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Impact of Crude Oil Price, Gold Price and Exchange Rate Fluctuation on Stock Market in India: An Empirical Analysis

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ABSTRACT

There are several indicators of an economy's performance but stock market is considered to be one of the most important indicators. Over the years there has been an increase in the crude oil prices and gold price in India and even the Exchange rate (USD vs. INR) has depreciated. In this paper, an attempt has been made to find out the relationship among crude oil price, exchange rate, gold price and stock market in India and also to examine the causal relationship among the variables. For the purpose of this research BSE 100 Index has been used as a representative of Indian stock market. Data has been collected for a period of 117 months beginning from September 2008 to May 2018. Augmented Dickey Fuller test, lag selection, Johansen's co-integration test, Vector Error Correction Model (VECM), Wald test and Granger Causality test have been used and it has been found that a long run relationship exists among BSE 100 index, gold price, exchange rate and crude oil price. It has also been found that out of all other variables selected for the study, exchange rate has a significant impact on the stock market movement in the short run. It has also been supported by Granger Causality test which shows that Gold price Granger causes Crude oil price.

1. Introduction

India being the 6th largest economy in the world has been witnessing a downturn recently in the foreign exchange rate and the crude oil price in the International market has been consistently increasing whereas the stock market also witnessed a downfall in the recent years and there has been an increase in the gold price too. In November 2016 and July 2017 Indian Government took two major internal macroeconomic decisions i.e. Demonetisation and GST implementation. It was believed that volatility in the financial market would last for few months and the economic stabilisation would soon be achieved but the economic volatility is still persisting. The complicated relationship among the economic variables has sought the attention of the researchers as well as the policy makers. In this study, an attempt is made to find out the relationship among crude oil price, exchange rate, gold price and stock market in India and also to examine the causal relationship among the variables.

Stock market is considered to be one of the most important indicators for judging the performance of an economy. In the last twelve months (ended on 31st October, 2018) BSE SENSEX has increased only by 3.53% and in the same duration the percentage change in the NIFTY FIFTY has been 0.22% positive which cannot be considered as a good improvement whereas in the last twelve months (ended on 31st October, 2018) US Dollar price in Indian Currency has increased by 14.048% which means that Indian Currency has depreciated. Crude oil price in International market has increased by 21.84% as compared to last year's price whereas the gold price in international market has declined by 4.42% [5]. It is a common phenomenon that all the markets are somehow related to each other as no market can work in isolation. Gold, oil, exchange rate, stock markets are also assumed to be inter-dependent as we know if there is an increase in the crude oil price in international market, India will also observe depreciation in rupees because that will lead to higher demand of US Dollar as the payment of importing oil is made in US Dollar. Increase in crude oil price will also lead to cost push inflation in an economy which will reduce the purchasing power parity of an economy. Devaluation in home currency and reduction in purchasing power parity will not attract the foreign investors (direct and portfolio) which in turn will reduce the supply of foreign exchange in an economy and if foreign portfolio investors start withdrawing their investment from an economy the stock market would automatically fall. Hence the investors will withdraw their investments from stock market and they will tend to invest in financial assets like gold and the gold price will increase because of the increase in demand. This is how different indicators of financial markets are theoretically associated with each other. This article will show the relationship between these variables in Indian economy from September 2008 to May 2018

2. Literature Review:

In a study of Indian stock market, it was found that no long run relationship existed between stock market of India and oil and gold markets. The study showed that there was no impact of oil and gold prices on investor's decision. Although in a developing country investments in gold and oil are known as the best source of investment, but for getting maximum return stock market is considered the best way of investment in the world. (Najaf & Najaf 2016)

In a study based on the influence of Exchange Rate on BSE Sensex & NSE Nifty, it was found that there was no significant cause and effect relationship between the two variables. The relationship that occurred between the variables

during different periods was because of the chance factor and not because of the cause factor. In the era of increasing integration in financial markets, one should take sufficient care while implementing exchange rate policies. Furthermore, indications were that the existence of foreign exchange restrictions did not isolate the domestic capital markets. (Polisetty et al. 2016)

Using daily data for over twenty years (considering logarithmic transformation only), the existence of co-integration, common trend, Granger causality and volatility spillover for these macro variables (gold price, stock price, real exchange rate for dollar and the oil price of crude oil) was examined. Initial statistical results indicated the possible existence of co-movements among them however, not all of them were moving simultaneously. It seemed that stock price and gold price were more likely to move on their own while oil price and exchange rates were likely to be influenced by other variables. (Samanta & Zadeh 2012)

The relationship between exchange rate ($/□) and Indian stock exchanges like BSE, NSE etc. for a period of eight years (from January 2005 to December 2012) were analysed by using some statistical tests like correlation, regression and anova. From the data analysis it was found that the result of correlation confirmed negligible relation between Exchange Rate and Nifty and negligible relation between Exchange rate and Sensex. (Patel, et al. 2013)

While examining the casual relationship between Sensex and gold price, a positive correlation between stock returns and gold price was found from 2002 to 2007 but due to economic crisis in USA in 2008 and 2011 this correlation seemed to be fading and it was established by using correlation and Johansen's co-integration test that there was no relation between gold prices and stock returns i.e. Sensex return in the long run period. The results of Granger causality test revealed that returns of Sensex index did not lead to increase in gold price and rise in gold price did not lead to increase in Sensex. (Narang & Singh 2012)

In a study, to examine the long-run relationship between gold prices and Karachi Stock Exchange (KSE) and Bombay Stock Exchange (BSE), it was found that no long-run relationship existed between monthly average gold prices and KSE stock index; whereas, a significant long-run relationship was proved between BSE stock index and average gold prices as indicated by co-integration test. Results of Granger causality test demonstrated that no causal relationship existed among average gold prices, KSE and BSE stock indices. (Bilal, et al. 2013)

A significant relationship between exchange rates and Borsa Istanbul (BIST 100) index 100 was found while analysing the long term relationship between exchange rates and Istanbul Stock Exchange. However, the direction of the effect of foreign currencies on BIST 100 gave mixed results. In other words, the effect of each foreign currency on the stock index might be different. As a result, the existence of both short term and long term significant relationships between foreign currency markets and securities exchanges could be stated. (Altin 2014)

3. Objectives:

The objectives of the present paper is –

1. To determine the impact of crude oil price, foreign exchange rate and gold price on the stock market (both in short run and long run) in India.
2. To determine the causal relationship among the variables.

4. Data Source:

The Study covers a period of 117 months beginning from September 2008 to May 2018. The data has been collected from secondary sources. The data regarding BSE 100 Index (as a proxy of stock market indicator), gold price (price of 10gram of gold), exchange rate ($ Vs. Rs.) is collected from Handbook of Statistics published by RBI and crude oil price per barrel in Indian currency is collected from indexmundi.com

5. Research Methodology:

The study presents an empirical investigation into:

1. The relationship between BSE 100 Index, gold price, exchange rate (USD vs. INR) and crude oil price in India using econometric approach.
2. The causal relationship among the macroeconomic variables considered in the study.

The methodology involves regressing BSE 100 Index on its explanatory variables through the following procedures:

a) Testing for stationary properties of the variables using the **Augmented Dickey Fuller** unit roots tests;
b) Followed by **lag selection** and **Johansen's co-integration test** to check for the existence of co-integrating and long run relationships;
c) Consequently the **Vector Error Correction Model (VECM)** is employed to estimate the error correction term;
d) **Wald test** is employed to determine whether the short run causality is running from the independent variables to dependent variable;
e) Finally, **stability and diagnostic tests** are also conducted to determine the robustness of the model adopted.
f) The **Granger Causality test** is employed to determine the causal relationship.

The model to be examined in the study on the basis of literatures reviewed is adopted to take the following functional form:

BSE100 Index = F (COILP, EXR, GLD) (1)

The econometric form of the model is given as

$$BSE100_t = \alpha_0 + \alpha_1 COILP_t + \alpha_2 EXR_t + \alpha_3 GLD_t + \varepsilon_t \quad (2)$$

The log-log model has been employed to estimate the elasticity (degree of responsiveness) of BSE 100 Index with respect to Gold Price, Exchange Rate and Crude Oil Price.

$$LogBSE100_t = \alpha_0 + \alpha_1 LogCOILP_t + \alpha_2 LogEXR_t + \alpha_3 LogGLD_t + \varepsilon_t \quad (3)$$

Where α_0 is a constant, α_1- α_3 are parameters to be estimated and ε_t is the error term. The model is estimated with the aid of E-views 10 software.

6. Hypothesis to be tested:

The following hypotheses are tested in the present study:

H_{01}: There is no long run and short run relationship among BSE 100 Index, gold price, exchange rate and crude oil price.

H_{02}: There is no causal relationship among BSE 100 Index, gold price, exchange rate and crude oil price.

7. Results and Discussions:

Augmented Dickey fuller test is applied to determine the level at which the variables are stationary.

Table No. 1: Unit Root Test

Variables	Null Hypothesis	I(0) / I(1)	Calculated ADF(t-Statistic)	Critical value	Prob	Inference
LGBSE	LGBSE has a unit root	I(0)	-0.59	-3.48 (1%) -2.88 (5%) -2.58(10%)	0.866	Non-stationery at 1%,5% and at 10%
D(LGBSE)	D(LGBSE) has a unit root	I(1)	-9.40	-3.48 (1%) -2.88 (5%) -2.58 (10%)	0.000	Stationery at 1%,5%,10%
LGCOILP	LGBSE has a unit root	I(0)	-2.12	-3.48 (1%) -2.88 (5%) -2.58(10%)	0.233	Non-stationery at 1%,5% and at 10%
D(LGCOILP)	D(LGBSE) has a unit root	I(1)	-7.55	-3.48 (1%) -2.88 (5%) -2.58 (10%)	0.000	Stationery at 1%,5%,10%
LGEXR	LGEXR has a unit root	I(0)	-0.89	-3.48 (1%) -2.88 (5%) -2.58(10%)	0.788	Non-stationery at 1%,5% and at 10%
D(EXR)	D(EXR) has a unit root	I(1)	-6.65	-3.48 (1%) -2.88 (5%) -2.58 (10%)	0.000	Stationery at 1%,5%,10%
LGGLD	LGGLD has a unit root	I(0)	-3.18	-3.48 (1%) -2.88 (5%) -2.58(10%)	0.0232	Stationery at 5%,10% but Non-stationery 1%,
D(GLD)	D(GLD) has a unit root	I(1)	-6.65	-3.48 (1%) -2.88 (5%) -2.58 (10%)	0.000	Stationery at 1%,

Source: Compiled by authors

In the above table all the variables are non-stationery at level {I(0)} for 1%, 5% and 10% level of significance excepting log of gold price, which became stationery at level for 5% and 10% level of significance but non-stationery at 1% significance level. All the variables became stationery after taking 1st difference {I(1)} at 1%, 5% and 10% level of significance. The above test result shows that all variables considered for the study are stationery after 1st order differentiation. If all the variables are stationery in the same order, then there is a possibility of long run associationship among the variables. To test the long run associationship among the variables Johansen co-integration test has been applied but before that lag order has been selected below.

Table No. 2: VAR Lag Order Selection Criteria

Endogenous variable: LGBSE LGCOILP LGEXR LGGLD
Exogenous Variable: C
Included in observation: 109

Lag	LogL	LR	FPE	AIC	SC	HQ
0	537.5398	NA	6.58e-10	-9.789721	-9.690956	-9.749668
1	1194.260	1253.190	5.16e-15	-21.54605	-21.05223*	-21.34579*
2	1217.714	43.03525*	4.51e-15*	-21.68283*	-20.79394	-21.32235
3	1221.726	7.067844	5.63e-15	-21.46287	-20.17892	-20.94218
4	1228.209	10.94249	6.75e-15	-21.28823	-19.60923	-20.60733
5	1238.928	17.30908	7.50e-15	-21.19135	-19.11728	-20.35024
6	1246.002	10.90271	8.96e-15	-21.02756	-18.55844	-20.02624
7	1260.934	21.91757	9.32e-15	-21.00796	-18.14377	-19.84642
8	1264.875	5.496190	1.19e-14	-20.78670	-17.52745	-19.46495

* indicates lag order selected by the criterion
LR: Sequential modified LR Test statistics (each test at 5%)
FPE: Final prediction error

AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
On the basis of VAR lag order selection criterion it is found that LR, FPE, SC, HQ, AIC is suggesting to take 1 as lag.
Source: Compiled by authors

Choosing appropriate lag length is essential before conducting Johansen co-integration test and Granger causality test. The above Var lag order selection criterions like LR {Sequential modified LR Test statistics (each test at 5%)}, FPE (Final prediction error), AIC (Akaike information criterion) are suggesting us to select two lag order whereas SC (Schwarz information criterion), HQ (Hannan-Quinn information criterion) suggested us to select one lags, as most of the criterions are signifying us to select two lags. So, for our study we have selected optimum lag length of two.

Table No. 3: Test of Co-integration (Trace and Max- Eigenvalue)
Sample (adjusted): 2008M12 2018M05
Included observations: 114 after adjustments
Trend assumption: Linear deterministic trend
Series: LGBSE LGCOILP LGEXR LGGLD
Lags interval (in first differences):1 to 2
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.200962	53.88107	47.85613	0.0122
At most 1	0.144034	28.30555	29.79707	0.0735
At most 2	0.064846	10.57568	15.49471	0.2390
At most 3	0.025397	2.932686	3.841466	0.0868

Trace test indicates 1 co-integrating eqn(s) at the 0.1 level
*denotes rejection of the hypothesis at the 0.1 level
**MacKinnon-Hauq-Michelis (1999) p-values
Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob**
None*	0.200962	25.57552	27.58434	0.0884
At most 1	0.144034	17.72987	21.13162	0.1403
At most 2	0.064846	7.642995	14.26460	0.4162
At most 3	0.025397	2.932686	3.841466	0.0868

Max-Eigenvalue test indicates 1 co-integration eqn(s) at the 0.1 level
*denotes rejection of the hypothesis at the 0.1 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Compiled by authors

The co-integration test result for the trace statistic test indicates one co-integrating equation at 5% significance level similarly Maximum Eigen statistic test also indicates one co-integrating equation. It means co-integrating equation indicated by trace statistic test is being well supported by Maximum Eigen statistic test. Since the power of Maximum Eigen statistic test is greater than the trace statistic test, we therefore employ the Maximum Eigen statistic test in estimating Vector Error Correction Model. However the co-integration test showed the existence of long run relationship among BSE 100 Index, Gold price, Crude oil price and Foreign Exchange Rate.

Table No. 4: Test of Co-integrating equation (Trace and Max- Eigenvalue)

Co-integrating Equation : Log likelihood 1249.728			
Normalised Co-integrating co-efficients (Standard Error in parentheses)			
LGBSE	LGCOILP	LGEXR	LGGLD
1.00	0.151264	-1.71749	0.766291
	(0.31689)	(0.85091)	(0.54254)
t statistic	0.4773	2.0184	1.4124

Source: Compiled by authors

Table No. 5: Test of Vector Error Correction Model
Dependent Variable: $\Delta LGBSE_t$
Method: Least Squares (Gauss-Newton / Marquardt steps)
Sample (adjusted): 2008M12 2018M05

Included observations: 114 after adjustments
D (LGBSE) = C(1)*(LGBSE(-1) + 0.151264475088*LGCOILP(-1) -
1.71741913326*LGEXR (-1) + 0.76629072194*LGGLD (-1) -
4.71625793634) + C (2)*D (LGBSE (-1)) + C (3)*D (LGBSE (-2)) + C (4)
*D (LGCOILP (-1)) + C (5)*D (LGCOILP (-2)) + C (6)*D (LGEXR (-1)) + C (7)
*D (LGEXR (-2)) + C (8)*D (LGGLD (-1)) + C (9)*D (LGGLD (-2)) + C (10)

Variables	Coefficient	Standard Error	t-statistics	Prob.	Significance
C(1) ECT_{t-1}	-0.039323	0.011775	-3.339544	0.0012	Significant at 1% and 5%.
C(2)$\Delta LogBSE_{t-1}$	0.128054	0106132	1.206553	0.2303	Not Significant
C(3)$\Delta LogBSE_{t-2}$	0.106272	0.085209	1.247199	0.2151	Not Significant.
C(4)$\Delta LogCOILP_{t-1}$	0.053774	0.049766	1.080526	0.2824	Not Significant
C(5)$\Delta LogCOILP_{t-2}$	0.042806	0.048267	0.886849	0.3772	Not Significant
C(6)$\Delta LogEXR_{t-1}$	-0.605254	0.174388	-3.470726	0.0008	Not Significant
C(7)$\Delta LogEXR_{t-2}$	0.499521	0.181967	2.745112	0.0071	Significant at 1% and 5%.
C(8)$\Delta LogGLD_{t-1}$	0.040407	0.115646	0.349403	0.7275	Not Significant
C(9)$\Delta LogGLD_{t-2}$	-0.017783	0.118988	-0.149451	0.8815	Not Significant
C(10) Constant	0.004195	0.001845	2.273373	0.0251	Significant
R-squared		0.309014	Mean dependent var		0.005215
Adjusted R-squared		0.249217	S.D. dependent var		0.019525
S.E. of regression		0.016918	Akaike info criterion		-5.237234
Sum squared resid		0.029767	Schwarz criterion		-4.997216
Log likelihood		308.5223	Hannan-Quinn criter.		-5.139824
F-statistic		5.167723	Durbin-Watson stat		2.032327
Prob(F-statistic)		0.000009			

Source: Compiled by authors

The coefficient of the error correction term is showing the expected negative sign and also significant which confirms the existence of long run causal relationship running from crude oil price, exchange rate and gold price to BSE 100 Index. The speed of adjustment of the error term is -0.039323. The scale of the coefficient implies that 0.03 percent of the disequilibrium in the preceding month's shock adjusts back to long run equilibrium in the current month. In other words it can be said that there exists convergence to achieve long run equilibrium. Also it takes 25.43 months (1/0.039323=25.43) to achieve long run and stable equilibrium because the speed of adjustment is very weak. The short run results of vector error correction model (VECM) reveal that BSE 100 Index of one as well as two months back is positively related to BSE 100 Index in the current month but they are insignificant because the P value is more than 0.05.

Similarly, Crude oil price of one month as well as two months back is positively related to BSE 100 Index but as the probability for both the coefficients are more than 0.05 they are also considered to be insignificant.

Exchange rate of one month back is negatively related to BSE 100 Index having the coefficient value of -0.605 and the probability is 0.00 which states significance at 1% level of significance so it is highly significant. Although exchange rate of two months back having positive coefficient of 0.49 and it is also significant at 1% level.

Gold price of one month back is having positive coefficient whereas that of two month's back is having negative coefficient but both are insignificant.

The R- squared value is 0.309, implying that approximately 31% of the variation in the BSE 100 Index is explained by the independent variables. Therefore other variables which are not the part of our current research are explaining 69% variation in the independent variables. It indicates the regression equation is not very much satisfactory but the overall equation is **highly statistically significant** as shown by the probability value of the F-statistic (0.009).

Table No. 6: Results of Wald Test

h_{01} :There is no short run causality running from Crude Oil Price to BSE100 Index			
Test Statistic	**Value**	**Df**	**Probability**
F-statistic	1.332873	(2, 104)	0.2682
Chi-square	2.665746	2	0.2637
h_{02} :There is no short run causality running from Exchange Rate to BSE100 Index			
Test Statistic	**Value**	**Df**	**Probability**
F-statistic	11.2888	(2, 104)	0.00
Chi-square	22.5777	2	0.00
h_{03} :There is no short run causality running from Gold Price to BSE100 Index			
Test Statistic	**Value**	**Df**	**Probability**

F-statistic	0.06666	(2, 104)	0.9355
Chi-square	0.13367	2	0.9355

Source: Compiled by authors

h_{01} (null hypothesis) is accepted because the P-value of Chi-square test is 0.2682 which is more than 0.05, so it can be said that Crude Oil Price has no short run impact on BSE100 Index.

h_{02} (null hypothesis) is accepted because the P-value of Chi-square test is less than 0.05, so null hypothesis is rejected at 5% level of significance, so it can be said that Exchange Rate has short run impact on BSE 100 Index. The result is in conformity with VECM result.

h_{03} (null hypothesis) is accepted because the P-value of Chi-square test is 0.13367 which is more than 0.05, so null hypothesis is accepted at 5% level of significance; therefore it can be said that Gold Price has no short run impact on BSE 100 Index. The result is also in conformity with VECM result.

Diagnostic and Stability Test:

To ascertain the robustness of the model used, standard practice calls for Stability and diagnostic test. The aim of this test is to investigate the stability of the coefficient estimate with the increase in the sample size. The stability of the estimated model is examined using the methodology of Cumulative Sum (CUSUM) test proposed by Brown et al (1975). If the plot of CUSUM stays within 5% significance level (depicted by two lines), then the coefficient estimates are said to be stable.

The diagnostic test is based on Serial Correlation (Breush-Godfrey correlation LM test), Autoregressive Conditional Heteroskedasticity (ARCH), and normality of the residual. The test results are reported in table 7.

Table 7: Diagnostics Test Result

Test Type	Null Hypothesis(H_0)	Statistic	Probability	Inference
Normality test (Jarque-Bera Statiscics)	Errors are normally distributed	Jarque-Bera Statistics = 2.29	Probability = 0.22	Fail to reject Ho
Serial Correlation (Breush-Godfrey correlation LM test)	No serially correlated errors	F-statistics =1.535324	Prob. of chi-square =0.1890	Fail to reject Ho
ARCH Test (Auto-regressive Heteroskedasticity test)	ARCH does not characterise model's error	F-statistics =3.125804	Prob. of chi-square = 0.0479	Reject Ho

Source: Compiled by authors

The diagnostic test suggests good fit of the model. The model does not suffer from, serially correlated errors, ARCH effect; the normality test result is also up to the expectation, because the prob. value is more than 0.05.

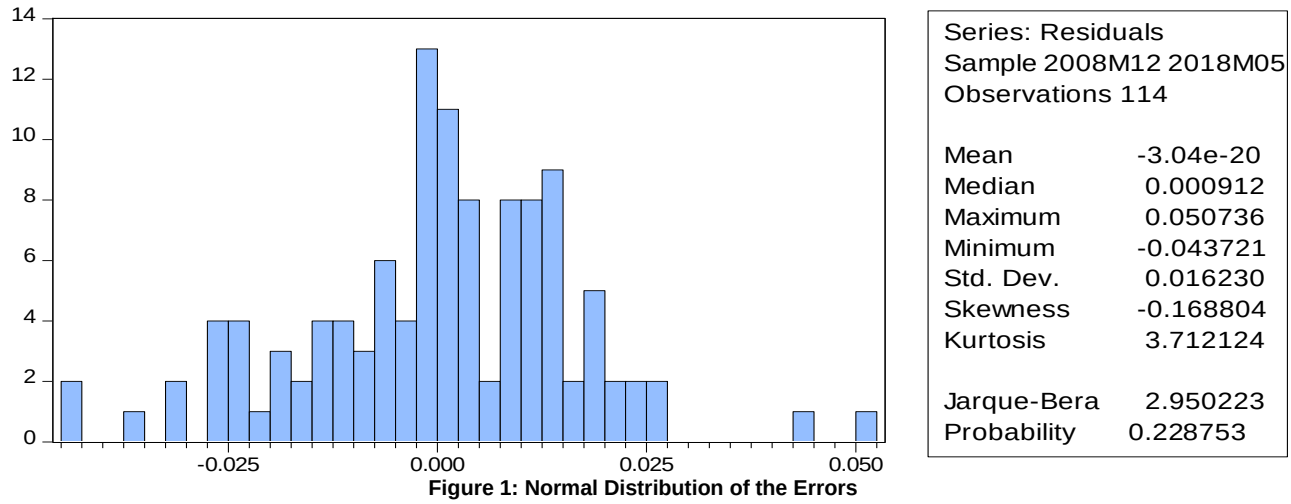
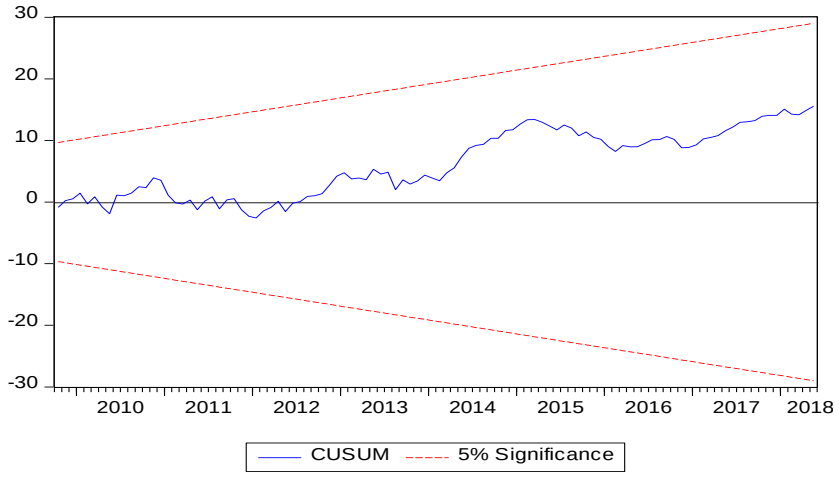


Figure 1: Normal Distribution of the Errors

Source: Calculated by authors

With regards stability test, the results of both the CUSUM plots lie within the 5% critical band width which confirms the stability of the coefficients and the correct specification of the model.

Figure 2: CUSUM Plots



The result of CUSUM test is showing an expected result, the cumulative sum line is lying within band line of 5% significance. It shows the stability of the relationship.

Table No. 8: Pair-wise Granger Causality Tests

Null Hypothesis	Obs	F-statistic	Prob.	Decision about the direction of causality
LGCOILP does not Granger Cause LGBSE	115	1.08392	0.3419	Accept H_0
LGBSE does not Granger Cause LGCOILP		1.27774	0.2828	Accept H_0
LGEXR does not Granger Cause LGBSE	115	10.6289	0.0000	**Reject H_0**
LGBSE does not Granger Cause LGEXR		1.32856	0.2691	Accept H_0
LGGLD does not Granger Cause LGBSE	115	0.24101	0.7862	Accept H_0
LGBSE does not Granger Cause LGGLD		0.35366	0.7029	Accept H_0
LGEXR does not Granger Cause LGCOILP	115	0.22204	0.8012	Accept H_0
LGCOILP does not Granger Cause LGEXR		0.66204	0.5178	Accept H_0
LGGLD does not Granger Cause LGCOILP	115	2.62386	0.0771	**Reject H_0**
LGCOILP does not Granger Cause LGGLD		0.05347	0.9480	Accept H_0
LGEXR does not Granger Cause LGGLD	115	0.26995	0.7639	Accept H_0
LGGLD does not Granger Cause LGEXR		2.20384	0.1152	Accept H_0

Source: Compiled by authors

The above granger causality test results show that there is no causality running from BSE 100 index to crude oil price and vice-versa. Similar results are found in case of gold price and BSE 100 Index, crude oil price and exchange rate and gold price and exchange rate. But it is found that Exchange rate granger causes BSE 100 Index rejecting the null hypothesis as the probability value is 0.00 but BSE 100 Index does not granger causes Exchange rate similarly gold granger causes crude oil price at 10% level of significance but crude oil price does not granger causes gold price. In conclusion it can be said that Exchange rate and BSE 100 index and gold price and crude oil price having unidirectional relationship.

8. Conclusion:

There exists a long run relationship among BSE 100 index, gold price, exchange rate and crude oil price as it is evident from Johensen co-integration test. VECM has been used to determine the error correction term of the co-integrating equation the result of VECM was also satisfactory, Wald test has been conducted to determine the short run impact of independent variables on the dependant variable, it has been found that the exchange rate has significant impact on BSE 100 index in short run but there is no short run causality running from the two independent variables like gold price and crude oil price. Different Stability and diagnostic test was applied to determine the robustness of the model adopted in the study, all diagnostic test proved to be satisfactory establishing the fact that the model is good fitted. Granger causality test has been conducted to determine the causal relationship between the variables and it is found that Exchange granger causes BSE 100 index and gold price granger causes crude oil price.

In brief, out of three variables i.e. Exchange rate, crude oil price, gold price, only exchange rate has significant impact on stock market which is proved by all the tests used in the model. So, policymakers should find out the ways to control the depreciation in home currency by taking proper foreign trade policies.

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