CHAPTER 3
RESEARCH METHODOLOGY
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Purpose of the present research was to discover answers to questions through the application of scientific procedure. The objectives of this research was to examine the impact of recession on performance of various categories of Mutual Funds in India, to study the investment / saving pattern of various categories of investors and to examine the behavior of the investors of Mutual Fund under the impact of recession. To meet these objectives a suitable research methodology was developed which is mentioned as under.

3.1 Research Design

Fundamentally, present research can broadly be divided into two parts; the first part consisting of an investigation of the impact of recession on the performance of various categories of mutual funds in India and the second part including the second and third objectives namely; to study the investment / saving pattern of various categories of investors and to examine the behavior of the investors of Mutual Fund under the impact of recession. Thus, first part involves usage of facts and information already available and an analysis of this data, therefore this is an analytical research and accordingly an analytical research design was planned. For the second part of the study (comprising of second and third objectives) an exploratory design was developed since this involves gaining insights and understanding the saving patterns of investors and their behavior pertaining to mutual fund investment.

3.1.1 Analytical Research Design

For purpose of investigation of impact of recession on the performance of various categories of mutual funds in India, twelve categories of mutual funds were included in the study namely; large cap equity funds, equity diversified funds, small and mid cap equity funds, equity linked saving schemes, index funds, hybrid- balanced funds, hybrid - monthly income plan-aggressive, hybrid-monthly income plan-conservative, debt-long term income funds, debt-short term income funds, debt-liquid funds and debt-ultra short term debt funds.
To be more specific, the major proportion of secondary data in this research is from UTI and Respective Mutual Funds. It gives detail about the net resource mobilized by the Mutual Funds in India from 1970 to 2010 (given in Chapter 1). Apart from this source of secondary data is CRISIL Mutual Fund yearbook 2010. It gives detail of performance of top five mutual funds in various categories of mutual fund before, during and after recession. Various measures like standard deviation, portfolio beta and ratios like Treynor Ration, Jenson’s Alpha, Sortino Ratio and Sharpe Ratio have been used to study the same. The measures which have been used in this research are as below:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
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<tbody>
<tr>
<td>Portfolio P/E</td>
<td>Price Earning Ratio (P/E) is defined as the price paid for a share relative to the profit / income earned per share. Trailing P/E is based on the past earnings i.e. actual earnings of a company. A portfolio’s trailing P/E ratio is compared with the average P/E for the respective mutual fund category in order to identify whether the portfolio is wisely priced or not. $\text{P/E} = \frac{\text{Market Value Per Share}}{\text{Earnings per Share (EPS)}}$</td>
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<tr>
<td>Dividend Yield</td>
<td>This measure is used to know how much dividend has been paid by a scheme in a year for a price an investor has paid for buying the units. An investor whose investment objective is capital consumption may choose to invest in a scheme with high dividend yield. $\text{Dividend Yield} = \frac{\text{Annual Dividends Per Share}}{\text{Price per Share}}$</td>
</tr>
<tr>
<td>Portfolio Beta</td>
<td>Beta is a measure of volatility of the portfolio with respect to the market, also known as systematic risk. A Beta measure of 1 indicates that the portfolio volatility will be same as that of index/ market. Any value greater than 1 indicates that the portfolio is more volatile than the index and vice versa. The formula for the beta of an asset within a portfolio is $\beta_a = \frac{\text{Cov}(r_a, r_b)}{\text{Var}(r_b)}$, where $r_a$ measures the rate of return of the asset, $r_b$ measures the rate of return of the portfolio benchmark, and cov($r_a$, $r_b$) is the covariance between the rates of return. The portfolio of interest in the CAPM formulation is the market portfolio that contains all risky assets, and so the $r_b$ terms in the formula are replaced by...</td>
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</table>
| **Sharpe Ratio** | **Sharpe Ratio** is arrived at by dividing the returns in excess of risk-free return with the standard deviation of portfolio returns and is also explained as the risk adjusted return measure. The ratio helps in identifying whether the fund returns are the result of good investment decisions or greater risk taken by the fund manager. **Higher the Sharpe ratio, the better it is.** The Sharpe ratio is calculated by subtracting the risk-free rate from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. The Sharpe ratio formula is: 
\[
\frac{r_p - r_f}{\sigma_p}
\]
Where:
- \( r_p \) = Expected portfolio return
- \( r_f \) = Risk free rate
- \( \sigma_p \) = Portfolio standard deviation |
| --- | --- |
| **Standard Deviation** | A statistical measure that defines the expected volatility and the risk associated with the portfolio. This explains the variation / deviation from the average returns delivered by the scheme. A higher standard deviation means higher volatility and vice versa. The standard deviation of an entire population is known as \( \sigma \) (sigma) and is calculated using:
\[
\sigma = \sqrt{\frac{\sum (x - \mu)^2}{N}}
\]
Where \( x \) represents each value in the population, \( \mu \) is the mean value of the population, \( \Sigma \) is the summation (or total), and \( N \) is the number of values in the population. The standard deviation of a sample is known as \( s \) and is calculated using:
\[
s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}
\]
Where \( x \) represents each value in the population, \( \bar{x} \) is the mean value of the sample, \( \Sigma \) is the summation (or total), and \( n-1 \) is the number of values in the sample minus 1. |
| **Treynor Ratio** | A risk adjusted measure of return that considers beta as a measure of volatility. The ratio explains the returns earned in |
excess of risk-free return per unit of market risk. Higher the Treynor ratio, the better it is.

The Treynor Ratio can be calculated with the help of the following formula:

\[
\frac{\bar{r}_p - \bar{r}_f}{\beta_p}
\]

Where,
- \(r_p\) = returns of the portfolio
- \(r_f\) = return of risk free instrument
- \(\beta_p\) = beta of the portfolio

The formula can be applied to any fund or portfolio where you can find a beta value—the beta is a measurement of market-related risk.

An investor might use the Treynor ratio to calculate the return generated by a fund over the return of short-term Treasury bills. If the fund returns 12% over three years, while the Treasury bill rate is 1.5% and the fund's beta is 0.5, then we can see the Treynor ratio is 21 (= \([12 - 1.5] \div 0.5\)).

**Jenson's Alpha**

A measure to judge the fund manager’s capacity to generate excess returns. This ratio enables an investor to choose a portfolio that can deliver better returns at a given level of risk.

Jensen’s Alpha is the difference between a series’ realized or expected rate of return and its expected position on the security market line given its risk level. If a series has a positive Jensen Alpha, it is positioned above the security market line, and is therefore outperforming what the CAPM would predict its performance to be. If a series has a negative Jensen Alpha, it is positioned below the security market line, and is underperforming what the CAPM would predict its performance to be.
### Sortino Ratio

A refined version of Sharpe ratio, this is a risk adjusted measure of return that considers the downside deviation of portfolio returns as denominator. This ratio penalizes only those returns that are less than the required rate of return.

The Sortino Ratio, however, only penalizes downside risk, and is defined as

\[
\text{Sortino Ratio} = \frac{\text{Portfolio Return} - \text{Target Return}}{\text{Downside Risk}}
\]

It is calculated as follows:

\[
\text{Sortino Ratio} = \frac{\langle R \rangle - R_f}{\sigma_d}
\]

Where,

- \( \langle R \rangle \) = Expected Return
- \( R_f \) = The Risk Free Rate of Return
- \( \sigma_d \) = Standard Deviation of Negative Asset Returns

The mutual funds included in this part of research study were selected using the ratings of CRISIL. CRISIL is accepted as one of the biggest financial consultants of India as are known to be engaged in very exhaustive analysis on mutual funds considering all the important parameters. They are the foremost provider of high end research to the world’s largest banks namely, HSBC, State Bank of India, Deutsche bank, CITI group Inc etc and other leading corporation. According to CRISIL’s rating top five mutual funds in various categories have been selected which are as follows:

**A. LARGE CAP EQUITY FUNDS**

1. Fidelity India Growth Fund
2. HDFC Top 200 Fund
3. UTI Opportunities Fund
4. Birla Sunlife Frontline Equity Fund-Plan A
5. Franklin India Bluechip Fund

**B. EQUITY DIVERSIFIED FUNDS**
1. Birla Sunlife Dividend Yield Plus
2. Fidelity Equity Fund
3. HDFC Equity Fund
4. Reliance Equity Opportunity Fund
5. UTI Service Industries Fund

**C. SMALL AND MID CAP EQUITY FUNDS**
1. DSP BlackRock Small and Midcap Fund
2. UTI Master Value Fund
3. ICICI Prudential Discovery Fund
4. Kotak Midcap
5. SBI Magnum Sector Umbrella-Emerging Business Fund

**D. EQUITY LINKED SAVING SCHEMES**
1. Fidelity Tax Advantage Fund
2. HDFC Tax Server Fund
3. ICICI Prudential Tax Plan
4. Canara Rebecco Equity Tax Saver – Dividend
5. HDFC Long Term Advantage Fund

**E. INDEX FUNDS**
1. Kotak Sensex ETF
2. Nifty Benchmark Exchange Traded Scheme
3. Franklin India Index Fund
4. Principal Index Fund
5. UTI Master Index Fund

**F. HYBRID - BALANCED FUNDS**
1. HDFC Balanced Fund
2. HDFC Pudence Fund
3. Birla Sunlife 95 Fund
4. DSP BlackRock Balanced Fund
5. Reliance Regular Savings Fund Balanced

**G. HYBRID – MONTHLY INCOME PLAN AGGRESSIVE**
1. HDFC Monthly Income Plan – LTP
2. Reliance Monthly Income Plan - LTP
4. Canara Robeco Monthly Income Plan
5  HSBC MIP – Savings

H. HYBRID – MONTHLY INCOME PLAN – CONSERVATIVE
1  Birla Sunlife Monthly Income
2  Birla Sunlife MIP
3  UTI Monthly Income Scheme
4  ICICI Prudential MIP Plan – Cumulative
5  SBI Magnum Monthly Income Plan

I. DEBT – LONG TERM INCOME FUNDS
1  Canara Robeco Income Plan
2  HDFC Income Fund
3  HSBC Income Fund – Investment Plan
4  HDFC High Interest Fund
5  LICMF Bond Fund

J. DEBT – SHORT TERM INCOME FUNDS
1  BNP Paribas Short Term Income Fund – Regular Plan
2  DSP BlackRock Short Term Fund
3  AIG Short Term Fund
4  Birla Sunlife Medium Term Plan
5  SBI Short Horizon Debt Fund – Short Term Fund – Retail

K. DEBT – LIQUID FUNDS
1  UTI Liquid Cash Plan
2  HDFC Liquid Fund
3  SBI Magnum Instacash
4  HDFC Cash Management Fund – Savings Plan
5  Principal Cash Management Fund

L. DEBT – ULTRA SHORT TERM DEBT FUNDS
1  HDFC Cash Management Fund – Treasury Advantage Plan
2  HDFC Floating Rate Income Fund – Short Term Plan – Retail
3  JM Money Manager Fund – Super Plan
4  Reliance Money Manager Fund – Retail
5  Birla Sunlife Floating Rate Fund – Long Term
Secondary data pertaining to these selected mutual funds was collected on the parameters and ratios mentioned above to further analysis and comparison of the mutual funds’ performance before, during and after recession.

3.1.2 **Exploratory Research Design**

To examine the investment/saving pattern of investors in mutual funds and to study the investor’s behavior during recession, the researcher carried out the study in the district of Allahabad including respondents from rural, semi-urban and urban areas of the selected district. Respondents for this part of the research study were investors of mutual funds.

3.1.2.1 **Sampling Design:**

Multistage random sampling technique was used to select the respondents. An exhaustive list of all fund houses in Allahabad was downloaded from the internet. A total number of fifteen fund houses were reportedly present in Allahabad district. Through simple random sampling (lottery system) five fund houses were selected out of this list. These fund houses were Rashmi Fin Mart, Sundaram Finance Group, S K Finance, Tathagat Housing and Finance and Anand Rathi Group. The researcher approached these fund houses and extracted lists of mutual fund investors. Finally names, mobile numbers and e-mail ids of a total number of 1000 investors was available for further investigation. Again through systematic random sampling a final list of 250 mutual fund investors was drawn. The selected sample had a mixture of respondents as it included males, females, various income groups, service / businessman, people across various age groups, and various geographical distribution across the city of Allahabad.

3.1.2.2 **Method of data Collection:**

**Tools used:** For this research structured questionnaire is used with definite, concrete and pre-determined question. These questions were presented with exactly the same wording and in the same order to all respondents. The structured questionnaire consisted of close ended as well as open ended questions. The developed questionnaire was first tested through a pilot survey, and after making requisite changes it was finally used for the main survey.
**Data Collection:** The questionnaire was mailed to the respondents electronically. For those respondents whose email id was not known, data was collected either telephonically through mobile or personal contact. Null data was received from twenty selected investors as they did not respond or were new investors not suitable for the present study.

The respondents were demographically classified and collected data was analyzed qualitatively using percentages.