OBJECTIVES OF THIS CHAPTER

This chapter discusses in details the research work undertaken in regard to conceptualizing:

- **What are the high level findings in regard to the performance of the selected mutual fund schemes for the period under study?**
- **What are the possible explanations to such performances?**
- **What are the learnings derived out of this research work for a retail investor?**
- **What are the new dimensions derived out of this research work for a researcher of financial markets?**
6.1 INTRODUCTION AND APPROACH

6.1.1 ISSUES CENTRAL TO THE RESEARCH WORK

A retail investor would invest his/ her hard earned money in mutual fund schemes primarily with an expectation to earn handsome returns. Thus to motivate him/ her, the need of the hour for asset management companies is to generate positive risk adjusted returns in all market phases and that too in a persistent manner. Thus maintaining the same level of performance across both bear and bull market phases has become an indispensable deliverable from the contemporary asset management companies.

6.1.2 THE SUBJECT OF ANALYSIS

In this research work, performance of large cap mutual funds schemes was studied. The primary reason for selecting mutual fund as a preferred investment vehicle of retail investors is that in the last 10 years the growth in gross domestic savings (GDS) for India had been 11% p.a. but the growth in assets under management (AUM) of the mutual fund industry was 21% p.a. for the corresponding period. In regard to selecting large cap mutual funds as the subject of analysis, the reasons are, as follows:

- The backdrop of the research is a combination of bear and bull market phases which means volatile market. When markets are volatile, large cap mutual funds are always in flavor.
- Secondly, large cap mutual fund schemes are predominantly composed of large cap stocks and hence can be easily benchmarked with NIFTY.

6.1.3 THE APPROACH TOWARDS ANALYSIS

The decision to hold on to a portfolio depends on whether the nature of the mutual funds which constitute the portfolio, change or remain uninfluenced when the markets shift from one phase to another (i.e. bear to bull and vice versa). This means that the need was to study the nature of performance of mutual funds.
To do the same three different aspects of a mutual fund scheme were identified as follows:

- What does a Fund deliver?
- Who makes the Fund deliver?
- How is the Fund made to deliver?

To measure these three qualitative aspects, the following three quantitative parameters were used respectively:

- Risk Adjusted Returns
- Fund Manager’s Decision Making Abilities
- Co-Movement between Fund & Benchmark

So the research questions derived were existence/ non existence of significant difference for the select set of large cap mutual fund schemes with NIFTY in regard to the above three parameters between consecutive bear and bull phases.

6.1.4 **THE ASPECTS OF ANALYSIS**

The research work was driven by the following three analyses:

- Comparing risk adjusted returns of selected large cap mutual fund schemes for the bear and bull phase with that of NIFTY
- Comparing decision making abilities of the fund managers of selected large cap mutual fund schemes for the bear and bull phase
- Comparing price co-movement of selected large cap mutual fund schemes vis-à-vis NIFTY for the bear and bull phase

6.2 **FINDINGS AND IMPLICATIONS**

6.2.1 **THE SIGNIFICANCE OF THE INTRODUCTORY ANALYSIS**

The objective of the research work undertaken in this section was to create a prelude to the overall analysis. This introductory analysis was an attempt to figure out three questions.
Can the large cap mutual fund schemes selected be benchmarked to NIFTY? In all subsequent analytical sections, NIFTY was used as the benchmark for all the selected large cap mutual fund schemes. Hence it was essential to check whether NIFTY can be conveniently used as a substitute of the other officially stated benchmarks.

Did the large cap mutual fund schemes selected outperform NIFTY in both the two phases? This analysis would help align the implications and understandings for further analysis.

Was the relationship between the large cap mutual fund schemes selected & NIFTY constant in both the two phases? This was essential for establishing a strong basis for further analysis.

6.2.1.1 Findings & Implications (First Aspect)

Findings: There have been no differences among the means as well as variances of weekly risk premium of all the officially stated benchmarks; statistically significant at 1% level as well as 5% level for all cases.

Implications: The NIFTY can be used as the benchmark for analysing the performance of all the large cap mutual fund schemes selected.

6.2.1.2 Findings & Implications (Second Aspect)

Findings: There have been no statistical differences between the means of weekly risk premium of any of the large cap mutual fund schemes selected and NIFTY in the bear or bull phases; statistically significant at 1% level as well as 5% level for all ten cases.

Implications: All the large cap mutual fund schemes selected neither outperformed nor underperformed NIFTY for the period of study.
6.2.1.3 FINDINGS & IMPLICATIONS (THIRD ASPECT)

Findings I. There have been no statistical difference in the means of excess weekly risk premiums of nine of the funds between the bear and bull phases; statistically significant at 1% level for all ten cases and 5% level for eight cases.

Review I. For ICICI Prudential Focussed Bluechip Equity, the average excess weekly risk premium of the fund in the bear phase has been significantly higher than that of the bull phase owing to lower degree of association of the fund with NIFTY in the bear phase.

Findings II. There have been no statistical difference in the means of weekly beta values of seven of the funds between the bear and bull phases; statistically significant at 1% level as well as 5% level for all seven cases.

Review II. For HDFC Top 200, DSPBR Top 100 & UTI Opportunities, the average beta value of the funds in the bull phase have been significantly higher than that of the bear phase, suggesting higher degree of association of the funds with NIFTY in the bull phase.

Findings III. There have been no statistical difference in the means of weekly alpha values of any of the funds between the bear and bull phases; statistically significant at 1% level for all ten cases and 5% level for nine cases.

Review III. For Reliance Focussed Large Cap Equity, a negative average weekly risk premium in the bear phase has lead to a marginally lower average alpha value in the bear phase than the bull phase.

Findings IV. The null hypothesis of no correlation between the daily returns of each selected large cap mutual fund scheme and NIFTY for the entire sample period was rejected at both 1% level and 5% level for all ten cases.

Implications. The excess weekly risk premiums, the means of weekly beta values and the means of weekly alpha values of majority of the large cap mutual fund schemes selected between the bear and bull phases were similar. Also the daily returns of each selected
large cap mutual fund scheme and NIFTY for the entire sample period was correlated. All these signified that the relationship between the large cap mutual fund schemes selected & NIFTY was essentially constant in both the two phases.

6.2.2 **THE SIGNIFICANCE OF THE ANALYSIS OF RISK ADJUSTED RETURNS**

The research work undertaken in this section had an objective to gauge whether the risk premium generated by the large cap mutual fund schemes was attractive for the investors and was persistent in nature in both the two phases (Bear and Bull). This analysis was hence an attempt to figure out two key questions:

- **Did the selected large cap mutual fund schemes generate higher risk premium per unit of risk than NIFTY in both the two phases?** A true form of performance evaluation for risky portfolios is to evaluate not the absolute returns but the risk adjusted returns. In this section, the risk adjusted returns of the fund schemes selected have been analysed for the bear and bull phases on an absolute basis. The analysis was to identify whether the selected large cap mutual fund schemes generated higher risk premium than NIFTY in both the two phases.

- **Did the selected large cap mutual fund schemes generate equal amount of higher risk premium per unit of risk than NIFTY in both the two phases?** Consistency or persistency in performance management can be measured through a relative comparison of out-performance/ under-performance across different market conditions. That was the objective of the analysis undertaken in this segment.

6.2.2.1 **FINDINGS & IMPLICATIONS (FIRST OR ABSOLUTE ASPECT)**

**Findings I.** There have been no statistical difference between the means of weekly Sharpe (as well as Treynor) ratios of any of the funds and the NIFTY in the bear or bull phases; statistically significant at 1% level as well as 5% level for all ten cases.
Findings II. The means of the weekly Jensen intercept have not been statistically different from zero value in either the bear or bull phase for nine of the funds; statistically significant at 1% level for all nine cases and 5% level for seven cases.

Review II. For UTI Equity and Reliance Focussed Large Cap Equity the average weekly Jensen intercept have been statistically higher than zero value in the bull phase signifying marginal outperformance of the broad based market index in the corresponding period. However, for UTI Opportunities the average weekly Jensen intercept has been statistically higher than zero value in the bear phase owing to a lower beta in the corresponding period.

Implications. Majority of the funds had not generated higher risk premium per unit of risk than NIFTY in either of the two phases. Although quite surprising, this implied that none of the selected large cap mutual fund schemes was able to outperform or underperform NIFTY in either of the two market phases.

6.2.2.2 Findings & Implications (Second Or Relative Aspect)

Findings I. There have been no statistical difference in the average excess weekly Sharpe (or, excess weekly Treynor) ratios of any of the funds between the bear or bull phases; statistically significant at 1% level as well as 5% level for all ten cases.

Note I. For Excess Sharpe (Or, Excess Treynor) Ratios – For all the funds, the weekly Sharpe (or, Treynor) ratios of the funds have been statistically same as the weekly Sharpe (or, Treynor) ratios of NIFTY. Hence for all the funds, the excess Sharpe (or, excess Treynor) ratios of the funds, by logic, has been equal to zero. Thus, it can be intuitively concluded that for all the funds the excess Sharpe (or, Treynor) ratios have been equal to zero in both the two phases. Hence this analysis does not provide any value-add to the research work.
Findings II. There have been no statistical difference in the average weekly Jensen intercepts of any of the funds between the bear or bull phases; statistically significant at 1% level as well as 5% level for all cases.

Note II. For Jensen Intercept - Since for seven out of ten funds, the average weekly Jensen intercept has statistically not been different than zero in either the bear or bull phases, hence for those seven funds, the average weekly Jensen intercept, by logic, has been equal in the bear vis-à-vis bull phase. Hence this analysis is significant only for those three funds for which the average weekly Jensen intercept has been statistically different from zero in either the bear or bull phases.

Implications. The analysis revealed that all the selected large cap mutual fund schemes had generated equal amount of higher risk premium per unit of risk than NIFTY in both the two phases. This meant that the nature of risk adjusted returns was not being significantly affected by change in market phases.

6.2.3 The Significance of the Analysis of Fund Manager’s Decision Making Abilities

The research work undertaken in this section was to evaluate the fund manager’s decision making ability of the selected large cap mutual fund schemes both on an absolute basis and a relative basis for the period under study. This analysis thus focused to identify two key aspects.

- Did the fund managers of the selected large cap mutual fund schemes generate positive risk return tradeoff from active portfolio management in both the two phases? An efficient portfolio manager would always try to justify his/ her fund management skills by validating his/ her active fund management decisions by a positive risk premium over and above the levels generated by a comparable index/ benchmark. The analysis was to identify whether the fund managers generated
additional risk premium over and above that generated by the NIFTY in both the two phases.

- Did the fund managers of the selected large cap mutual fund schemes generate equal amount of positive risk return tradeoff from active portfolio management in both the two phases? The objective of the analysis undertaken in this segment was to measure consistency or persistency in active fund management skills of the fund managers across different market conditions.

6.2.3.1 FINDINGS & IMPLICATIONS (FIRST OR ABSOLUTE ASPECT)

Findings. The means of the weekly Fama (or, Information) ratio have not been statistically different from zero value in either the bear or bull phase; statistically significant at 1% level for all ten cases and 5% level for seven cases.

Review. For UTI Equity and Reliance Focussed Large Cap Equity, the average Fama (or, Information) ratio of the funds in the bull phase has been significantly higher than zero value, signifying marginal outperformance of the broad based market index by the fund manager in the corresponding period only.

However, for UTI Opportunities, the average Fama (or, Information) ratio of the fund in the bear phase has been significantly higher than zero value, signifying marginal outperformance of the broad based market index by the fund manager in the corresponding period only.

Implications. Like risk adjusted returns, the fund managers had actually failed to generate positive risk return trade-off from active portfolio management in either of the two market phases. This meant that in either of the two phases, active portfolio management did not pay off.
6.2.3.2 Findings & Implications (Second Or Relative Aspect)

Findings. There have been no statistical difference between the average weekly Fama (or, Information) ratios of any of the funds between the bear and bull phases; statistically significant at 1% level as well as 5% level for all ten cases.

Note. For Fama (Or, Information) Ratio - Since for seven out of ten funds, the average weekly Fama (or, Information) ratio has not been statistically different from zero value in either the bear or bull phases, hence for those seven funds, the average weekly Fama (or, Information) ratio, by logic, has been equal in the bear vis-à-vis bull phase. Thus this analysis is significant only for those three funds for which the average weekly Fama (or, Information) ratio has been statistically different from zero in either the bear or bull phases.

Implications. Although the fund managers had failed to generate positive risk return trade-off from active portfolio management in either of the two market phases, the risk return trade off that was generated in the two phases was equal. So again, in terms of decision making abilities, change in market phases, were not affecting the parameter.

6.2.4 The Significance Of The Analysis Of Price Co-Movement between Fund & Benchmark

Any mutual fund scheme can remain consistently well performing in varying market phases when the fund manager adapts himself/ herself to the uniqueness of the prevailing market condition and reflects the same in his/ her fund management style. The market does not behave in the same manner in the bear and bull phases. Hence, the fund manager too cannot follow identical investment management strategies in these two phases. The research work undertaken in this section was to evaluate to what extent were the fund managers of the large cap mutual fund schemes selected able to do the same in the bear and bull phases both on an absolute and a comparative basis.
• Did the selected large cap mutual fund schemes exhibit a long run equilibrium relationship with NIFTY in both the two phases? The objective of the analysis undertaken in this segment was to identify whether regression and cointegration existed between the rebased daily closing price of NIFTY and the rebased daily closing NAV of the selected large cap mutual fund schemes in both the two market phases. Regression was performed as an attempt to establish whether the NAV of the selected large cap mutual fund schemes replicated NIFTY movements based on a long term, equilibrium relationship and cointegration was an attempt to prove validity of the regression model.

• Did the nature of short run relationship between the selected large cap mutual fund schemes and NIFTY differ for the two phases? Post cointegration, the error correction model was created for each of the selected large cap mutual fund schemes in the bear and bull phases separately. The error correction model was required to figure out the rate of speed of adjustment of NAV of the funds to changes in NIFTY prices for the bear and bull phases separately. Thereafter the test of equality of ECM coefficients for the two phases was conducted in order to identify whether the funds responded to changes in NIFTY at the same rate or at varying rates between the two phases.

6.2.4.1 Findings & Implications (First Aspect)

Findings: Out of twenty possible cases (ten funds; two phases for each fund).

• Nine cases (45%) displayed significant cointegration,

• Eight cases (40%) displayed marginal cointegration and

• Three cases (15%) displayed no cointegration.

Eight out of ten funds displayed cointegration with NIFTY in the bear phase and nine out of ten funds were cointegrated with NIFTY in the bull phase.
For fund wise tabulation of cointegration statuses for both bear and bull phases for all the selected large cap mutual fund schemes kindly refer to Table 6.2.4.1.1.

A close scrutiny of the cointegration results indicate that there was no fund whose net asset values have not been cointegrated (neither significantly nor marginally) with the prices of NIFTY in both the bear and bull phases.

**Review**: The fact that HDFC Top 200 has not been cointegrated with NIFTY in the bear phase, explains the observation of Section 1B that the average beta value of the fund in the bull phase has been significantly higher than that of the bear phase.

The fact that UTI Equity has not been cointegrated with NIFTY in the bull phase, explains the observations of Sections 2 and 3 that the average weekly Jensen intercept, the average weekly Fama (and, Information) ratio of the fund has been statistically higher than zero value in the bull phase.

Finally the fact that UTI Opportunities has not been cointegrated with NIFTY in the bear phase, explains the observations of Section 1B that the average beta value of the fund in the bull phase has been significantly higher than that of the bear phase and of Sections 2 and 3 that the average weekly Jensen intercept, Fama (and, Information) ratio of the fund has been statistically higher than zero value in the bear phase.

**Additional Findings**: A fund wise comparison of the two cointegrating equations for the two phases revealed that most of the fund managers (Table 6.2.4.1.2):

- Had being maintaining a higher intercept value in the bear phase than the bull phase (5 out of 6 cases) and
- Had being maintaining a higher beta value in the bull phase than the bear phase (5 out of 6 cases).

**Implications**: Thus majority of the funds exhibited a long run equilibrium relationship with NIFTY in both the two phases.
6.2.4.2 FINDINGS & IMPLICATIONS (SECOND ASPECT)

Findings I. The results of the error correction based test of cointegration performed for all funds have been summarized in Table 6.2.4.2.1. The following are the observations from the analysis:

- Only one fund in the bull phase had a statistically significant intercept value in the error correction model (1 out of 20 cases).
- For 8 funds (out of 10 applicable cases) it had been observed that the coefficient of daily change in NIFTY price is lower in the bull phase than the bear phase.
- For 8 funds (out of 10 applicable cases) it had been observed that the coefficient of one day lagged error term of the cointegrating equation is lower in the bull phase than the bear phase.
- In case of 6 funds (out of 10 applicable cases) it had been observed that higher coefficient of daily change in NIFTY price in bull (than bear) phase is associated with lower coefficient of one day lagged error term in bull (than bear) phase.

Implications I. The first observation indicates that change in daily NAV is primarily independent of any fixed factor (constant). The existence of an intercept term for UTI Equity in the bull phase can be well correlated with the fact that the net asset values of this fund were not cointegrated with the prices of NIFTY in the bull phase.

The second observation indicates that fund managers replicate NIFTY to a significantly higher extent in the bull phase than bear phase. The two exceptions were HDFC Focussed Large Cap Equity & HSBC Equity which otherwise has no other inconsistencies.

The third observation indicates that the fund managers try to eliminate short term deviations of their respective funds from the NIFTY at a significantly faster pace in the bull phase than the bear phase. The two exceptions were UTI Mastershare & UTI Equity. For
both these funds, the proportion of cointegration has also decreased in the bull (than bear) phase.

The fourth and final observation indicates that when the fund manager is replicating NIFTY at a higher proportion on the same day basis in the bull (than bear) phase, then the tendency to correct previous day anomalies reduces correspondingly in the bull (than bear) phase in most of the cases.

**Findings II.** Although most of the funds demonstrated higher degree of association with NIFTY in the bull phase than the bear phase, it was imperative to check whether this difference in the degree of association was significant in nature or a mere chance occurrence due to sampling. The same was achieved in the concluding analysis and the findings summarized in Table 6.2.4.2.2. The results indicated that the average coefficients for both the two variables in the two phases were unequal; statistically significant at 5% and 1% level for all ten cases.

**Implications II.** Although majority of the funds exhibited a long run equilibrium relationship with NIFTY in both the two phases, but the nature of short term relationship was absolutely different between the two phases. It seemed that fund managers replicated changes in NIFTY in their mutual fund portfolio at a much faster pace in the bull phase than the bear phase.

**6.3 CONCLUSION DERIVED FROM THE ENTIRE ANALYSIS**

- The key features of the funds (viz. beta and alpha) have remained the same in both the two phases for majority of the funds.
- None of the funds could significantly outperform the benchmark (i.e. NIFTY) in either of the two phases.
- None of the fund managers displayed varying decision making abilities between the two phases.
• The relative performance (viz. excess risk premium) of majority of the funds, in relation to the benchmark (i.e. NIFTY) did not differ significantly between the two phases.

• The daily net asset values of almost all the funds have been cointegrated with the daily prices of NIFTY in both the two phases.

• But, the nature of cointegration (as explained by the coefficients of the error correction model) has been significantly different:
  o Changes in the daily prices of NIFTY influenced same day changes in the daily net asset values of majority of the funds to a significantly higher extent in the bull phase than the bear phase.
  o The past disequilibrium in the tracking of NIFTY (e.g. one period lagged error) was adjusted at a significantly slower pace for majority of the funds in the bull phase than the bear phase.

6.4 UNDERSTANDING ACQUIRED FROM THE RESEARCH WORK

Understanding regarding performance of the selected large cap mutual fund schemes:

• None of the funds outperformed or underperformed the benchmark.

Understanding regarding portfolio management skills of the fund managers:

• The fund management style of all fund managers varied significantly between the two phases.

• Majority of the fund managers readjusted his/ her fund portfolio to reflect changes in NIFTY at a much faster pace in the bull period than the bear period.

Understanding regarding retail investors' fund holding styles:

• For the selected mutual fund schemes, the investors' could have negated the risks associated with market swings and phase changes (bear to bull and vice versa) by holding on to their schemes.
6.5 SIGNIFICANCE OF THE STUDY

Comparative analysis of performance of mutual fund schemes in consecutive bear vis-à-vis bull phases in the Indian securities market in itself is a less researched work. However, this research work added yet another dimension by giving particular reference to retail investors and how should they manage their mutual fund investments given varying market conditions.

Also this research work considered the latest consecutive bear and bull phases of the Indian securities markets and thus extended the already existing findings and observations, based out of previous research works, to a more contemporary period. Finally this research work is a well timed attempt to enhance retail investor participation in the Indian equity markets.

6.6 LIMITATIONS AND DRAWBACKS

Given the research objectives and the research framework, this research work suffers from the following limitations/ drawbacks as mentioned segment wise.

6.6.1 Limitations On Account Of The Research Objectives

- The bear and bull phases are essentially short term market phases and thus the study spanned across only two calendar years.
- The study was limited to only large cap mutual fund schemes and ignored all other categories of mutual fund schemes which are of significant interest to retail investors.

6.6.2 Limitations On Account Of The Research Framework

- This research study only considered retail growth schemes of the selected large cap mutual fund schemes and did not focus on institutional plan, dividend option & direct schemes.
• Though return rates for treasury bills have been used as a proxy for risk free returns, yet this approach suffers from a drawback that treasury bills are not available to retail investors as an investment product.

• Although cointegration and error correction models had been extensively applied in this research work, yet Granger causality check between NIFTY & the selected large cap mutual fund schemes had not been performed.

6.7 SCOPE OF FURTHER RESEARCH

Research is a perpetual exercise and hence its scope is vast and endless. Yet this particular research work can be logically extended to include/ introduce the following:

• For a more conclusive understanding this research work can be conducted across multiple consecutive bear and bull market phases and the findings can be compared for consistency/ irregularity.

• For a more conclusive understanding this research work can be conducted across multiple categories of mutual fund schemes (e.g. mid cap mutual fund schemes, equity linked savings schemes etc.) for the same time period as for this work and the findings can be compared for consistencies/ irregularities.

• This research work demonstrated the application of error correction model in evaluating fund managers’ responses to change in market phases in a parametric manner. This opens up a new approach towards quantitatively evaluating fund managers’ market timing, persistency and other fund management skills.
OUTCOMES OF THIS CHAPTER

The research work undertaken, as elaborated in this chapter, had helped in establishing the following understandings:

- The amount of risk adjusted returns generated by the selected mutual fund schemes was similar to that of NIFTY and similar in both the two phases. The amount of risk return tradeoff generated by the mutual fund managers similar in both the two phases. There existed a long run equilibrium relationship between the mutual fund schemes and NIFTY in both the two phases but the nature of short term relationship between the selected mutual fund schemes and NIFTY varied significantly between the two phases.

- The selected mutual fund schemes could not outperform NIFTY in either of the two phases through active portfolio management. Also, in terms of fund manager’s decision making abilities, change in market phase did not affect the parameter. However most of the fund managers maintained a higher beta value in the bull phase than the bear phase but a higher intercept value in the bear phase than the bull phase. This highlighted that the fund managers were replicating NIFTY at a much higher pace in the bull period than the bear period.

- For the selected large cap mutual fund schemes, the investors’ could have negated the risks associated with market swings and phase changes (bear to bull and vice versa) by simply holding on to their portfolio.

- This research work demonstrated the application of error correction model in evaluating fund managers’ responses to change in market phases in a parametric manner. This opens up a new approach towards quantitatively evaluating fund managers’ market timing, persistency and other fund management skills.