CHAPTER 8
Observations & Findings: Summary

A) **Primary Data Analysis** reveals predicting the type of investor based on their demographic factors are significant. Reference base considered as Conservative Investor and the categorical dependent variable (Aggressive Investor and Moderate investor) versus this reference categorical variable reveals the following, using Multivariate Logistic Regression model.

a) As age increases there is greater likelihood of the Investor being conservative than being Aggressive.

b) Male Investors are more aggressive than Female Investors.

c) Higher Qualification and Occupation and increase in Income more aggressive the investor compared to conservative investor.

d) As age increases Investor is more moderate as compared to being conservative.

e) Males are moderate investors compared to females.

f) With increase in Income, Qualification, and Occupation Investor is more conservative as compared to being moderate

Sample responses of at least 1000 respondents would significantly impact predictability of type of investor based on the demographic variables opines the Researcher.

B) **Secondary Data Analysis** of the entire NSE Nifty Fifty Population revealed the following characteristics:

a) The returns are penalized due to the volatility present in the stocks and NSE Market index, and drift adjusted returns are higher than the returns received by the investor during sample study span of five years ended 2014. These drift adjusted returns are employed for portfolio construction.

b) Indian stock markets are indeed Volatile, with the NSE index having annualized volatility of 20.64%, with volatility on Power Grid Ltd stock having the lowest annualized volatility factor of 24.76% and the highest volatility being recorded by two
stocks Asian Paints Ltd & Tata Power company Ltd recording annualized volatility figures of 106.84% and 109.22% respectively during the sample study span 2009 to 2014.

c) Descriptive Statistics, hypothesis testing revealed the following features

1) Majority of the stock had mean daily returns of zero percent, wherein the Null Hypothesis of Mean Zero returns were accepted and few stocks and NSE Market index had 0.06% daily returns where the Null Hypothesis was rejected.

2) Daily standard deviation of NSE Market index was 1.3%, which was the lowest and daily standard deviation of stock ranged from as low as 1.56% registered by Power Grid Ltd to a high of 6.88% recorded by Tata Power Company Ltd.

3) Almost all stocks barring a few assets had Skewness in the Mean daily returns, and about 50% stocks recording negative skewness index and rest displaying positive skewness to the right, despite taking Lognormal of the daily closing stock price ratios.

4) Excess Kurtosis (Leptokurtosis/Fat tails) were significantly observed in all stocks and the Market.

5) Median Daily Returns on all 50 stocks were different from their mean daily returns, leading to Non-Normality in the Empirical data set being analyzed for the sample period of five years.

6) 50% of the observations were observed to be between the two Quartiles (First and third).

7) Outliers were found in all stocks which caused skewness and kurtosis in the data set, which significantly influenced other parameters like beta of the security.

d) Normality Test:- All stocks and the Market Index Significantly rejected the Null Hypothesis of Normality, being confirmed by Jarque- Bera test, Shapiro-Wilk test and Doornick Chi-Square test.

e) White noise test using the Ljung-Box test for autocorrelation in the mean returns were significantly observed in over 50% of the stocks using a lag order of 8, with very few displaying serial autocorrelation in the first order lag.
f) Arch effect test using eight lags also displayed significant leptokurtic property in all stocks and index, which enabled detection of time varying phenomena in the conditional volatility and hence different models needed to be employed to capture these dynamics.

g) Auto correlation and Partial auto correlation plots (ACF & PACF) revealed time interdependency among returns and few stocks displaying no serial autocorrelation as indicated by the Correlologram Analysis of plots.

h) Augmented Dickey Fuller test (ADF test) for the existence of random walk (unit root test) corroborates the use of Random Walk Model for Forecasting volatility in stock market returns, the stationary test in this regard led us to conclude that the data sample plots look stationary.

i) Historical Volatility estimators on the empirical data set revealed that the Yang-Zhang Historical Volatility Price range estimators were the most efficient in the class of extreme value estimators.

j) Simple linear regression model was undertaken by regressing all the 50 stock returns on the market returns data set for the five year period and beta of the individual asset were computed which revealed that the most aggressive stock happened to be DLF Ltd which had a beta of 1.6417 against the beta of the market of 1, and the most conservative amongst stocks was Hindustan Unilever asset which had the beta of 0.434446. Even Residual Diagnostic tests undertaken revealed asymmetries and leptokurtic property in the residuals of stock returns. Chow test was undertaken for testing the stability of beta parameter and all the securities displayed stability in the beta values.

k) Out of sample forecast (one step ahead or one year ahead) of Conditional volatility predominantly showed that GARCH & EGARCH Model was the best suited in forecasting long run conditional volatility in stock returns.

C) Gann Analysis can be successfully employed in the Indian Stock Markets in both Intraday as well long term prediction of stock prices, and can definitely help traders and investors in finding the support and resistance levels, besides helping the investors decide at what price or above to buy the stock and at what price or below to
sell the stock, also we can get the requisite target price levels and position at which to fix the stop loss order levels both for buy as well as sell decisions.

D) Portfolio Management: Traditional/Modern finance models are contained in most of the standard reference Financial Management books which was used for the Indian Stock Markets, prominent of them being:

1) Sharpe's Portfolio Optimization model: The role of Idiosyncratic Volatility in the Investors Realized returns were found significant for the sample set of twenty stocks carefully chosen to form an optimal portfolio for the Investor. When the short sales were not allowed only seven top stocks could be included in the optimal portfolio returning 34.74%, with a Volatility of 14.74% and Coefficient of Variation of 42.44% in the stock returns. When short sales were allowed on this select sample of twenty stocks catapulted the returns to 77.36%, with a portfolio standard deviation of 36% and coefficient of variation of 46.53%. Although the risk of loss significantly increases when an Investor resorts to short selling strategy of stocks, but researcher observed that for a steep increase in optimal portfolio returns when short sales were allowed is worth considering despite a marginal increase in the volatility of this optimal portfolio so constructed by employing successfully the Sharpe's Portfolio Optimization Model.

2) Finance theories and models such as the Sharpe's Single index model, and various models used is applicable for individual securities as well as a portfolio hence researcher found the various performance metrics similar to one used for Mutual Funds, and various mutual fund performance metrics were computed to reveal which securities were better in terms of giving risk adjusted rates of returns for the investor.

3) Eugene Fama's Decomposition of excess returns (four factor model) was significantly employed on the sample twenty securities which formed the optimal portfolio and it was found that idiosyncratic volatility is indeed priced in the Indian Stock Markets thereby challenging the Diversification Conundrum.