

PROJECT REPORT



A study on relationship of fluctuations of prices of gold, silver and copper on BSE SENSEX

SUBMITTED TO

Mrs. Sukhvinder Kaur

Mrs. Garima

MADE BY:

EKAMJEET SINGH ANAND

SHARANPREET KAUR

HARSIMRAN KAUR

ARSHDEEP KAUR

SIMARJEET SINGH

HARNEET KAUR

CERTIFICATE

This is to certify that information and data used in the project is based on the data from various resources, which have been mentioned in the Bibliography.

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Mrs. Sukhvinder kaur

(Prof.)

Mrs. Garima

(Prof.)

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INTRODUCTION

There have been a lot of changes made in India's economy primarily driven by liberalization and globalization since 1991. These changes have impacted positively or negatively almost all the sectors of our economy along with India's Capital market. Multiple factors play their role in the growth of economy such as macroeconomic variables, performance of industry and investment climate, political stability etc. In this study we pertain to perform comparative analysis between Indian Stock Market and macroeconomic variable Gold and silver price. The objective of the study is to investigate the relationship between Indian Stock market and Gold Price and silver price. Investors have historically used risky strategies in their portfolios such as diversifying across countries, including gold and silver investments, because such investments typically have had an inverse relationship with stock market movements. Technology has changed the environment in which there are very few obstacles today to hinder investors from buying or selling assets anywhere in the world. There are also many other options for investors to avert risk so that gold is not considered merely another commodity. In the commodity market, gold and silver has its exceptional significance and gold is still considered as a safe investment when compared to equity and constantly rising because of its big demand in the country and mainly gold provides the full security for short term and long term return. As per World Gold Council (WGC), Indians hold more than 18 thousand tons of gold, which signifies more than eleven percent of the total gold stock and it is largest in the world. According to the Gems and Jeweler Export Promotion Council (GJEPC), the apex institution of Gem and Jeweler in India will organize the first Indian Gold and silver Jeweler Summit 2018. The Summit will mainly concentrate on four large areas i.e. export of Jeweler, code of conduct and values for jeweler industries in India, spot exchange of gold in India and value addition through Jeweler manufacturing (GJEPC India). After the global financial crisis in 2008, day by day the capital flows of emerging economies stock markets have incessantly much better and their removal of the international capital controls due to the liberalization of economies. At the same time, it was very difficult and risky to make their investment decisions because the unexpected

Volatility of stock market returns. Therefore, the bottomless insecurity in stock

Market returns as a result of its volatility has a causal relationship and influencing the demand for gold. In this context, this paper investigated the relationships between gold price and Indian stock market indexes i.e. NSE-Nifty and BSE- Sensex. Results show that there is a positive association with Indian.

HYPOTHESIS

Hypothesis of the project is as follows.

NULL HYPOTHESIS- THERE IS NO EFFECT OF FLUCTUAIONS IN THE PRICES OF GOLD AND SILVER ON THE BSE SENSEX.

ALTERNATIVE HYPOTHESIS- THERE IS AN EFFECT OF FLUCTUATIONS IN THE PRICES OF GOLD AND SILVER ON THE BSE SENSEX.

VARIABLES

Variables used in the project re as follows

DEPENDENT VARIABLE	INDEPENDENT VARIABLE
BSE SENSEX	GOLD PRICE
	SILVER PRICE
	COPPER PRICES

In our research report, we have taken the BSE SENSEX as a dependent variable and prices of gold, silver and copper as independent variable since these are enough to bring a change in the behavior of Sensex.

People not only change their investment decision on the basis of the prices of the stock, their investment decagons are also influenced by other variables as well about which have discussed in the project.

OBJECTIVES

PRIMARY OBJECTIVES

- To study about the relationship between the volatility of the gold and silver prices in the commodity market.
- To carry out the comprehensive analysis of the gold and the silver market in India

SECONDARY OBJECTIVES

- To study different factors affecting the gold & silver prices
- To find out how price of gold & silver fluctuate in the Indian commodity market?
- To interpret about the movement of prices of gold & silver in the commodity market
- To find whether the gold or silver is a good investment or not?

A relation between Independent and Dependent variables was to be made in order to study the effects on the dependent variables.

Dependent variable- BSE SENSEX

Independent variables- Gold and Silver

LITERATURE REVIEW

The existence of unidirectional or bidirectional relationship between gold Price and Sensex for the period of 10 years (2002-2012) was studied by

Narang and Raman.

The results of the analysis show that there is no Causality between the gold price and Sensex. The results revealed that Returns of Sensex index does not lead to increase in gold price and rise in Gold price does not lead to increase in Sensex. Bhutan and Dash (2018) assessed the dynamic causality analysis between Indian gold price movements and Indian stock market returns by using secondary monthly time series data with causality and Johansen integration test. Johansen co-integration indicated that there is a long term relationship exists between gold price and stock returns and Granger causality test results pointed out that there is no causal relation between gold and stock return.

Afsal and Haque (2016)

Specified the market interactions in the very important macroeconomic indicator i.e. gold price and stock markets based on Saudi Arabia. They mainly pointed out the non-linear dependencies with stock market in the Saudi Arabian perspective by the help of univariate and multivariate models of generalized autoregressive conditional heteroskedasticity (GARCH) analysis. The findings chiefly proved that there is no dynamic relationship between gold price and stock market.

Sur and Bhunia (2016)

observed the impact of selected macroeconomic variables on Indian stock market by using so many important macroeconomic indicators i.e. BSE-Sensex, NSE Nifty, Gold price, Crude oil price, Real Interest rate, Wholesale price index and Exchange rate with monthly time series data for the period from 1997 to 2015. The results revealed that the positive reaction of sensex

and nifty on crude oil prices, exchanges rates, real interest rates and whole prices indices but a negative impact from Sensex and nifty to real interest rates.

Sireesha (2013)

Examined the impact of macroeconomic factors and the variations introduced in Indian Stock Market via them. Linear regression technique was the key fundamental behind her research methodology and she performed analysis on Nifty, Silver and Gold returns via same. Gold and silver are considered primarily for analysis as these have been lucrative to the Indian investors and hence are studied in parallel with the stock returns. Internal variables and their performance revealed interdependence between these variable with returns on stock, gold and silver. GDP and Inflation has significant influence on Stock Return whereas Money supply had the same on Gold Returns.

Venkatraja, B. (2014)

Spent time analyzing the existence and extent of relationship between the performances of Indian Stock Market with context to the various macroeconomic variables. These variables include price of gold, index of industrial production, inputs from foreign institutions in terms of investment, wholesale price index and the effective exchange rate. Analysis was conducted on grounds of monthly data collected starting April 2010 and spanning until June 2014. Technique involved behind the research was regression methodology. As an outcome of the research it was discovered BSE Sensex was positively influenced by all the macroeconomic variables listed above except the gold price, in fact gold price had an inverse relation with Stock market variations for BSE Sensex. In addition, it was discovered that coefficients of all the variables were statistically noticeable except for the index of industrial production.

Luthra and Mahajan (2014)

In their study aimed to analyze the impact which certain macroeconomic factors had on BSE Banked. The fundamental variables covered for the analysis include growth rate of GDP, inflation rate, exchange rate and the price of gold. Shedding details on the BSE Bankex, it is basically an index launched by BSE that includes the banks (both public and private sector) listed on the Bombay Stock Exchange. Index of BSE BANKEX has online visibility and display across the nation on the BOLT trading terminals. As an outcome of the study it was evident and conclusive that BSE Bankex was influenced positively by the exchange rate, rate of inflation and

GDP, however was inversely impacted by Gold Price. Further it was concluded that stock prices for banks were not at all influenced by any of these variables

RESEARCH METHODOLOGY

With a view to accomplish the pre-determined set of objectives of our research, different set of techniques and tests have been adopted. First and foremost, to fulfill the research objectives, descriptive statistics technique like mean, standard deviation, variance, etc. are carried to show the nature and basic characteristics of the variables used in the analysis. Inferential statistics is used for linear regression analysis which creates a mathematical model that can be used to predict the values of a stock price of Bombay stock exchange indices based upon the values of macroeconomic variables. In other words, we use the model to predict the value of Y when we know the value of X. Here, we used the sign-f to analysis the overall significance of the sample regressions and t- test and p-value to check the individual significance of the macroeconomic variables

Collection of data

The first and the foremost step to analyses and research is the collection of the data.

Secondary source – when the researcher collects the data from the secondary sources such as journals, internet and the statistical books available online as well as offline

Descriptive statistics technique

Descriptive statistics describes the patterns and general trends of a dataset and summarize it in single value. It enables a reader to quickly understand and interpret the set of data that has been collected. In our study, descriptive statistics provide a useful quantitative summary of macroeconomics variables such as gold and silver prices and BSE indices. Here, descriptive statistics provide a historical account of variables behavior and convey some future aspects of the distribution of dataset. We have used measures of central tendency (mean) and measures of Variability (standard deviation, range, variances, minimum and maximum) to explain the dataset.

Inferential statistics technique

Inferential statistics is used to make inferences/ valid judgments about the characteristics of a population based on sample data. These statistics techniques are the ways of analyzing data that allow the researcher to make conclusions about whether a hypothesis was supported by the results... A null hypothesis states that the results will be due to chance whereas an alternate hypothesis tells that the results are due to the manipulation of the independent variable. Here in our study, null hypothesis (H₀) is there is no relationship between Bombay stock exchange indices and selected macroeconomics variables while alternate hypothesis (H_a) is that there is relationship between 19 | P a g e Bombay stock exchange indices and selected macroeconomics variables. There are different ways to inference the results. Here, we used correlation matrix analysis and linear regression analysis (t ratio, f-sign, and p- value, r-square) which allows us to make a conclusion related to our hypothesis. We have used 5% of level of significance and two tailed test so as to accept or reject our null hypothesis according. Regression analyses are typically done using statistics software and here we used SPSS software.

Econometric Regression Model

Linear regression analysis is an inferential statistical technique that is used to learn about the relationship between an independent variable (referred to as X) and dependent variable (referred to as Y) When there is only one independent variable, the prediction method is called simple regression. So, the regression equation $Y_i = \beta_0 + \beta_1 X_i + u_i$ where Y_i is the dependent variable, X_i is the independent variable, β_0 is the constant (or intercept), β_1 is the slope of the regression line which represent the strength and direction of the relationship between the independent and dependent variables and u_i is random error term. Here, in our study we carried out this method to see and interpret the effect of macroeconomic variables (gold and silver price) on stock exchange indices (share price).

DATA

- AVERAGE OF GOLD PRICES IS TAKEN FOR THE YEAR 2018 PER 10 GRAMS.
- AVERAGE OF SILVER PRICE IS TAKEN FOR THE YEAR 2018 PER 10 GRAMS.
- AVERAGE OF BSE SENSEX IS TAKEN FOR THE YEAR 2018.

DATA ANALYSIS

For data analysis, SPSS software was used in order to calculate results.

Following results were obtained

1. R square through descriptive statistics
2. P-stat
3. T-stat
4. Anova

Model Summary (BSE)					
<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>		
.83	.68	.63	1714.89		

ANOVA (BSE)					
	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
<i>Regression</i>	126268098.96	3	42089366.32	14.31	.000
<i>Residual</i>	58816725.57	20	2940836.28		
<i>Total</i>	185084824.53	23			

Coefficients (BSE)					
	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
<i>(Constant)</i>	44587.91	15830.75	.00	2.82	.010
GOLD	.14	.54	.04	.25	.802
SILVER	-87.63	23.62	-.50	-3.71	.001
copper	50.12	15.95	.53	3.14	.005

Regression Statistics	
Multiple R	0.824713433
R Square	0.680152247
Adjusted R Square	0.632175084
Standard Error	1720.449916
Observations	24

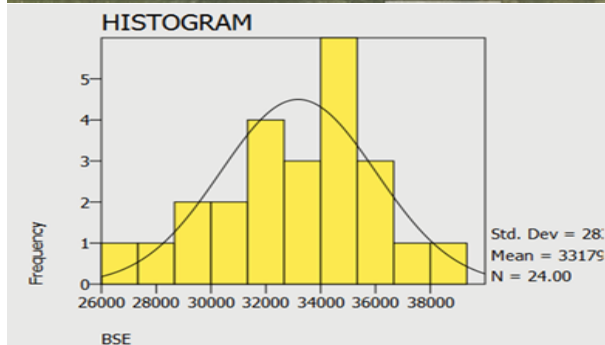
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0
Intercept	44610.17973	15882.24226	2.808808668	0.010843681	11480.40291	77739.95654	11480.40291
X Variable 1	0.151993394	0.54422438	0.279284426	0.782894238	-0.98323877	1.287225558	-0.98323877
X Variable 2	88.06183389	23.66338458	3.721438648	0.001348184	137.4227892	38.70087863	137.4227892
X Variable 3	49.50051457	15.90672008	3.111924665	0.00549422	16.31967791	82.68135123	16.31967791

ANOVA

	df	SS	MS	F	Significance F
Regression	3	125885844.4	41961948.14	14.17658329	3.49116E-05
Residual	20	59198958.3	2959947.915		
Total	23	185084802.7			

Valid cases = 24; cases with missing value(s) = 0.

Variable	N	Mean	S.E. Mean	Std Dev	Variance	Minimum	Maximum
BSE	24	33179.61	579.05	2836.75	8047166.28	27213.73	38059.32
GOLD	24	30232.50	172.06	842.93	710523.91	28800.00	31710.00
SILVER	24	421.08	3.27	16.03	257.05	397.92	462.55
copper	24	425.23	6.07	29.74	884.27	369.43	469.35



INTERPRETATION

- R square means 68% variation in dependent variables is due to independent variables.
- P value of annova is quite low, less than 5%, it means that the model is statistically significant
- In t table, p value of silver is coming out to be low, this means that it also significant.

There is a negative relation between BSE senex and the prices of commodities. From the table with descriptive statistics, there is a maximum variation in the dependent variable BSE . Silver has the least variation in the model which means that there is very less impact of fluctuation in silver prices on BSE Sensex. Gold prices have the maximum impact on

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