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AN EXAMINATION OF LONG-RUN AND SHORT-RUN RELATIONSHIP BETWEEN CRUDE OIL PRICE, GOLD PRICE, EXCHANGE RATE AND INDIAN STOCK MARKET

R.KANAKARAJAMMAL
LECTURER

DR. DHARMAMBAL GOVERNMENT POLYTECHNIC COLLEGE FOR WOMEN
CHENNAI

S.PAULRAJ
ASSOCIATE PROFESSOR
MADRAS INSTITUTE OF TECHNOLOGY
ANNA UNIVERSITY
CHENNAI

M.V.ARULALAN
ASSOCIATE PROFESSOR
GURU NANAK COLLEGE
CHENNAI

ABSTRACT

This study was to examine the long-run and short-run relationships between the crude oil prices, Gold prices, Exchange rate and BSE SENSEX an Indian data. The monthly data from January 1995 to September 2012 was used in this study. This study entails the use of ADF Test, PP test and KPSS test for testing the stationarity of variables, Johansen multivariate cointegration test to examine the existence of long run relationships among the variables. In order to capture the short run dynamics, VEC model is established. Granger causality test is carried out to study the direction of causality between the variables. The variance decomposition method is used to find out the proportion of the forecast error of one variable due to the other variables. The results show that all the variables were stationary at first difference with constant and trend, one cointegrating equation was present. The results of the causality test indicate that there is no causal relation between BSE SENSEX and Gold Price and also between BSE SENSEX and Exchange Rate. The results of variance decompositions revealed that out of three macroeconomic variables crude oil price showed larger importance in the interpretation of changes in BSE SENSEX.

KEYWORDS

BSE, Granger causality, Macroeconomic variables, Variance Decomposition, VECM.

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1. INTRODUCTION

Nowadays, stock exchange is the main component of economy in most developed and developing countries. Many researchers have been done long run and short run relationship among stock price index and macroeconomic variables in developed and developing countries. Many Empirical results show that oil price, gold price and Exchange rate greatly affect the Economy and stock market. Therefore this paper attempts to examine the long run and short run relationships between Macroeconomic variables such as crude oil price, gold price and Exchange rate on Indian Stock Market. The study employs the econometric technique of co integration and VEC Model in order to estimate the long-run and short-run relationships between variables.

The rest of the paper is organised as follows: section 2, the past literature is reviewed. While in section 3, provided the data sources and methodology to examine the long-run and short-run relationships between Indian Stock Market and selected variables. The empirical results are discussed in section 4 and finally the conclusion is stated in the section 5.

2. REVIEW OF LITERATURE

The relationship between macroeconomic variables and stock market movements has dominated the academic and practitioner's literature since long. Due to shortage of time and inability to cover all the past studies, some of relevant literatures on the macroeconomic determinants of stock prices have been reviewed in this section that has provided a base for this paper.

Mukherjee and Naga (1995) employed the Johansen co integration test, Vector Error Correction Model(VECM) and found that the Japanese Stock market was co integrated with six macroeconomic variables, namely, exchange rate, money supply, exchange rate inflation rate, industrial production index, long term government bond rate and the short term call money rate. The results of the long run coefficients of the macroeconomic variables were consistent with the hypothesised equilibrium relationship. **Abdalla and Murinde (1997)** investigated interactions between exchange rate and stock prices in the emerging financial markets of India, Korea and Pakistan and Philippines. They found that the results for India, Korea, Pakistan suggest that Exchange rate Granger Cause on stock prices. **Hamilton (2000)** defines an oil price shock as net oil price increase –a long change in the nominal price of oil relative to its previous three years high if positive or zero otherwise. **Ahmed(2008)** investigated the nature of causal relationship between stock prices and key macroeconomic variables (i.e., IIP, Exports, FDI, Money Supply, Exchange Rate, Interest rate) representing real and financial sector of the Indian economy. Using quarterly data, Johansen approach of co integration indicated the presence of a long relationship between stock prices and IIP. In case of short run BSE SENSEX caused to exchange rate. **Gogineni (2008)** explored the reaction of the US stock market as a whole and of different industries to daily oil price changes. It was found that the direction and magnitude of the market's reaction to oil price changes depended on the magnitude of the price changes. Oil price changes most likely caused by supply shocks had a negative impact while oil price changes. **Ghosh, Roy, Bandyopadhyay and Choudhuri (2010)** examined the primary factors responsible for affecting Bombay Stock Exchange (BSE) in India. The paper investigated the relative influence of the factors affecting BSE and thereby categorizing them. With the help of multiple regression models and applying Factor analysis the primary factors were traced out. The relationship between BSE SENSEX and some other important economical factors like, Oil prices, Gold price, Cash Reserve Ratio, Food price inflation, Dollar price, Foreign Capital Inflows has been estimated taking into consideration the Multicollinearity problem among different independent variables and attempted to eliminate it. The results revealed that dollar price along with "Factor 1" i.e; "External Reserve" and "Factor score 2" i.e; "Inflation inertia" are significantly affecting BSE SENSEX. The fluctuations in SENSEX due to Oil and CRR are significant. Any rise in Oil price will create inflation inertia which will generate stochasticity in SENSEX. The External reserves taken together will act as

resource generating Factor in attracting Foreign Capital inflows, which will make SENSEX more sensitive. **Wang and Huang (2010)** analysed the daily data and employed time series method to explore the impacts of fluctuations in crude oil price, gold price, and exchange rates of the US dollar vs. Various currencies on the stock price indices of the United States, Germany, Japan, Taiwan, and China respectively, as well as the long and short-term correlations among these variables. The empirical results showed that there exist co-integrations among fluctuations in oil price, gold price and exchange rates of the dollar vs. various currencies, and the stock markets in Germany, Japan, Taiwan and China. This indicated that there existed long-term stable relationships among these variables. Whereas there was no co-integration relationship among these variables and the U.S. stock market indices. **Kumar (2011)** aimed at studying the nature of the causal relationship between stock prices and macroeconomic variables in India. For this purpose the techniques of unit root tests, cointegration and Granger causality test has been applied between the NSE Index and macroeconomic variables, viz., REER, Foreign exchange reserve, balance of trade, FDI, IIP, WPI using monthly data for the period from 1st April 2006 to 31st March 2010. The major findings of the study are that there was no co-integration between Nifty and all other variables except WPI as per the Johansen co-integration test as per the Johansen co-integration test. Nifty did not Granger cause WPI and WPI also did not Granger NIFTY.

3. DATA AND METHODOLOGY

The following methodological approach is adopted in this study for establishing the relationship between variables and Indian Stock market.

3.1 DATA DESCRIPTION

The present study uses monthly data from January, 1995 to September, 2012 to examine the relationships between selected variables and BSE SENSEX INDEX (i.e., BSENIX) (Used as a proxy to Indian Stock markets). The variables, Crude oil price (i.e., COP), Gold price (i.e., GP) and Exchange rate (i.e., EXRT) were used in this study. The data are obtained from websites of World Bank Data base, RBI, Bombay stock exchange Ltd.

3.2 VARIABLES

A vast amount of studies document that significant relationship exists between Macroeconomic variables and Stock market. In this study three Macroeconomic variables were selected. These variables are Crude oil prices, Gold prices and Exchange Rate.

3.2.1 BSE SENSEX INDEX

The Indian Stock market has been through a lot of phases in a span of few years and the investors have had their share of surprises too. The SENSEX crash of January 2008 swept with it a large number of small scale investors while registering a record dip of 2062 points in a day. The major cause of this crash was attributed to the recession in the global economies, especially with the US dollar losing its strength to the Indian rupee. A large amount of equity in the form of shares was floated in the Indian economy as an impact of Foreign Institutional Investors (FIIs) withdrawing their money from the Indian markets. In 2009 the market was in a recovery mode, in 2010 it consolidated. After maintaining a range of 17,500-20,500 for more than a year, the SENSEX finally crashed. This crash was triggered by major global events, such as the S&P downgrading US debt from AAA to AA+, concern about the AAA rating status of French debt, sovereign debt crisis spreading to bigger Euro zone economies like Italy, Greece and Spain. Hence, several global indices, like the Dow Jones Industrial Average (US), DAX (Germany), CAC (France), and FTSE (UK), broke their major supports. The Bombay Stock Exchange (BSE) is known to be the oldest exchange in Asia. The Bombay Stock Exchange developed the BSE SENSEX in 1986, giving the BSE a means to measure overall performance of the exchange. The SENSEX is the benchmark for the Indian Stock exchange, which captures the price movement. It is considered to be the pulse of the Indian stock markets. Theoretically, the rising SENSEX is an indicator of economic growth and is considered good for the market. So BSE SENSEX has been selected for this study as the representative of Indian stock markets.

3.2.2 GOLD PRICE

The gold rate in today's market depends entirely on the demand and availability of the metal. Gold prices hit its all-time high of \$1,895 an ounce in September 2011. Investors were worried about both the U.S. debt crisis and the euro zone crisis. It seemed neither the dollar nor the euro were safe investments. When other investments look too risky, gold always looks like a good hedge. It is not possible to state that gold's value changes as a result of activity within the stock market and it is also not possible to state that the level of the stock market changes as a result of activity in the gold market. But the historical evidence is overwhelming. Over the long-term, gold and stocks tend to move in opposite directions. This has been born out in research done by the World Gold Council for decades which shows that there is indeed a negative long-term correlation between gold and stocks, as measured by all of the major stock indices, namely the Dow Jones Industrial Average, the Standard & Poor's 500, and the Wilshire 5000. Whether the stocks being compared to gold are large blue chips or small, aggressive growth companies, the correlation to gold is still negative over the long-term.

3.2.3 CRUDE OIL PRICE

Oil is one of the most precious commodities on earth and is available only in limited amounts. Crude oil is the basic form of oil from which is used to extract other useful form of oils like petroleum, diesel, jet-fuel after refining. Companies involved in oil production are exploration and production (E & P) companies (back-end) and refining and marketing companies (front-end). In India, ONGC and Oil India are the leading front-end players while IOC, HPCL, BPCL and Reliance are major back-end players. There are a number of reasons leading to a rise in the oil prices like, a weak dollar. As oil exporting nations get money in terms of dollar for their oil, their profits decrease as dollar becomes weak. So, to protect their margins, they increase oil cost. Also the prices of crude oil are determined by the demand and supply gaps. Higher growth in developing countries like India and China increases demand for oil thereby leading to a price rise. Lastly, war between an oil exporting nation and an oil importing nation (like US and Iran).

Oil prices have significant impact on financial markets. Initially stock market rises in tandem with oil prices as it is the economic growth which is creating more demand for oil in the first place. Because of this increased demand, oil prices are increasing (sometimes they increase because of just speculation which is a dangerous situation and a warning signal). But if oil prices keep on increasing and sustain at higher values for a longer period of times, it will have detrimental effects on the economy. Higher the oil price increase and longer the higher prices are sustained, the bigger the macro economic impact.

3.2.4 EXCHANGE RATE

When it comes to the US being a consumer, it has one of the largest appetites in the world. To keep up its demand for consumption, its imports are huge when compared to exports. This created pressure since there were more payments in dollars than receipt of any other currency, which made the supply of the dollar greater for imports payment and less receipt of foreign currency from exports. This resulted in the depreciation of the dollar's value, which again caused more outflow of dollar for import payments. This created a state of inflation and made consumables costlier to US. To control inflation US resorted to increase in interest rates to cool down pressure on demand side of consumption. This factor along with recession in all other sectors, particularly real estate, is causing the mighty US dollar to shake. Until the 70s and 80s India aimed at to be self-reliant by concentrating more on imports and allowing very little exports to cover import costs. However, this could not last long because the oil price rise in the 1970s and 80s created a big gap in India's balance of payment. Balance of payment (BOP) of any country is the balance resulting from the flow of payments/receipts between an individual country and all other countries as a result of import/exports happening between an individual country, in our case India and rest of the world. This gap widened during Iraq's attempt to take over Kuwait. Thereafter, exports also contributed to FX reserve along with Foreign Direct Investment into the Indian economy and reduced the BOP gap. Indian rupee appreciation against dollar impacted the Indian economy heavily. The advent of floating exchange rate in 1973, reforms of financial markets in the early 1990s and the Asian currency crisis of 1997-98 have jointly made a strong pitch for the dynamic linkage between stock and foreign exchange market. Both the markets are considered as the most sensitive segment of the financial markets because the impact of any such deviation is associated with policy variables as well as macroeconomic variables. However, in the case of foreign exchange market, the impact is direct whereas in the case of stock market there is an indirect impact.

3.3 RESEARCH METHODOLOGY

The main objectives of this paper is how macroeconomic variables affected stock market movement and to what extent or proportion will be explained when there is a shock of error in each variable on stock price indices during this study period and to study the long run and short run relationship that exist between the macroeconomic variables and BSE Sensex Index. First, variables are to be converted in to its log natural form to avoid the problem of heteroscedasticity. Second Unit root tests (ADF, PP, and KPSS) on time series data are to be carried out to ascertain the integration property of the variables. Thirdly, Johansen

cointegration test to be carried out to examine the co-integrating relationship if the variables are of integrated of same order and then VCE model, Causality and variance decompositions analysis are to be used for further proceedings.

3.3.1 UNIT ROOT TEST

Many of variables studied in macroeconomics, monetary economics and financial economics were non-stationary time series. It is compulsory to test the selected time series data for stationary before proceeding for cointegration test and establishing long-run relationships. This paper used three different tests. They are Augmented Fuller test, Phillips Perron test and KPSS test. It is decided upon rejection or acceptance of the null hypothesis by comparing the statistics obtained by the test with critical value. The null hypothesis is that series is not stationary and has a unit root test in the first two tests. If the calculated value is greater than the critical value then null hypothesis is rejected and the series is decided to be stationary. The lag length of the time series analysis is determined by choosing the lag length given by minimum Akaike Information Criteria and Schwarz Information Criteria. KPSS test is preferred in recent studies because ADF test is often criticised for not being able to make distinction between unit root and near unit root process in case of short time series. Null hypothesis of KPSS stationarity test is reverse of the null hypothesis of ADF and PP unit root test. Thus, hypothesis to be built for KPSS test means that null hypothesis time series is stationary and on the other hand alternative hypothesis means that time series is not stationary.

3.3.2 JOHANSEN CO-INTEGRATION TEST

Johansen co-integration test has developed by Johansen and Juselius (1990) in order to investigate of long-run equilibrium relationship between the variables of same integrated order. In applying econometrics techniques determination of lag length of an autoregressive process is a difficult task. To overcome this problem various lag length selection criteria such as Akaike Information criterion, Schwarz Information Criterion, Hannan Quinn Criterion, Final Prediction Error, and corrected version of AIC have been suggested in the literature.

The number of lags in cointegration analysis is chosen on the basis of Hannan Quinn Information criterion in this paper. He derives a test on the number of characteristic roots that are different from zero by considering the two following statistics: the trace value statistics (λ_{trace}) and maximum Eigen value statistics (λ_{max}). The null hypothesis of trace test is that the number of cointegrating vector is less than or equal to 'r' against the alternative hypothesis that more than 'r'. The null hypothesis for Eigen value test is at most 'r' cointegrating vector against 'r+1' cointegrating vector.

3.3.3 VECTOR ERROR CORRECTION MODEL (VCEM)

After the co-integration relationship between the selected variables is established, a vector error correction model (VCEM) can be conceived using these variables. It explains the short-run dynamics between the variables to show the short-term relationship of variables. Before estimation of VCEM model with associated co-integration vector. In this study optimal lag length of VAR was chosen $p=1$ according to BIC criterion.

3.3.4 GRANGER CAUSALITY ANALYSIS

Granger causality test has been performed in the study in order to determine the direction of the relationship between the variables used in the model. It was proposed by C.J. Granger (1969). This study has applied Granger Causality with 2 lags.

3.3.5 VARIANCE DECOMPOSITION

The variance decomposition provided further evidence of relationship among the variables under investigation. The variance decomposition showed the proportion of the forecast error of one variable due to the other variable. Therefore, the variance decomposition makes possible to determine the relative importance of each variable in creating fluctuation in other variables.

4. RESULTS ANALYSIS AND DISCUSSION

This section presents the results of Econometric techniques on monthly data of Macroeconomic variables and Indian Stock market for the period from January 1995 to September 2012.

4.1 DESCRIPTIVE STATISTICS

The descriptive statistics for all the four variables under study, namely, BSE Sensex proxy for Indian stock market index, crude oil price, Gold price, Exchange rate are presented in table 1. Generally values for zero Skewness and Kurtosis at 3 represents that the observed distribution is normally distributed. It is observed that all the selected series have non-symmetric distributions (Even if the median values of variables are close to the average values). The kurtosis value indicates that all the selected series except Exchange rate are less peaked than the normal distribution. The value of Standard Deviation indicates that the exchange rate is less volatile compare to BSE Sensex, Crude oil price and gold price. The Jarque-Bera statistic confirmed that the none of the series is normally distributed.

TABLE 1: DESCRIPTIVE STATISTICS RESULTS

Variables	LnBSEENX	LnCOP	LnGP	LnEXRT
Mean	8.810043	7.412537	10.0078	3.773461
Median	8.557308	7.296284	9.782255	3.802451
Maximum	9.915898	8.687366	11.46367	4.024323
Minimum	7.960864	6.093547	9.313327	3.44634
Std. Dev.	0.689362	0.746405	0.642023	0.118279
Skewness	0.341854	0.001815	0.795438	-0.858144
Kurtosis	1.451931	1.767792	2.297474	3.500911
Jarque-Bera	25.1791	13.34883	26.58976	28.10304
Probability	0.000003	0.001263	0.000002	0.000001
Sum	1858.919	1564.045	2111.647	796.2003
Sum Sq. Dev.	99.79615	116.9952	86.56061	2.937888
Observations	213	213	213	213

4.2 UNIT ROOT TEST RESULTS

The first simplest type of test that can be applied to check for stationarity is actually plot the time series and may look for possibility of trend in mean and variance, evidence of auto-correlation and seasonality in the data. If these patterns are found in the series that the series can be regarded as non-stationary. The graph of selected variables at log levels and first differences of variables is displayed in figure 1(a), – (h).

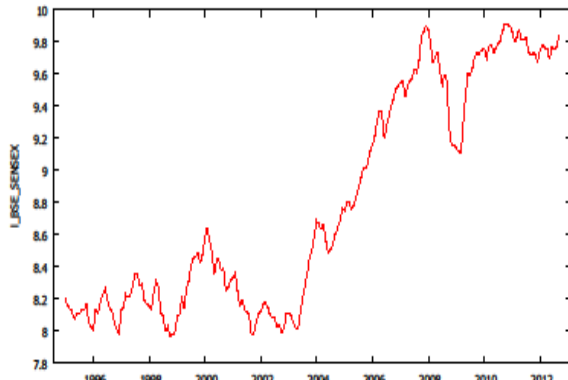


Fig.1(a). Log Level BSE SENSEX Index , 1995-2012(Monthly)

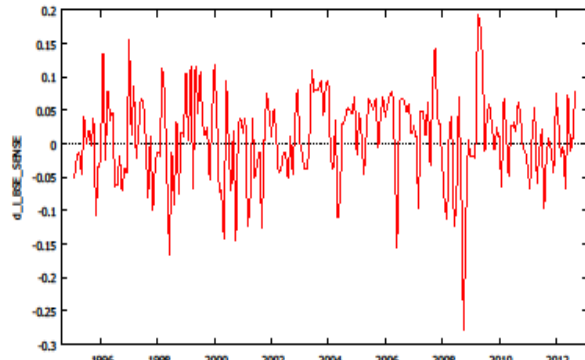


Fig.1(b).First Difference of BSE SENSEX Index , 1995-2012

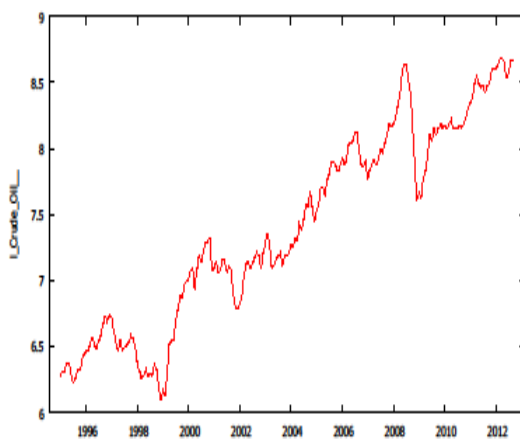


Fig.1(c). Log Level Crude Oil Prices , 1995-2012(Monthly)

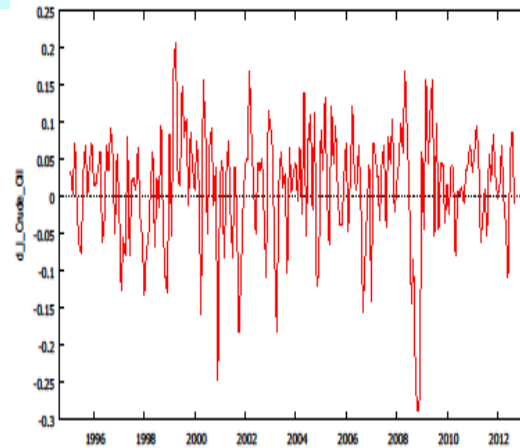


Fig.1(d)First Difference of Crude Oil Prices , 1995-2012(Monthly)

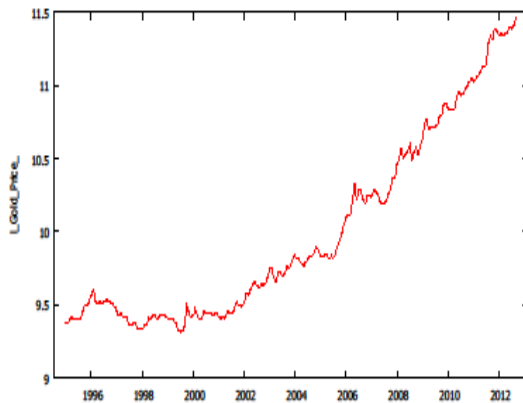


Fig.1(e)Log Level Gold Prices , 1995-2012(Monthly)

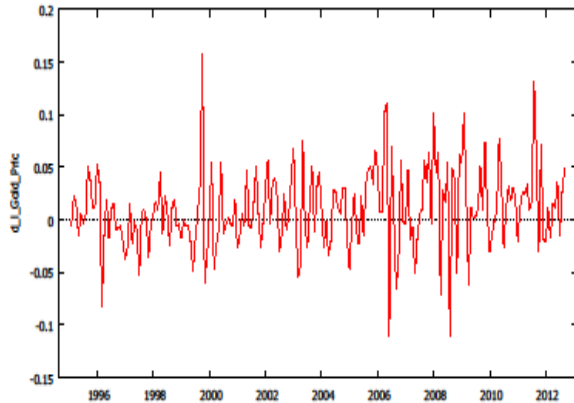


Fig.1(f)First Difference of Gold Prices , 1995-2012(Monthly)

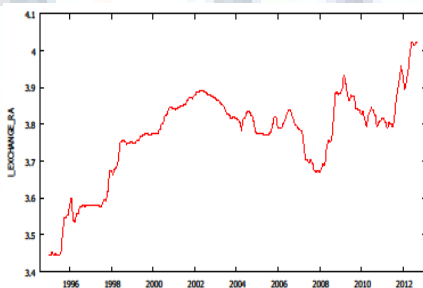


Fig.1(g). Log Level Exchange Rate , 1995-2012(Monthly)

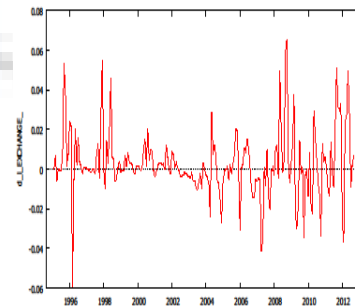


Fig.1 (h)First Difference of Exchange Rate, 1995-2012(Monthly)

Apart from visual inspection, formal test for stationary is essential to opt for appropriate methodological structure .As a first step; we tested all the variables (BSE SENSEX, Crude oil Prices, Gold Prices and Exchange Rate) for stationarity by applying ADF, PP unit root test and KPSS stationarity test. The results of ADF, PP and KPSS Statistics are given in Table 2(a) and2 (b). On the basis of these three tests, all the series are found to be non-stationary at levels with intercept and also all the series are found to be non- stationary at level with intercept and trend at 1% significance level. However , after taking the first difference , ADF test, PP test and KPSS test results gives us all the series are stationary with constant and trend at 1% level of significance. Thus all the three stationary test indicate that all the series are individually integrated by order I (1).

TABLE 2 (a): ADF, PP, AND KPSS TEST RESULTS (LEVELS)

variables	ADF TEST		PP TEST		KPSS TEST	
	H ₀ : variable is non-stationary		H ₀ : variable is non-stationary		H ₀ : variable is stationary	
	constant	Constant and Trend	constant	Constant and Trend	constant	Constant and Trend
LnBSENSEX	-0.492728	-2.268816	-0.431482	-2.328079	1.639000	0.259613
LnCOP	-0.804077	-3.604086	-0.781605	-3.472291	1.807709	0.071641
LnGP	2.114126	-1.019385	2.285970	-0.951307	1.6992	0.4475
LnEXRT	-1.980940	-2.367136	-1.812863	-2.103454	1.002228	0.282516

TABLE 2 (b): ADF, PP, AND KPSS TEST RESULTS (FIRST DIFFERENCES)

variables	ADF TEST		PP TEST		KPSS TEST	
	H ₀ : variable is non-stationary		H ₀ : variable is non-stationary		H ₀ : variable is stationary	
	constant	Constant and Trend	constant	Constant and Trend	constant	Constant and Trend
LnBSENSEX	-11.3367	-11.386	-11.40006	-11.39385	0.110992	0.064867
LnCOP	-11.65305	-11.62759	-11.64223	-11.61667	0.025517	0.023280
LnGP	-14.06049	-14.50268	-14.05184	-14.53970	0.801932	0.023568
LnEXRT	-9.848383	-9.836195	-9.935139	-9.916202	0.178918	0.152232
Asymptotic critical values						
	ADF TEST		PP TEST		KPSS TEST	
Significance level %	constant	Constant and Trend	constant	Constant and Trend	constant	Constant and Trend
1%	-3.46	-4.00	-3.46	-4.00	0.74	0.22
5%	-2.87	-3.43	-2.87	-3.43	0.46	0.15
10%	-2.57	-3.13	-2.57	-3.13	0.35	0.12

Note: The Number of lag length selection in ADF test based on Schwarz information criterion and PP test based on bernnet kernel and KPSS Newly- west

4.3 MULTIVARIATE CO INTEGRATION TEST RESULTS

The Multivariate cointegration analysis using Johansen method, the first step is the appropriate lag selection for the variables. Two lag length has been selected I in this study on the basis of HQC(See Table 3 (a))

TABLE 3 (a): VAR LAG ORDER SELECTION CRITERIA

lags	loglik	p(LR)	AIC	BIC	HQC
1	1350.62349	NA	-14.080672	-13.737630*	-13.941697
2	1378.30540	0.00000	-14.204290*	-13.586814	-13.954136*
3	1390.63092	0.07622	-14.165407	-13.273497	-13.804073

VAR system,

The asterisks below indicate the best (that is, minimized) values

of the respective information criteria, AIC = Akaike criterion,

BIC = Schwarz Bayesian criterion and HQC = Hannan-Quinn criterion.

Johansen’s test of co integration is applied to discover any long run relationship between BSE SENSEX and Chosen macroeconomic variables i.e. Crude oil Price, Gold Price and Exchange Rate .The number of lags in co integration analysis chosen on the basis of Hannan –Qannan Information Criterion. Johasen derives a test on the number of characteristic roots that are different from zero by considering the two following statistics ; the trace Eigen value statistics(λ trace) maximum Eigen value statistics(λ max).the results for both Trace statistics and Maximal Eigen statistic were reported in Tables 3(b) and3 (c) respectively.

TABLE 3 (b): UNRESTRICTED CO INTEGRATION RANK TEST (TRACE)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None *	0.120253	47.85211	40.17493	0.0071
At most 1	0.060671	20.94679	24.27596	0.1242
At most 2	0.033469	7.802989	12.3209	0.2523
At most 3	0.00311	0.654126	4.129906	0.4789
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

TABLE 3 (c): UNRESTRICTED CO INTEGRATION RANK TEST (MAXIMUM EIGEN VALUE)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.120253	26.90532	24.15921	0.0208
At most 1	0.060671	13.1438	17.7973	0.2187
At most 2	0.033469	7.148862	11.2248	0.2368
At most 3	0.00311	0.654126	4.129906	0.4789
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

From the above tables 3 (b) and 3(c) , both test recognised one co integrating vector ,therefore , the study used one co integrating vector in order to establish the long run relationship among the variables. The co integration equation will be chosen based on log likelihood ratio. From the Johansen co integration result all three log likelihood ratio is 1522.902. The estimated co integration vector, normalised on Ln BSESENSEX is presented in Table 3(d).

TABLE 3 (d): NORMALIZED COINTEGRATING COEFFICIENTS

Panel A: Normalized cointegrating coefficients			
LnBSENX	LnCOP	LnGP	LnEXRT
1	-1.848027	-1.357616	4.152478
	(-1.48661)	(-1.69547)	(-2.67826)

Notes: standard error in parentheses ()

The estimated equation and coefficient is as follows:

$$\text{LnBSENX} = 1.84\text{LnCOP} + 1.358\text{LnGP} - 4.153\text{LnEXRT}$$

From the above normalised co integration equation which reveals that Exchange Rate have negative effect on BSE SENSEX in the long run. Exchange Rate and BES SENSEX are inversely related. BSE SENSEX decrease in the long run by 4.135 units if Exchange rate increase by a unit. On the other hand Crude oil Price and Gold price has a positive effect on BSE SENSEX. The crude oil price coefficient is +1.4 showing significant, implying that 1% increase in crude oil price while others keep constant contributes 1.84% increase in BSE SENSEX, similarly Gold Price co-efficient +1.35 showing significant implying that 1% increase in Gold Price in India leads to 1.35% increase in BSE SENSEX index.

4.4 VECTOR ERROR CORRECTION MODEL

After the co integration relationship between the selected variables is established, a Vector Error Correction Model (VCEM) can be conceived using these variables. The VCEM output obtained and given in Table 4. An error correction equation depicting relationship of BSE SENSEX with other variables is presented below.

$$D(\text{LnBSENX}) = -0.00071 * [\text{LnBSENX}(-1) - 0.87835 * \text{LnCOP}(-1) - 0.23448 * \text{LnGP}(-1) + 2.125018 * \text{LnEXRT} + 7.96966] + 0.201867 * D(\text{LnBSENX}(-1)) - 0.01455 * D(\text{LnCOP}(-1)) - 0.174828 * D(\text{LnGP}(-1)) - 0.35792 * D(\text{LnEXRT}(-1)) + 0.009307$$

TABLE 4: VECTOR ERROR CORRECTION ESTIMATES

Cointegrating Eq:	CointEq1			
LnBSENX(-1)	1			
LnCOP(-1)	-0.87835			
	(-0.18862)			
	[-4.65660]			
LnGP(-1)	-0.23448			
	(-0.20637)			
	[-1.13623]			
LnEXRT(-1)	2.125018			
	(-0.58374)			
	[3.64034]			
C	-7.96966			
Error Correction:	D(BSENX)	D(COP)	D(GP)	D(EXRT)
CointEq1	-0.00071	0.077583*	0.010177	-0.00745
	(-0.02093)	(-0.02483)	(-0.01235)	(-0.00513)
	[-0.03402]	[3.12413]	[0.82393]	[-1.45338]
D(LnBSENX(-1))	0.201867 *	0.052742	0.006943	-0.01315
	(-0.07643)	(-0.09067)	(-0.0451)	(-0.01872)
	[2.64114]	[0.58170]	[0.15396]	[-0.70249]
D(LnCOP(-1))	-0.01455	0.207367*	0.0217	0.007315
	(-0.0567)	(-0.06726)	(-0.03345)	(-0.01389)
	[-0.25661]	[3.08328]	[0.64868]	[0.52677]
D(LnGP(-1))	-0.17389	0.081639	0.01301	-0.01374
	(-0.12342)	(-0.1464)	(-0.07282)	(-0.03023)
	[-1.40899]	[0.55763]	[0.17866]	[-0.45444]
D(LnEXRT(-1))	-0.35792	-0.62059	0.053762	0.321341
	(-0.29926)	(-0.355)	(-0.17658)	(-0.0733)
	[-1.19599]	[-1.74812]	[0.30447]	[4.38396]
C	0.009307	0.009331	0.009319	0.002015
	(-0.0047)	(-0.00557)	(-0.00277)	(-0.00115)
	[1.98133]	[1.67445]	[3.36199]	[1.75147]
R-squared	0.075874	0.121719	0.00646	0.132792
Adj. R-squared	0.053335	0.100297	-0.01777	0.11164
Sum sq. resids	0.856782	1.205668	0.298278	0.051399
S.E. equation	0.064648	0.07669	0.038145	0.015834
F-statistic	3.366267	5.68208	0.266582	6.278151

According to cointegrating coefficient in the long run it can be expected 0.88% increase of crude oil price, 0.23% increase of Gold price if BSE SENSEX increases for 1%. On the other hand 1% increases of Exchange rate would decrease BSE sensex for 2.13% in the long run.

In the short run, all the variables confirms to the signs (negative) and statistically insignificant except BSE SENSEX. The error coefficient confirms present short run disequilibrium i.e., the error will corrected 0.07% in the next period and also a weak relationship exist because the coefficient of determination (7.6%) shows small proportion explained by all the selected variables. This suggest that in the process of the short run adjustment for the Bombay stock market only DLnBSENX(-1) is significant at 1% level of significance but others are not even at 10% level of significance. This means that Bombay Stock Market price are being adjusted each month dominated by the influence of the market's own performance rather than selected Macro economic variables. The results are interesting and useful in understanding the Indian stock market mechanism as well as its return generating process. The VCEM analysis presented in above Table4 shows that two out of the three variables are relatively integrated in the long run and these variables are influencing in the pricing process. These variables are crude oil prices and gold prices.

4.5 GRANGER CAUSALITY TESTS

The Results of the Granger causality test are given table 5. The results suggest that to reject the null hypothesis of Granger non causality between BSESENSEX and Gold Prices, Exchange Rate in any direction. It also shows that the unidirectional granger causalith exist at 5% level of significance between BSE Sensex and Crude Oil Prices. This implies that the BSE Sensex cannot be used as a leading indicator for further growth in gold price and exchange rate in India.

TABLE 5: PAIR WISE GRANGER CAUSALITY TESTS

Sample: 213			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DlnBSENX does not Granger Cause DlnCOP	210	3.89533	0.0219
DlnCOP does not Granger Cause DlnBSENX		0.11347	0.8928
DlnEXRT does not Granger Cause DlnBSENX	210	1.68548	0.1879
DlnBSENX does not Granger Cause DlnEXRT		0.72363	0.4862
DlnGP does not Granger Cause DlnBSENX	210	1.89619	0.1528
DlnBSE NXdoes not Granger Cause DlnGP		0.50129	0.6065

4.6 VARIANCE DECOMPOSITION

The results of variance decompositions presented in Table 6. Its shows that when analysing the components of the BSE SENSEX explains 100% of the components of variation in the 1st period when the shock by a standard deviation of one in the variable itself and take back down out of reach in the second period to 99.26% of the error prediction of the variability while about 0.13%, 0.48% and 0.11 % error in predicting the dynamic contrast in due to crude oil price, gold price and exchange rate respectively. This means that during the 2nd period can change the BSE SENSEX explain about 99.26% of the forecast error in the BSE SENSEX itself, While the changes in Gold prices explains about 0.48% of forecast error in BSE SENSEX followed by dynamic changes in crude oil price, which explains about 0.13% of forecast error in BSE SENSEX and changes in the Exchange Rate that explains about 0.11% of the forecast error in the BSE SENSEX. While noting the increase with proposition attributable to Crude oil price, Gold Price and Exchange rate during the 6th period of up to about 0.50%, 0.30% and 1.72% respectively and then continue to fluctuate with tendency to increase or decrease that about 3.83%, 0.11% and 1.40% respectively on the Crude oil price, Gold price and Exchange rate in the 24th period. As is also noted that Crude oil price is ranked first in terms of impact on the BSE SENSEX in this period followed the exchange rate and then Gold price.

TABLE 6: VARIANCE DECOMPOSITION IN BSE SENSEX

Period	S.E.	DlnBSENX	DlnCOP	DlnGP	DlnEXRT
1	0.065006	100.0000	0.000000	0.000000	0.000000
2	0.100538	99.2606	0.1383	0.4822	0.1189
6	0.200234	97.46184	0.509665	0.304479	1.724015
24	0.398814	94.6518	3.8252	0.1154	1.4076

The analysis of the components of variance clearly shows that the relative importance of exchange rate in interpreting the BSE SENSEX is the largest in the short term which runs for six periods followed by the relative importance of crude oil price while the relative importance gold price is the least in the interpretation of changes with BSE SENSEX. In the long run, these relative importance are subject to certain changes, which occupies the crude oil price ranked first followed by the relative importance of Exchange Rate while remainder of this relative importance of the Gold price is least in the interpretation of changes in BSE SENSEX.

5. CONCLUSION

This study examined the long run and short run relationship between Crude oil price, Gold price, Exchange rate and BSE Sensex Index. All series used in this study were found that at log level data was non-stationary but stationary at first difference with constant and trend. Using Multivariate co-integration analysis, only one co-integrating equation between the variable was found. In the long run Exchange rate had a negative impact on Stock market index, While Crude oil price and Gold price affected stock Index positively. The VCEM analysis depicted that the coefficients of VCEM was insignificant showing adjustment. The results of Variance decomposition illustrated that among the variables, Crude Oil price was explaining the maximum Variance and most of the changes in BSE SENSEX are explained by itself so, BSE SENSEX is found exogenous among these variables because 95% change in BSE SENSEX in comes from itself. The test of Granger Causality suggests that the direction of causality from BSE SENSEX to Crude oil price since the estimated F statistics is significant at 5% level. On the hand, there is no reverse causation from Crude oil to BSE SENSEX. This indicates that we can use BSE SENSEX index to better predict the Crude oil price than simply by the past history of Crude oil price.

6. REFERENCES

1. Abdalla, I.S.A and V.Murinde (1997), "Exchange rate and Stock price interactions in emerging financial markets: Evidence on India, Korea, Pakistan and Philippines", Applied Financial Economics, Vol.7, pp.25-35.
2. Ahmed S. (2008), "Aggregate Economic Variables and Stock Markets in India", International Research Journal of Finance and Economics, Vol.1, pp. 141-164.
3. Ghosh A., Roy S., Bandyopadhyay G. And Choudhuri K. (2010), "Determinants Of BSE SENSEX: A Factor Analysis Approach", Paper presented at the International Conference of Business and Applied Sciences Academy at Bloomsburg University, Bloomsburg, Pennsylvania, USA.
4. Gogineni S. (2008), "The Stock Market Reaction to Oil Price Changes, available at Gungel N.http://69.175.2.130/~finman/Prague/Papers/TheStockMarketReactiontoOilPriceChanges.pdf Stock Returns", International Research Journal of Finance and Economics, Vol.10, pp. 140-152
5. Hamilton J.D(2000), "What is an oil shock?", NBER working paper no.7755
6. Kumar. A(2011), "An Empirical Analysis of causal relationship between stock market and macroeconomic variables in India", International Journal of computer Science and Management Studies 11:01, pp. 8-14
7. Mukherjee, T., Naga. A(1995), "Dynamic relations between macroeconomic variables and the Japanese stock market: An application of a vector error correction model", The Journal of Financial Research, Vol. 2, pp. 223-237.
8. Wang M., Wang C. And Huang T. (2010), "Relationships among Oil Price, Gold Price, Exchange Rate and International Stock Markets", International Research Journal of Finance and Economics. Vol.47, pp. 82-91.

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