CHAPTER III

RESEARCH METHODOLOGY

The present research is an attempt to study the performance evaluation of index mutual funds and Exchange Traded Funds (ETFs) in India. With a view to develop a sound theoretical framework for investigation, review of literature relating to performance evaluation of mutual funds has been done in the previous chapter.

The study limits itself to Index funds, equity ETFs and Gold ETF Schemes of mutual fund companies and examine the growth performance of passive mutual fund’s product, behavior of returns and comparative analysis of ETF and Index Mutual Fund schemes in India. This chapter attempts to discuss the research methodology used for the study by elaborating sampling design, data collection, data analysis, the research tools used and limitations of the study.

3.1 RESEARCH DESIGN

For this study, analytical research design was employed using secondary public time-series data of monthly closing NAV prices of ETFs, Gold ETFs and Index Mutual Funds listed on the stock exchanges. This study adheres to Sharpe’s conclusion that the best way to measure fund performance is to compare it with other comparable funds (Sharpe, 1991). The aim of this thesis is to provide comprehensive quantitative research on the performance of ETFs and Index Mutual Funds in relative to their respective market benchmark indices as well as comparable schemes.
3.2 ANALYTICAL FRAMEWORK

Figure 2: Analytical framework

INDEPENDENT VARIABLE

- Benchmark Index
- Index Funds
- ETFs
- Gold ETFs

SECONDARY DATA

- Monthly Return

QUANTITATIVE ANALYSIS

- Mean
- OST
- Paired sample T-Test
- ANOVA

HYPOTHESES

- ETF performance=Benchmark index performance
- Index Fund performance=Benchmark index performance
- ETF performance=Index Fund performance
- Index Fund performance=ETF performance
- Gold ETF performance=Benchmark index performance

OST – Other Statistical Tools, namely Standard Deviation, Skewness, Kurtosis, Range and Coefficient of Variation.
3.3 OBJECTIVES

The objectives of the study are

1. To evaluate the monthly returns of Index Mutual Fund, ETFs and Gold ETF schemes for the period 2010 to 2014.

2. To identify the trends of Index Mutual Funds and Exchange Trade Funds (ETFs) and Gold ETF.

3. To analyze the performance of Index Funds, ETFs and Gold ETF in relation to their market indices.

4. To conduct a comparative analysis of Index Mutual Funds and Exchange Traded Funds (ETFs) for the period 2010-2014.

3.4. DATA SOURCING

This study is completely based on the secondary data. This data is collected from various source such as Stock exchanges, SEBI, Value Research Magazines, journals, articles, books and the published and unpublished documents of the mutual funds have been considered in the research.

The data was collected from the ICRA, the Stock Exchanges, and the respective fund houses. The monthly closing prices of benchmark index, prices of gold and NAV of the funds was taken from the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE), AMFI and in.finance.yahoo.com and bullion-rates.com.

For evaluating market return, CNX Nifty Junior, CNX Nifty, S&P BSE Sensex, CNX Midcap, CNX Dividend opportunities, CNX 500, CNX Bank, CNX
100, NASDAQ 100, HangSeng, CNX PSU Bank, CNX Nifty Shariah, CNX Infrastructure, CNX Total Return Index and price of gold have been taken as benchmark indices.

3.4.1 PERIOD OF THE STUDY

The study covers a period of five years from 1st January 2010 to 31st December 2014.

3.5 DATA ANALYSIS APPROACH

The aim of the data analysis was to compare the monthly returns of index funds, ETFs to its respective benchmark. The performance of ETFs and index funds was measured by comparing their monthly returns with the returns of the underlying indices. The performance of Gold exchange traded funds (ETFs) was measured by comparing their monthly returns with the returns of the gold prices. The share prices for ETFs and benchmark indices as well as NAV for index funds were converted into monthly returns. Then, ANOVA technique has been used to measure the difference between the average return of various schemes of index funds and ETFs. Besides, the returns of the index funds, ETFs and Gold ETF schemes were statistically compared to their respective benchmark indices, using the paired sample $t$-test. The paired sample $t$-test statistically validated if there was a significant difference in the performance of ETFs, index funds and Gold ETFs relative to the benchmark index and comparable funds.

3.6 TOOLS FOR ANALYSIS

For the purpose of analysis of data various statistical tools are used. To understand and analyze the performance of index mutual fund, ETFs and Gold ETFs returns statistical tools namely, Mean, Standard deviation, Skewness, Kurtosis and
Coefficient of Variation are used. ANOVA technique is applied to measure the difference between the average return of each scheme. Paired “t” test is applied to test the significant difference between average returns of each scheme and the average return of its benchmark Index and comparable funds.

3.6.1 ANOVA Test:

The F-test was developed by R.A. Fisher. The object of the test is to find out whether the two independent estimates of population variance differ significantly or whether the two samples be regards as drawn from the normal populations. F- Test is based on ratio of variance. That variance represents rows and columns and degree of freedom, it also represents how rows affect and column affect. The ANOVA single factor imply ratio of variance, the average variation with the average of the average.

3.6.2 The paired-sample t-test:

The paired-samples or dependent t test is used for within-subjects or matched-pairs designs in which observations in the groups are linked. The linkage could be based on repeated measures, natural pairings and pairings created by the experimenter. In any of these cases, the analysis is the same. The dependency between the two observations is taken into account, and each set of observations serves as its own control, making this a generally more powerful test than the independent samples t test.

3.7 SAMPLING

To construct the sampling scheme, all the open ended schemes of index fund and ETFs in mutual fund industry are taken into consideration. A total of 29 equity ETFs were listed on the exchange in December 2013. Out of 29 ETFs, 5 were
removed from the data set because the fund does not have at least one year track record. The final sample consists of 24 selected growth oriented open ended equity ETF schemes. The time period under investigation varied across indices.

A total of 24 index funds were listed on the exchanges in December 2013. Out of 24 index funds, one was removed from the data set because the fund does not have at least one year track record. The final sample consists of 23 selected growth oriented open ended index fund schemes.

All the open ended schemes of Gold ETFs in mutual fund industry are taken into consideration. A total of 14 Gold ETFs were listed on the exchanges in December 2013 and formed the universe. The final sample consists of 14 selected growth oriented open ended Gold ETF schemes. The time period under investigation varied.

3.7.1. Sample Units:

Sample units of the study is as given below:

1. Index Mutual Fund Schemes
   ICICI Prudential Nifty Junior Index Fund
   IDBI Nifty Junior Index Fund
   Principal Index Fund
   UTI Nifty Index Fund
   Franklin India Index Fund - NSE Nifty Plan
   ICICI Pru Index Fund
   SBI Nifty Index Fund
   HDFC Index - Nifty Plan
   Birla Sun Life Index Fund
2. Exchange Traded Funds

R*Shares Banking ETF

Goldman Sachs Banking BeES Fund

Motilal Oswal MOSt Shares M100 ETF Fund

Goldman Sachs Nifty Junior BeES Fund

R*Shares CNX 100 ETF

ICICI Prudential CNX 100 ETF Fund

R*Shares Nifty ETF

Kotak Nifty ETF Fund
Motilal Oswal MOSt Shares M50 ETF Fund
ICICI Prudential Nifty ETF Fund
Birla Sun Life Nifty ETF Fund
Religare Invesco Nifty Exchange Traded Fund
IIFL Nifty ETF Fund
Goldman Sachs Nifty ETS Fund
ICICI Prudential SPIcE Fund
Kotak Sensex ETF Fund
SBI Sensex ETF
Motilal Oswal MOSt Shares NASDAQ - 100 ETF Fund
Goldman Sachs Hang Seng BeES Fund
Kotak PSU Bank ETF
Goldman Sachs PSU Bank BeES Fund
Goldman Sachs CNX Nifty Shariah BeES Fund
Goldman Sachs Infra BeES Fund
Quantum Index Fund

3. **Gold Exchange Traded Funds**

UTI Gold Exchange Traded Fund
Goldman Sachs Gold ETF Fund
Kotak Gold ETF Fund
R*Shares Gold ETF
Quantum Gold Fund
SBI Gold Exchange Traded Scheme
Axis Gold ETF Fund
HDFC Gold Exchange Traded Fund
ICICI Prudential Gold Exchange Traded Fund
Religare Invesco Gold Exchange Traded Fund
Birla Sun Life Gold ETF
IDBI Gold Exchange Traded Fund
Motilal Oswal MOSt Shares Gold ETF Fund
Canara Robeco Gold Exchange Traded Fund

3.8 HYPOTHESES

To achieve the first, three and fourth objectives of the study the following Null hypotheses have been formulated and tested.

$H_0^1$: There is no significant difference in the returns of index fund schemes.

$H_0^2$: There is no significant difference in the average return of Index funds that track the CNX Nifty Junior and the average return of CNX Nifty Junior Index.

$H_0^3$: There is no significant difference in the average return of Index funds that track the CNX Nifty and the average return of CNX Nifty Index.

$H_0^4$: There is no significant difference in the average return of Index funds that track the S&P BSE Sensex and the average return of S&P BSE Sensex Index.

$H_0^5$: There is no significant difference in the average return of Index funds that track the CNX Dividend Opportunities and the average return of CNX Dividend Opportunities Index.

$H_0^6$: There is no significant difference in the average return of Index funds that track the CNX 500 and the average return of CNX 500 Index.

$H_0^7$: There is no significant difference in the returns of exchange traded fund (ETFs) schemes.
H₀⁸: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Bank and the average return of CNX Bank Index.

H₀⁹: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Midcap and the average return of CNX Midcap Index.

H₀¹⁰: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Nifty Junior and the average return of CNX Nifty Junior Index.

H₀¹¹: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX 100 and the average return of CNX 100 Index.

H₀¹²: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Nifty and the average return of CNX Nifty Index.

H₀¹³: There is no significant difference in the average return of exchange traded funds (ETFs) that track the S&P BSE Sensex and the average return of S&P BSE Sensex Index.

H₀¹⁴: There is no significant difference in the average return of exchange traded funds (ETFs) that track the NASDAQ 100 and the average return of NASDAQ 100 Index.

H₀¹⁵: There is no significant difference in the average return of exchange traded funds (ETFs) that track the Hang Seng and the average return of Hang Seng Index.
$H_0^{16}$: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX PSU Bank and the average return of CNX PSU Bank Index.

$H_0^{17}$: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Nifty Shariah and the average return of CNX Nifty Shariah Index.

$H_0^{18}$: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Infrastructure and the average return of CNX Infrastructure Index.

$H_0^{19}$: There is no significant difference in the average return of exchange traded funds (ETFs) that track the CNX Nifty Total Return and the average return of CNX Nifty Total Return Index.

$H_0^{20}$: Index funds on average, which track CNX Nifty Junior, do not significantly outperform the average ETFs counterpart.

$H_0^{21}$: Index funds on average, which track CNX Nifty, do not significantly outperform the average ETFs counterpart.

$H_0^{22}$: Index funds on average, which track BSE Sensex, do not significantly outperform the average ETFs counterpart.

$H_0^{23}$: There is no significant difference in the returns of gold exchange traded fund schemes.

$H_0^{24}$: There is no significant difference in the average return of UTI Gold Exchange Traded Funds and the average return of gold price.
H₀25: There is no significant difference in the average return of Goldman Sachs Gold Exchange Traded Funds and the average return of gold price.

H₀26: There is no significant difference in the average return of Kotak Gold Exchange Traded Funds and the average return of gold price.

H₀27: There is no significant difference in the average return of R*Shares Gold Exchange Traded Funds and the average return of gold price.

H₀28: There is no significant difference in the average return of Quantum Gold Exchange Traded Funds and the average return of gold price.

H₀29: There is no significant difference in the average return of SBI Gold Exchange Traded Scheme and the average return of gold price.

H₀30: There is no significant difference in the average return of Axis Gold Exchange Traded Scheme and the average return of gold price.

H₀31: There is no significant difference in the average return of HDFC Gold Exchange Traded Scheme and the average return of gold price.

H₀32: There is no significant difference in the average return of ICICI Prudential Gold Exchange Traded Scheme and the average return of gold price.

H₀33: There is no significant difference in the average return of Religare Invesco Gold Exchange Traded Scheme and the average return of gold price.

H₀34: There is no significant difference in the average return of Birla Sun Life Gold Exchange Traded Scheme and the average return of gold price.

H₀35: There is no significant difference in the average return of IDBI Gold Exchange Traded Scheme and the average return of gold price.
$H_{0}\text{36: There is no significant difference in the average return of Motilal Oswal MOSt Shares Gold Exchange Traded Scheme and the average return of gold price.}$

$H_{0}\text{37: There is no significant difference in the average return of Canara Robeco Gold Exchange Traded Scheme and the average return of gold price.}$

### 3.9 SIGNIFICANCE OF THE STUDY

This study has proven that the performance of ETFs, Index funds and Gold ETFs are the same as their benchmark indices. So an investor looking for a long-term passive investment strategy shall consider to invest in Index funds to get optimum returns. This study has also proven that gold ETFs have earned highest average monthly return than index funds and equity ETFs. So an investor may consider this investment alternative for diversification and short term gain. Therefore a combined investment portfolio should be considered to yield a higher reward-to-variability ratio.

### 3.10 SCOPE OF THE STUDY

The study is confined only to index funds, equity ETFs and gold ETFs listed in India. The scope of this study is limited to index funds and ETFs that are created from equities and gold and listed on the exchanges that track a CNX Nifty Junior, CNX Nifty, S&P BSE Sensex, CNX Midcap, CNX Dividend opportunities, CNX 500, CNX Bank, CNX 100, NASDAQ 100, HangSeng, CNX PSU Bank, CNX Nifty Shariah, CNX Infrastructure, CNX Total Return Index and price of gold. The scope of the study is also restricted for the time period January 2010 to December 2014 only.
3.11 LIMITATIONS OF THE STUDY

Due to the nature of this study, various limitations have been identified. This include:

- The performance of index funds and ETFs has been appraised in relation to its benchmark index only and not with active or managed mutual fund schemes.
- There may be structural breaks in the time period and this has not been considered in the study.
- The study also has not considered macroeconomic factors like exchange rate, inflation and political risks which could have impacted the performance of the funds.