CHAPTER-I
GENERAL INTRODUCTION

1.1 INTRODUCTION:

Forecasting is a technique to measure, a certain value of an uncontrollable variable for a particular future period of time by using historical figures, expectations, trends, and experience. It is one of the expeditiously growing fields of business world which is mainly based on powerful statistical theory and applications. Over the past few years, there has been lot of research work carried out in predicting the future and making better decisions. This process of research has been led to several developments in forecasting methods.

In the business area, forecasting techniques play a vital role to make decisions with in a short period it may be compress by years to days and days to hours and even minutes. Forecasting is significant and adequate to assist in proper planning. Forecasting is a familiar statistical method to make strategic decisions in the fields of transportation, production and stock marketing. Forecasting is all about doing some predictions about the future as accurately as possible, given all the information available including historical data and knowledge of any future events that might impact the forecasts. This becomes an integral part of the decision-making activities of all the fields and domains as it can play an important role in many areas like production planning, sales inventory and demand analysis.

In general, forecasting methods can be divided into two broad categories and so on namly: (i) Qualitative and (ii) Quantitative. Qualitative forecasting techniques generally employ the judgment of experts in the suitablearea to generate predictions. Quantitative forecasting methods are used when historical data on variables of interest are available. These methods are based on an analysis of historical data over a particular period of time for the specific variable of interest and possibly other related time series. Depending on the requirements and other constraints, one can choose between qualitative and quantitative methods of forecasting. The accuracy of the predicted values is mainly because of this vital selection only.
In the stock market forecasting techniques play an integral role to predict the values of sensex to make prosperous access in the stock prices. Ultimate aiming at earn high profit using well defined trading strategies. The vital idea to successful stock market prediction is achieving best results also minimize the unreliable forecast the stock price. Indisputably, forecasting stock indices is very difficult because of the market volatility that needs accurate forecast model. The stock market indices are highly fluctuating that’s fall the stock price or raising the stock price. Fluctuations are affecting the investor’s belief. Determining more effective ways of stock market index prediction is important for stock market investor in order to make more informed and accurate investment decisions.

In general, there are two basic approaches to forecasting prices in grain markets, fundamental analysis and technical analysis. While they are often presented as substitutes or competitors in price forecasting, the two can be appreciative. Most market analysts pay attention to both fundamental and technical factors even though they may insist one over the other.

In the statistical tools Forecasting is the major objective. Generally, it is assumed that the forecast is quantitative, explicit, unambiguous and therefore verifiable in that there are conceivable outcomes that would validate or refute it. For instance, economic forecasts, forecasts of demographic, political, meteorological, astronomical and many other circumstances. Forecast is applicable for Notional Income and its components, population, election outcomes, weather and eclipses and so on.

Forecasting is firmly related to policy evaluation. Infact, most methods of policy evaluation rely upon a specific type of forecast. Forecasting is a scientific process which aims at reducing the uncertainty of the future state and business & trade. More specifically, business forecasting refers to the statistical analysis of the past and current movements in a given time series, so as to attain clues about the future pattern of the movements. With the help of forecasting, a trader is not dependent purely on guess work, but has a sound footing for his decision on the future course of action.
There are several different access to forecasting. The earliest approach to forecasting is that of expert notion based on the informed judgment of experts conversant with the phenomena in question. An important certain case is that of contemplation surveys, such as surveys of capital investment applications or consumption anticipations, where decision makers themselves are asked to forecast their own future actions. In general, the factors relevant to the forecast such as anticipation surveys, budgets, sales and credit conditions, are not considered in the situation of an explicit frame work. In this approach rather, these factors are weighted and evaluated subjectively by the expert.

A modern variant of the method of expert opinion, the Delphi method, pools the judgments of a panel of experts in order to obtain forecasts. Each of the experts is consulted and then their forecasts are presented, in summary statistical form, to all. This presentation of responses is usually done anonymously and without face to face contact, in order to avoid problems of small-group interaction, which might create certain, biases in the outcome. The experts are then asked to revise their forecasts on the basis of the summary of all the forecasts and perhaps additional information. This process is repeated until the group of experts reaches a consensus.

A more formal approach is endurance forecasting based on the assumption that the system has a certain momentum, with the future replicating the past. The simplest type is the status quo forecast, which predicts that the present value of the variable will continue through time into the future.

The forecasting methodology involves two types of analysis. The first may be categorized as historical analysis of past events and the second as cross section analysis of present conditions. Many forecasting methods have been developed which use a combination of both types of analysis.

1.2 ANALYSIS IN FORECASTING TECHNIQUES:

1.2.1 Fundamental analysis:
Fundamental price analysis is based on the notion that the underlying supply/demand conditions in a given market ultimately determine price. Since the futures market is attempting to discover prices that will balance supply and demand in some future time period, there is uncertainty in initially establishing an equilibrium price. The market may be “shocked” by new information; resulting in traders’ changing their appraisals of what the equilibrium price will be in the future. Fundamental analysis is attempts to both anticipate changes in supply/demand information, and to evaluate the direction and range of price movement resulting from new information.

Fundamental analysis may be simple (intuitive), or complicated (using a statistical or mathematical model). In both cases, analysts are attempting to assess price implications of economic variables including:

1. Seasonal use patterns
2. Seasonal supply patterns
3. Prices of substitute goods
4. Prices of compliment goods
5. Market structure

1.2.2 Technical analysis:

Technical analysis is simply the analysis of price trends -- by looking at past prices, volume, and open interest technical analysts attempt to identify buy and sell signals based on underlying market emotion. The idea is to reduce the opportunity cost of buying too early or selling too late.

There are precisely an infinite number of ways to look at past prices, but some of the more common technical indicators include:

1. Bar Charts
2. Lines of support and resistance
3. Consolidation planes (also called price channels)
4. Key reversals
5. Price Gaps and
6. Moving Averages

1.3 DESCRIPTION OF RESEARCH DATA:

The current study is designed to bring out some of the important performance related conditions of forecasting models; the research is carried on more volatile type of data and variables. As we can observe this kind of behavior in some of the stock market variables, we planned to collect the data from Bombay Stock Exchange (BSE) which is one of the chief trading centers where all most all Indian companies are listed out for trading.

1.4 DATA DESCRIPTION AND ANALYSIS VARIABLES:

The latest models in forecasting area which involves more volatility in nature is found in the financial problems and the present study is taken from the stock market indices like SENSEX.

SENSEX: The SENSEX (or SENSitveindEX) was introduced by the Bombay stock exchange on January 1, 1986. It is one of the prominent stock market indexes in India. Based on SENSEX several investors plan their financial investments accordingly. Even though some of the foreign financial organizations look this index as standard index.

This study covers the time period from July 1st, 1997 to December 24th, 2014. Thus, the data set contained 4321 observations. This data set is quite similar in length to data sets in previous studies of similar nature. We used data for all listed companies traded on the Bombay stock exchange. The data consists of daily opening and closing prices. The source of the closing price data is the taken from www.yahoofinance.com.

1.5 CHAPTER SUMMARIES:
The plan of the present research study itself reveals how the objectives of the study are achieved within the described framework.

**Chapter – I** is introductory in nature. It contains the general introduction about the forecasting methods besides the various objectives of the present research study. It brings out the organization of the present study and chapter scheme.

**Chapter – II** Deals with a brief literature series of forecasting methods, Forecasting types, classifications, assumptions and applications forecasting methods. The graphical Forecasting method and Qualitative forecasting method, Exploratory forecasting techniques have also been explained in this chapter.

**Chapter – III** presents Random walk models, General linear models, Time Series models and ARIMA models (It also contains Box-Jenkins methodology for forecasting technique based on ARIMA models). The concept of Neural Networks and its back propagation methods also have been discussed in this chapter.

**Chapter – IV** discusses the concept about residual measures like MAPE, MAD, RMSE and also Auto Correlation and their corresponding tests.

**Chapter – V** describes empirical investigation, error measures and forecasting of the stock market data by using advanced forecasting models are predicted.

**Chapter – VI** depicts the conclusions of the present research study. It also presents suggestions for future research work on the lines of the present study. Some selected references for the present research study have been given listed the title “BIBLIOGRAPHY”.

1.6 **OBJECTIVES OF THE CURRENT RESEARCH STUDY:**
The main objective of the present research study is to develop some forecasting methods along with residual measures with a special reference to Random walk, General Linear models, Time series models namely (1) ARIMA model and (2) Artificial Neural Network models. The following are basic objectives of the present study.

1. To study the transpose behavior of financial indices like SENSEX, BSE and so on. During the period of 1997-2014.

2. To fit the Random walk models with appropriate parameters and find predictions using fitted models and hence to draw conclusions on the performance of the model.

3. To estimate telavent parameters of General linear model (regression model) and hence pridcting various forecasts and to draw conclusions based on the results pbtained.

4. To fit the ARIMA models with best suitable parameters and find various forecasts for the next few periods and hence to comment on the performance of the model.

5. To find the forecasting the indices by applying Artificial Neural Network models and to find the performance.

6. To calculate Error measures like MAPE, RMSE, MAD by using Random walk, General Linear models, Time series and Artificial Neural Networks residuals.

7. To compare the performance among Random Walk, General linear model, ARIMA and ANN and to draw conclusions about the applicability of the models to Stock market data based on some residual measures.

8. To draw the inference based on forecasted values calculated from the best model from the above research work and identified the best model for the stock market performance.