Chapter – II

Materials and Methodology of the Study
INTRODUCTION

Chapter – I, Introduction, Objectives, Hypotheses, Scope of the study and Limitations of the Study have been dealt with. In this chapter, Chapter – II, Materials and Methodology of the Study includes Universe, Types and Sources of data, Period of the study, The process and the Tools used, Operational definition and the Chapter scheme have been dealt with.

METHODOLOGY

The methodology of this study consists of the research design, developed on the sound principles of research. The research design consists of:

I. Universe,

II. Types and Sources of Data,

III. Period of the study,

IV. Statistical tools used and methodology used in analysis,

V. The process and the tools used for analysis,

VI. Operational definition of concepts,

VII. Chapter scheme.

I. UNIVERSE

The closing prices of the indices of the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE), the monthly data sets of Foreign Institutional Investments and macroeconomic variables have been taken for the study.

From the BSE and NSE, the prices of AUTO, FMCG, IT and METAL have been taken for this study.

Among the macroeconomic variables Consumer Price Index (CPI), Call Money Rate (CMR) and Dollar Price (DP) have been selected for this study.
II. TYPES AND SOURCES OF DATA

The present study is purely based on published secondary data. The required data for analysis have been collected from the websites like

1. www.bseindia.com
2. www.nseindia.com
3. www.sebi.org
4. www.rbi.org.in
5. www.worldbank.org

The review of literature has been prepared from

1. www.google.com
2. www.finance.indiamart.com
3. www.yahoofinance.com

III. PERIOD OF THE STUDY

Prices of monthly inflows of FII under National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) and the macroeconomic variables like Call Money Rate (CMR), Consumer Price Index (CPI) and Dollar Price (DP) were for about a period of 12 years from 1st January 2005 to 30th September 2016 have been used for analyzing and testing the influence of macroeconomic variables on Indian stock market with the monthly inflow of foreign institutional investments (FIIs) as an intervening variable.

IV. STATISTICAL TOOLS USED AND METHODOLOGY USED IN ANALYSIS

In order to analyse the data collected, the researcher has used relevant statistical tools like

1. Descriptive Statistics
   a. Returns
   b. Mean
c. Standard Deviation  

d. Maximum and Minimum  

e. Skewness  

f. Kurtosis  

2. Augmented Dickey Fuller test (ADF)  

3. Johansen Co-Integration test  

4. Granger Causality test  

5. Correlation Matrix  

6. Simple Regression  

7. Sobel test  

V. THE PROCESS AND THE TOOLS USED FOR ANALYSIS  

The following process has been undertaken to analyse the impact of economic variables on Indian stock market through the monthly inflow of FIIs.  

1. Finding normality with Descriptive Statistics  

   All the tests necessary for this study can be conducted only if the data collected are continuous. The continuity of the data is the basic necessity for the normality of the data collected and tested. The Descriptive Statistics test is used for testing the normality of time series data.  

2. Finding stationary with Augmented Dickey-Fuller Test (ADF)  

   Augmented Dickey-Fuller test is used for checking the existence of stationarity level of time series data. It may be noted that the time series data can be subjected to further analysis only after checking the existence of the stationarity level.
3. **Finding long-run relationship with Johansen-Juselius (JJ) Co-integration Test**

   The Co-integration test has been conducted in this study to know the existence of long run equilibrium relationship among the indices of BSE and NSE and FII—the selected variables, by testing the existence of the co-movement between them.

4. **Finding Short-run relationship with Ganger Causality Test**

   It is very important to ascertain the fact whether the indices of BSE and NSE are leading FII and macroeconomic variables or the macroeconomic variables and FII is leading the indices of BSE and NSE. Ganger Causality test is to uncover the causal relationship between them (i.e.) to find out the cause and effect relationship between them.

5. **Finding relationship between variables with Correlation Matrix Test**

   Correlation Matrix test is used for identifying the association between CPI, CMR and Dollar Price--the selected macro economic variables and the indices of BSE and NSE.

6. **Ascertaining the impact of variables with Regression Analysis**

   After ascertaining the existence of relationship among the economic variables, Simple Linear Regression analysis is used for knowing the percentage of impact of selected macro economic variables and the Indian stock market.

7. **Testing the intervening variable with Sobel Test**

   To identify FII has an intervening variable; the Sobel test has been conducted.
The process of and tools for analysis have been presented in Figure 01.

**Figure 01**

The Process of and Tools for Analysis

- **Stages**: Objectives → Finding Normality → Finding Stationarity → Finding the co-integration in the Long-run → Finding the causality in the Short-run → Finding the correlation between variables → Ascertaining the quantum of impact of variables → Testing intervening variables
- **Tools Used**: Descriptive Statistics → Augmented Dickey-Fuller Test (ADF) → Johansen-Juselius (JJ) co-integration Test → Canger Causality Test → Correlation Matrix Test → Regression Analysis → Sobel Test
VI. OPERATIONAL DEFINITIONS

The following are the operational definition of concepts of the study,

1. **Foreign Institutional Investment**

   Foreign institutional investment denotes all those investors or investment companies that are not located within the territory of the country in which they are investing. These are actually the outsiders in the financial markets of the particular company. Foreign institutional investment is a common term in the financial sector of India.

2. **Stock Market**

   Stock market is a place where shares of public companies are listed and traded. The stock market is the market in which shares of publicly held companies are issued and traded either through exchanges or over-the-counter markets. The stock market is also known as the equity market.

3. **Inflation Rate**

   The rates at which the general level of prices for goods and services are rising and subsequently, purchasing power are falling. Central banks attempt to stop severe inflation, along with severe deflation, in an attempt to keep the excessive growth of prices to a minimum.

4. **Interest Rate**

   The interest rate is the rate which is charged or paid for the use of money. An interest rate is often expressed as an annual percentage of the principal. It is calculated by dividing the amount of interest by the amount of principal. Interest rates often change as a result of inflation and Federal Reserve Board policies.

5. **Exchange Rate**

   The exchange rate is the rate at which one currency is converted into another. The exchange rate is used when simply converting one currency to
another (such as for the purposes of travel to another country), or for engaging in speculation or trading in the foreign exchange market.

6. **Stationarity**

   A common assumption in many time series techniques is that the data are stationary. A stationary process has the property that the mean, variance and autocorrelation structure do not change over time. In light of the present study it means a flat looking series, without trend, constant variance over time, a constant autocorrelation structure over time and no periodic fluctuations.

7. **Co integration**

   Co integration is a statistical property of time series variables. Two or more time series are co integrated if they each share a common type of stochastic drift: that is, to a limited degree they share a certain type of behaviour in terms of their long-term fluctuations, but they do not necessarily move together and may be otherwise unrelated.

8. **Causality**

   Causality is the relationship between an event (the cause) and a second event (the effect), Causality analysis tests whether the second event is the consequence of the first and vice versa. Though the causes and effects are typically related to changes or event, include objects, variables, facts and state of affairs.

9. **Abbreviations Used**

   The following abbreviations commonly used in the global financial market have been used in this study also;

   **ADF** – Augmented Dickey-Fuller Test

   **E-VIEWS** – Econometrics Views

   **NSE** – National Stock Exchange Indices

   **BSE** – Bombay Stock Exchange Indices
VII. CHAPTER SCHEME

The study is designed to have five chapters. They are as follows:

Chapter - I

- deals with the “Brief Introduction, Objectives, Null Hypotheses, Scope and Limitations” of the study.

Chapter – II

- contains “Materials and Methodology” of the Study.

Chapter – III

- deals with the “Foreign Institutional Investments and Stock Market – A Review” of the study.

Chapter - IV

- contains with “Analysis and Interpretation of Data” of the study.

Chapter – V

- contains “Findings, Suggestions, Conclusion and Scope for Further Research” of the study.
Towards the end of this research work, comprehensive bibliographies on the subject have been added, along with following Annexures

Annexure I - Description of Variables

Annexure II – Papers Published

CONCLUSION

In chapter-II, Materials and Methodology of the study, includes Universe, Statistical tools used, Operational definition and Chapter Scheme. The chapter helps to adopt new tools for analysing and testing the mediating effect of FII as the intervening variable using Sobel test. Chapter II provides the overall framework of the analysis part of this study which is discussed in detail in the forthcoming chapters. The Review of Literature and other concepts related to study area have been included in the Chapter – III.