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An Analysis of Relationship between Crude Oil, Gold, Sensex and Currency

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ABSTRACT: Oil and gold are considered as investment assets and are closely related to evolution of the stock market indices. These commodities have an influence on the decisions about the investment portfolios that can affect stock market returns. Hence it is important for the investors to analyze the influence of the crude oil, gold and stock markets before they decide on their investment strategies. This paper attempts to find out the relationship between crude oil, gold, sensex and the currency. The data has been taken for the years 01/01/2018 to 31/12/2022. Correlation analysis has been used to identify the degree of correlation. Regression analysis has been used to analyze the interdependency of crude oil, gold with sensex and currency. The findings revealed that sensex is influenced by multiple factor like economic growth, political development and other factors. The price of only oil, gold and currency won't have a significant influence on the value of the sensex.

Key words: Sensex, Gold, Oil, Correlation, Regression.

I. INTRODUCTION:

In the globalization era financial markets undergo continuous significant changes, which in turn affectdifferent economies in the world. In many developing countries like India, there has been marked change in principles of government towards consolidation of Indian economy with world economy. The turbulence effect in one market is felt if one market experiences the increase in their level of integration, shocks and events that happened in that market it affects the other interlinked financial markets. This will have a direct effect on the stability since negative and positive effects will spread among the co-integrated capital market. The trend of market in the world of economy is noticeable in financial and commodity market also. On the other hand, there is a common belief that the price of commodities tends to move since they are influenced by common macroeconomic factor like rate, exchange rate and inflation. Other macroeconomic factors like gold and oil are the two strategic commodities which have received close attention recently due to the rush in prices and increase in economic usage.

In the world the most commonly traded commodities are crude oil and its price is changeable in its market. Gold is considered as the leader in the precious metal market and as an investment asset commonly known as 'safe heaven' which compensate for risks in financial markets. In the year 2009 oil price has risen while the dollar continued to crash down but before oil price surge the dollar exchange rate was strong.

1.1 CRUDE OIL- Petroleum also called crude oil is a thick and black liquid. Crude oil is a naturally occurring, unrefined petroleum product composed of hydrocarbon deposits and other organic. Crude oil is a mixture of many different chemicals (mostly hydrocarbons), most of which burn well. It is separated into simpler, more useful mixtures by fractional distillation in oil refineries to give separate chemicals such as gasoline (or petrol) for cars, kerosene for airplanes and bitumen for roads. Since India imports 82% of its oil needs and aims to bring that down to 62% by 2022 by replacing it with local exploration, renewable energy and indigenous ethanol fuel.

1.2 GOLD-Gold is a soft, dense, yellow metal. They use this gold to make jewelry, and as money. Gold is the most precious metal and from the ancient time it has a more prominence value in the post and in the future. This metal is a symbol of wealth, supremacy, beauty, and it holds immense religious magnitude in Indian culture.

1.3 SENSEX-Sensex, otherwise known as the S&P BSF sensex index, is the benchmark index of the Bombay stock exchange (BSE) in India. Initially composed in 1986, sensex is the oldest stock index in India, the index's composition is reviewed in June and December each year Analysts and investors observe the growth, development of particular industries and booms and busts of Indian economy by sensex. It is a free – float market – weighted stock market index of 30 well established and financially sound companies listed on Bombay stock exchange.

1.4 CURRENCY-In exchanging goods and services, we need a common denominator to value the goods and services. A currency acts as an intermediary and is necessary to perform as common denominator . Exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. Exchange rates are determined in the foreign exchange market which is open to the wide range of different types of buyers and sellers. National stock exchange of India limited (NSE) is the leading stock exchange of India, located in Mumbai, NSE was established in 1992 as the first dematerialized electronic exchange in the country and it provides modern fully automated screen – based electronic trading system.

1.5 EXCHANGE RATE-Exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. Exchange rates are determined in the foreign exchange market. Which is open to the wide range of different types of buyers and sellers and currency trending is continuous 24 hours a day except weekends i.e. trading from 20:15 GMT on Sunday until 22:00 GMT Friday. National stock exchange of India limited (NSE) is the leading stock exchange of India, located in Mumbai, NSE was established in 1992 as the first dematerialized electronic exchange in the country and it provides modern fully automated screen – based electronic trading system. This offered easy trading facility for the investors across the length and breadth of the country.

II. REVIEW OF LITERATURE-

According to Samuel Thangaraj.S (2017) in their article has explained how gold has been considered as a lucrative investment over the decade. Daily average data has been taken for the study. Karl Pearson correlation has shown that there is a positive correlation between gold and stock market. The findings of the study have revealed that gold has an influence on the stock market represented by the Nifty 50 Index. Kanungo.A.K , Dang.P in their study have analysed the stock market from 2005 to 2019 . The authors have studied the pre global financial crisis, during the crisis and post crisis. The variables have been analysed used Granger Causality Test, Johansen Cointegration and vector autoregression. The Granger Causality Test revealed the granger effect amongst all the variables. Impact of the exchange rate has changed over the previous period. Sivasubramanian.K, Dr.Raju.V and Jagadish.K.K in their article have analysed the variable of gold, Nifty, and crude oil for the study. Data has been studied for a decade. This period was selected to find out the impact of the financial policy of 1991 . Regression analysis has been used to study the variables. The findings revealed that gold price has a positive relation with Nifty points whereas crude oil price doesn't have an influence on the determination of gold price.Mongi Arfaoui, Aymen Ben Rejeb (2017) in their article have tried to examine in a global perspective the interdependencies and the interlinkages between gold, oil, US Dollar and stock prices between 1995 and 2015. Simultaneous equation estimation has allowed to examine the direct and the indirect effect between the variables. The findings revealed that there is a negative relationship between oil and stock prices while oil prices are affected by gold rates and USD. US Dollar is negatively affected by stock market and significantly by the oil and gold prices. **According to Shaminder Kaur, Deepinder Kaur(2017) -** in this article "dynamic relationship between gold price and Indian stock market". In this article he has try to show the relationship between gold price and Indian stock market. The data is based on secondary data. The data is collected from 2007 to 2016 on monthly average data. He has used Karl Pearson correlation test and it shows positive result. The finding is that there is significant impact on stock market indicator BSE-SENSEX. It concludes by saying increase in sensex or gold price leads to increase in gold price or sensex. **'V Gayathri, Dr. Dhanabhakyam' (2014)** – In this study "co integration and causal relationship between gold price and nifty" in there article they try to test their relationship, both variables of the study have witnessed significant changes over international gold price and daily NSE nifty data are obtained for a period of 10 years from January 2003 to December 2013 with 2888 observations. They used time series techniques to study the co integration and causal relationship between gold price and NSE nifty index. **According to 'Girish Karunakaran Nair, Nidhi Choudhary, Harsh**

Purohit' (2015) – in this article " the relationship between gold price and exchange value of US dollar in India" they tried to understand the impact of recession of 2008 on relationship between exchange rate of US dollar in INR and gold prices in India. They used granger causality test to check the lead lag relationship between the variable. The data collected and study is divided in three phases they are pre, during and post financial crisis. The study hence concludes that exchange value of US dollar is an important factor in fluctuations in gold price. **According to 'Shilpa Lodha' (2017)** – In this research they try to show the "the study to gold price, crude oil price, and exchange rate" they have taken the data of 9 years from 2005 to 2014,there study examines the long run and short run interdependence between USD/INR exchange rate, gold price and crude oil prices. They have used Johansen Co integration test on long run and granger causality test and VAR model on short run. The result shows no long run and bidirectional granger causality excise between crude oil and USD/INR exchange rate

2.1 STATEMENT OF PROBLEM-The value of the crude oil, gold, sensex, currency fluctuates every day (continually changes).More factors are influencing the price such as demand and supply, stock, market, crude oil, foreign currency. So, in this study an attempt has been made to analyze which are the commodities that influence the fluctuations in the sensex.

2.2 OBJECTIVES OF THE STUDY

a) To study the long term relationship between the variables.

b). To study the Joint contribution of crude oil, Gold, and Currency in predicting the movements in the Sensex.

2.3HYPOTHESIS OF THE STUDY :

H0: There is no significant Joint contribution of crude oil, Goldand Currency in predicting the movements in the Sensex

H1: There is a significant Joint contribution of crude oil, Gold and Currency in predicting the movements in the Sensex

III. RESEARCH METHODOLOGY-

3.1 DATA COLLECTION: To evaluate the impact of crude oil, gold and currency in predicting the movements of the sensex data was collected for a span of five years .i.e., 2018 to 2022 for the purpose of the study. The collected data was then analyzed on Statistical Package for Social Sciences (SPSS) software.For literature review and other details the author has referred to journals, books, websites .etc.

3.2 METHODOLOGY FOR THE STUDY:A multiple correlation coefficient yields the maximum degree of linear relationship that can be obtained between two or more independent variable and a single dependent variable. When more than two variables are involved then it is said to be multiple correlation. Anova stands for Analysis of variance. It is a statistical method used to analyze the differences between the means of two or more groups or treatments. It is often used to determine whether there are any statistically significant differences between the means of different groups. Multiple Correlation and ANOVA were computed to find out the relative contributions of different variables on the dependent variable. Tests were conducted on a 5% level of significance. In this article the influence of crude oil, gold and currency on the sensex movement have been taken for the study.

4. Data Analysis And Interpretation- Crude oil, petroleum are global commodities and RE influenced by the demand and supply factors. Hence they change too often. The data has been collected for a span of 5 years from 2018 to 2022 to understand whether these commodities influence the sensex. Here the data is analyzed by using ANOVA and Multiple Correlation Analysis

Table 1: Multiple Correlation Coefficient of Crude oil, Gold, and Currency in predicting the movements in the Sensex

Variables	$R_{4(2,3,4)}$
1. Price of Crude oil 2. Price of Gold 3. Currency value 4. Movement in Sensex	0.147

Source: Secondary Data

From Table 1, it can be seen that the multiple Correlation Coefficient is 0.147 which is **not significant**, as the error is more than the desired value. It indicates that there is **no significant Joint Contribution** of Crude oil, Gold, and Currency in predicting the movements in the Sensex. Thus, the null hypothesis that there is no significant Joint Contribution of Crude oil, Gold, and Currency in predicting the movements in the Sensex is **Not Rejected**. It may therefore be said that Crude oil, Gold, and Currency did not Jointly contribute and are not good predictors for the objective fixed.

Table 2: Variable -wise Individual contribution in predicting the movements in the Sensex

Variable	Beta Coefficient	% Of Contribution
Crude Oil Price	-.097	1.0961
Gold Price	.094	0.987
Currency Value	-.020	0.086

Source: Secondary data

From Table 2, it is evident that Beta Coefficient for Crude Oil Price, Gold Price, and Currency Value are -.097, .094, and -.020 are not significant. It indicates that there is no significant Individual contribution of Crude oil, Gold, and Currency in predicting the movements in the Sensex. Thus, the null hypothesis that there is no significant Joint Contribution of Crude oil, Gold, and Currency in predicting the movements in the Sensex is

Not Rejected. It may therefore be said that Crude oil, Gold, and Currency did not individually contribute and are not good predictors for the objective fixed.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.147[a]	.022	-.045	513.58238	.022	.325	3	44	.807

a. Predictors: (Constant), Currencyvalue, Goldprice, crudeoilprice

Source: Secondary Data

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	257138.113	3	85712.704	.325	.807[b]
	Residual	11605741.970	44	263766.863		
	Total	11862880.080	47			

a. Dependent Variable: relationshipbetweencrudeoilgoldprices currencywithSensex
b. Predictors: (Constant), Currency.value, Gold. price, crudeoilprice

Source: Secondary Data

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	186.252	80.332		2.319	.025			
	Crudeoilprice	-3.581	5.723	-.097	-.626	.535	-.113	-.094	-.093
	Goldprice	14.033	22.395	.094	.627	.534	.105	.094	.093
	Currencyvalue	-.619	4.654	-.020	-.133	.895	-.043	-.020	-.020

a. Dependent Variable: relationshipbetweencrudeoil,goldprices,currencywithSensex

Source: Secondary Data

Interpretation: It can therefore be said that Sensex can't be influenced by just three variables like Crude Oil Prices, Gold prices, and Currency, but Sensex is majorly influenced by a wide range of factors like economic growth, corporate earnings, political developments, and Global market trends among others. Impact of crude oil, Gold Prices, and Currency Prices on the Sensex will depend upon the overall market conditions and investor sentiment at any given time.

IV. FINDINGS OF THE STUDY:

1. Crude oil, Gold, and Currency did not jointly contribute significantly in predicting the movement of the Sensex.
2. Sensex can't be influenced by just three variables like Crude Oil Prices, Gold prices, and Currency.
3. Sensex is majorly influenced by a wide range of factors like economic growth, corporate earnings, political developments, and Global market trends among others.
4. Impact of crude oil, Gold Prices, and Currency Prices on the Sensex will depend upon the overall market conditions and investor sentiment at any given point of time.

V. SUGGESTIONS FOR THE STUDY:

The above data are compared by two variables it shows the dependency level of one another the higher the value the higher the risk. We can also analyze the market risk involved and the stock exchanges and the performance of variable in a daily basis. The investors, stock holders and the other party related need to consider the environmental changes for decision making purpose so that they can consider the fluctuation in the value of crude oil, gold, sensex and currency.

VI. CONCLUSION:

The interdependencies among oil prices, sensex, gold and currency has an impact on the managerial and investment decisions **.**From this study we can conclude that the relationship between the crude oil, gold sensex and currency are not influencing the movement in the sensex. It is influenced by various other factors in the economy. India's dependency on the Russian crude oil and the continuous struggles of the emerging markets along with the trend to softer world economy in addition to the country's political events move forward these challenges to be drivers of crude oil, gold and currency in the next decade. From this study we can conclude that the relationship between the crude oil, gold sensex and currency are depended on one another for the decision making purpose in the globalization era, if one market experience the increase in the value and in another market may experience the decrease in the value. The price of commodities which tends to move simultaneously with the influence of common factors like interest rate exchange rate and inflation it leads to higher risk because of fluctuation in the value.

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