International Journal For Technological Research In Engineering
Volume 4, Issue 7, March-2017 *ISSN (Online): 2347 - 4718*

TO STUDY ABOUT RELATIONSHIP BETWEEN GOLD PRICE, NEW YORK STOCK EXCHANGE (NYSE) & BOMBAY STOCK EXCHANGE (BSE)

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Abstract: Basically investment is employment of funds with a purpose of earning income or capital appreciation. Gold is adulated all over the India and world for its price and rich history; people have continuous to hold gold considering it as a good avenue for investment. Gold has customarily been considered a smart investment in India and its excellent performance in modern years has substantially confirmed the wisdom of that tradition. Similarly, moments of the stock exchange are watched all over the world as they are well thought-out the barometers of industrial performance. In this paper, consider the Bombay Stock Exchange (BSE) as its sensex is the oldest as well as being more popular stock exchange in India. The new York stock exchange (NYSE) is also the largest stock exchange in the world & its movements influence the world economy. This paper deals with the relationship between gold price, BSE & NYSE. In this paper some the some of data taken few years into account for doing the research.
Keyword: Gold Price, Stock Exchange, BSE, NYSE

I. INTRODUCTION

Stock markets can demonstrate involved inter-relationships at different time scales, not effortlessly discernible through conventional methods of analysis [1-4]. These connections have become even more difficult with the advent of globalization. The intricacy degree can vary from pair to pair and depending on the inter-dependencies arising from the requirements of the two economies, possibly and global factors also on the size of economies of the two countries. For a moderately insular economy like that of India, the scenery of the stock market's correlations with other countries can be subtle. Usually, insularity is predictable to protect an economy from short term global trends, whereas possibly impacting it in the long run. The study of the capital market of a country in conditions of a wide range of financial variables and macro-economic has been the subject matter of many researches since last few years. Observed studies reveal that once financial deregulation takes place, the stock markets of a country become more sensitive to both external forces and domestics and One such factor is the price of gold. Experiences show that the movement of gold prices is always higher during period of stock market slump. In India, stocks do not appear to be apparent as an alternative to gold. The reason for investment gold is, to a large amount, guided by the individual sentiments. Usually gold investing habits of Indians strongly embedded in the Indian Social Psyche. In India gold market has been held by individuals for years and has approved hands of many generations. This tendencies propose positive returns during a crisis of such a magnitude has renewed the interest in gold.

II. NECESSITATE AND OBJECTIVES OF THE STUDY

There are various distinctive qualities that split gold from the rest of the commodities, for example the U.S. dollar is price rises fears, weakening, appearance of China and India, Supply constraints, Geopolitical instability. Nevertheless, gold is viewed as a safe haven during all times of political or economic calamity.

Objectives of the study:

- To evaluate the different factors which affect the gold price.
- To analyzed study the impact of exchange rate of USD with INR on gold prices.
- To analyzed study the impact of Prices of crude oil on the gold prices.
- To analyze and study the impact of repo rate on the gold price.
- To study the impact of Inflation on the gold prices
- To study the performance of BSE & NYSE
- To study about know the return and risk of the stock exchanges

III. IMPORTANCE OF STOCK EXCHANGE

- Given that new capital through IPO's The company can appreciate their investment by providing employees additional incentives by granting share options which in turn will create a sense of belonging towards the company.
- Inventory in the stock exchange will increase their public profile
- Stock exchange provides comfort to the customers and suppliers
- Stock exchange a readymade market for the sellers & buyers

IV. RESEARCH METHODOLOGY

For fundamental research to ascertain the quantitative relationship between prices of gold and other factors (daily prices of gold and other factors) like stock exchange were collected from the data from various secondary sources like magazine, newspapers, internet, books, journals were referred to understand the relationship between price movements of gold and other factors. The main data sources are Gem & Jewellery Export Promotion Council (GJEPC), World Gold Council (WGC) nad State Trading Corporation (STC) Ltd. In addition to custom of statistical packages the quantitative data was analyzed through regression etc. For

the quantitative study, the period of some years is taken commencing from November 2006 to December 2011 is considered, throughout which daily prices of gold and other factors were taken into account.

Hypotheses:
Hypothesis Assumed (H0):

- Gold Prices is not depending upon Dollar exchange rate.
- Gold prices do not depend on crude oil prices.
- The Repo rate does affect the gold prices.
- Inflation rate doesn't affect the gold prices.

H0: There is no difference between the groups
Hypothesis Assumed H1: There is difference between the groups

Tools and techniques:
A comparative study of different factors have been done on the various parameters like Standard Deviation, trend analysis, Regression, and correlation to make possible the tedious task of analysis of these factors. Furthermore analyzing the factors will suggest the investors that whether it will be profitable for the investors to invest in gold or not.

V. CALCULATION OF METHODOLOGY

To evaluate & understand of stock exchanges and gold price a clear assessment is done by taking into account of various statistical tools. For this purpose, the tools selected are standard deviation, correlation, mean & variance, which are applied on the returns from the respective stock exchanges. The gathering of data is done from secondary sources only. This information is gathered from the official textbooks, publications, magazines, journals etc. and related website links, published materials.

Calculation:
To analyses, the relationship between gold price, New York stock exchange (NYSE) & Bombay stock exchange (BSE), in this paper present the one-way ANOVA and two-way ANOVA methods.

One Way ANOVA:
Though the test is a useful statistic, it is limited to testing hypotheses about two levels or conditions. The analysis of discrepancy (ANOVA) was developed to allow a researcher to test hypotheses about two or more conditions. Fundamentally, then, one could learn to compute ANOVAs and never compute another test for the rest of one's life.
As with the test, you are computing a statistic to test the declaration that the means of the populations of participants given the particular treatments of your conduct test will all perform in a alike approach on the dependent variable. That is, you are testing H0: $\mu1 = \mu2 = \mu3 = ...$, typically through the hopes that you will be able to reject H0 to provide evidence that the different hypothesis (H1: Not H0) is more likely. To test H0, you take a sample of participants and arbitrarily assign them to the levels of your factor. In this method, calculations steps are summarized in table explain follow:

Summarized table for One Way ANOVA

Source of Variation	Sum of Square (SS)	Degree of Freedom (d.f.)	Mean Square (MS)	Variance Ratio of F
Between the Samples	SSC	k-1	$\boldsymbol{MSC} = \frac{\boldsymbol{SSC}}{\boldsymbol{k-1}}$	$\frac{\boldsymbol{MSC}}{\boldsymbol{MSE}}$
Within the Samples (error) (column)	SSE	N-k	$\boldsymbol{MSE} = \frac{\boldsymbol{SSE}}{\boldsymbol{N-k}}$	-
Total	SST	N-1	-	-

SST: Total sum of square of variance
SSC: Sum of squares between samples due to columns
SSE: Sum of squares within samples due to error
MSC: Mean sum of squares between samplesdue to columns
MSE: Mean sum of squares within samples due to error
Note:
While calculating values sometimes we may subtract a constant from each obserbation.
While calculating F ratio we compare mean sum of squares for
Rows and error
Columns and error & calculate F ratio as $F = \frac{Larger\ \ value}{Smaller\ \ value}$
Example: A pharmaceutical company wishes to test whether its three salesmen A, B and C tend to make sales of the same size or whether they differ in their selling ability as measured by the average size of their sales. The following are the weekly sales record of three salesmen.

A	B	C
20 units	50 units	60 units
30 units	20 units	20 units
20 units	20 units	30 units
40 units	30 units	50 units
30 units	40 units	40 units

Determine whether the average sales of three salesmen differ in size.
Two Way ANOVA:
It is believed that two independent factors might have an effect on the response variable of interest it is possible to design the test so that an ANOVA can be used to test for the effects of two factors simultaneously. Such a test is called two factor ANOVA. Here the data are classified according to two independent factors, for examples, a comparison of various tablet formulations. In this case one factor is represented in rows & the other in columns. In two-way classification one can test two sets of hypothesis with the same data at the same time. The procedure for ANOVA is somewhat different than the one followed while dealing with the problem of one-way classification. In two-way classification. SST is given by
SST=SSR+SSC+SSE
SST: Total sum of squares
SSR: Sum of squares due to Rows
SSC: Sum of squares due to columns
SSE: Sum of squares due to error

All the information about the two way ANOVA is summarized in the following table:

Table: Summarized of Two Way ANOVA

Source of Variation	SS	d.f.	MSS	F-ration
Due to rows	SSR	$h-1$	SSR/(h-1)=M_1	$F_C = \frac{M_1}{M_3}$
Due to columns	SSC	$k-1$	SSC/(k-1)=M_2	$F_C = \frac{M_2}{M_3}$
Due to error	SSE	(h-1) (k-1)	SSE/(h-1)(k-1)=M_3	-
Total	SST	$hk-1$	-	-

Example: The following data represent the number of units of production per day turned out by 5 different workers using 4 different types of machines:

Worker	Machine Type			
	A	B	C	D
1	40	34	43	42
2	42	36	48	39
3	30	32	40	28
4	39	34	42	49
5	34	38	45	35

Test whether the mean productively is the same for the different.

VI. ANALYSIS & INTERPRETATION RETURNS

Table 1 NYSE Composite Index Yearly

Year	Ending Price	Retruns(X)	X-mean	(x-mean)2
2005	7753.95	6.95%	2.05%	4.2025
2006	9139.02	17.86%	12.96	167.9616
2007	9740.32	6.58%	1.68	2.8224
2008	5757.05	-40.89%	-45.79	2096.7241
2009	7184.96	24.80%	19.9	396.01
2010	7964.02	10.84%	5.94	35.2836
2011	7477.03	-6.11%	-11.01	121.2201
2012	8443.51	12.93%	8.03%	64.4809
2013	10400.33	23.18%	18.28	334.1584
2014	10839.24	4.22%	-0.68	0.4624
2015	10143.42	-6.42%	-11.32	128.1424

TABLE 2 BSE

Year	End price	Return	X-mean	(x-mean)2
2005	9,397.93	42.33%	22.58	509.8564
2006	13,786.91	46.70%	26.95	726.3025
2007	20,286.99	47.15%	27.4	750.76
2008	9,647.31	-52.45%	-72.2	5212.84
2009	17,464.81	81.03%	61.28	3755.2384
2010	20,509.09	17.43%	-2.32	5.3824
2011	15,454.92	-24.64%	-44.39	1970.4721
2012	19,426.71	25.70%	5.95	35.4025
2013	21,170.68	8.98%	-10.77	115.9929
2014	27,499.42	29.89%	10.14	102.8186
2015	26,117.54	-4.87%	-24.62	606.1444

TABLE 3 GOLD

Year	Price (rs)	X return(%)	X-mean	(x-mean)2
2005	7000	24	11.246	126.4725
2006	8400	20.8	8.046	64.7381
2007	10800	16.5	3.746	14.0325
2008	12500	19.8	6.546	42.8502
2009	14500	19.3	6.546	42.8502
2010	18500	22.3	9.546	91.1261
2011	26400	31.1	18.346	336.5757
2012	31050	10.3	-2.454	6.0221
2013	29600	-18.7	-31.454	989.3541
2014	28006.5	0.8	-11.954	142.8981
2015	26343.5	-5.9	-18.654	347.9717

	NYSE	BSE	GOLD
MEAN	4.9	19.75	12.75
Standard Deviation	17.46026	35.40828	14.15784
Standard Variance	304.678	1235.746	200.444

One Way ANOVA						
	2005	2006	2007	2008	2009	2010
NYSE	6.95	17.86	6.58	-40.89	24.8	10.84
BSE	42.33	46.7	47.15	-52.45	81.03	17.43
GOLD	24.2	20.8	16.5	28.8	19.3	22.3
TOTAL	73.48	85.36	70.23	-64.54	125.1	50.57

One Way ANOVA					
	2011	2012	2013	2014	2015
NYSE	-6.11	12.93	23.18	4.22	-6.42
BSE	24.64	25.7	8.98	29.89	-4.87
GOLD	31.1	10.3	-18.7	0.8	-5.9
TOTAL	49.63	48.93	13.37	34.91	-17.19

SQUARE						
	2005	2006	2007	2008	2009	2010
NYSE	48.30	318.9	43.29	1671.9	615.04	117.50
BSE	1791.8	2180.8	2223.1	2751.0	6565.8	303.80
GOLD	585.64	432.6	272.2	829.44	372.49	497.29

TOTAL	2425.8	2932.5	2538.6	5252.4	7553.3	918.60

SQUARE					
	2011	2012	2013	2014	2015
NYSE	37.33	167.18	537.31	17.80	41.21
BSE	607.12	660.49	80.64	893.41	23.71
GOLD	967.21	106.09	349.69	0.64	34.81
TOTAL	1611.67	933.76	967.64	911.86	99.74

VII. CONCLUSION

The period after post liberalization has shown massive growth in India. India should try to be the source of power for the future generations to come & make its presence felt in the world scenario. More & more instruments should be developed to have additional impact on NYSE and measures should be taken to increase the growth in Indian economy.

Gold contains an massive shine to invest in and considered a safe haven for savings and stock market appears to be volatile and risky in nature. Observed relationship is investigated of Gold and Stock Market Index-SENSEX. A granger causality test result shown that a unidirectional relationship from SENSEX to Gold prices indicating SENSEX effects Gold prices. This relationship results indicate a high degree of positive correlation between both SENSEX and Gold Prices. According to the long run and short run return psychiatry it has been observed that returns yielded by stock market were comparatively higher than gold investment returns.

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