Introductory Description

Mutual fund is an undertaking which functions in the form of financial intermediary between the investors and business world. They initiate resource mobilization, allocation of resources and development of financial markets in the economy. The basic objective of the mutual funds is to collect the funds from the large number of investors which usually hesitate to enter directly into capital markets due to various constraints such as lack of expertise, professional knowledge, adequate resources,
availability of adequate time for study and analysis, etc. Therefore, the present study is a humble effort to examine the performance of the mutual funds as a financial intermediary in the society. The study has concentrated on three important aspects. First, performance evaluation of mutual funds as per financing point of view, analysing the different risks and returns while investing in the financial markets. Second, the performance evaluation of the mutual funds as per the investors (Unit Holders) point of view who have contributed their money to the mutual funds. Their perception, attitude, behaviour preferences objectives, satisfaction, etc. regarding mutual funds are studied. Third aspect is related with the performance of mutual funds in context to their regulatory norms whether the mutual funds are performing as per norms or not.

3.2 Need for the Present Study

The mutual fund is an important financial institution which can play a significance role in the development of any country. If they perform in an efficient way and to the expectation of the investing public, then a large number of investors can be attracted toward these. India's saving rate is above 23 percent, and is considered to be the highest in the world. In India, household sector’s savings is largest among all the sectors. The rate of conversion of this saving in investment is very low, i.e. around 7%, in comparison to other developed countries.

Mutual funds are supposed to be the best investment vehicle for small investors, but it has observed from the market and other reliable sources that mutual funds have not reached to their expectations. There is need to study the investors perceptions and factors influencing their investment decisions. So, in order to identify how far mutual funds satisfy the aspirations of the investors, this study was initiated.

Today it is noticed that a large number of mutual funds schemes have been floated in the market. It is very difficult for an average investor to examine their performance. Thus, it is very important to evaluate the performance of the mutual funds so that the retail investors can make valued judgment for selecting the mutual funds for their investment purposes. Further, it is also significant to know which mutual funds is functioning as the prescribed regulatory norms whether the
investment decisions have been taken by the fund managers as per guidelines, or not. It is essential to ensure due diligence, transparency and safety in portfolio selection by the mutual funds. In the light of above-mentioned observations, the present study is initiated.

3.3 Statement of the Problem

The basic objective of the mutual funds is to manage the investment of unit holders in efficient manner. The fund manager should design their portfolio as per the objectives of the fund and revise the same as per the conditions prevailing in the market. Appropriate consideration to yield, safety and liquidity is given. It is expected from the mutual funds to provide better return than to the market return. In the past years, the mutual funds industry has grown tremendously in terms of size of funds mobilized and number of the schemes floated in the market. It was felt important to evaluate the performance of Indian mutual funds through various popular performance models. The present study aims at to answer a few questions in this respect. What is the performance of the mutual funds in context to their risk and return incurred during the study period? Whether the mutual funds have outperformed the market or not? What is the position of mutual funds performance among the different schemes? Which type of mutual funds are performing well and which are below the expectation level? What are the basic motives for investing in the mutual funds in India? What is the attitude of the investors towards the mutual funds investment? Whether the investors are satisfied with the performance of mutual funds? Whether the mutual funds in India are following the regulatory norms, or not? What is the impact of regulatory norms on the mutual fund performance? Is the present form of fund performance information dissemination adequate? These are some questions which the present study attempts to answer.

3.4 Objectives of the Study

The basic objective of the present study is to evaluate the performance of selected mutual funds in India. The performance is examined in the light of three aspects: financing point of view, investors’ point of view and as per regulatory norms. The specific sub-objectives are as follows:-
(i) To examine the trends in terms of growth, size, volumes, etc of mutual funds in India.

(ii) To evaluate the financial performance of selected mutual funds in India.

(iii) To evaluate the performance of selected mutual funds in context to standard performance models like Sharpe, Treynor, Jensen, Eugene Fama, etc.

(iv) To evaluate the performance of mutual funds as per investors view.

(v) To study the profile, attitude, preferences, investment objectives, etc of the mutual funds investors.

(vi) To examine the impact of regulations on the performance of selected mutual funds in India.

(vii) To suggest certain measures relating to functioning of mutual funds in India.

3.5 Hypotheses and Statements Designed

On the basis of objectives, the study proposes to test statistically important hypotheses designed which are as under:

(i) There is no significant difference among the mutual fund schemes performance evaluation as per Sharpe’s, Treynor’s and Jensen’s Models.

(ii) Index returns and schemes returns are not significantly related.

(iii) Past performance of the scheme does not have any significant relationship with that of current performance.

(iv) Investment preference is independent of age groups (Male) towards mutual funds.

(v) Investment preference is independent of age groups (Female) towards mutual funds.

(vi) Financial need does not depend upon any particular factor

(vii) Investment decisions are not significantly influenced by the profile of investors.

(viii) Objective of selecting Mutual Funds schemes are not significantly influenced by the investors profile.

(ix) There is no significant impact of the demographic factors on the investment objectives.
The present study also proposes to examine a few important statements relating to mutual funds as per investors view, which are as under:

(i) The proportion of investors agreeing that investing in mutual funds is less risky as compared to shares.

(ii) The proportion of investors agreeing that mutual funds are more suitable to small investors who are otherwise hesitant of entering into stock market.

(iii) The proportion of investors agreeing that mutual funds have the ability to weather the market fluctuations.

(iv) The proportion of investors agreeing that the risk and return characteristics of Indian mutual funds are not in conformity with their stated objectives.

(v) The proportion of investors agreeing that investing in funds is much better in terms of returns than depositing in bank.

(vi) The proportion of investors agreeing that growth schemes are highly preferred to income schemes.

3.6 Scope of the Study

This research work attempts to evaluate the performance of mutual fund industry in India under the regulated environment after the introduction of the SEBI (Mutual Funds) Regulations- 1996, enforcing uniformity in rules and regulations. Performance evaluation of mutual fund in this study is confined to three aspects namely, financial, investing public and regulatory body. In financial aspect, the performance of the mutual funds is evaluated from return incurred by them and their comparison with the stock market index. Investment performance of the mutual funds is evaluated through a survey conducted on the mutual fund investors considering their attitude, satisfaction and other aspects. Finally, the impact of regulatory measures taken from time to time by regulatory authority on the performance of the mutual funds. For evaluating the financial performance of selected mutual funds, the period of the study is taken from 2002-03 to 2012-13 i.e. April 2002 to March 2013.
3.7 Sources of Data

The present study is an exploratory study to understand the mutual fund industry in India, leading players, present scenario, and its performance evaluation. The research on the topic is based on both the primary and secondary data. Secondary sources of information include the available and accessible records of Association of Mutual funds of India (AMFI), companies’ websites, value research websites, UTI, Institute of capital Markets, Database websites, periodical financial statements of various mutual funds, journals, magazines, books, etc. Further, to examine the impact of regulatory provisions on mutual funds performance, the SEBI Manual and UTI Regulatory norms have been considered. Secondary data was also collected from unpublished records and reports for making observations.

The primary data required for this study was to examine the performance of the mutual funds as per their investors view. To have such information, a detailed questionnaire was prepared. Before preparation of schedule questionnaire, a detailed discussion was held with the investors, officers of banks, SEBI, Value research India Private Limited, fund managers, brokers, etc. to have their point of view. After that the questionnaire was tested through a pilot survey among investors. The questionnaire was revised on the preferences for mutual funds. The researcher contacted personally to the investors and brokers to collect primary data for this study. The purposive convenience sampling method has been used for collecting the data from the respondents.

3.8 Sampling Technique

For designing a sampling plan, it is an extremely important to know about the characteristics of the population to be taken under study. The main population characteristics under study needs to be singled out very carefully so that the population may be sub divided, in case of need, with respect to that particular characteristics, for ensuring the selection of a reliable sample. There are basically two methods of selecting samples from a population: random and non random. The statistical inferences drawn from random or Judgmental sampling may become technically improper for extending these to generalised conclusion. On the other
hand, random samples may offer some safety against of the sampling improprieties. Three important random sampling: stratified, cluster and simple, may either be used individually or in collectively depending on the population equal change of being selected. However, the success of this depends upon the characteristics of population. If population is homogeneous, then it may produce satisfactory. If the population is heterogeneous, then the population may be divided into strata and sample elements may be drawn from each stratum through simple random sampling.

3.8.1 Sample size and its Adequacy

Adequate size of sample is very important for the success of any research study. Significance of sample size lies in the control of sampling errors which are associated with the sample selection. Increase in the sample size reduces the sampling error and consequently enhancing the inferences about the population parameters. The adequacy of the sample size should also be looked at from the view point of inferential statistics which helps in finding out the conclusions. Most of the inferential statistics, like student-T, Chi-square, F-ratio, etc. require that the sample mean should follow a normal distribution. Because, if the sample mean is not normally distributed, the reliability of inferences drawn may become questionable.

3.8.2 Sample Study

The success of any sample depends upon its size and technique chosen for its selection. Some improprieties become usually features in such studies unless due care and constant watch are being followed by the researcher while choosing the sample size and sampling technique. A few important improprieties in this respect are: (i) presence of biasness on the part of investigator, (ii) omission of important factors relevant in the study, (iii) non-representativeness of sample to population, and (iv) insufficiency of data which may lead to erroneous inferences. All efforts have been made by the researcher at her best level to control the above said improprieties while conducting this research study.
3.8.3 Sampling Frame

The Indian mutual fund industry came under liberalized environment in the year 1993 with the introduction of SEBI (Mutual Funds) Regulations. The industry was brought under the uniform regulatory control with the implementation of SEBI (Mutual Funds) Regulations 1996. Hence, this study attempts to review the performance of the industry from 2002 onwards, after the introduction of uniform rules and regulations for mutual funds in India.

To study the financial performance of mutual funds, the sampling frame was selected after considering the number of mutual funds, assets under management (AUM) and the schemes of mutual funds currently operating in India. Out of 44 mutual funds companies, 18 mutual fund companies were selected and 4 categories of mutual fund schemes, namely Equity diversified (growth), ETF, Tax Savings, and Index/sectorial/contra were selected. On the basis of types of scheme, 20 (Equity diversified), 10 (Index/sectorial/contra Scheme), 10 (Exchange Traded Fund (ETF)) and 10 Tax Savings (ELSS), in total 50 schemes were selected. All the mutual funds which are having more than 250 crores assets under management (AUM) have been included in the sample. The sample frame is adequate for the present study in order to justify the population view.

Thus, the sampling frame for the purpose of the study includes the follows schemes given in Table 3.1 as below:

<table>
<thead>
<tr>
<th>Tax Saving Schemes (ELSS)</th>
<th>ETF</th>
<th>Growth (Equity Diversified)</th>
<th>INDEX/ Sectorial and Contra Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBI Magnum Taxgain 1993</td>
<td>GS Junior BeES</td>
<td>HDFC Top 200 Growth</td>
<td>SBI Magnum Contra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Principal Growth Fund</td>
<td></td>
</tr>
<tr>
<td>HDFC Taxsaver</td>
<td>Reliance R* Shares Banking ETF</td>
<td>HDFC Equity Fund Growth</td>
<td>UTI Contra</td>
</tr>
<tr>
<td>Principal Tax Saver</td>
<td>GS Bank BeES</td>
<td>Reliance Vision Fund</td>
<td>UTI Banking Sector</td>
</tr>
<tr>
<td>Scheme</td>
<td>Company/ Plan</td>
<td>Fund Name</td>
<td>Company/ Plan</td>
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<tr>
<td>---------------------------------------------</td>
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</tr>
<tr>
<td>Birla Tax Relief 1996</td>
<td>Kotak Sensex ETF</td>
<td>Reliance Growth</td>
<td>UTI Nifty Index Fund</td>
</tr>
<tr>
<td>UTI Equity Tax Saving Plan</td>
<td>ICICI SENSEX Prudential</td>
<td>Cangrowth Plus</td>
<td>Franklin India Prima Fund</td>
</tr>
<tr>
<td>ICICI Prudential Tax Saving Plan</td>
<td>GS Nifty BeES</td>
<td>UTI Mastershare</td>
<td>Franklin India Pharma</td>
</tr>
<tr>
<td>Tata Tax Saving Fund</td>
<td>Quantum Index Fund - Growth</td>
<td>DSPBR- Equity</td>
<td>UTI Opportunities Fund [UTI Grandmaster 93]</td>
</tr>
<tr>
<td>Taurus Tax Shield Fund</td>
<td>Kotak PSU Bank ETF</td>
<td>UTI Master Value Fund Growth</td>
<td>Franklin India Bluechip Fund</td>
</tr>
<tr>
<td>Reliance Tax Saver</td>
<td>GS PSU Bank BeES</td>
<td>SBI Magnum Global</td>
<td>UTI Opportunities Fund</td>
</tr>
<tr>
<td>Sundaram Tax Saver</td>
<td>GS Liquid Scheme</td>
<td>UTI Balanced Growth</td>
<td>SBI Magnum Index Fund</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UTI-CCP Balanced Funds (Scholarship)</td>
<td>SBI Pharma Fund</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sundaram Select Midcap Regular</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>LIC MF Equity Fund</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDFC Mid Cap opportunities</td>
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<td>HDFC Long Term Advantage</td>
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<td>HDFC Prudence</td>
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<td>ICICI Prudential Dynamic</td>
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<td></td>
<td></td>
<td>ICICI Prudential Top 100 Regular</td>
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<tr>
<td></td>
<td></td>
<td>HDFC Capital Builder Fund</td>
<td></td>
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</tbody>
</table>

(Source: AMFI)

**3.8.4 Justification for the Sample**

**Secondary Data**: Using record of AMFI and NSE websites both, close-ended and open-ended schemes launched before 2002 were taken whose AUM is more than 250 crores. Efforts were made that each type of funds be included in the sample. So, Growth Funds, Index funds, Tax Saving Funds, ETF funds, Sectorial funds, Contra funds, etc. were considered. The sample is restricted to the 50 schemes which is almost one third of the growth scheme launched before the 2002. In case of
ETF, scheme selected for the research work, this condition was relaxed as most of ETFs were launched after 2006.

**Primary Data:** To elicit information from the investors, all the investors registered at the Karvy Stock Broking Ltd. were contacted between June 2013 and July 2013. 2243 mutual fund investors were registered members at various offices in the north India i.e. Delhi (691), Gurgaon (298), Faridabad (189), Chandigarh (321), Ludhiana (383), Shimla (361). Out of that 1500, were approached. Response of 1056 were received and out of that 56 responses were rejected due to incomplete in nature. A detailed questionnaire covering various aspects of the investment decision of investors were prepared and finalized. After pre-testing, the same research instrument was distributed in registered members and collected personally from the investors. The response rate was 60 percent approximately. Thus, the primary sampling frame for the present study consists of 1000 investors, which is adequate for evaluating the view of population. Analytical tools and techniques used in this study have been briefly described here as follows:

**3.9 Tools of Analysis**

The tools like return, risk, and risk-free rate of return were used for risk-return analysis of schemes in relation to that of the market as per Sharpe, Treynor and Jensen Models. The major portion of funds mobilized through growth schemes are invested in equity shares. In analyzing the risk-return relationship the CAPM is used widely. The CAPM uses the concept of beta to link risk with return. Beta as a measure of systematic risk shows how the NAV of a growth scheme responds to changes in market performance. Statistical package SPSS 21.0 was used for primary data analysis.

**3.9.1 Net Asset Value** is the amount a unit holder would receive if the mutual funds were wound up. It is also called the mutual fund's calling card. Since the unit holders are part owners of the assets and liabilities of the mutual fund, NAV is the net value of all assets and liabilities, i.e the market value of total assets and market value of total liabilities. What is the peculiar to NAV is:
• NAV changes daily
• NAV is computed as a value per unit holding
• Returns to the investor are determined by Cost of Mutual Fund and Net Asset Value

**Computation of NAV:**

\[
\text{NAV} = \frac{\text{Net Assets of the Scheme}}{\text{Number of units outstanding}}
\]

Where;

Net assets of the scheme = Market value of investments + receivables + other accrued income + other assets - Accrued expenses - other payables - other liabilities.

Using the beta concept the CAPM helps to define the required return on a security. The equation for calculating the expected return based on CAPM is as follows:

\[
R_i = R_f + \beta (R_m - R_f)
\]

- \( R_i \) = Expected return
- \( R_f \) = Risk-free return
- \( \beta \) = Measure of systematic risk
- \( R_m \) = Market return


NAV values on every Monday of the sample schemes for the period of (April 2002 to March 2013) eleven years were used based on the data available.

**3.9.2 Portfolio Return** refers to the yield from the selected growth schemes with
growth option. Portfolio returns (R_p) are calculated on the basis of changes in the NAV on a weekly basis. Average of such weekly returns (AR_p) is calculated on a yearly basis and for the entire period of study as follows:

$$R_p = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

R_p is the return of the portfolio on a weekly basis, 't' is the time period.

3.9.3 Market Return is calculated on the basis of the changes in the BSE 100 Index on a weekly basis (R_m) and the averages of such weekly returns (AR_m) are arrived at for every year and for the total period of study. BSE 100 index was used as a benchmark for the selected growth schemes as it is widely considered as a market proxy or benchmark for the purpose of academics, research and practising fund managers. BSE 100 index is used as a benchmark as it is a broad based index, consisting of 100 actively traded equity shares representing more than 70 percent of the total market capitalization in Bombay Stock Exchange. The market return is calculated as follows:

$$R_m = \frac{\text{Market Index}_t - \text{Market Index}_{t-1}}{\text{Market Index}_{t-1}}$$

3.9.4 Risk-free return (R_f) is the return available from zero risk investment avenues like treasury bills and bank deposits. The current RBI bank rate of 6.00 percent is assumed as the risk-free rate of return as it has been constant for many years and is related with the most commonly preferred investment avenue namely bank deposits.

Risk is the uncertainty and variability of returns / capital appreciation or loss of both. Total risk is measured with the help of standard deviation of both scheme and market returns. The total risk of an investment consists of two components: Diversifiable and non-diversifiable risk.

3.9.5 Diversifiable (Unsystematic) risk represents that portion of an investment's risk that can be eliminated by holding enough number of varied types of securities. Unsystematic risk is that portion of total risk calculated as follows:
Unsystematic Risk = (σ_p^2) - (β^2 x σ_m^2)

σ_p - Standard Deviation of the Scheme

σ_m - Standard Deviation of the Market

3.9.6 Non-diversifiable (Systematic) risk is that part of total variability in returns caused by factors due to economic, social and political causes. Systematic risk is not unique to an investment avenue and is unavoidable. Each security possesses its own level of systematic risk, which is measured using beta coefficient.

Systematic Risk = β^2 x σ_p^2

3.9.7 Beta reflects how volatile the return from an investment in response to market swings. It measures the impact of the market forces on return expected from funds. Beta is calculated by relating portfolio return with market return using regression analysis. Beta greater than one, depicts high sensitivity of scheme's returns against market being aggressive. Beta values less than one indicates defensive nature of the scheme. The regression slope coefficient from the Characteristic Regression Line (CRL) measures the systematic risk of an asset. The CAPM is applied to compute the beta value from the following formula:

R_i = α + β R_m + e

3.9.8 Covariance reflects the degree to which the market and scheme returns vary. A positive covariance means that the market and scheme returns move in the same direction whereas a negative covariance implies that the return moves in the opposite direction. Covariance is calculated using the formula:

\[ \text{COV}(X,Y) = \frac{1}{N} \sum_{i=1}^{N} (x_i - \bar{x})(y_i - \bar{y}) \]

3.9.9 Coefficient of Correlation (r) measures the nature and the extent of relationship between stock market index return and the scheme's return for a particular period. The co-movement of schemes performance with that of market index is studied with the help of a simple linear regression analysis using the
following formula:

\[ r = \frac{\sum_{i=1}^{n} xy}{\sqrt{\sum_{i=1}^{n} x^2 - \sum_{i=1}^{n} y^2}} \]

\[ x = (X - \bar{X}) \]

\[ y = (Y - \bar{Y}) \]

3.9.10 Autocorrelation Coefficient measures the association within the chronological sequence of observations of net assets value to verify whether the present NAV value is based on the past NAV and is calculated using the formula:

\[ r_k = \frac{\sum (y_t - \bar{Y})(y_{t+k} - \bar{Y})}{\sum (y_t - \bar{Y})^2} \]

\[ y_i \] denote an observation in a time sequence 't'

\[ y_{i+k} \] denote the first or earliest observation

\[ r_k \] is called the lag k sample autocorrelation coefficient

\[ \bar{Y} \] Denotes the mean value of variable Y

3.9.11 Coefficient of Determination \( (r^2) \) is the square of the correlation coefficient and indicates the degree of diversification. It gives the percentage variation in the scheme's return as explained by the variation in the market's return. A low \( r^2 \) indicates that scheme has further scope for diversification and a high \( r^2 \) indicates that the scheme is well diversified.

3.10 Technique of Analysis

The collected information was analyzed using simple and sophisticated techniques as follows:

3.10.1 Compound Annual Growth Rate (CAGR) calculates the growth in variables (number of funds, funds mobilized, assets under management, number of schemes) on a yearly basis.

\[ CAGR = [(P_1 / P_0)^{(1/n)} - 1] \times 100] \]

\( P_1 \), \( P_0 \), \( n \) are the variables in the current period, base period and the number of years
3.10.2 **Compound Growth Rate (CGR)** calculates the growth in variables for the entire period of study. CGR is a superior measure of calculating compounded return than simple return with the following formula:

\[
\text{CGR} = \left[\left(\frac{P_n}{P_0}\right)^{(1/n)} - 1\right] \times 100
\]

3.10.3 **Rank Correlation** is used when information is sufficient to rank the data. The rank correlation coefficient is a measure of correlation that exists between two sets of ranks. It is a measure of association that is based on the ranks of the observations and not on the numerical values of the data as calculated using the following formula:

\[
R = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}
\]

R denotes coefficient of rank correlation

D refers to the difference of rank between the paired items in two series.

3.10.4 **Kendall's Coefficient of Concordance** is a non parametric measure of relationship determining the degree of association among several (k) sets of ranking of N objects.

\[
W = \left\{ \frac{\sum (R_i - \bar{R})^2}{\left( \frac{1}{12} \right) k^2 (N^3 - N)} \right\}
\]

Where

k is the number of sets of rankings

N is the number of objects ranked

R_i is the sum of ranks assigned by all the k judges

\((1/12) k^2 (N^3 - N)\) is the maximum possible sum of the squared deviations

3.10.5 **Chi-square test** is a non-parametric test explaining whether or not two attributes are associated or not, using the following formula:
\[ \chi^2 = \sum \frac{(0_i - E_i)}{E_i} \]

Where

\( \chi^2 = \) chi - square

\( o_i \) is the observed frequencies

\( E_i \) is the expected frequencies

3.10.6 **Z Test** is used to verify the extent of relationship between the market and the scheme using the correlation coefficient with the help of the formula

\[ Z \text{ test} = \frac{r}{\sqrt{1 - r^2}} \times \sqrt{n} \]

3.10.7 **Z Test (Comparison of Mean):** It is a measure of significance of the difference between the means of factors influencing choice of mutual fund organisation and scheme using the following formula:

\[ Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}}} \]

3.10.8 **ANOVA (F test)** is the analysis of variance used in the case of multiple samples. It is developed by R.A. Fisher. This technique is used to test equality of three or more same means.

**Binomial Test of Significance** is used to test the probability model to make inference about population proportion from observations satisfying the Bernoulli trials using Z test. The proportion of investors agreeing with the specific attitude statements has been tested using the following formula to identify the attitude towards mutual fund industry in India and the extent of distribution of investors accepting with the specific attitude statements:

\[ Z = \frac{x/n - p}{\sqrt{(p(1-p))/n}} \]
x is the number of respondents agreeing
p, q and n is the proportion of acceptance, non acceptance and number of Bernoulli trials.

The models developed on the assumptions of 'The Capital Asset Pricing Model' and tested by Treynor (1965), Sharpe (1966), Jensen (1968) and Fama’s Decomposition of Returns was used to evaluate the performance of selected growth schemes.

3.10.9 Sharpe Index ($S_t$) measures the risk premium of the portfolio with reference to the total amount of risk. The index $S_t$ measures the slope of the line emanating from risk-free rate outward the portfolio. The larger the $S_t$, the better the portfolio has performed. $S_t$ is the reward to variability of the scheme's total risk and is a summary measure of scheme's performance adjusted for risk.

\[
S_t = \frac{AR_{pt} - R_f}{\sigma_{pt}}
\]

$S_t$ = Sharpe Index , $AR_{pt}$ = Average return on portfolio 't',
$R_f$ = Risk-free rate of return ,
$\sigma_{pt}$ = Risk involved in portfolio t' returns

3.10.10 Treynor Index ($T_t$) sums up the risk and return of a portfolio in a single number. The index measures the slope of the line emanating outward from the risk-free rate to the portfolio under consideration. Treynor index is a reward to volatility of the portfolio. The characteristic line relates the market return to a specific portfolio return without any direct adjustment for risk. This line can be fitted through a least square regression involving a single market portfolio. To use Treynor’s measure first the CRL of portfolios are fixed by estimating the following equation:

\[
R_p = a_p + b_p R_m + e_p
\]

$R_p$  Return on portfolio 'p'
a_p   Intercept coefficient for portfolio
\[ b_p \quad \text{Portfolio's beta coefficient} \]
\[ R_m \quad \text{Return on market index} \]
\[ e_p \quad \text{Random error term for portfolio 'p'} \]
\[ T_i = \frac{AR_{pt} - R_f}{\beta_p} \]

3.10.11 **Jensen** constructed a measure of absolute performance on a risk-adjusted basis while Sharpe and Treynor models provided measures for ranking the relative performance of various portfolios on a risk-adjusted basis. Equilibrium average return on a portfolio is the benchmark. Equilibrium average return is the return of the market portfolio for a given systematic risk calculated with the following formula:

\[ \text{EAR}_p = R_f + (R_m - R_f) \beta_p \]

\( \text{EAR}_p \) is the equilibrium return of the portfolio 'p' indicating superior / inferior performance of the portfolio's alpha (\( \alpha \)). Jensen's Alpha is the intercept of the CRL. If alpha is positive, the portfolio has performed better and if it is negative, scheme performance is not up to the benchmark. In a well-diversified portfolio, the average value of alpha of all stocks turns out to be zero.

3.10.12 **Eugene Fama's Decomposition of Total Returns**

Eugene Fama provides for an analytical framework, which enables for a detailed analysis of scheme performance popularly known as Fama's Decomposition of Total Return. The total return on a portfolio constitutes of risk-free return (\( R_f \)) and excess return.

The excess return arises from different factors such as risk accepted and stock selection. The excess return can be decomposed into two components, namely risk premium (reward for bearing risk) and for stock selectivity (return from stock selection).

Each portfolio will have both systematic risk and unsystematic risk. Hence risk premium can be decomposed into two components namely, return for bearing
systematic risk (market risk) and return for bearing unsystematic risk.

\[
\text{Return for Systematic Risk (R_s)} = P_p (R_m - R_f)
\]

\[
\text{Return for Unsystematic Risk (R_u)} = \left[\left(a_p / a_m\right) - P_p \right] \times (R_m - R_f)
\]

The return from pure stock selectivity (R_3) is the difference between the actual return and the sum of the other three components. The return for pure (net) selectivity is the additional return obtained by a portfolio manager for his superior stock selection ability over and above the return mandated by the total risk of the portfolio.

Fama's net selectivity = \[ R_p - \left[ R_f + \left( a_p / a_m\right) \times (R_m - R_f) \right] \]

Hence, the total return on a fund can be decomposed into four components:

Total return on Portfolio = Risk-Free return (R_f) + Return for bearing Systematic risk (R_s) + Return for bearing Unsystematic risk (R_u) + Return from pure Stock Selectivity (R_3)

3.10.13 Sharpe's Differential Return

Sharpe's Differential Return measures the ability of fund managers in both security selection and diversifying portfolio. The difference between the expected return and actual return of the portfolio are called differential returns. If a portfolio is well diversified, the two measures (Jensen and Sharpe) indicates same quantum of differential return. In case the portfolio is not fully diversified, the Sharpe Differential Return would be small in magnitude than Jensen's alpha. The difference can be interpreted as a decline in performance resulting from lack of diversification. Sharpe's Differential returns are computed by applying the following equation to measure the incremental returns earned by the mutual fund manager for a given level of total risk using the formula:

\[
R_i = \{ R_f + (R_m - R_f) \times \frac{\sigma_p}{\sigma_m} \}
\]
3.10.14 Information Ratio (IR)

\[ IR = \frac{(R_p - R_m)}{\sigma_{er}} \]

Where \( R_m \) is the return on the benchmark- in this case BSE sensex and \( \sigma_{er} \) is the standard deviation of the excess return i.e. returns of the portfolio in the excess of the market. This ratio focuses on the risk return generated by the fund managers’ ability to use information to deviate from the bench mark, the higher the better. The standard IR measure, however, runs into problems if there are negative excess returns. Hence, an alternate measure called as the ‘Modified Information Ratio (MIR)’ is also used. This is determined as follows.

\[ MIR = \frac{(R_p - R_m)}{\sigma_{er}^{\gamma}} \]

The only change is that the denominator, the standard deviation of the excess returns, is modified by adding an exponent. The exponent is excess return divided by the absolute value of the excess return. When the excess return is positive the standard IR and MIR the same. When excess return is negative, the IR and MIR can be very different.

3.10.15 Poolability Test:

For making empirical analysis, it is essential to test for poolability of data. This test uses the F-Statistic, and the same is applied for both the groups of funds.

The F- Statistics is calculates here as under:

\[ F = \frac{(S_2 - S_1)/[(n - 1)(K + 1)]}{S_2/[nT - n(K + 1)]} \sim F((n - 1)(K + 1), n(T - K - 1)) \]

Where: \( S_2 - S_1 \) is the difference between the collective residual sum of squares and the sum of all individual regressions residual sum of squares. \( N \) is the number of cross sections. \( T \) is total number of observations, and \( K \) is the number of regressors. This test will examine the difference between the slope co-efficient of the cross...
sections. Thus, the null hypothesis is set as that the slope co-efficients are the same for all.

3.10.16 Rank Order Scoring

In the case of analysis using ranks, the total scores are obtained by way of multiplying the frequency with the weights assigned for each rank. The highest weight is assigned for the first rank and the weights are reduced by one for each successive rank.

3.10.17 Degree of Safety

The highest weight has been assigned for the highest degree of safety. The weights are reduced by one for each successive degree of safety thereby assigning the lowest weight (one) for the lowest degree of safety.

3.10.18 Degree of Satisfaction

The highest weight has been assigned for the fully satisfied and the weight one is assigned for the not satisfied state of opinion by way of reducing weight by one degree for each successive degree of satisfaction.

3.10.19 Degree of Importance

The highest weight has been assigned for very important and the weight one is assigned for not at all important as reduced by one point of weight for each successive degree of importance.

3.10.20 Degree of Agreement

The highest weight of five points was assigned for strongly agreeing and the lowest weight of one point was assigned for strongly disagreeing statement. For each successive degree of agreement one point of differentiation was assigned.

Total scores are arrived by way of multiplying the frequencies with their respective weights. Average scores are calculated by way of dividing the total score by the total number of observations in each case.
3.11 Limitation of the study

The following are the important limitations of the study:

In the present study, both types of data; primary as well as secondary, are used for analysis and interpretation. Though all precautions were taken in collecting these data, still the short comings of the use of such data are in evitable.

The financial performance of the schemes is determined on the basis of composite average return calculated for the entire period of the study. Which are based on the NAV’s of the respective mutual funds schemes. The data relating to NAVs have been complied from the published data of various sources, so accuracy of the results is based on the reliability of published data.

The financial performance in this study is calculated on the basis of composite average return, risk premium and risk free return. The risk free return is computed on the basis of rate of interest on saving account of the commercial banks which varies over the period of study. In the present study average risk-free return is assumed at 6% for the entire period of study.

The performance evaluation of ETF Schemes is measured from the data of their launching in the market. Hence, 5 years period is considered from their evaluation, instead the period of the study i.e. 2002 to 2013.

The present study is carried out for selected four types of schemes of mutual funds like equity diversified tax savings (ELSS), ETF schemes and Index/contra/sectorial etc. The other schemes could not be incorporated in the sample selection. So the limitation of sample is evitable. However, due care has been taken while selecting the schemes in this study.

The present study does not cover the impact of mergers and takeovers on the mutual fund schemes taken in the sample.

The period covered in this study is from 2002-03 to 2012-13. So, the performance evaluation of selected mutual fund covers eleven years, i.e. 2002-2013 only.

The primary data in this study were collected from those mutual funds investors
who were registered with the Karvy Stock Broking Ltd. only. Opinion survey of 
investors was restricted to Punjab, Haryana, Chandigarh and Delhi NCR.

In this study, various statistical tools, performance models and other analytical tools 
have been used. On the basis these, the results have been complied. The limitation is 
dependent on the power of standard statistical test and the level of significance 
chosen for statistical inferences. The tools used in this study are widely accepted in 
such types of the studies.

There are some inherent limitations of any empirical sample study like lack of 
representativeness of the sample, errors associated with the observation made, 
inherent variability in the units, etc.

The above mentioned limitations have been properly, taken care of by the 
researcher while conducting this research study. The constant personal liaison with 
the respondents and investigation method has been followed to check the accuracy 
of responses.