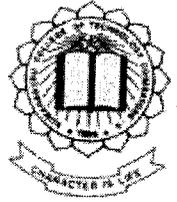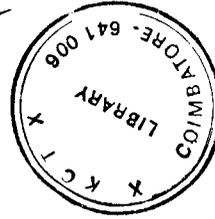# A STUDY ON THE RELATIONSHIP BETWEEN GOLD PRICE AND SENSEX.

A SUMMER PROJECT REPORT (MBA703)

Submitted by

S.Parthiban
Register No: 0920400033

Under the Guidance of
Senior Lecturer Mr. A. Senthil Kumar

in partial fulfillment for the award of the degree

of
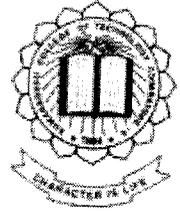
MASTER OF BUSINESS ADMINISTRATION

in

Department of Management Studies

KUMARAGURU COLLEGE OF TECHNOLOGY
(An Autonomous Institution Affiliated to Anna University of Technology, Coimbatore)

COIMBATORE – 641 049

October, 2010

KUMARAGURU COLLEGE OF TECHNOLOGY
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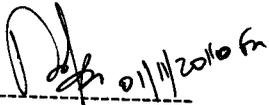### OCTOBER 2010

This is to certify that the project entitled

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is the bonafide record of project work done by

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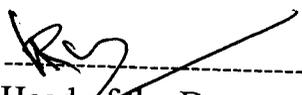
Register No: 0920400033

of Master of Business Administration during the year 2010 – 2011

Project Guide A. SENTHIL KUMAR MBA,PGDCA,M.Phill,Ph.D,
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Submitted for the Summer Project Viva-Voce examination held on _____
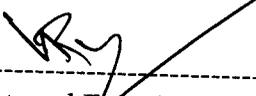
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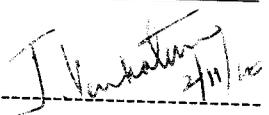
External Examiner

CCap/HRD/2010-11

30.10.2010

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr Parthiban S**. (Roll No: 09MBA33) from KCT Business School , Coimbatore has successfully completed his summer project work titled " A Study on the Relationship between Gold Price and Sensex ",during the period 15.07.2010 to 25.08.2010.

During this period he was regular in attendance and his conduct was good.

For Coimbatore Capital Limited
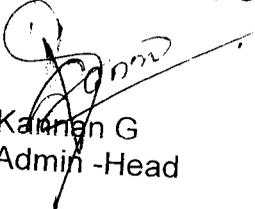
Kannan G
Admin -Head

DECLARATION

I affirm that the project work titled A STUDY ON THE RELATIONSHIP BETWEEN GOLD PRICE AND SENSEX being submitted in partial fulfillment for the award of Master of Business Administration is the original work carried out by me. It has not formed the part of any other project work submitted for award of any degree or diploma, either in this or any other University.

S. Parth

(Signature of the Candidate)

S.Parthiban

0920400033

I certify that the declaration made above by the candidate is true.

01/4/2016

Signature of the Guide,

With Name & Designation

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF CHARTS

ABSTRACT

The study examines the relationship between domestic gold prices and stock market returns in India for the period 1999 to 2010. The study uses monthly data. The required data have been collected from the database of Reserve Bank of India.The study is concluded that Gold prices provide a consistently better return with less volatility. The equity investments (Sensex) provide a higher average return but with high volatility. The range of returns in equity is relatively high. The return of gold is more consistent than Sensex. There is a weak association between gold prices and Sensex movements. Hence, investing in gold is preferable during a volatile capital market.

CHAPTER - 1

INTRODUCTION

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND STUDY

Since pre-historic times, gold has been accepted as a universal means of exchange because of its indestructibility, beauty, and rarity compared to other more common metals. As the economies and banking systems evolved, gold was no longer a part of individual ruler's treasury. It is now a part of the reserves of the nation held (normally) by the Central Bank. The industrial revolution, and the organisational and technical changes it brought about, facilitated the production of modern standard "token" notes and coins (coins whose intrinsic value was much less than their face value) issued by central banks. Under the international gold standard in the 19th century, the coins were first made formally redeemable for gold. Then gold formed the bulk of international reserves held by the Central banks and the treasuries of the main economic powers but, inevitably, with the growth of international trade and the development of financial markets, foreign currency holdings, mainly in the form of short-term securities such as Treasury Bills, came to assume greater importance.

Even after the Second World War gold did not lose its importance. Under the Bretton Woods agreement of 1944 all major western countries like United States, Britain, France and Germany undertook to maintain a fixed value for their currencies against the US dollar. The US dollar meanwhile remained pegged to gold at $ 35 per oz of gold. In the late 1960s, the peg came under pressure and was abandoned in 1968 and finally dismantled formally in 1971. The dollar saw its value against other currencies improve sharply. With inflationary conditions too prevailing, gold came to be regarded as a safe haven. Even though the gold standard was abandoned, there were other reasons driving demand for gold. From the figures with International Monetary Fund (2001), nearly 58% of countries in the world are holding gold as part of their reserves, Some of the reasons for which the Central banks, financial institutions and individuals across the world hold gold are as follows:
World Gold Council reports that out of 176 countries with IMF, 102 countries keep some gold as part of their reserves.

The first reason is security, gold offers full security as long as it is retained by central banks. There is no credit risk attached to gold. Secondly, gold is able to maintain its liquidity even at times of crisis situations like high global inflation or political turbulence. Gold may not be the most liquid of all assets but is definitely superior to other commodities in this respect. Gold holdings do not fetch any return. But this zero return is the price of the option provided by gold. Portfolio managers have to diversify to reduce risk. The third reason for holding gold is to build a diversified portfolio. In the long run, the price of gold has shown a very low and even a negative correlation with the dollar and with US treasuries. Gold is not affected by the policy decisions of any individual country and cannot be frozen or repudiated as can be the case for foreign securities. Gold also has taken the role of an asset of last resort. World Economic History shows that countries have repeatedly used gold as security against loans when they have had difficulties with their Balance of Payments and have felt the need to borrow in the international capital markets.

Gold and silver have been sought and prized since prehistoric times. They have also been both a cause of war and a medium of exchange.
Gold is the standard by which the value of anything is assessed; it is universally accepted.

Silver does not lag behind in global trade markets and as an investment. In the code of Menes, an Egyptian ruler of 3100 BC, it   is declared that .one unit of gold is equal to two and-a-half units of silver in value.. Silver was actually more widely employed as the standard of value until the nineteenth century.

According to the World Gold Council Report, India stands today as the world's largest single market for gold consumption. In developing countries, people have often trusted gold as a better investment than bonds and stocks.

Gold and silver have been popular in India because historically these acted as a good hedge against inflation. In that sense these metals have been more attractive than bank deposits or gilt-edged securities.

Despite recent hiccups, gold is an important and popular investment for many reasons:

- In many countries gold remains an integral part of social and religious customs, besides being the basic form of saving. Shakespeare called it .the saint-seducing gold..

- Superstition about the healing powers of gold persists. Ayurvedic medicine in India recommends gold powder and pills for many ailments

- Gold is indestructible. It does not tarnish and is also not corroded by acid . Except by a mixture of nitric and hydrochloric acids.

- Gold has aesthetic appeal. Its beauty recommends it for ornament making above all other metals.

- Gold is so malleable that one ounce of the metal can be beaten into a sheet covering nearly a hundred square feet.

- Gold is so ductile that one ounce of it can be drawn into fifty miles of thin gold wire.

- Gold is an excellent conductor of electricity; a microscopic circuit of liquid gold. Printed. on a ceramic strip saves miles of wiring in a computer.

- Gold is so highly valued that a single smuggler can carry gold worth Rs. 50 lakh underneath his shirt.

- Gold is so dense that all the 90,000 tonnes estimated to have been mined through history could be transported by one single modern super tanker.

- Finally, gold is scam-free. So far, there have been no Mundra-type or Mehta-type scams in gold.

Thus, the lure of this yellow metal continues.

On the other hand, it is interesting to note that apart from its aesthetic appeal gold has no intrinsic value. You cannot eat it, drink it, or even smell it. This aspect of gold compelled Henry Ford, the founder of Ford Motors, to conclude that .gold is the most useless thing in the world..

Sensex: The Barometer Of Indian Economy

Bombay Stock Exchange is the oldest stock exchange in Asia with a rich heritage, now spanning three centuries in its 133 years of existence. What is now popularly known as BSE was established as "The Native Share & Stock Brokers' Association" in 1875.

BSE is the first stock exchange in the country which obtained permanent recognition (in 1956) from the Government of India under the Securities Contracts (Regulation) Act 1956. BSE's pivotal and pre-eminent role in the development of the Indian capital market is

driven trading system in 1995. Earlier an Association Of Persons (AOP), BSE is now a corporatized and demutualized entity incorporated under the provisions of the Companies Act, 1956, pursuant to the BSE (Corporatizations and Demutualization) Scheme, 2005 notified by the Securities and Exchange Board of India (SEBI). With demutualization, BSE has two of world's best exchanges, Deutsche Börse and Singapore Exchange, as its strategic partners.

Over the past 133 years, BSE has facilitated the growth of the Indian corporate sector by providing it with an efficient access to resources. There is perhaps no major corporate in India which has not sourced BSE's services in raising resources from the capital market.

Today, BSE is the world's number 1 exchange in terms of the number of listed companies and the world's 5th in transaction numbers. The market capitalization as on December 31, 2007 stood at USD 1.79 trillion. An investor can choose from more than 4,700 listed companies, which for easy reference, are classified into A, B, S, T and Z groups.

The BSE Index, SENSEX, is India's first stock market index that enjoys an iconic stature, and is tracked worldwide. It is an index of 30 stocks representing 12 major sectors. The SENSEX is constructed on a 'free-float' methodology, and is sensitive to market sentiments and market realities. Apart from the SENSEX, BSE offers 21 indices, including 12 sect oral indices. BSE has entered into an index cooperation agreement with Deutsche Brose. This agreement has made SENSEX and other BSE indices available to investors in Europe and America. Moreover, Barclays Global Investors (BGI), the global leader in ETFs through its Shares brand, has created the shares BSE SENSEX India Tracker' which tracks the SENSEX. The ETF enables investors in Hong Kong to take an exposure to the Indian equity market.

BSE has tied up with U.S. Futures Exchange (USFE) for U.S. dollar-denominated futures trading of SENSEX in the U.S. The tie-up enables eligible U.S. investors to directly participate in India's equity markets for the first time, without requiring American Depository Receipt (ADR) authorization. The first Exchange Traded Fund (ETF) on SENSEX, "SPIcE" is listed on BSE. It brings to the investors a trading tool that can be easily used for the purposes of investment, trading, hedging and arbitrage. SPIcE allows small investors to take a long-term view of the market.

BSE continues to innovate. In recent times, it has become the first national level stock exchange to launch its website in Gujarati and Hindi to reach out to a larger number of investors. It has successfully launched a reporting platform for corporate bonds in India christened the ICDM or Indian Corporate Debt Market and a unique ticker-cum-screen aptly named 'BSE Broadcast' which enables information dissemination to the common man on the street.

For the premier Stock Exchange that pioneered the stock broking activity in India, 128 years of experience seems to be a proud milestone. A lot has changed since 1875 when 318 persons became members of what today is called "The Stock Exchange, Mumbai" by paying a princely amount of Re1.Since then, the country's capital markets have passed through both good and bad periods. The journey in the 20th century has not been an easy one. Till the decade of eighties, there was no scale to measure the ups and downs in the Indian stock market. The Stock Exchange, Mumbai (BSE) in 1986 came out with a stock index that subsequently became the barometer of the Indian stock market.

SENSEX is not only scientifically designed but also based on globally accepted construction and review methodology. First compiled in 1986, SENSEX is a basket of 30 constituent stocks representing a sample of large, liquid and representative companies. The base year of SENSEX is 1978-79 and the base value is 100. The index is widely reported in both domestic and international markets through print as well as electronic media.

The Index was initially calculated based on the "Full Market Capitalization" methodology but was shifted to the free-float methodology with effect from September 1, 2003

Due to is wide acceptance amongst the Indian investors; SENSEX is regarded to be the pulse of the Indian stock market. As the oldest index in the country, it provides the time series data over a fairly long period of time (From 1979 onwards). Small wonder, the SENSEX has over the years become one of the most prominent brands in the country. The growth of equity markets in India has been phenomenal in the decade gone by. Right from early nineties the stock market witnessed heightened activity in terms of various bull and bear runs. The SENSEX captured all these events in the most judicial manner. One can identify the booms and busts of the Indian stock market through SENSEX.

1.2 NEED FOR STUDY

Indians see gold as a precious commodity. Even in religious texts of Hindus, gold finds a mention as a commodity of immense values. They treat it as a metal to be possessed only by kings and gods. Like in other countries, in India gold is demanded for three uses, namely, jewellery, retail investment and industrial use. From Table 1, we can see that the demand for gold in India is the highest as compared to other developed and developing nations. The primary driver of gold demand is demand for gold jewellery. Gold traditionally has been demanded for making gold ornaments. The sale during the 'Diwali' festival and marriage season is high. Most of the sales are bunched during this time as Diwali coincides with harvesting and sale of crops. Gifting of gold ornaments to the bride is an age-old practice in India. Gold ornaments are also worn by Indian men as bracelets, rings, metal chains. Before the beginning of construction of houses, people are known to have stored gold at the construction site. It is gifted to relatives during ceremonies and as a sign of love and affection and social position.

Gold provided the means to convert wealth into the most on contracted and indestructible form which also facilitated hassle free transfer of wealth from one generation to another. Another reason for the economic significance of gold is the ease it offers in hoarding unaccounted wealth. Black money has been maintained in terms of gold bars, jewellery etc. Ayurveda, the ancient Indian medical system enquires gold to be used in medicines. Gold fillings are also used by Indians. Gold has always been looked upon as a store of value. This ability to act as a store of value has been known to our ancestors and habit of investment in gold has always been encouraged. Also, gold kept on person provided unlimited liquidity as against banks and eliminated safety concerns. It alsa does not get damaged during storage.

In one of the earliest research works on the subject (Rao and Nagabhushanam,1960), it was empirically established that, during the period 1901 to 1913 (which was a sub-period of the gold exchange standard era 1898-1914), (i) gold demand exhibited higher income elasticity than both silver and merchandise, (ii) price elasticity for gold demand was negative, and (iii) gold was preferable to silver.

Liberalization of import restriction on gold has also encouraged demand .Drawing a relationship between the change in prices of gold and the events that have taken place would be useful to realise the importance of an economic study of gold. With the liberalisation of import norms of gold in 1993 the prices have improved but have never reached the heights set in 1978-79. After the 1997 the prices of gold have tended to drift downwards. With the signing of the Washington Agreement, the prices hardened to some extent. With the global stock markets picking up in 1999 and doing well till March 2000 the interest in gold diminished. After April 2001, the prices have again moved upwards.

1.3 REVIEW OF LITERATURE

Dirk G. Baur[1](2009) studied the volatility of equity returns generally exhibits an asymmetric reaction to positive and negative shocks. Economic explanations for this phenomenon are leverage and volatility feedback effects. This paper studies the volatility of gold and demonstrates that there is an inverted asymmetric reaction of gold to positive and negative shocks, i.e. positive shocks increase the volatility by more than negative shocks. The paper argues that this effect is a result of the safe haven property of gold. Macroeconomic and financial uncertainty is transmitted from the equity market to the gold market causing the special asymmetric reaction. The empirical results hold for gold bullion and gold coins denominated in different currencies, different time periods and for different distributional assumptions. Finally, we show that the inverted volatility effect of gold can lower the aggregate risk of a portfolio for specific correlation levels.

Brajesh Kumar[2] Priyanka Singh .The Case Of Indian Stock And Commodity Markets this paper is based on an empirical study of volatility, risk premium and seasonality in risk-return relation of the Indian stock and commodity markets. This investigation is conducted by means of the General Autoregressive Conditional Heteroscedasticity in the mean model (GARCH-in-Mean) introduced by Engle et al. (1987). A systematic approach to model volatility in returns is presented. Volatility clustering and asymmetric nature are examined for

[1] Dirk G. Baur "The Volatility of Gold" (2009)

Indian stock and commodity markets. The risk-return relationship and seasonality in risk-return are also investigated through GARCH-in-Mean modelling in which seasonal dummies are used for return as well as volatility equation. The empirical work has been carried out on market index S&P CNX Nifty for a period of 18 years from January 1990 to December 2007. Gold prices from 22nd July 2005 to 20th February 2008 and Soybean from October 2004 – December 2007 are also considered. The stock and commodity markets returns show persistence as well as clustering and asymmetric properties. Risk-return relationship is positive though insignificant for Nifty and Soybean where as significant positive relationship is found in the case of Gold. Seasonality in risk and return is also found which suggests the asymmetric nature of return, i.e. negative correlation between return and its volatility.

Sangeeta Chakravarty[3] re-examined the relationship between stock price and some key macro economic variables in India for the period 1991-2005 using monthly time series data. The study uses Granger non causality test procedure developed by Toda and Yamamoto(1995). The results of the study indicate that index of industrial production and inflation Granger cause stock price but stock price does not cause either of the two so the causation is unidirectional. The causal relation between stock price and money supply is unidirectional as stock price Granger cause money supply but money supply does not. On the other hand there is no causal relation between stock price and exchange rate. Similarly there is no causal linkage between gold price and stock price.

Ganesh Mani[4] and Srivyal Vuyyuri analysed the importance of gold in India need not be elaborated to an economist or to a layman. Traditionally gold has been deeply entrenched in the Indian social psyche. The economic importance is also not less as has been elaborated in the paper. But there have been few empirical studies. Hence this paper tries to make an attempt at explaining the importance through a study of gold price determination.

Dirk G. BaurIs[5] analysed about gold a hedge against sudden changes in stock and bond returns, or does it instead have a subtly different property, that of being a safe haven? This paper addresses these two interlinked questions. A safe haven is defined as a security that is uncorrelated with stocks and bonds in case of a market crash. This is counterpoised against a

[3] Sangeeta Chakravarty "Stock Market and macro economic behaviour in India"
[4] Ganesh Mani and Srivyal Vuyyuri "Gold Pricing in India: An Econometric Analysis"

hedge, defined as a security that is uncorrelated with stocks or bonds on average. We study constant and time-varying relationships between stocks, bonds and gold in order to investigate the existence of a hedge and a safe haven. The empirical analysis examines US, UK and German stock and bond returns and their relationship with gold returns. We find that gold is a hedge against stocks on average and a safe haven in extreme stock market conditions. This finding suggests that the existence of a safe haven enhances the stability and resiliency of financial markets since it reduces investors' losses at times when a reduction is needed the most. A portfolio analysis further shows that the safe haven property is extremely short-lived so that an investor buying gold one day after a shock loses money.

P K Mishra[6], J R Das Gold studied the capital market of a country in terms of a wide range of macroeconomic and financial variables has been the subject matter of many researches since last few decades. Recently one such variable, that is, gold price volatility has attracted the attention of many researchers, academicians and analysts. Thus, this paper is an attempt to analyse the causality relation that may run between domestic gold prices and stock market returns in India. The study by taking into consideration the domestic gold prices and stock market returns based on BSE 100 index, investigates the Granger causality in the Vector Error Correction Model for the period January 1991 to December 2009. The analysis provides the evidence of feedback causality between the variables. It infers that the Gold prices Granger-causes stock market returns and stock market returns also Granger-causes the gold prices in India during the sample period. Thus, both the variables contain some significant information for the prediction of one in terms of another.

Christophe faugere[7] re-examined the relationship between stock prices and one of best investment considered in India i.e. gold prices for 2005 using daily time series data. The study uses Granger non causality test procedure developed by Toda and Yamamoto(1995). The study looks after the rise of gold market in India. The future of the gold and Gold price movements are determined by the perception of gold as a 'store of value' rather than its fundamentals as a commodity. The precious metal's value is also determined by such factors as inflation, interest rates and the presence of lucrative alternative investment avenues in the economy.

[6] P K Mishra , J R Das "Gold Price Volatility and Stock Market Returns in India" American Journal of Scientific Research ,ISSN 1450-223X Issue 9(2010), pp.47-55,EuroJournals Publishing, Inc. 2010 http://www.euroiournals.com/ajsr.htm

Giam Quang Do[8] This paper focuses on testing possible linkages among international gold and ASEAN emerging markets based on daily data from July 28, 2000 to March 31, 2009. The Granger causality test and the Johansen co integration technique were applied to examine possible short-run associations and the long-run co integrations among the international gold and five emerging stock markets in ASEAN (Indonesia, Malaysia, Philippines, Thailand and Vietnam). Results of the Granger causality test shows that the short-run associations appear in almost all the pairs formed from the selected stock markets. Meanwhile, few evidences of the short-run associations are observed from the gold market to the stock markets as well as from the stock markets to gold market. Results of the Johansen cointegration test for long-run relationships between the selected markets show that the six selected market price indexes are not co integrated all together. However, they are low co integrated to each other (only four over 15 market pairs show the presence of co integrating relations). Especially, Thailand stock and international gold markets are operating independently from other selected markets. The paper suggests that portfolio diversification should be implemented when investing in ASEAN emerging stock markets and gold should be an item included in the portfolio.

Rakesh Gupta[9] observed hypothesis of market efficiency is an important concept for the investors who wish to hold internationally diversified portfolios. With increased movement of investments across international boundaries owing to the integration of world economies, the understanding of efficiency of the emerging markets is also gaining greater importance. In this paper we test the weak form efficiency in the framework of random walk hypothesis for the two major equity markets in India for the period 1991 to 2006. The evidence suggests that the series do not follow random walk model and there is an evidence of autocorrelation in both markets rejecting the weak form efficiency hypothesis.

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[8] Giam Quang Do "Cointegration and causality among international gold and ASEAN emerging stock markets."

1.4 PROBLEM STATEMENT

Investment in gold is often considers as a hedge against inflation. In India gold is considered as investment as well as personal possession of esteem value. As investment in gold may channel funds from the stock market, hence a study is conducted to determine the linkages between gold market and Sensex.

1.5 OBJECTIVES

- **Primary objective:**

  To study the relationship between Gold Price and Equity Market (Sensex).

- **Secondary Objective:**

  To study the price patterns of Gold and Sensex.

1.6 SCOPE OF THE STUDY

This study would deal with trading in the Sensex and gold market .The average price of every month is collected for 11 years of gold and Sensex. The study measures the relationship between the gold and equity market Sensex and to find the appropriate time to invest.

CHAPTER - 2
RESEARCH METHODOLOGY AND
MICRO & MACRO ANALYSIS

CHAPTER 2A

RESEARCH METHODOLOGY

2.A.1 TYPE OF STUDY

There are three types of research design, they are

- Exploratory Research,
- Descriptive,
- Analytical research design

This study comes under analytical research

Meaning

Under this research, the researcher goes into the researching stage with a specific topic about which he have not made any kind of conclusions. Often it is called as question. The researcher surveys the information and views already out there both before and during research . That will required reading, plus evaluation of the resource handled by the researcher. By the end of the research the researcher will be able to contribute his own thoughts to the academic discussion by drawing some conclusions about the topic he has chosen. Hence this study comes under analytical research.

2.A.2 METHOD OF STUDY

The study is based on Secondary data. The data required for the study is collected from RBI(Reserve Bank of India) .

2.A.3 SOURCE OF DATA

The data for the study has been taken from Website of Bombay Stock Exchange and the spot gold price of Mumbai had sourced from the Handbook of Statistics on Indian Economy – 2010 of Reserve Bank of India.The prices of gold is measured in Indian Rupees per 10 gms.

- www.rbi.org.in

2.A.4 TOOLS FOR ANALYSIS

- Mean

- Standard deviation

- Range, Maximum & Minimum

- Coefficient of variation

- Correlation coefficient

Mean

For a data set, the mean is the sum of the values divided by the number of values. The mean of a set of numbers $x_1, x_2, ..., x_n$ is typically denoted by $\bar{x}$, pronounced "x bar". This mean is a type of arithmetic mean. If the data set was based on a series of observations obtained by sampling a statistical population, this mean is termed the "sample mean" to distinguish it from the "population mean". The mean is often quoted along with the standard deviation: the mean describes the central location of the data, and the standard deviation describes the spread. An alternative measure of dispersion is the mean deviation, equivalent to the average absolute deviation from the mean. It is less sensitive to outliers, but less mathematically tractable.

$$Mean = \sum x/n$$

Standard deviation

It shows how much variation there is from the "average" (mean, or expected/budgeted value). A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data is spread out over a large range of values.

$$Standard\ deviation\ (\sigma) = \sqrt{\sum d^2/n - (\sum d/n)^2}$$

Coefficient of variation

The coefficient of variation (CV) is a normalized measure of dispersion of a probability distribution. It is defined as the ratio of the standard deviation σ to the mean μ:

$$c_v = \frac{\sigma}{\mu}$$

This is only defined for non-zero mean, and is most useful for variables that are always positive. It is also known as unitized risk or the variation coefficient. It is expressed as percentage. The coefficient of variation should only be computed for data measured on a ratio scale.

Range

The difference between the smallest and the largest numbers in the given values.

Minimum

The smallest number in the given values.

Maximum

The largest number in the given values.

Correlation coefficient

A correlation is a single number that describes the degree of relationship between two variables.

$$r = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

Where:

N	=	number of pairs of scores
Σxy	=	sum of the products of paired scores
Σx	=	sum of x scores
Σy	=	sum of y scores
Σx^2	=	sum of squared x scores
Σy^2	=	sum of squared y scores

The symbol r is used for the correlation. Through the magic of mathematics it turns out that r will always be between -1.0 and +1.0. If the correlation is negative, we have a negative relationship; if it's positive, the relationship is positive.

- -1.0 to -0.7 strong negative association.

- -0.7 to -0.3 weak negative association.

- -0.3 to +0.3 little or no association.

- +0.3 to +0.7 weak positive association.

- +0.7 to +1.0 strong positive association.

2.A.5 PERIOD OF STUDY

- To analyze, 11 years of monthly data are collected (July 1999 to June 2010).
- The spot price of Mumbai gold is selected because BSE Sensex is a spot market.

CHAPTER 2B

MACRO-MICRO ANALYSIS

2.B.1 Global Gold Market

International gold markets are experiencing a surge in demand as fear over Europe's debt crisis encourages investors to diversify their portfolios, it has been claimed. The Financial Times reports interest in the precious metal has risen in the US, South Africa, Canada and Austria in 2010.It noted that the Austrian Mint sold six times the amount of its Vienna Philharmonic coin last month when compared with the same period in 2009. Furthermore, the Rand refinery in South Africa raised production of its Krugerrand by 50 per cent in order to keep up with levels of demand.

This is according to Unity Marketing, which recently surveyed 1,000 shoppers and found that the average expenditure on jewellery by those with a minimum household income of $100,000 (£62,011) per year increased by 31 per cent to $4,813 in the three months to September compared with the same period in 2008.

Indians have a huge fascination for gold. This is evident in the fact that India is the largest consumer as well as importer of gold in the world. Gold plays a very important role in the social, religious and cultural life of Indians. India Gold Market looks poised to achieve greater heights given the fascination for gold in the country. India consumes about 800 MT of gold which accounts to about 20% consumption of gold globally. More than 50% of this is used for making gold jewellery.

2.B.2 Size of India Gold Market

The domestic India gold market is estimated to be more than US$15 billion and is expected to rise significantly in the coming years. During April 2008 to February 2009, gems and jewellery worth US$ 17.79 billion was exported from the country. United Arab Emirates imported more than 30% of gems and jewellery from India, making it the largest importer from the country. Hong Kong was the second largest importer with 25% followed by United States with 20%. The gem and jewellery industry accounts for more than 10% of India's total commodities exports.

The government has taken steps to protect the public from buying adulterated gold; Hallmarking of gold jewellery is one such step. Hallmarking of gold jewellery indicates the accurate finding out and official recording of the proportionate content of precious metals present in gold. The marking is done either by laser marking machine or by punches. Hallmark is the official mark used in several countries across the world as an assurance of purity or fineness of gold jewellery. The Bureau of Indian Standard or BIS was named by the Government as the lone agency in the country for providing hallmarking of gold jewellery under the provisions of the BIS Act, 1986.

Though India is the leading consumer of gold in the world, the gold market in India is largely fragmented and unorganized. Due to the non availability of a benchmark price, the gold prices in India vary very much from region to region. The festive and the wedding season in the country witnesses a heavy demand for gold. Despite the global economic recession, the gold consumption in the country during these times has not abetted.

2.B.3 Factors affecting India Gold Market

The monsoons and the harvest of the country have a significant affect on the sale and purchase of gold in the country. Both these factors determine the amount of purchasing power that people will have, which in turn decides on the amount of gold consumption and other consumptions as well. Purchasing gold and other precious metals on occasions like Akshaya Tritiya is considered to be auspicious.

CHAPTER - 3
DATA ANALYSIS & INTERPRETATION

CHAPTER 3

DATA ANALYSIS AND INTERPRETATION

The data collected for the of the study is analysed and presented under the following sections.

3.1 HISTORICAL DATA OF SPOT PRICE OF GOLD AND SENSEX

S.No	Year	Gold price in Rupees	Sensex points
1	Jul-99	4,109	4,542
2	Aug-99	4,051	4,898
3	Sep-99	4,087	4,764
4	Oct-99	4,179	4,445
5	Nov-99	4,749	4,622
6	Dec-99	4,615	5,006
7	Jan-00	4,473	5,205
8	Feb-00	4,509	5,447
9	Mar-00	4,707	5,001
10	Apr-00	4,542	4,658
11	May-00	4,460	4,434
12	Jun-00	4,500	4,749
13	Jul-00	4,521	4,280
14	Aug-00	4,529	4,477
15	Sep-00	4,516	4,090
16	Oct-00	4,518	3,711
17	Nov-00	4,538	3,998
18	Dec-00	4,483	3,972
19	Jan-01	4,541	4,327
20	Feb-01	4,466	4,247
21	Mar-01	4,370	3,604
22	Apr-01	4,269	3,519
23	May-01	4,267	3,632
24	Jun-01	4,441	3,457
25	Jul-01		

26	Aug-01	4,380	3,245
27	Sep-01	4,449	2,812
28	Oct-01	4,631	2,989
29	Nov-01	4,688	3,288
30	Dec-01	4,604	3,262
31	Jan-02	4,576	3,311
32	Feb-02	4,693	3,562
33	Mar-02	4,901	3,469
34	Apr-02	4,920	3,338
35	May-02	5,041	3,126
36	Jun-02	5,226	3,245
37	Jul-02	5,313	2,988
38	Aug-02	5,188	3,181
39	Sep-02	5,129	2,991
40	Oct-02	5,239	2,949
41	Nov-02	5,210	3,229
42	Dec-02	5,243	3,377
43	Jan-03	5,444	3,250
44	Feb-03	5,752	3,284
45	Mar-03	5,771	3,049
46	Apr-03	5,433	2,960
47	May-03	5,192	3,181
48	Jun-03	5,561	3,607
49	Jul-03	5,509	3,793
50	Aug-03	5,363	4,245
51	Sep-03	5,462	4,453
52	Oct-03	5,718	4,907
53	Nov-03	5,695	5,045
54	Dec-03	5,850	5,839
55	Jan-04	6,094	5,696
56	Feb-04	6,179	5,668
57	Mar-04	6,018	5,591

58	Apr-04	5,986	5,655
59	May-04	5,916	4,760
60	Jun-04	5,736	4,795
61	Jul-04	5,862	5,170
62	Aug-04	6,059	5,192
63	Sep-04	6,126	5,584
64	Oct-04	6,170	5,672
65	Nov-04	6,361	6,234
66	Dec-04	6,551	6,603
67	Jan-05	6,445	6,556
68	Feb-05	6,149	6,714
69	Mar-05	6,108	6,493
70	Apr-05	6,262	6,154
71	May-05	6,151	6,715
72	Jun-05	6,030	7,194
73	Jul-05	6,134	7,635
74	Aug-05	6,058	7,805
75	Sep-05	6,249	8,634
76	Oct-05	6,535	7,892
77	Nov-05	6,874	8,789
78	Dec-05	7,168	9,398
79	Jan-06	7,586	9,920
80	Feb-06	7,925	10,370
81	Mar-06	8,038	11,280
82	Apr-06	8,059	11,852
83	May-06	8,985	10,399
84	Jun-06	9,969	10,609
85	Jul-06	8,952	10,744
86	Aug-06	9,559	11,699
87	Sep-06	9,469	12,454
88	Oct-06	8,998	12,962
89	Nov-06	8,695	13,696

90	Dec-06	9,140	13,787
91	Jan-07	9,133	14,091
92	Feb-07	9,069	12,938
93	Mar-07	9,545	13,072
94	Apr-07	9,370	13,872
95	May-07	9,321	14,544
96	Jun-07	8,878	14,651
97	Jul-07	8,707	15,551
98	Aug-07	8,741	15,319
99	Sep-07	8,836	17,291
100	Oct-07	9,311	19,838
101	Nov-07	9,691	19,363
102	Dec-07	10,340	20,287
103	Jan-08	10,311	17,649
104	Feb-08	11,291	17,579
105	Mar-08	11,888	15,644
106	Apr-08	12,632	17,287
107	May-08	11,810	16,416
108	Jun-08	12,143	13,462
109	Jul-08	12,353	14,356
110	Aug-08	13,028	14,565
111	Sep-08	11,861	12,860
112	Oct-08	12,220	9,788
113	Nov-08	12,691	9,093
114	Dec-08	12,143	9,647
115	Jan-09	12,923	9,424
116	Feb-09	13,473	8,892
117	Mar-09	14,800	9,709
118	Apr-09	15,232	11,403
119	May-09	14,475	14,625
120	Jun-09	14,621	14,494
121	Jul-09	14,639	15,670

122	Aug-09	14,996	15,667
123	Sep-09	15,723	17,127
124	Oct-09	15,864	15,896
125	Nov-09	17,040	16,926
126	Dec-09	17,138	17,465
127	Jan-10	16,684	16,358
128	Feb-10	16,535	16,430
129	Mar-10	16,603	17,528
130	Apr-10	16,679	17,559
131	May-10	17,997	16,945
132	Jun-10	18,741	17,701

3.1 CHART OF GOLD PRICE AND SENSEX DATA
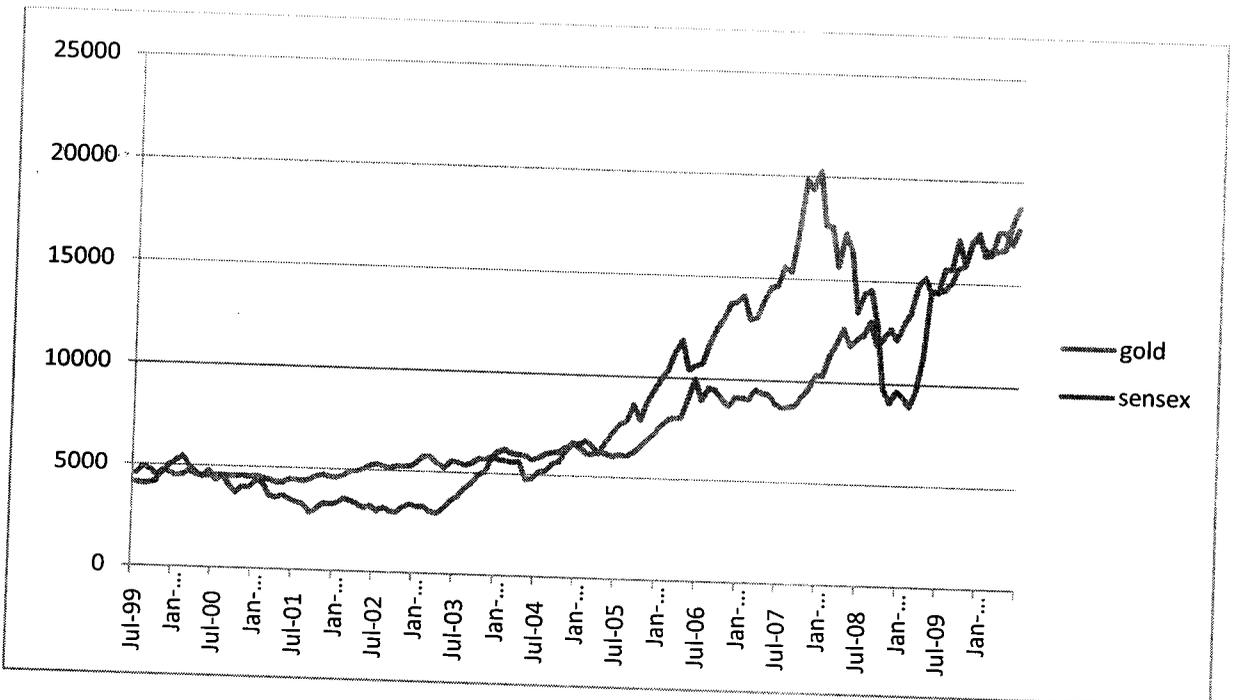
Table 3.2   Mean of Sensex Points and Gold Price in Rupees

No. of years	Year	Gold	Sensex
1	1999-2000	4415	4814
2	2000-2001	4455	3943
3	2001-2002	4709	3248
4	2002-2003	5373	3171
5	2003-2004	5794	5037
6	2004-2005	6189	6190
7	2005-2006	7465	9547
8	2006-2007	9177	13209
9	2007-2008	10475	17140
10	2008-2009	13318	11571
11	2009-2010	16554	16773
Mean	1999-2010	7993	8604

3.2 CHART OF MEAN
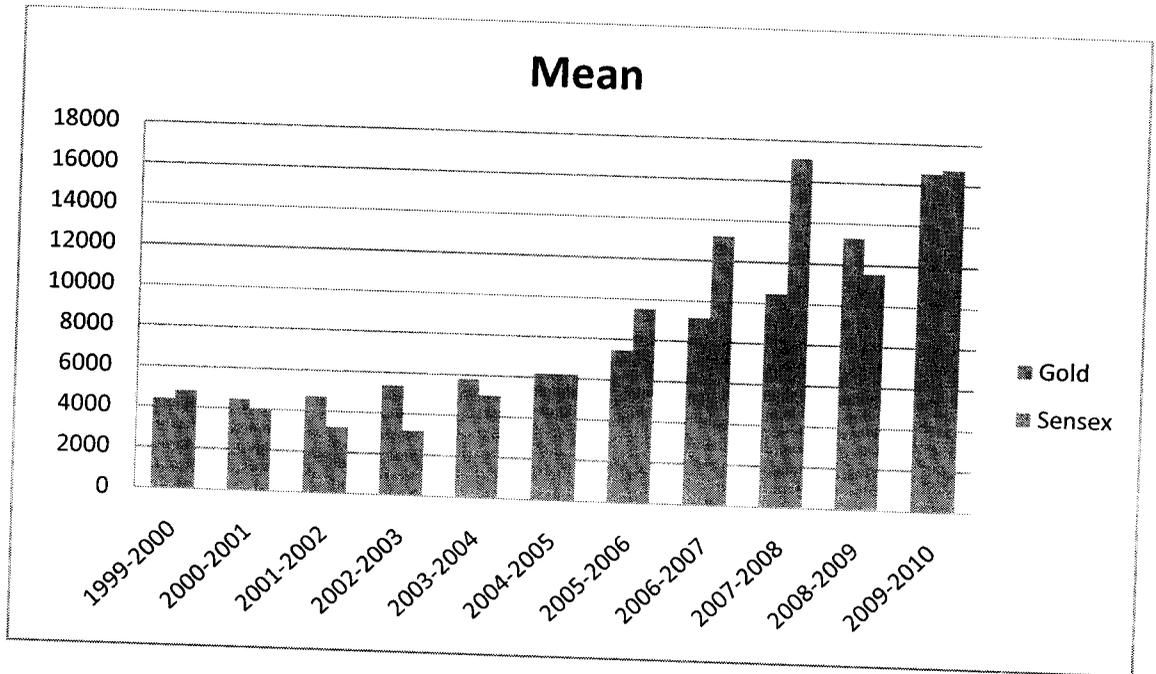
Interpretation

Table 3.2 shows the mean value of Sensex points and gold prices for each year which helps to identify the mid value of the given data. During the period of 2008-2009, Sensex had declined from 17140 to 11571 with the difference of 6000 points, but in the gold price there are no such deviations, this shows the level of fluctuations.

Inference

Table 3.2 shows the mean return of Sensex is higher than the gold. This indicates Sensex investments fetch high return than investments in gold. The mean of Sensex had been dropped from 17140 to 11571 in 2008-2009 period but gold price had increased from 10475 to 13318 on the same period this shows there is a no relationship between gold price and Sensex and shows the high volatility in the equity market and it lead to high risk.

Table 3.3   Standard Deviation of Sensex Values and Gold Price .

No. of years	Year	Gold price in Rupees	Sensex Points
1	1999-2000	245.69	309.88
2	2000-2001	100.09	349.74
3	2001-2002	263.81	200.13
4	2002-2003	221.10	197.68
5	2003-2004	259.27	662.79
6	2004-2005	189.26	648.66
7	2005-2006	1206.86	1409.09
8	2006-2007	276.95	1157.19
9	2007-2008	1436.89	2017.10
10	2008-2009	1175.30	2422.54
11	2009-2010	1157.63	750.97
Grand years	1999-2010	3906.57	5216.67

3.3 CHART OF STANDARD DEVIATION FOR GOLD PRICE AND SENSEX

Standard Deviation
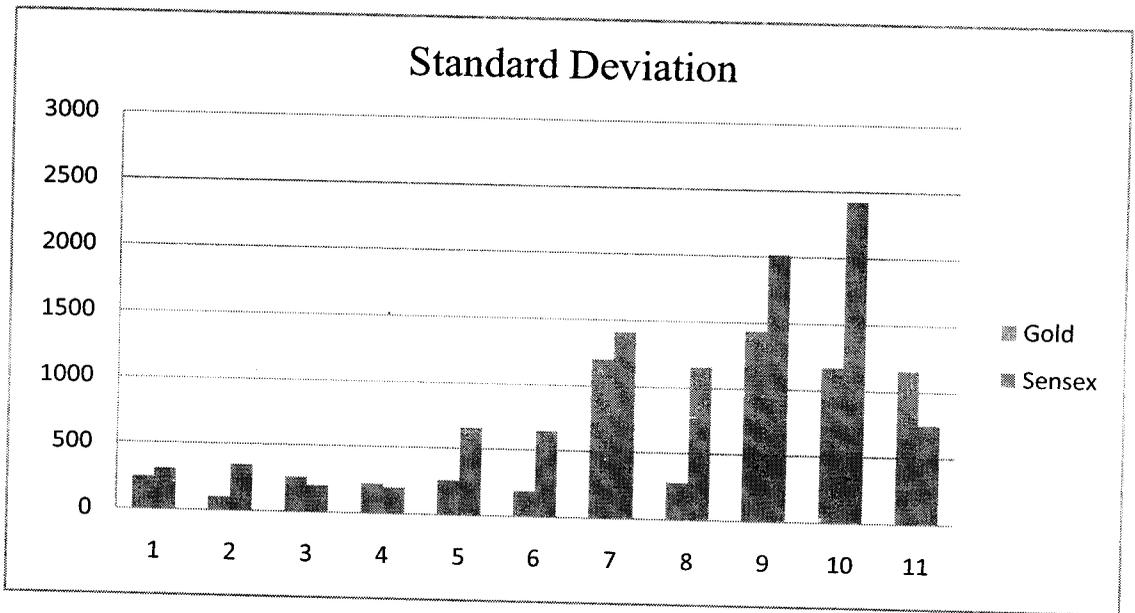
Interpretation

Table 3.3 shows standard deviation which identifies the deviation percentage from the mean from the given data. Sensex percentage of deviation is always high than the gold price deviation. This shows the high volatility between them.

Inference

Table 3.3 shows the volatility of Sensex is higher than the Gold, measured through higher standard deviation. This indicates that Sensex investments are more volatile than the Gold investments.

Table 3.4 Range and Maximum Minimum of Sensex Values and Gold Price

No. of years	Year	Gold Price in Rupees			Sensex Points		
		Range	Max	Min	Range	Max	Min
1	1999-2000	698	4749	4051	1014	5447	4434
2	2000-2001	274	4541	4267	1021	4477	3457
3	2001-2002	846	5226	4380	751	3562	2812
4	2002-2003	642	5771	5129	658	3607	2949
5	2003-2004	817	6179	5363	2046	5839	3793
6	2004-2005	689	6551	5862	2024	7194	5170
7	2005-2006	3911	9969	6058	4217	11852	7635
8	2006-2007	864	9559	8695	3907	14651	10744
9	2007-2008	3924	12632	8707	6825	20287	13462
10	2008-2009	3372	15232	11861	5734	14625	8892
11	2009-2010	4103	18741.42	14638.85	2034	17701	15667
Period	1999-2010	14690	18741	4051	17475	20287	2812

3.4 CHART OF RANGE
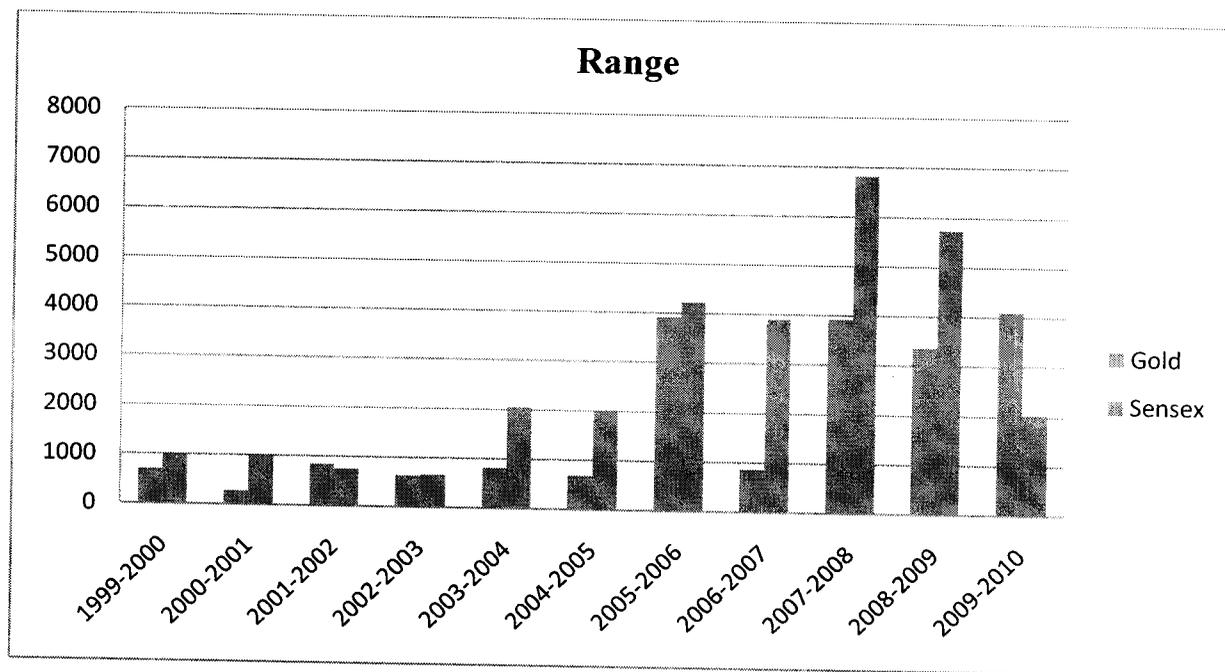
Interpretation

Table 3.4 shows Range, maximum and minimum of Sensex values and gold prices. Gold reached a maximum price of Rs. 18741 in the year 2009-10. The lowest price of gold was Rs.4,051 in the year 1999-2000. The range between these two prices is Rs.14,690. The Sensex values during the period was even more volatile. The Sensex points reached a maximum of 20287 in the year 2007-08 and the lowest was 2812 in the year 2001-02.

Inference

In table 3.4 Sensex has provided a maximum return of 20287 and a minimum of 17475 during the study period. Gold investments have provided a maximum of Rs.18741 and a minimum of Rs.4051 returns during the study period. And also the range of the Sensex had very high than the gold in all period. It indicates the range of returns were wide in equity investments.

Table 3.5   Coefficient of variation of Sensex Values and Gold Price in %.

No. of years	Year	Gold	Sensex
1	1999-2000	5.56	6.44
2	2000-2001	2.25	8.87
3	2001-2002	5.60	6.16
4	2002-2003	4.12	6.24
5	2003-2004	4.47	13.16
6	2004-2005	3.06	10.48
7	2005-2006	16.17	14.76
8	2006-2007	3.02	8.76
9	2007-2008	13.72	11.77
10	2008-2009	8.82	20.94
11	2009-2010	6.99	4.48
Grand CV	1999-2010	48.87	60.63

3.5 CHART OF COEFFICIENT OF VARIATION
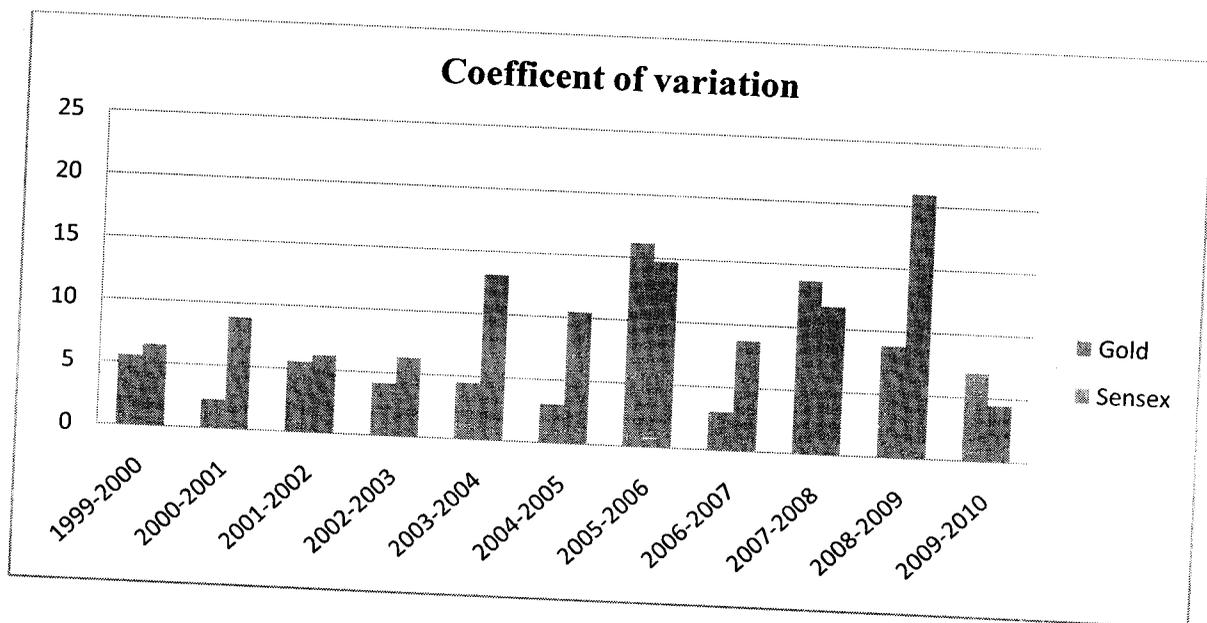
Interpretation

Table 3.5 shows coefficient of variation which shows the level of variation. If the variation is less for any variable, it is considered as consistent performer. Between Sensex values and gold prices, the gold market with a Coefficient of Variation of 48.87% is performing consisting better than Sensex which as 60.63% coefficient.

Inference

Table 3.5 the Coefficient of Variation of gold 48.87 is less than Sensex which is 60.63. It indicates that the gold prices are more consistent than the Sensex values, it shows investing in gold had provided constant return.

Table 3.6   Correlation of Sensex Values and Gold Price

No. of years	Year	Gold & Sensex
1	1999-2000	.269
2	2000-2001	.704
3	2001-2002	.195
4	2002-2003	.236
5	2003-2004	.850
6	2004-2005	.395
7	2005-2006	.795
8	2006-2007	-.177
9	2007-2008	-.258
10	2008-2009	.161
11	2009-2010	.731
Grand r	1999-2010	.844

3.6 CHART OF CORRELATION COEFFICIENT FOR GOLD PRICE AND SENSEX.
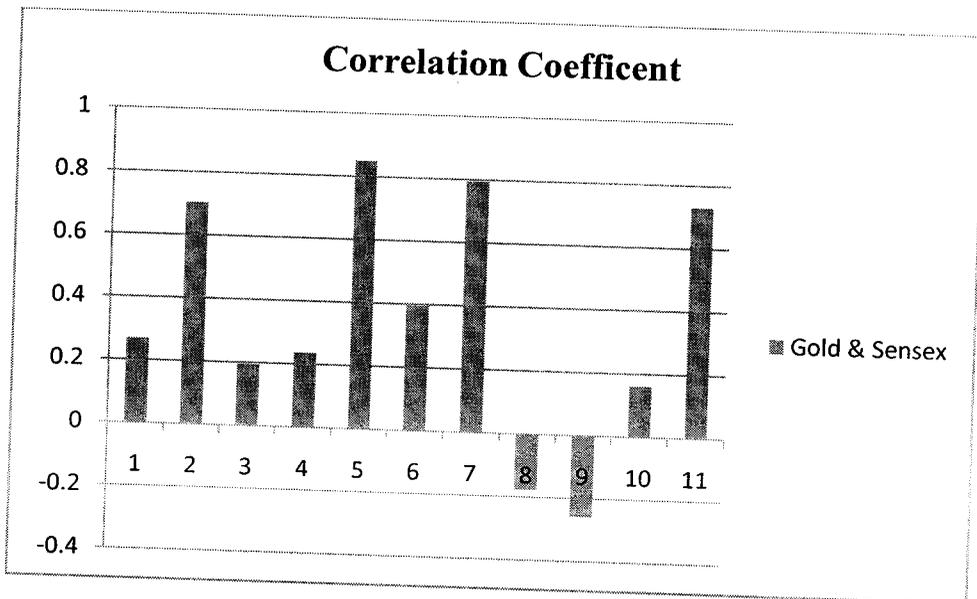
If the correlation is negative, we have a negative relationship; if it's positive, the relationship is positive.

- -1.0 to -0.7 strong negative association.

- -0.7 to -0.3 weak negative association.

- -0.3 to +0.3 little or no association.

- +0.3 to +0.7 weak positive association.

- +0.7 to +1.0 strong positive association

Interpretation

Table 3.6 shows the correlation which shows the level of relationship between Sensex values and gold prices. The analysis shows low correlation in the range of .269 to .195 for seven years in eleven years but in the long term it shows positive association. There is high correlation between Sensex and Gold prices during the entire study period to the extent of .844.

Inference

The correlation analysis shows that there is a strong relationship with .844 between gold price and Sensex values in long term but in eleven years seven years are weakly correlated. This indicates a weak association between Equity and Bullion market in short term.

CHAPTER - 4
CONCLUSION

CHAPTER 4

CONCLUSION

4.1 Findings

❖ The mean return of Sensex is higher than the gold. This indicates Sensex investments fetch high return than investments in gold. The mean of Sensex had been dropped from 17140 to 11571 in 2008-2009 period but gold price had increased from Rs.10475 to Rs.13318 on the same period this shows there is a no relationship between gold price and Sensex and shows the high volatility in the equity market and it lead to high risk.

❖ The volatility of Sensex is higher than the Gold, measured through higher standard deviation. This indicates that Sensex investments are more volatile than the Gold investments.

❖ Sensex has provided a maximum return of 20287 and a minimum of 17475 during the study period. Gold investments have provided a maximum of Rs.18741 and a minimum of Rs.4051 returns during the study period. And also the range of the Sensex had very high than the gold in all period. It indicates the range of returns were wide in equity investments.

❖ The Coefficient of Variation of gold 48.87 is less than Sensex which is 60.63. It indicates that the gold prices are more consistent than the Sensex values, it shows investing in gold had provided constant return.

❖ The correlation analysis shows that there is a strong relationship with .844 between gold price and Sensex values in long term but in eleven years seven years are weakly correlated. This indicates a weak association between Equity and Bullion market in short term.

4.2 Suggestion & Recommendations

- Though the correlation is high between the spot gold market and Sensex in long term that is ten years, the correlation is low between one year. The correlation holds good in short term. During the short-term period, investing in gold during the bear run in Sensex is advisable.

- Investment represented through Sensex provided a relatively high average returns, the risk proposition is high. Hence investment in gold is considered as less risky.

- Investment in gold will provide a consistent return than investment in the equity market in long period of time.

4.3 Conclusion

The study examines the relationship between domestic gold prices and stock market returns in India for the period 1999 to 2010. The study uses monthly data. The required data have been collected from the database of Reserve Bank of India.The study is concluded that Gold prices provide a consistently better return with less volatility. The equity investments (Sensex) provide a higher average return but with high volatility. The range of returns in equity is relatively high. The return of gold is more consistent than Sensex. There is a weak association between gold prices and Sensex movements. Hence, investing in gold is preferable during a volatile capital market.

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