DATABASE AND RESEARCH METHODOLOGY

In this chapter database used and the methodology adopted for this research has been elaborated. The study will mostly revolve around selected AMCs, their specific mutual fund schemes and the techniques applied on them. This chapter is subdivided into the following sections:

3.1 Asset Management Companies Selected.
3.2 Schemes Selected.
3.3 Period of Study.
3.4 Data Type and Source.
3.5 Techniques Applied.
  3.5.1 Daily NAV since 1\textsuperscript{st} April 2000 upto 31\textsuperscript{st} March 2010.
  3.5.2 Returns since 1\textsuperscript{st} April 2000 upto 31\textsuperscript{st} March 2010.
  3.5.3 Beta or the market risk of the fund.
  3.5.4 R- Square of Fund Return.
  3.5.5 Standard Deviation or the Total Risk of the fund.
  3.5.6 Sharpe’s ratio as on 31\textsuperscript{st} March 2010.
  3.5.7 Treynor’s ratio as on 31\textsuperscript{st} March 2010.
  3.5.8 Modigliani risk-adjusted performance.
  3.5.9 Jensen's Performance Index or Alpha.
  3.5.10 Information ratio.
  3.5.11 Compound Annual Growth Rate.
  3.5.12 Risk Adjusted Compound Annual Growth Rate
  3.5.13 Expense Ratio.
  3.5.14 Four Firm Concentration Ratio.
  3.5.15 Herfindahl – Hirschman Index.
  3.5.16 Independent sample t- test.
  3.5.17 One way ANOVA.
3.6 Benchmarks.
3.7 Risk Free Rate of Return.
3.8 Limitations of the Study.
3.1 ASSET MANAGEMENT COMPANIES SELECTED

The basis of selection has been purely their Assets Under Management (AUM). Top five AMCs have been taken on the basis of Assets Under Management. Coincidently two mutual funds are from public sector sponsored or public sector bank sponsored and two are privately operated or private sector bank sponsored and one is purely private amongst them. All of them top the chart for having maximum assets under management in their respective categories. Hence a Public-Private comparison which will make this study more interesting, fruitful and applicable is possible.

Public sector sponsored mutual funds to be studied are as under:
1) Unit Trust of India AMC Limited.
2) State Bank of India Financial Pvt. Limited.

Private sector mutual funds to be studied are as under:
1) Reliance Capital Asset Management Limited.
2) HDFC Asset Management Company Limited.
3) ICICI Prudential Limited.

The following figure 3.1 which shows the average AUM share of the selected AMCs in the Indian mutual funds industry from 1st April 2000 upto 31st March 2010 which validates the selection of these AMCs.

*Figure – 3.1*

*Average Contribution towards Total AUM (as on 31st March 2010)*

![Pie chart showing average AUM share](Source: www.amfiindia.com)
Though during the period of the study, the total number of Asset Management Companies (AMC’s) operating in the Indian financial market ranged from 35 – 40 during the period of study but due to the vastness of their data and to avoid any ambiguity, all in all five AMCs have been selected for the study. Another reason for choice is that their contribution towards total AUM of the Indian mutual fund industry has ranged between 45 to 55% in the decade starting from 1\textsuperscript{st} April 2000.

### 3.2 SCHEMES SELECTED

Though there are hundreds of schemes available in the market but to keep the study on track, composed and focused only income, growth, Equity Linked Savings Schemes (ELSS) and balanced schemes of the above mentioned AMCs will be taken into consideration for the analysis. These schemes have also been selected because they are more popular and preferred as compared to other types of schemes. Following is the list of mutual funds schemes selected for the research work:

#### SCHEMES SELECTED

<table>
<thead>
<tr>
<th>A) Balanced Schemes</th>
<th>B) Growth Schemes</th>
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<tbody>
<tr>
<td>1) HDFC Balanced Plan</td>
<td>1) HDFC Growth Plan</td>
</tr>
<tr>
<td>2) ICICI Prudential Balanced Plan</td>
<td>2) ICICI Prudential Growth Plan</td>
</tr>
<tr>
<td>3) Reliance Regular Savings Balanced Plan</td>
<td>3) Reliance Growth Plan</td>
</tr>
<tr>
<td>4) SBI Magnum Balanced Plan</td>
<td>4) SBI Magnum Equity Plan</td>
</tr>
<tr>
<td>5) UTI Bond Plan</td>
<td>5) UTI Equity Plan</td>
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</tbody>
</table>

<table>
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<tr>
<th>C) Income Schemes</th>
<th>D) ELS Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) HDFC Income Plan</td>
<td>1) HDFC Tax Saver Plan</td>
</tr>
<tr>
<td>2) ICICI Prudential Income Plan</td>
<td>2) ICICI Prudential Tax Plan</td>
</tr>
<tr>
<td>3) Reliance Regular Savings Income Plan</td>
<td>3) Reliance Tax Saver Plan</td>
</tr>
<tr>
<td>4) SBI Magnum Income Plan</td>
<td>4) SBI Magnum Tax Gain Plan</td>
</tr>
<tr>
<td>5) UTI Bond Plan</td>
<td>5) UTI Equity Tax Saving</td>
</tr>
</tbody>
</table>
The following figure shows the contribution of the selected schemes towards total no. of schemes floating in the market during the study period.

Figure - 3.2

Average Contribution towards Total No. of Schemes

From the above figure it can be clearly seen that the selected schemes are capturing more than 80% of the market. Hence their choice for the study is justified.

3.3 PERIOD OF STUDY

Though mutual funds have been active in India since 1963 but giving due importance to the availability of historical data the period of study has been decided upon as 2000-2010. The other reason for this is that this very period has seen tremendous growth in this industry inspite of the frequent hiccups, this time period has been said to be the crucial years for mutual funds. This period has been chosen because the participation of private sector was permitted in the year 1993, and since one of the purposes of the study is to compare public private mutual funds the period of 7 years from 1993 to 2000 is sufficient enough to let the private players become comparable with the public sector sponsored AMCs. Moreover most of the schemes selected for the study have their inception dates in or after 2000, hence the
Data Base and Research Methodology

Data for them is not available before 2000. Another reason for choosing this study period is the fluctuations shown by the BSE SENSEX which is considered as the barometer of the economy.

3.4 DATA TYPE AND SOURCE

As per the nature of the study, it shall be based on secondary data. The requisite data will be compiled from various official sources like institutions concerned with the selected mutual funds, journals related to finance, economy, capital market, management and commerce, websites of AMFI, SEBI, ICICI, HDFC, UTI, SBI, BSE, NSE etc, monthly fact sheets and other reports of selected mutual funds, and any other reliable sources of data.

3.5 TECHNIQUES APPLIED

The parameters on the basis of which the selected funds will be compared are the following:

3.5.1 Daily NAV since 1st April 2000 upto 31st March 2010

NAV is the definite value of a single unit of a given mutual fund scheme on a given particular business day. The NAV signifies the liquidation value of the fund's investments on that specific day after accounting for all expenses. It is calculated by the respective AMCs after deducting all liabilities of the fund from the realizable value of all assets and dividing it by number of units outstanding. In the context of mutual funds, NAV per unit is computed once a day based on the closing market prices of the securities in the fund's portfolio. All mutual funds' buy and sell orders are processed at the NAV of the trade date. However, investors must wait until the following day to get the trade price. (Source: http://en.wikipedia.org/wiki/Net_asset_value).

In this study NAV values of all the selected mutual funds has been taken on daily basis from www.bluechipindia.com. Initially the data was compiled in MS Excel and then treated appropriately for making it comparable. There were certain missing values in the series which were calculated by Intraportation and Extraportation. On an average 2450 values of NAV of each option in each scheme from each AMC have been used as the foundation of this study.

3.5.2 Daily and Total Returns since 1st April 2000 upto 31st March 2010.

Arithmetic Return is also referred to as the yield. Returns refer to the proportionate increase in the value of a unit of mutual fund in respect to its previous NAV. Such an increase may or may not be distributed amongst the investors in the form of dividend. These are those profits
which the unit-holder would have got if they sell the units. Returns can be calculated on
daily, weekly, monthly, quarterly and yearly basis. In this study to get the most reliable
results, returns will be considered on daily and annual basis. Total return for the 10 year study
period has also been calculated using the following formulae:

\[
FUND\ RETURN = \frac{NAV\ t2 - NAV\ t1}{NAV\ t1} \times 100
\]

This gives the difference between the Net Asset Value for two specific dates divided by the
NAV of preceding date.

3.5.3 Beta of the mutual fund.

This common measure compares a mutual fund's volatility with that of a benchmark and is
supposed to give some sense of how far you can expect a fund to fall when the market takes a
dive, or how high it might climb if the bull is running hard. A fund with a beta greater than 1
is considered more volatile than the market and less than 1 means less volatile. So say your
fund gets a beta of 1.10 then it has a history of fluctuating around 10% more than the
benchmark. In that case if the market is up, the fund should do better by 10%. But if the
market goes down, the fund should plunge by 10% more. Beta is dependent upon the time
period used to calculate it. That is why beta is generally calculated using longer periods of
time. It is expected that 10 years will cover several different sets of market conditions so that
we get a good average of the relative volatility (i.e. beta). It has been calculated using the
following equation:

\[
Y = a + \beta X
\]

Y = dependent variable i.e. daily return values of the fund
a = point of intercept i.e. constant
X = independent variable i.e. daily return values of the benchmark


All the graphs through which beta values have been derived are given in annexure.

3.5.4 R-Square of the funds

Beta of a fund should always be interpreted along with R-Square which is the square of ‘r’,
i.e. the correlation co-efficient. This value gives the proportion of the determined variable
which can be affected by the other variable. For example if R-Square between variable ‘x’
and ‘y’ comes out to be 0.50 then it can be said that 50% of the behavior of the variable ‘x’ is due to variable ‘y’. A higher figure implies that the descriptive variable is indeed a good descriptive factor for the changes in the factor being studied. An R-Square of value ‘1’ indicates perfect correlation with the index. A mutual fund with 0.8 correlation suggests that its probability of moving in the same track as the index are 80%. (Source: http://www.idfcmf.com/mutual_fund_performance.aspx). All the graphs through which r - square values have been derived are given in annexure.

3.5.5 **Standard Deviation or the Total Risk of the fund.**

Standard deviation measures how far a fund's recent numbers drift from its long-term average. For example, if Fund X has a 10% average rate of return and a standard deviation of 5%, most of the time, then it means that, its return will range from 5% to 15%. A large standard deviation supposedly shows a more unpredictable fund than a smaller one.

\[
\text{Standard Deviation} = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}
\]

\[
n = \text{No. of values during the study period.}
\]
\[
x = \text{Daily return on fund NAV.}
\]
\[
\bar{x} = \text{Average of daily return during the study period.}
\]

3.5.6 **Sharpe’s Ratio as on 31st March 2010.**

The Sharpe ratio is the returns generated over the risk free rate, per unit of risk. Risk here is taken to be the fund's standard deviation. As standard deviation represents the total risk taken by a fund, the Sharpe ratio reflects the returns generated despite all possible risks. It thus represents the tradeoff between risks and returns.

\[
\text{Sharpe’s ratio} = \frac{(R_p - R_r)}{\sigma_p}
\]

\[
R_p = \text{Average of daily fund return over 10 year period}
\]
\[
R_r = \text{Risk-free return over a period (average return on 91 day T – Bill during the study period which comes out to be 6.43 %.)}
\]
\[
\sigma_p = \text{Total risk expressed as the standard deviation of fund return}
\]

Higher value of Sharpe’s ratio indicates better performance of portfolio and vice versa. The Sharpe’s measure of portfolio performance is also a relative measure that ranks the funds in
terms of risk (total risk) and return. The ratio is also termed as reward to variability ratio (Pasricha and Jain, 2005).

3.5.7 **Treynor’s Ratio as on 31st March 2010.**

Treynor Ratio is a measure of the excess return per unit risk, where the excess return is defined as the difference between the portfolio's return and the risk-free rate of return over the same period.

\[
\text{Treynor's Index} = \frac{(R_p - R_f)}{\beta_p}
\]

Where,
\[R_p = \text{average of daily fund return over 10 year period}\]
\[R_f = \text{Risk-free return over a period (average return on 91 day T – Bill during the study period which comes out to be 6.43 %.)}\]
\[\beta_p = \text{Market-risk expressed as the beta coefficient of the fund}\]

Higher value of Treynor’s index indicates better performance of portfolio and vice versa. The Treynor’s measure of portfolio performance is a relative measure that ranks the funds in terms of risk (market risk) and return. (Pasricha and Jain, 2005).

3.5.8 **Compound Annual Growth Rate**

It is the year-over-year growth rate of a portfolio for a particular period of time. Although it sounds grave, its denotation is very simple – it is the growth rate of an amount articulated on an annualized basis. This also takes into contemplation the impact of compounding. In this study CAGR has been calculated using FORTRAN 77 version and its t-values have also been compared. The null hypothesis tested by this is:

\[H_0: \text{There is no significant difference between the average annual returns of the scheme.}\]

Level of significance has been taken to be 0.05.

CAGR isn't the actual return in reality but it's a make-believe number that explains the rate at which an investment would have grown if it at all grew at a firm rate. CAGR can be taken as a tool to find the smoothed return.
3.5.9 Risk Adjusted Compound Annual Growth Rate

When using the CAGR, it is important to remember two things: firstly the CAGR does not reflect investment risk, and secondly the same time periods must be used. Investment outcomes are volatile, which means that they can vary drastically from one year to another, but CAGR does not reflect volatility. CAGR is a logically calculated number that provides a "smoothed" annual yield, so it can give the delusion that there is a stable growth rate even when the value of the considered investment can vary significantly. This volatility, or investment risk, is very important to consider when making investment decisions. In order to compare the performance and risk characteristics between investment alternatives, investors can use a Risk-Adjusted CAGR. A simple method for calculating a risk-adjusted CAGR is the following formula:

\[
\text{Risk-adjusted CAGR} = \text{CAGR} \times (1 - \text{Standard Deviation})
\]

Here annual standard deviation of fund/index is to be taken. If the standard deviation (risk) is zero, the risk-adjusted CAGR is left unaffected. Larger the standard deviation, lower is the risk-adjusted CAGR.

3.5.10 Expense Ratio.

It is a measure of what it costs an AMC to operate a single mutual fund. Depending on the type of fund, operating expenses differ extensively. The major component of operating expenses is the fee paid to a fund's investment manager or advisor. Other costs include record keeping, custodial services, taxes, legal expenses, accounting and auditing fees etc. An expense ratio is determined by the AMCs through the below mentioned calculation,

\[
\text{Total Operating Expenses of the Fund} / \text{Total AUM of the fund}
\]

(In this study the values of the expense ratios have been taken from the respective factsheets and websites of all the selected mutual funds)

Expense ratio states how much an investor pays to a fund in percentage terms every year to manage the investment. For example, if an investor invest 1,000 in a fund with an expense ratio of 1.5 per cent, then 15 is being paid to the fund to manage the money. In other words, if a fund earns 10 per cent and has a 1.5 per cent expense ratio, it would mean an 8.5 per cent return for an investor. Fund’s NAVs are calculated net of fees and expenses, therefore it is necessary to know how much the fund is deducting. The expense ratios of equity and debt
funds differ. Since the expenses of equity funds are more than those of debt funds, the expense ratio on equity funds is greater (Source: www.business-standard.com).

3.5.11 Four Firm Concentration Ratio

Four Firm Concentration Ratio (FFCR) is the proportion of total output in an industry produced by the four largest firms in an industry. The FFC ratio is calculated based on the market share of the largest firms in the industry. A FFC ratio over 90 (that is 90% of industry output is produced by the four largest firms) is a good indicator of oligopoly and that these four firms have significant market control. It is calculated using the following formulae:

\[ CR_m = \sum_{i=1}^{m} S_i \]

Therefore it can be expressed as:

\[ CR_m = S_1 + S_2 + \ldots + S_m \]

where \( S_i \) is the market share and \( m \) defines the \( i^{th} \) firm

The market share of the following AMCs has been considered in terms of their AUM:

1) Reliance Capital Asset Management Limited.
2) HDFC Asset Management Company Limited.
3) ICICI Prudential Limited.
4) Unit Trust of India AMC Limited.

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<th>Table – 3.1</th>
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<tr>
<td><strong>Concentration Levels</strong></td>
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<tr>
<td>Level</td>
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<tr>
<td>-------</td>
</tr>
<tr>
<td>Ratio</td>
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</table>

Concentration ratios range from a low of 0% to a high of 100%. At the low end, a 0% concentration ratio indicates an exceedingly competitive market. At the high end, a 100% concentration ratio means an extremely concentrated oligopoly (Sumalatha, 2007).

3.5.12 Herfindahl – Hirschman Index

The Herfindahl index (also known as Herfidalh – Hirschman Index or HHI) is a measure of the size of the firm in relation to the industry and an indicator of the level of competition among them. Named after economists Orris C. Herfindahl and Albert O. Hirschman, it is an
economic concept. The HHI is calculated by summing the squared market share of all the AMCs in the mutual funds industry. It ranges on a scale from 0 to 10,000. The larger the HHI, the more concentrated is the industry or market. An industry with an HHI greater than 1800 is a highly concentrated one. Also an industry with the value of HHI between 1000 to 1800 is moderately concentrated one and HHI of less than 100 is unconcentrated. Increases in HHI generally indicate a decrease in competition and an increase of market power, whereas decreases indicate the opposite. In this study Assets Under Management of the firm as a share of total AUM of the industry has been taken as a variable for estimating the concentration. (Werden, 2009). Following formulae is used for further calculations:

\[
HHI = s_1^2 + s_2^2 + s_3^2 + \ldots + s_n^2
\]

where \(s_i\) is the market share of the \(i^{th}\) firm.

6.2.13 Modigliani risk-adjusted performance or \(M^2\)

It is a measure of the returns of an investment portfolio after making necessary adjustments for the total risk of the return. In other words it measures the returns of the portfolio, adjusted for the deviation of the portfolio (typically referred to as the risk), relative to that of some benchmark. It is a derivative of the widely used Sharpe’s Ratio, but it has the significant advantage of being in units of percent return as opposed to the Sharpe Ratio – an abstract, which makes it radically more instinctive to understand. It has been calculated using the following formulae.

\[
M^2 = \sigma_m * \{R_p - R_f\} / \sigma_p + R_f
\]

\(R_f = \) Risk free rate
\(\sigma_m = \) Standard Deviation of the benchmark index
\(R_p = \) Average of daily fund return
\(\sigma_p = \) Standard Deviation of the portfolio

In fundamental terms, for a fund with any given risk and return, the M2 measure is corresponding to the return the fund would have achieved if it had the same risk as the market index. Thus, the fund with the highest M2 measure, like the fund with the highest Sharpe ratio, would have the highest return for any level of risk. (*Dhume and Ramesh 2011*).
3.5.14 Jensen's Performance Index

In finance, Jensen's alpha (or Jensen's Performance Index) is used to determine the abnormal return of a security or portfolio of securities over the theoretical expected return. The security could be any asset, such as stocks, bonds or mutual funds. The theoretical return is predicted by a market model, most commonly the Capital Asset Pricing Model (CAPM) model. The market model uses statistical methods to predict the appropriate risk-adjusted return of an asset. Jensen's alpha was first used as a measure in the evaluation of mutual funds by Michael Jensen in 1968. It is supposed to be 'risk adjusted', which means it takes account of the relative riskiness of the asset. After all, riskier assets will have higher expected returns than less risky ones. If an asset's return is even higher than the risk adjusted return, that asset is said to have "positive alpha" or "abnormal returns". Investors are constantly seeking investments that have higher alpha. A measure that represents the average return of a portfolio over and above the one predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return.

\[ \alpha_j = R_p - [ R_f + \beta_i (R_m - R_f) ] \]

- \( R_p \) = portfolio return  
- \( R_f \) = risk free rate of return  
- \( \beta_i \) = beta of portfolio  
- \( R_m \) = market return

3.5.15 Information Ratio

A ratio of portfolio returns above the returns of a benchmark (usually an index) to the volatility of those returns. The information ratio (IR) measures a portfolio manager's ability to generate excess returns relative to a benchmark, but also attempts to identify the consistency of the investor. This ratio will identify, if a manager has beaten the benchmark by a lot in a few months or a little every month. Higher the IR more consistent a manager is and consistency is an ideal trait. Information ratio is a measure of the risk-adjusted return of a financial security or asset or portfolio (Clement 2009). It is also defined as expected active return divided by tracking error, where active return is the difference between the return of the security and the return of a selected benchmark index, and tracking error is the standard deviation of the active return; i.e.

\[ IR = \frac{(R_p - R_m)}{TE} \]
It measures the excess return over the benchmark index of an investment keeping its tracking error in consideration.

TE is the Standard Deviation of the difference between fund and index return.

i.e. \( \text{TE} = \text{Standard Deviation of} \ (R_p - R_m) \)

\( R_p = \) Average of daily return of the fund for the 10 year period

\( R_m = \) Average of daily Return of the index for the 10 year period

3.5.16 One – Way ANOVA

It is a technique used to compare the mean of more than two populations, such as comparing the impact of two different fertilizers on the crop etc. In such circumstances one generally does not want to consider all possible combinations of two populations at a time for that would require great number of tests before we would be able to arrive at a decision. This would also consume lot of time and money, and even then certain relationships may be left unidentified. Therefore, one utilizes the ANOVA technique even though it investigates the differences among the mean of all populations simultaneously. In other words the basic principle of ANOVA is to test the difference among the mean of the populations by examining the amount of variation within each of these samples, relative to the amount of variation between the samples. *(Kothari, 2004. 256 - 258).* In this study population refers to the NAV values of the five schemes selected in each category of growth, income, balanced and ELSS mutual fund. Testing was done twice for dividend and growth options separately. This technique will be applied to test the following null hypothesis:

\[ H_0: \text{There is no significant difference between the mean of average NAVs of the five schemes selected.} \]

3.5.17 Independent Sample t test

Independent sample t-test is a statistical technique that is used to analyze the mean comparison of two independent groups. In independent samples t-test, when we take two samples from the same population, then the mean of the two samples may be identical. But when samples are taken from two different populations, then the mean of the sample may differ. In this case, independent sample t-test is used to draw conclusions about the means of two populations, and used to tell whether or not they are similar. *(Source: http://statisticssolutions.blogspot.in/2009/04/independent-sample-t-test.html).* In this study
two populations refer to public sector sponsored and private sector mutual funds schemes. This technique will be applied to test the following null hypothesis:

\[ H_0: \text{There is no significant difference between the mean of averages of average NAVs of the public sector sponsored and private sector mutual funds schemes.} \]

The procedure was applied twice for each scheme separately for its dividend option and growth option.

### 3.6 BENCHMARK

A proper analysis of performance is always incomplete without comparing it with a specific benchmark. In this study following indexes have been selected for acting as benchmarks for the below mentioned schemes:

a) Equity Linked Savings Schemes – S&P CNX 500  
   *(Source: [http://www.nseindia.com/marketinfo/indices/histdata/historicalindices.jsp](http://www.nseindia.com/marketinfo/indices/histdata/historicalindices.jsp))*

b) Growth Schemes – BSE SENSEX  

The above selection has been made keeping in mind the portfolios of the mutual fund schemes to be studied. These indexes include the maximum no. of companies in which the funds invest their money.

### 3.7 RISK FREE RATE OF RETURN

For calculating Sharpe’s ratio and Treynor’s ratio, a risk free rate of return was required. In this study average return on 91 day Treasury bill for the last decade (1st April 2000 upto 31st March 2010) has been taken which comes out to be 6.43% *(Source: [http://www.debtonnet.com/newdon/files/marketinformation/tbill1.asp?style=&amp;action=1](http://www.debtonnet.com/newdon/files/marketinformation/tbill1.asp?style=&amp;action=1)).* 91 day T-Bill was chosen because a lot of previous studies which have also been mentioned in the review literature supported it as a reliable benchmark.

### 3.8 LIMITATIONS OF THE STUDY

Research as a field has no limitations but specific research works do have because all the questions related to an issue can never be studied in a single piece of work. This study is no exception as such despite its theoretical and practical relevance the study does suffer from certain limitations. Following are a few perceived limitations which could be realized during the course examination:
1) The study is confined to some selected Asset Management Companies in India while the inclusion of others may provide more appropriate results. Performance appraisal of all the schemes operated by all the Asset Management Companies was not possible due to the non availability of the data and the vastness of the sector.

2) Benchmarks for income and balanced schemes are not publically available hence Treynor’s ratio. Information ration, Jensen’s ratio and M - square for them could not be calculated.

3) Though utmost care was taken while selecting the parameters and variable for comparison, still the inclusion of some other might influence the result. Many other techniques like Fama’s ratio, Capital Asset Pricing Model etc could have been applied. But because the results might have become confusing, more techniques were avoided.

4) The study is purely based on secondary data which has been collected from websites, journals and books related to mutual funds. Primary data was not collected due to lack of resources. Otherwise investor’s perception regarding the performance of public sector sponsored and private sector mutual funds could have been judged.