Chapter 6
Analysis of Secondary Data
CHAPTER 6
ANALYSIS OF SECONDARY DATA

As mentioned above the secondary data was collected from AMFI and scrutinized for the research. A random check of the NAV’s was done on the respective sites of the Mutual Fund, to doubly check the data accuracy and authenticity for the data provided by AMFI.

The relevant data of Open Ended Equity Schemes having three years past records where extracted from the total data provided by AMFI. Thus 58,304 numbers of records were extracted from the total data provided by AMFI. Finally, the data of 78 Mutual Fund Schemes were extracted which were available for a period of 3 years starting from 1st July, 2004 till 29th June, 2007 (As 30th June, 2007 was a Saturday). This data was taken as the final data for secondary data collection and analysis. Similarly the BSE Sensex index data was collected for the period of 3 years starting from 1st July, 2004 till 29th June, 2007 from the Internet site of Bombay Stock Exchange. The total data was taken for analysis by using the software package of Microsoft Excel and FoxPro for further analysis.
Evaluation Criteria

There were total 18 Criteria that were used to evaluate the Mutual Fund Performance for the three years data. The details of the same are as under:

Returns of 3 years period

The returns of the 3 year period were taken for the evaluation of this criteria. The NAV as on 1st July, 2004 was taken and the NAV of the 29th June, 2007 was considered for the evaluation of these criteria. Wherever, there was dividend declared, the dividend was factored in the closing NAV to come out with actual returns given by the scheme. The XIRR formula of the EXCEL package was used to calculate the annualized returns of the scheme over the 3 years period.

Further, as a starting point to this analysis, the XIRR value was taken to categorise the schemes into an High Performer and an Low Performer schemes, taking the returns of BSE Sensex index as a Benchmark, which was the proxy to the Market. Since the research is focused to Open Ended Equity Scheme, it was felt appropriate to take BSE Sensex index as the proxy to the Market. The BSE Sensex Index is a well-known index comprising of the top 30 scrips in the Market and an accepted Sensex by most of the Fund houses as a Benchmark.
Mean Returns

The arithmetic mean returns of the schemes were taken to calculate this criteria. The NAV of all the three years were taken for this variable. The NAV of the all the three years divided by the count gave the average NAV of the scheme. The IRR formula of the EXCEL package was used to calculate the returns derived during the three years. This returns was again divided by three being the number of years of the data considered for the research.

Standard Deviation of the Returns

The standard deviation gives the idea of how much have the portfolio deviated from the actual returns. This is used to measure the variability on an annual basis. This measures the total risk to the fund. The annualized return for the three years period was taken to calculate the standard deviation of the fund. Initially, the variance of the funds was calculated by taking the annualized returns on a year-on-year basis and the square root of variance was taken as the Standard Deviation of the fund.

Coefficient of variations of the Returns

The coefficient of variations of the returns is an alternative measure to the risk of fund. It is the standard deviation divided by the returns of the 3 years.
period of the scheme. The coefficient of variation gives the ratio of the Standard deviation to the expected returns. The lower the ratio of standard deviation to the mean return, the better for the risk return tradeoff.

**NAV percentage change in the 3 years period**

This gives us how much percentage change of the NAV over the period of three years. Here again, the NAV of 1\textsuperscript{st} July, 2004 and the NAV of 29\textsuperscript{th} June, 2007 have been considered for the NAV percentage change over the 3 years period.

**Geometric Mean of the Excess Return over the Benchmark**

The geometric mean of the excess return over the Benchmark gives us how well the fund manager was able to pick stock and perform above the benchmark. In the study, since the Benchmark was taken as BSE Sensex, the returns of the BSE Sensex were considered to analyse the excess return over the benchmark. Here the year-on-year of the scheme and the benchmark was taken to calculate the returns. The mean return was calculated by taking three as the nth root, considering the three years data.
Value at Risk (VAR)

VAR measures the maximum loss an investor can have over a certain period of time given a certain level of confidence. In the present study the VAR is calculated for the three years period with $\alpha = 97.5\%$ ($Z_\alpha = -1.96$).

Sharpe Index

The Sharpe Index is the standard Performance Measure. The Sharpe ratio is a portfolio performance measure used to calculate the return of a fund with respect to risk. The calculation is done by taking the return of the fund minus the risk-free rate divided by the fund’s standard deviation. In the present research, the 3 years FIMDA Gilt curve return of 7.91% has been taken as the Risk Free Rate.

Modigliani Measure

The Modigliani Measure measures the performance of the risk-matched portfolio. This measure expresses the fund’s performance relative to the market in percentage terms and believe that the average investor would find it easy to understand this measure.
The measure is expressed as under:

Modigliani Measure = Funds average excess return / standard deviation of the funds excess return \times standard deviation of index excess return.

The fund with higher Modigliani measure represent the highest level of return for any level of risk.

**Information Ratio**

This is the measure comparing a fund to its benchmark. The Information Ratio is same as that of the Sharpe Ratio however, the major difference is that Sharpe Ratio compares the return of the asset against the return of the Risk Free Asset. Whereas the Information Ratio compares the excess return over the benchmark index. A brief detail of the Treynor Index has been covered in Chapter 2 (Review of related literature).

**Beta Coefficient**

The Beta coefficient describes how the returns of the portfolio are correlated to the return of the market as a whole. In the present research the market return was taken as the performance of the BSE Sensex Index over the three years period.
An asset, which has a beta of '0', means that the return of the portfolio is not at all correlated with that of the market and that asset is independent. However, in the research none of the portfolio showed a beta of zero. A positive beta shows that the asset follows the market. A negative beta shows that the asset inversely follows the market. The beta coefficient was the key parameter in the capital asset pricing model.

**Treynor Index**

The Treynor Index is used to measure the performance of a portfolio over a given period of time. The Treynor index considers the risk of the portfolio.

The Treynor Index considers the beta of the portfolio rather than the standard deviation as used in the Sharpe Index. Here it is assumed that the portfolio is a well-diversified portfolio. Brief details of the Treynor Index have been covered in Chapter 2 (Review of related literature).

**Jensen Alpha α Coefficient**

Jensen Alpha or the Jensen’s Performance Index is used to measure the excess return of a portfolio over the portfolio’s required rate of return as determined by the capital asset pricing model.
The main reason to analyse the performance of a Mutual Fund Manager is not only to look at the overall performance of the portfolio but also the risk of the portfolio. Brief details of the Jensen Alpha $\alpha$ Coefficient has been covered in Chapter 2 (Review of related literature)

**Treynor & Mazuy's $\alpha$ Coefficient**

The Treynor & Mazuy's $\alpha$ Coefficient measures the market timing skill and the security selection ability of the Fund Manager. Treynor and Mazuy added a quadratic term $\gamma(R_m - R_f)^2$ to the Jenson's Model to come out with the market timing skill.

The equation is as under:

$$(R_p - R_f) = \alpha + \beta(R_m - R_f) + \gamma(R_m - R_f)^2 + E_p$$

**Treynor & Mazuy's $\gamma$ Coefficient**

The Treynor & Mazuy's $\gamma$ Coefficient is the market timing skill added to the Jenson's Model as mentioned above. In the present research, two beta's have been taken to calculate the market timing skills viz one related to the BSE Sensex Index and the other to the NSE Nifty Index.
Henriksson & Merton's $\alpha$ Coefficient

Like the Treynor & Mazuy's $\alpha$ Coefficient, the Henriksson & Merton's $\alpha$ Coefficient is the measure of the market timing skill and the security selection ability of the Fund Manager. Henriksson & Merton's have used $\gamma Z_m$ where $Z_m = \max(0, R_m - R_f)$ to the Jensen Alpha.

The equation is as under:

$$(R_p - R_f) = \alpha + \beta (R_m - R_f) + \gamma Z_m + E_p$$

Henriksson & Merton's $\gamma$ Coefficient

Same like the Treynor and Mazuy's $\gamma$ coefficient, the two beta's have been taken to calculate the market timing skills with the above $Z_m$ parameter.

It is pertinent to note that the Treynor & Mazuy's $\alpha$ Coefficient and Henriksson & Merton's $\alpha$ Coefficient are used to measure the stock selection ability of the Fund Managers. The Treynor & Mazuy's $\gamma$ Coefficient and the Henriksson & Merton's $\gamma$ Coefficient are used to measure the market timing ability of the Fund Managers.
Finally the Treynor & Black Appraisal Ratio is the ratio to measure the Fund Managers forecasting ability. The Treynor & Black Appraisal ratio equals to the Jenson Alpha divided by the standard deviation of the error term in the regression used to obtain the $\alpha$ Coefficient.

Appraisal ratio depends on (a) the quality of security and (b) how efficiently the active portfolio is balanced (Treynor Jack and Black Fischer).

Taking all the above 18 criteria the values were calculated for all the 78 Mutual Funds. However, since the Factor Analysis has evolved only 4 core factors, only the final four core factors were considered for the development of the Discriminant Analysis.
Chapter 7
Collection of Primary Data
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COLLECTION OF PRIMARY DATA

A Semi Structured questionnaire was prepared to collect the primary data. The Sample questionnaire has been attached herewith as Annexure ‘A’.

In all, 18 criteria’s were shortlisted as the parameters affecting the performance of the Open Ended Equity schemes based on the research paper conducted by Pendaraki et al on the Greek Mutual Fund. As the questionnaire was already tested on the Greek Mutual Fund, it was felt that the questionnaire does not require a pre-testing.

As proposed in the project proposal, the primary data was collected from the Fund Managers / Assistant Fund Managers. The above questionnaire was administered to 12 Fund Houses, based on the short listed schemes of the secondary data collected. However, the feedback was received from only 8 Fund Houses and 32 Fund Managers/Assistant Fund Managers. In slight deviation to the earlier research proposal, the Fund Managers and the Assistant Fund Managers were of the opinion that the feedback should also be collected from the Research Analysts who are also acting as Back-up Fund Manages in few of the Fund Houses. In view of the same, out of the 32 feedback of the questionnaire 2 feedbacks are from Research Analysts.
Efforts were made to contact many other Fund Managers / Assistant Fund Manager to get more feedback. However, as most of the Fund Managers/Assistant Fund Manager were too busy, it was felt that the analysis will be confined with the 32 feedback received from the 8 Fund Houses would be sufficient to resemble a large sample. The KMO was 0.702, which indicated that the sample is adequate and we may proceed with the Factor Analysis. The data was collected from the focussed sample.

In most of the above primary data collection, the questionnaire was collected by one to one interaction with the Fund Managers / Assistant Fund Managers. However, wherever it was not possible to interact with the Fund Managers / Assistant Fund Managers, the questionnaire was collected by coordination with their Research Departments.

In all the above process a brief data description was given to the Fund Managers / Assistant Fund Manager to interpret the 18 criteria used for collection of the Primary data. The brief data description given as Annexure to the questionnaire is attached herewith as Annexure ‘B’.

The semi-structured questionnaire was in three parts. Part A included the variables affecting the returns of Mutual Fund Schemes with structured questions. Part B included the variables that lower the risk of Mutual Fund Schemes with structured questions. The Part C of the questionnaire was an
unstructured part, which covered any other vital information, which the Researcher was able to gather in the course of the interview from the Fund Manager on the performance of Mutual Fund Schemes. The data was collected by way of focused interviews with the Fund Managers.

A rating scale of even ratings of 1 to 6 was given to the Fund Managers / Assistant Fund Managers to rate the criteria. The non-biais scale was used to ensure that there is no bias in the feedback received in the questionnaire feedback.

The data thus collected by way of questionnaire viz the primary data was then loaded to the SPSS software and the data reduction tool viz Factor Analysis was done to extract the various factors affecting the performance of Open Ended Equity Schemes of Mutual Fund.

In the earlier research done on the Greek Mutual Fund, the Factor Analysis tools was used for the data reduction and identify the core factor.