Chapter I

INTRODUCTION AND DESIGN OF THE STUDY

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1.1. Introduction

Investment is the commitment of funds in an asset or financial instruments with the aim of generating future returns in the form of interest, dividend or appreciation. An investor has numerous investment options to choose from, depending on his risk profile and expectation of returns. Different investment options represent a different risk-reward trade off. Low risk investments are those that offer assured, but lower returns, while high risk investments provide the potential to earn greater returns. Hence, an investor’s risk tolerance plays a key role in choosing the most suitable investment. Various investment options available are Bank Deposits, Commodities like Gold and Silver, Post Office Savings Schemes, Public Provident Fund, Company Fixed Deposits and Stock Market options like Bonds and Debentures, Mutual Funds, Equity Shares and the like. Of the various types of investment options in the Stock Market, Gold Exchange Traded Funds (Gold ETFs) happens to be one of the best options to be included in the portfolio for diversification of risk. In the present competitive globalized business scenario, risk is attached with every dimension. Financial markets are not free from imperfections, which make results inconsistent with the expectations. The concept of risk management in case of investment decision assumes greater importance in the modern day financial management. The objective of financial investing is to earn the largest possible profit or return on investment. Investing always involves a
certain amount of risk, because there is a chance that an investment will yield not only profit but also loss. Thus investing aims at profit maximization and risk minimization.¹

The Indian stock market has enlarged a new life in the post-liberalization era. It has experienced a structural change with the setting up of SEBI, opening up to the foreign investors, establishment of the NSE, instigation of the screen based trading system, dematerialization of securities and introduction of derivative instruments. The activities of the market have increased in all respects. Market capitalization has increased spectacularly. Number of listed companies has gone up. But the most important and amazing phenomena of all are the movement of secondary market share prices which are reflected in either the upward or downward trend in the major share price indices in the country. The stock market reflects the performance of an economy. When the economy does well and the companies make worthwhile profit, people get induced to invest in stocks because they expect higher return from their stockholding. Stock prices are changed every day by the market. Buyers and sellers cause prices to change as they decide how valuable each stock is. Basically, share prices change because of supply and demand. If more people want to buy a stock than sell it - the price moves up. Conversely, if more people want to sell a stock, there

would be more supply (sellers) than demand (buyers) - the price would start to fall. Volatility in the stock return is an integral part of stock market with the alternating bull and bear phases. In the bullish market, the share prices soar high and in the bearish market share prices fall down and these ups and downs determine the return and volatility of the stock market. Volatility is a symptom of a highly liquid stock market. Pricing of securities depends on volatility of each asset. An increase in stock market volatility brings a large stock price change of advances or declines. Investors interpret a raise in stock market volatility as an increase in the risk of equity investment and consequently they shift their funds to less risky assets. It has an impact on business investment spending and economic growth through a number of channels. Changes in local or global economic and political environment influence the share price movements and show the state of stock market to the general public.

In this changed scenario, risk management of investing in corporate securities has attained particular significance. For the development of the economy our nation requires massive capital. India still enjoys very low credit rating in the international markets. The capital for the development of the economy has to come mostly from the domestic market. Investment in the New Issues Market and the Secondary Market is dependent on the confidence of the investors. Therefore an upward trend in mobilization of capital market can be achieved only when investors are satisfied about their
returns. By raising the confidence level of investors, risk management results in sustained growth of equity culture, which is a highly desirable phenomenon for the growth of the economy. The equity culture directly contributes to the growth of the net worth of the companies and in that way it contributes to the growth of capital in the economy.

Risk is the chance that the actual return from an investment will differ from its expected return. It is the inability to predict with knowledge the course of future events that introduce risk. Investors are primarily concerned about how to achieve the highest possible returns without bearing unacceptable risk. Future return is an expected return and may or may not actually be realized. Risk, or the chance of an unexpected return, is involved when investment decisions are made.

Though risks cannot be completely eliminated it can be reduced by adopting precautionary measures. That is, by proper management of risk factors, the intensity of loss of investing in corporate securities can be minimized. For an investor, the risk management helps various ways namely identify the various types of risks related to a particular investment, measure the risks and to compare the different investment opportunities, control the risk factors, find out the best time for purchase or sale of securities, plan the portfolios, attain efficiency in operations, stabilize earnings, help in
investment decisions, raise the confidence of investors, take precautions against risks and define the limit to which an investor can take risk.

Understanding risk means that investors can consciously plan for the consequences of adverse outcomes and by doing so, be better prepared for the inevitable uncertainty. Before venturing into the capital market investors have to learn the basics and apply them diligently to make gains from investment. Enquiry conducted by the researcher has found that many investors turn to investment in shares without knowledge of the theories and other essentials needed to manage the risks in the stock market. Despite the fact that much vigilance and safeguards are necessary in this field, the investors often fail to exercise utmost diligence, and the result is huge losses and frustration leading to their forced exit from the market. In this background the researcher makes an attempt to bring forth the basis of investment and risk management- the existing theories of evaluating corporate securities.

Nowadays, when share prices are decreasing, the investors prefer investing in bullion, because the returns are usually normal and risk also very small. Moreover the prices of bullion market are not as volatile as the stock market, which is known for knee jerk behavior. But investing in bullion is not a simple job, unlike stock market or other markets. However bullion investment doesn’t have on option of investing a small amount. A
thorough knowledge about the market condition is necessary for investing in bullion. The price of products of bullion market varies depending on the supply demand balance. The gold price over the years has been increasing steadily. Gold and silver are seen as the ultimate risk less investment, a hedge against inflation and a safe heaven investment asset. Investors buy gold and silver as a prudent way of protection. Gold was the preferred vehicle for investment before stocks and bonds. The booming capital market returns and the ever rising demand for gold and silver as an alternative, requires investing community to do a proper homework before arriving at the investment decisions such as the amount to be invested, investment avenue, investment mix, market (where to invest) and investment horizon.

In recent times, given the situations of economic and political uncertainty, or conflict, gold has been considered as a safe heaven. The price of bullion is primarily influenced by investment demand, which is primarily related to the expected strength, or weakness of the US dollar. With renewed investment demand coming from bullion investors for portfolio protection, it is most likely that gold and silver will continue its long-term upward trend in the next coming years. The disparity in demand and supply can result in added volatility in the bullion market. An increase in bullion prices will only result if the demand for gold and silver far exceeds its supply. In this
context, the present study highlights the study on Risk – Return Analysis of Investment in Bullion and Equity in India.

1.2. Statement of the Problem

India is one of the largest investment designation varying large number of people making investment in both bullion and equity market. The invested is including domestic and foreign institutions. The primary objects of investment is to generate more income with minimum risk involve. The risk and return integral part of the any market and both are very high in the capital market. In this evident that the majority investors involving in the capital market are the illiterate in terms of the matters of the capital market and therefore investors are not aware the real problems of the market as a results sometimes they incurred huge loss, which will this motivate other investors. So there is need for studying the relation in between risk and return analysis both bullion and equity market in India.

The aim of investors’ is getting investment opportunities with minimum risk and maximum returns. Risk and returns are important variables that investors are looking for, at the time of investment decision making. The Capital Asset Pricing Model (CAPM) developed by Sharpe and Lintner proposes that a linear relationship, existing between the expected returns on risky assets and the systematic risk measured by beta, is the only relevant risk measure. There is a positive relationship between risk and
Naturally rational investors would expect a high return for bearing high risk. If there is no trade-off between risk and return, there is no need of considering about the risk. Assessing the vital return on investment to be made in the stock market is a challenging job before an ordinary investor. Different market models and techniques are being used for taking suitable investment decisions.

Today, a number of factors affect the bullion and Equity Market. Many investors expect continuous high rates of return on bullion and Equity investment. This present study is intended to analyze the right time for investment in bullion and Equity, besides knowing the various factors affecting the gold and stock market. So, the research study aims to analyze gold, silver, Sensex and nifty prices returns, timing of investment in bullion and Equity, bullion and Equity investment market avenues, and the like. Stock market research is essential to good financial and investment decision making. It will be able to determine the market price and trading volume for the stock, high and low price for the stock over different periods and the earnings for the company. To ascertain the right choice of a security or portfolio to an investor, it depends on the level of risk that the stock carries. An estimation of the risk-return profile of a security or portfolio is an important aspect in investment management. The stock market research will allow one to assess the possible risk of a stock against the possible rewards the stock may offer. The present study in this context is relevant in
explaining the parity between risk and return in the Indian equity and bullion market. The finding of the study would be helpful to all the stakeholders of the bullion and equity market for deciding appropriate decision regarding the time of investment, horizon of investment, quantum of investment and even portfolio selection. In this context, the present study is aimed to study the risk-return analysis of bullion and equity in India.

1.3. **Scope of the Study**

The present study is focused on analyzing the risk return on investment in bullion and equity market. Although there are many studies available on the Risk-Return on investment in general, no specific study has been undertaken to study on Risk-return analysis of investment in billion and equity. The findings of the study will help to improve the investor awareness of various investment avenues, investment mix, good investment division and also the right time of investment and bullion and Equity market. The present study is undertaken in the view of both investors and institutions based on secondary data collected from different sources.

1.4. **Objectives of the Study**

The following are the main objectives of the present study

i. To review the existing literature in the fields of bullion and equity market.
ii. To study the origin, growth and development of bullion and equity market in India.

iii. To study the risk return analysis of the bullion and equity market in India.

iv. To analyze the cause and effects of relationship between the dependent and independent variables and also affecting the various factors of gold and sensex

v. To present findings of the study and offer suitable suggestions for improving the earning potential among the investors of bullion and equity investment in India.

1.5. Hypothesis of the Study

The following hypotheses is framed and tested in the present study.

i. There is no significance mean difference between the Gold Return and BSE Sensex Return.

ii. There is no significance mean difference between the Gold Return and NSE Nifty Return.

iii. There is no significance means difference between the Gold Return and Silver Return.
iv. There is no significance means difference between the BSE Sensex Return and NSE Nifty Return.

v. There is no significance means difference between the Silver Return BSE Sensex Return.

vi. There is no significance means difference between the Silver Return and NSE Nifty Return.

vii. There is no significant relationship between the Gold Return and BSE Sensex Return.

viii. There is no significant relationship between the Gold Return and NSE Nifty Return.

ix. There is no significant relationship between the Gold Return and Silver Return.

x. There is no significant relationship between the BSE Sensex Return and NSE Nifty Return.

xi. There is no significant relationship between the Silver Return BSE Sensex Return.

xii. There is no significant relationship between the Silver Return and NSE Nifty Return.
xiii. The time series is non-stationarity among the study variables
xiv. There is no co-integration relationship among the study variables
xv. There is no Granger Causality among the study variables.
xvi. There is no linear relationship between the dependent and independent variables.

1.6. Methodology and Data Collection

The present study is based on secondary data. The required data were collected from websites of Bombay Stock Exchange, National Stock Exchange and World Gold Council, Annual Report of RBI, Annual Report of SBI and various business related newspapers and magazines. The researcher has used different statistical tools for analyzing the collected data. The present study is mainly based on the data collected from RBI database, BSE database and World Gold Council database for the period from 2001 to 2015.

1.7. Period of the Study

The period of the present study is consisting of fifteen years ranging from 2001 to 2015.
1.8. Operational Definitions and Concepts

The present study consists of different concepts related to bullion and stock market. The definitions of such concepts are presented below.

1.8.1. Arbitrage

Simultaneously buying and selling a commodity in different markets to take advantage of price differentials.

1.8.2. Bear market

It is a type of market, where in the price movements are downward trend.

1.8.3. Bullion

It is a market where all kinds of costliest metals like gold and silver are traded.

1.8.4. Bullion coin

A bullion coin is a coin that is valued by its weight in a specific precious metal. Unlike commemorative or numismatic coins valued by limited mintage, rarity, condition and age, bullion coins are purchased by investors seeking a simple and tangible means to own and invest in the gold, silver, and platinum markets.
1.8.5. Bull market

A financial market of a group of securities in which prices are rising or are expected to rise. The term "bull market" is most often used to refer to the stock market, but can be applied to anything that is traded, such as bonds, currencies and commodities.

1.8.6. Commodity pool

A commodity pool is an investment structure where many individual investors combine their moneys and trade in futures contracts as a single entity in order to gain leverage.

1.8.7. Derivative

The derivative of a function of a real variable measures the sensitivity to change of a quantity (a function value or dependent variable) which is determined by another quantity (the independent variable). Derivatives are a fundamental tool of calculus. In finance, a derivative is a contract that derives its value from the performance of an underlying entity. This underlying entity can be an asset, index, or interest rate, and is often called the "underlying". Derivatives can be used for a number of purposes, including insuring against price movements (hedging), increasing exposure to price movements for speculation or getting access to otherwise hard-to-trade assets or markets. Some of the more common derivatives include
forwards, futures, options, swaps, and variations of these such as synthetic collateralized debt obligations and credit default swaps.

1.8.8. **Forward transaction**

Purchase or sale for delivery and payment at an agreed date in the future; similar to a futures contract, except that forward transactions are not subject to the standardized procedures and regulations of a commodities futures exchange.

1.8.9. **Futures contract**

An agreement made on an organized exchange to take or make delivery of a specific commodity or financial instrument at a set date in the future.

1.8.10. **Gold standard**

A gold standard is a monetary system in which the standard economic unit of account is based on a fixed quantity of gold.

1.8.11. **Hedge**

A transaction initiated with the specific intent of protecting an existing or anticipated physical market exposure from unexpected or adverse price fluctuations.
1.8.12. Inverted market

A condition in the futures market in which the contract for the current
month is trading at a higher price than for a future month. Also known as
backwardation. Compare to contango.

1.8.13. Physicals market

A marketplace in which the physical product is traded, as opposed to
a futures market where "contracts" are traded and physical delivery of the
product may or may not take place.

1.8.14. Stock Exchange

Stock exchange is a place or organization by which stock traders
including people and companies can trade stocks.

1.8.15. Sensex

Sensex' an abbreviation of the Bombay Exchange Sensitive Index
(Sensex) - the benchmark index of the Bombay Stock Exchange (BSE). It is
composed of 30 of the largest and most actively-traded stocks on the BSE.

1.9. Framework of Analysis

A comparative analysis of Return and Risk on bullion and equity is
studied by using various statistical tools. The study is based on monthly and
Fifteen years data encircling the closing stock price indices of BSE(Sensex), the monthly Indian gold price and other Macro variables. After appropriate fitting the data, there are 98 observations. E-views 8 package program has been used for arranging the data and execution of econometric analyses. The econometric tools used there are Augmented Dickey Fuller (ADF) and Philips Parron (PP) both at levels and 1st differences, Johansen’s system co-integration test and Granger causality test and Multiple Regression Test have been used. The details of analysis are presented below.

1.9.1. Return Analysis

The return may be measured as the total gain or loss to the holder over a given period of time. It is defined as a percentage return on the initial amount invested. The return on Bullion and Stock market investments are measured by following formula.

\[
\text{Return} = \frac{\text{Current Market Price} - \text{Previous Market Price}}{\text{Previous Market Price}} \times 100
\]

1.9.2. ‘t’ Test

‘t’ Test is one of the most commonly used techniques for testing a hypothesis on the basis of a difference between sample means. In other words, the t test determines a probability that two populations are the same with respect to the variable tested. For the t test for independent samples
you do not have to have the same number of data points in each group. We have to assume that the population follows a normal distribution (small samples have more scatter and follow what is called a t distribution). Corrections can be made for groups that do not show a normal distribution. The t test can be performed knowing just the means, standard deviation, and number of data points. Raw data must be used for the t test. For testing the hypotheses t-test value must be calculated using Formula-2.2

Formula-2: To calculate ‘t’ value for testing hypotheses

\[
t = \frac{\bar{X}_1 - \bar{X}_2}{S} \times \sqrt{\frac{n_1 + n_2}{n_1 n_2}} \quad \text{Df} = n_1 + n_2 - 2
\]

Where:

\(\bar{X}_1\) = mean of sample 1

\(\bar{X}_2\) = mean of sample 2

\(S\) = Standard deviation (calculated using Formula-3)

\(n_1\) = Number of Sample 1

\(n_2\) = Number of Sample 2

\(\text{D.f}\) = Degrees of freedom

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2 http://www.ruf.rice.edu/~bioslabs/tools/stats/ttest.html
Formula-3 Standard deviation

\[ S = \sqrt{\frac{\sum(X_i - \bar{X}_1)^2 + \sum(X_i - \bar{X}_2)^2}{n_1 + n_2 - 2}} \]

The calculated value of t-distribution has been compared with the table value level of confidence on the given degree of freedom. When the calculated value was less than the table value of t-distribution, the hypothesis is accepted. In case, the calculated value is exceeded the table value, the hypothesis is rejected. For the purpose of this analysis 5% in the level of significance for two – tailed test has been adopted.

1.9.3. Risk Analysis

Risk in investment means that the future returns from that investment is unpredictable. All investors prefer low risk and high return investment. So the researcher wants to measure the risk-adjusted performance evaluation by way of adopting following measurements.

Beta (systematic risk), Standard deviation (total risk) was Used to measure to systematic risk and total risk. Further correlation, is used to describe the relationship between the returns of Bullion and Stock markets.

i. Beta to measure systematic Risk

ii. Standard deviation to measure total Risk
iii. Correlation to describe the relationship between the variable under study.

1.9.3.1. Beta

The degrees to which different portfolios are affected by these systematic risks, as compared to the effect on the market as a whole, is measured by Beta. The Beta factor describes the movement in a stock’s or portfolio’s returns in relation to that of the market return. The main purpose of using slope or Beta is to predict the change in the market. Beta is a measure of the market or non-diversified risk associated with any given security in the market. The data from Appendix (A) is fed into Microsoft Excel tool and Beta was calculated for the two bullions Gold and Silver against the two markets indices BSE Sensex and NSE NIFTY. Beta could be translated as follows

i. A beta of 0 indicates that the portfolio is uncorrelated with the market.

ii. A beta less than 0 (negative) indicate that it moves in the opposite direction of the market.

iii. A beta between 0 and 1 signifies that it moves in the same direction as the market, with less volatility.
iv. A beta of 1 indicates that the portfolio will move in the same direction, have the same volatility and is sensitive to systematic risk.

v. A beta greater than 1 indicates that the portfolio will move in the same direction as the market, with a higher magnitude, and is very sensitive to systematic risk.

For example beta of an investor's portfolio is 2 in relation to a broad market index, such as the Sensex. If the market increases by 2 per cent, then the portfolio will generally increase by 4 per cent. Likewise, if the market decreases by 2 per cent, the portfolio generally decreases by 4 per cent. This portfolio is sensitive to systematic risk, but the risk can be reduced by hedging.  

1.9.3.2. Standard Deviation

The standard deviation is less affected than the range by extreme and untypical values. It is a very accurate measurement for showing how closely the values in the list cluster around or diverge from the average. The standard deviation is lower if the values cluster closely around the mean and becomes higher the more they diverge from it. For the mathematically

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3. www.investopedia.com
inclined, the standard deviation is defined as the square root of the variance, that is

$$\text{Standard deviation} = \sqrt{\sum (x / \bar{x})^2 / n}.$$  

Where $\bar{x}$ is the Mean.

The Mean is the average value in a data set and is a measure of the central tendency of a data set. It is determined by adding all the values and dividing the sum by the number of values in the data set.

$$\text{Mean} = \frac{\sum X_i}{N}$$  

Where, $i = 1, 2, 3,...n$

$n = \text{number of samples (or) number of values}$

**1.9.3.3. Simple Correlation**

The correlation is one of the most common and most useful statistics. A correlation is a single number that describes the degree of relationship between two variables. The correlation coefficient may take on any value between plus and minus one (-1.00 < $r$ <+1.00). The sign of the correlation coefficient (+, -) defines the direction of the relationship, either positive or negative. A positive correlation coefficient means that as the value of one variable increases, the value of the other variable increases; as one decreases the other decreases. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice-versa. Taking the absolute
value of the correlation coefficient measures the strength of the relationship. It is expressed as,

\[ r = \frac{\sum xy - (\sum x \sum y)/n}{\sqrt{\sum y - (\sum x)^2/n} \cdot \sqrt{\sum x - (\sum y)^2/n}} \]

1.9.3.4. Price Trend and Forecast Analysis

Price Trend Analyses are as follows

i. Stock Market Trends

Market index is the collection of securities whose prices are averaged to reflect the overall investment performance of a particular market for financial assets. This study is using two indices namely Sensex of BSE and Nifty of NSE.

ii. Methodology for Calculating Sensex

S&P Sensex was first compiled in 1986 and is calculated by free-float market capitalization methodology. It consists of 30 scrip’s representing large, well established and financially sound companies across key sectors. Base year for Sensex was taken as 1978-79 with base value of 100 index points.
iii. Methodology for Calculating Nifty

The CNX Nifty is a well-diversified stock index accounting for 22 sectors of economy. It is owned and managed by India Index Services and Products (ISL) which is a joint venture between NSE and Crisil. It was started in 1995 with the base value of 1000 index points. It is calculated by free-float market capitalization methodology.

1.9.3.5. Compound Annual Growth Rate (CAGR)

The CAGR means the year over year growth rate of an investment over a specified period of time. The CAGR is calculated by taking the $n^{th}$ root of the total percentage growth rate. Where “n” is number of years in the period being considered? This can be calculated as follow:

\[
\text{CAGR} = \left( \frac{\text{Ending value}}{\text{Beginning value}} \right)^{\left(\frac{1}{\text{no. of years}}\right)} - 1
\]

The CAGR isn’t the actual return in reality. It is an imaginary number that describes the rate at which an investment would have grown if it grew at a steady rate.

1.9.4. Unit Root test

Unit Root tests are used to decide if the time series data is stationary or non-stationary. If the critical value is lower than the calculated value, null hypothesis is rejected and series is decided to be stationary.

$H_0$: Time Series is non-stationary
If all the sets of data are found I (1) (non-stationary), and if the regression produces a I (0) error term, the equation is said to be co-integrated. On the other, if there are two variables, \( x_t \) and \( y_t \), which are both non-stationary in levels but stationary in first differences, then \( x_t \) and \( y_t \) would become integrated of order one, I(1), and their linear combination should have the form:

\[
z_t = x_t - ay_t
\]

However, if there is a I (0) such that \( z_t \) is also integrated of order zero, I (0), the linear combination of \( x_t \) and \( y_t \) is said to be stationary and the selected variables are also to be co-integrated (Engle & Granger, 1987). If two variables are co-integrated, there will be a contributory long-run relationship between them.

The Augmented Dickey and Fuller (ADF) test uses a regression of the first differences of the series against the series lagged once, and lagged difference terms, with optional constant and time trend terms:

\[
\Delta y_t = a_0 + a_1 t + \gamma y_{t-1} + \sum b_i y_{t-i} + e_t
\]

In the equation \( \Delta \) is the first-difference operator, \( a_0 \) is an intercept, \( a_1 t \) is a linear time trend, \( e_t \) is an error term, and \( i \) is the number of lagged first-differenced terms such that \( e_t \) is the white noise. The test for a unit root has the null hypothesis that signifies \( \gamma = 0 \). If the coefficient is
significantly different from zero, the hypothesis that \( y_t \) encloses a unit root is considered as rejected. If the test on the level series fails to reject, the ADF procedure is then applied to the first-differences of the series. Rejection escorts to the finale that the series is integrated of order one, \( I(1) \).

A drawback of the ADF test is its assumption that the errors are statistically independent and have constant variances. This study used the software tool E-Views 8 to do the analysis.

### 1.9.5. Johansen Co-Integration Test

Co-integration tests endow with a mean to establish whether a set of endogenous variables share a common long-run stochastic trend. A pronouncement of co-integration specifies interdependence of the endogenous variables, which may be the result of economic connections between the markets or arbitrage activity between investors.

Hypothesis to be examined with Johansen co-integration test to be applied on the study has been presented below:

\( H_0: \) There is no co-integration relationship among variables

The Johansen (1988) approach to testing for co-integration relies on the relationship between the rank of a matrix and its characteristic roots, or eigenvalues. Let \( X_t \) be a vector of \( n \) time series variables, each of which is
integrated of order (1), and assume that \( X_t \) can be modelled by a Vector Auto Regression (VAR)

\[
X_t = A_1 x_{t-1} + ... + A_p x_{t-p} + \varepsilon_t
\]

(3)

Rewriting the VAR as

\[
\Delta x_t = \Pi X_{t-1} + \Sigma \Gamma \Delta X_{t-i} + \varepsilon_t
\]

(4)

Where, \( \Pi = \Sigma A_i - I \), \( \Gamma_i = -\Sigma A_i \). If the coefficient matrix \( \Pi \) has a reduced rank \( r < k \), there exists \( k x r \) matrices \( \alpha \) and \( \beta \) each with rank \( r \) such that \( \Pi = \alpha \beta' \) and \( \beta' x_t \) are stationary. The number of co-integrating relations is given by \( r \), and each column of \( \beta \) is a co-integrating vector.

Equation (4) can be modified to allow for an intercept and a linear trend.

The number of distinct co-integrating vectors can be obtained by determining the significance of the characteristic roots of \( \Pi \). To identify the number of characteristic roots that are not different from unity we have used two statistics, the trace test and the maximum eigenvalue test:

\[
\lambda_{\text{trace}}(r) = -T \Sigma \ln(1 - \lambda_i)
\]

(5)

and

\[
\lambda_{\text{max}}(r,r+1) = -T \ln(1 - \lambda_{r+1})
\]

(6)

Where, \( \lambda_i \) = the estimated values of the characteristic roots (eigenvalues) obtained from the estimated \( \Pi \) matrix, \( r \) is the number of co-
integrating vectors, and \( T \) = the number of usable observations. The trace test evaluates the null hypothesis that the number of distinct co-integrating vectors is less than or equal to \( r \) against a general alternative hypothesis (the number of distinct co-integrating vectors is more than or equal to \( r \)). The maximum eigenvalue test examines the number of co-integrating vectors versus that number plus one. If the variables in \( X_t \) are not co-integrated, the rank of \( \Pi \) is zero and all the characteristic roots are zero. Since \( \ln (1) = 0 \), each of the expressions \( \ln (1 - \lambda_i) \) will equal zero in that case. Critical values for the test are provided by Johansen and Juselius (1990) and by Osterwald-Lenum (1992).

1.9.6. Pair-Wise Granger Causality Tests

We test for the dearth of Granger causality by estimating the following VAR model (Olushina Olawale Awe, 2012):

\[
Y_t = a_0 + a_1 Y_{t-1} + \ldots + a_p Y_{t-p} + b_1 X_{t-1} + \ldots + b_p X_{t-p} + U_t \tag{7}
\]

\[
X_t = c_0 + c_1 X_{t-1} + \ldots + c_p X_{t-p} + d_1 Y_{t-1} + \ldots + d_p Y_{t-p} + V_t \tag{8}
\]

Testing Hypothesis to be examined with Pairwise Granger causality test to be applied on the study has been presented below:

\( H_0: \) There is no Granger causality among the variables.

\( H_0: b_1 = b_2 = \ldots = b_p = 0 \) against \( H_1: \) Not \( H_0 \) is a test that \( X_t \) does not Granger-cause \( Y_t \).
Similarly, testing $H_0: d_1 = d_2 = \ldots = d_p = 0$ against $H_1$: Not $H_0$ is a test that $Y_t$ does not Granger cause $X_t$. In case of Granger causality between the two variables, null hypothesis is rejected if the probability value is less than alpha $(0.05)$.

1.9.7. Multiple Regression Analysis

Multiple regression analysis is also used to check multiple variables effect on share price changes. Multiple regression is used to account for (predict) the variance in an interval dependent, based on linear combinations of interval, dichotomous, or dummy independent variables. Multiple regression can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level and can establish the relative predictive importance of the independent variables. Power terms can be added as independent variables to explore curvilinear effects. Cross-product terms can be added as independent variables to explore interaction effects. One can test the significance of difference of two $R^2$'s to determine if adding an independent variable to the model helps significantly.

In general, multiple regression procedures will estimate a linear equation of the form:

$$Y = a + b_1 * X_1 + b_2 * X_2 + \ldots + b_n * X_n$$
In the above the regression coefficients (or B coefficients) represent the independent contributions of each independent variable to the prediction of the dependent variable.

1.10. Scheme of the Report

The present study consists of six chapters. They are


The Second Chapter “Review of Literature” deals with a conceptual framework and given a brief review of existing literature related to the study. It provides the conceptual Framework of the Study, risk and return relationship in stock market and commodity prices, Investor’s Preference and Risk and Return Analysis of bullion market like precious metals are gold and silver, efficiency of the markets for gold and silver, long run relationship between gold and silver prices, Investment Perspective, Multifactor Model of Gold Industry Stock Returns, Precious Metals and inflation, Oil Price Risk and Emerging Stock Markets, Gold Prices, Exchange Rates, Macroeconomic Influences on the Stock Market, effect of
gold and oil prices upon international stock market indexes, Dynamic relations between macroeconomic variables and the Japanese stock market, Exchange rate and Stock price interactions in emerging financial markets, Aggregate Economic Variables and Stock Markets in India, Determinants Of BSE Sensex, Gold Prices and Financial Stability in India, Impact of Macroeconomic Variables on Stock Prices in India, Integration between FOREX and Capital Markets in India, comparative analysis of the propagation of stock market fluctuations in alternative models of dynamic causal linkages, impact of domestic gold price on stock price indices, an analysis of Postal Investment and Small Savings, Women Investors, Factors Influencing Investment Decision of Generations in India and also provides the review of the literature related to the factors of risk and return analysis of Bullion and Equity Market and its related issues in India and around the world for the purpose of fully understanding the historical perspective and current methodologies available on this subject.

The Third Chapter “Origin and Growth of Bullion and Equity Markets in India” examines the investment and stock market in India, concept of investment, history of investment, debt equity and free cash flow, saving and investment, importance of savings, types of financial investment, investment avenues, Foreign Direct Investment and Indian stock market, investment opportunities for retail foreign investors, profile of multi commodity exchange, profile of bullion market, overview of stock market,
overview of global stock market, commodity exchanges in the World, commodity exchanges in India, origin and growth of Indian stock market, major investment industries in Indian stock market, profile of Bombay Stock Exchange (BSE) and National Stock Exchange (NSE).


The Fifth Chapter “An Analysis of Factors Influencing the Risk and Return on Gold and Sensex in India” analysis the effect of various factors in the risk and return in gold and sensex in India. The Empirical Analysis of Influencing Variables of top nine variables namely Call money rate, Cash Reserve Ratio (CRR), price of Crude oil, Foreign Exchange rate, Food inflation, Inflation, Interest rate, Net FII and Forex reserve.

The Six and Final Chapter “Summary of Findings, Suggestions and Conclusion” provides the predominant findings of the present study of risk-return analysis of Bullion and Equity Market in India and also provided suitable suggestions to stakeholders for the effective decision making in the field of financial market.