IMPACT OF WORLD HAVOC ON INFORMATIONAL EFFICIENCY IN INDIA

(A Study in the context of Mumbai Stock Exchange)

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The world Recession of 2008 has been accused of infecting stock markets and their trading activities round the globe, India being no exception to this. The present paper targets to depict the role played by "havoc" in influencing the content of informational efficiency in India. The study incorporates the use of GARCH model for two sub periods of three years each in reporting the fate of effecting in Indian Stock Market. SENSEX being the oldest benchmark index is used to provide evidences about persistence of volatility in the Indian scene in and around 2008.

***Keywords**: Primage, GARCH, Recession, Persistence, Volatility.*

INTRODUCTION

The very first decade of 21st century has witnessed one of the most dreadful turmoil, the economic recession. No matter, such an occurrence is a casual phenomenon but what is of great concern is the repercussions plagued by it and the severity in th e intensity. From the struck of August 2008, there has been exaggeration of the turmoil in the international financial markets together with spreading the same in developing economies. After infecting US with the sub primage crisis, the wave spread to Europe and later on got converted into a full blown global macroeconomic crisis.

The wild fire grew leaps and bounds indicating that the recession would last longer and probability of recovery seeming next to impossible. Efforts have been suggested and put into effect both by Government and banks to counterfeit either the contagion or to diminish the impact of the crisis.

Regional financial crisis, as observed, are frequent in their occurrence and they may phase out without poisoning the national economies round the world. But when it comes to the financial system of the United States, the impact can be beyond imagination. The

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pace with which Indian economy is integrating with global ties, it is open to all external catastrophic events and their detrimental impact.

The shadowing of international bourses with the mists of global chaos has made several investment banks to collapse and suffocated them with triggering losses. In response, interest rates have seen severe decline together with declining shipping rates. But what is more fearsome is the spillovers of the stock markets.

MOTIVATION OF THE STUDY

The present paper attempts to highlight the influential power of world recession on the benchmark index of Bombay Stock Exchange i.e. SENSEX. Since SENSEX is the oldest index of Indian domain which is traded on the oldest stock exchange of India therefore the study uses the daily returns of BSE. The occurrence of "GLOBAL CHAOS 2007" had its roots in India since August 2008 and it becomes imperative to find out the nature and content of its detrimental power.

DATA

The data for the study comprises of daily closing prices of SENSEX from 1st April, 2004 to 31st March, 2010. It has been collected from the official website of Bombay Stock exchange (now Mumbai). The paper also inculcates daily closing values of Nifty Junior for the same time span. For the purpose of descriptive analysis, the study period has been classified into two subgroups.. One period spans from 1st April,2004 to 8th August, 2007 while the other sub period spans from 9th August,2007 to 31st March, 2010.

HYPOTHESIS

The present study tries to evaluate the viability of the following hypothesis:

H_0: there is no impact of world recession on informational efficiency of the spot market of BSE.

H_1: there is an impact of world recession on informational efficiency of the spot market of BSE.

The underlined hypothesis targets to evaluate the importance of "old news" as against "recent news" in determining the persistence of volatility.

INDIAN STOCK MARKET IN AND AROUND 2008

The Indian Stock Market witnessed dramatic fall in its equity arena as the global malfunctioning ruined both the liquidity conditions as well as the domestic foreign exchange market. With the reversal of portfolio aggravating the problems, the balance sheet of most of the corporate giants developed stains on it. Notwithstanding this, FIIs investment started degenerating and thus global chaos overpowered the equity floors in and around 2008.

The investment of FIIs recorded over Rs. 10, 00,000 crore between January 2006 and January 2008. But from January 2008 to January 2009, the investment of FIIs drove out from the equity market. These withdrawals made the SENSEX to roll down from over 20000 to less than 9000 in a year. Moreover, liquidity has been crippled in the stock market. The stock prices have even lost to around 90% of their value. The primary market got derailed and secondary market is in the deep abyss.

With the onset of economic chaos, the equity rolled down to very low levels and even many well established companies could not complete their rights issues even after offer prices being fixed at very low rates. This made ambitious projects to pack themselves in the plan itself and upsetting the corporate ventures of the future. Thus the devastating scene gives every justification to go into the intricate study of several issues inter woven with the World Recession of 2007.

METHODOLOGY

The paper initiates from the descriptive statistics calculated from the log return series generated for the daily closing return value of the SENSEX. For this,

$$R_t = Log\left(\frac{P_t}{P_{t-1}}\right)$$

Where,

R_t › Daily log return for the day t

P_t › Daily closing price for the day t

P_{t-1} › Daily closing price on the day t-1

The GARCH (1, 1) model is applied to find the dynamism of old news and recent news caused due to the onset of recessionary trends.

To rule out impact of any internal factor on the performance of Index, the log returns of Nifty Junior is also incorporated. The above formula is applied to find the daily log return. The GARCH (1,1) model is applied to deal with the element of heteroscedasticity. The daily log return of SENSEX has been taken as dependent variable, supported by Nifty junior as an independent variable together with S&P 5oo as another exogenous variable. The inclusion of Nifty Junior is done to isolate the impact of domestic wide factors on the index return series. The lagged return of S&P 500is imbibed to dismantle the propelling international forces. The date of 9th August, 2007 is used as a cutoff date for determining pre recession period and post recession era. Hence the GARCH (1, 1) is modeled as follows:

$$R_{NIFTY,t} = \gamma_0 + \gamma_1 R_{Junior,t} + \gamma_2 R_{SP,t} + \varepsilon_t \quad (1)$$

$$\varepsilon_t/\psi_{t-1} \sim N(0,h_t)$$

$$h_t = \omega + \gamma_3 \varepsilon_{t-1}^2 + \gamma_4 h_{t-1}^2 \quad (2)$$

Where:

ω	is the mean
$R_{Junior,t}$	is the daily log return of NIFTY JUNIOR
$R_{SP,t}$	is the daily log return of S&P 500
ε_t	is the error term
ψ_{t-1}	is the information set available at time t-1
ε_{t-1}^2	is the measure of news about volatility from previous period
h_{t-1}^2	Represents last period forecast variance

The first equation is the GARCH specification for the mean return equation and equation (2) represents the conditional variance equation. The GARCH model is run for both the sub periods in order to portray the persistence level of news in context of the oldest stock exchange of the country i.e. BSE. Nifty Junior is used as a controlling index as BSE does not have any subordinate and efficient index as efficient as the former. The empirical exercise is carried out and the results are compiled in the next section.

EMPIRICAL RESULTS

The basic statistical measures throw light on the initial symptoms of volatility pattern in Indian scene with respect to economic recession. The study on total 1478 observations of

BSE SENSEX in two window period show a decline in the mean return. The average mean return of 1094 observations of the pre recession period is 0.000351 which has declined to 0.00025 for 384 observations of the post recession phase.

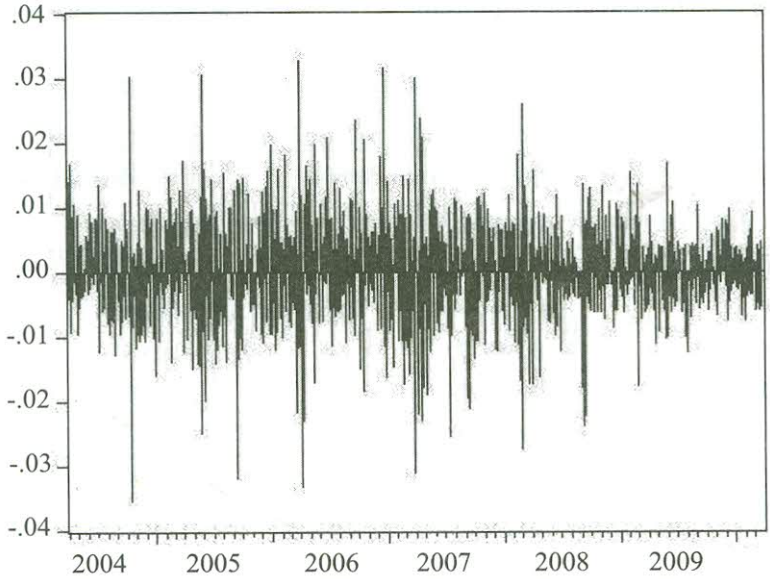
TABLE 1.1: SUMMARY STATISTICS OF SENSEX

Statistic	Pre Recession Period	Post Recession Period
Mean	0.000351	0.00025
Median	0.000715	0.000431
Maximun	0.034444	0.069444
Minimum	-0.05129	-0.0504
Standard Deviation	0.007148	0.010654
Skewness	-0.6356	0.389548
Kurtosis	7.966327	8.913662
Jarque –Bera	1197.946	569.2542
Probability	0	0
Sum	0.383837	0.096102
Sum Sq. Deviation	0.05584	0.043474
Observations	1094	384

This decrease is indicative of the fact that trading activities at BSE suffered greatly after the disastrous strike of the World Recession. Again the table of summary statistics reveals that standard deviation has hiked, though minutely, from 0.007148(pre recession period) to 0.010654(post recession period). The Jarque- Bera(JB) test rejects the null hypothesis of normality of time series data and projects that the daily log return series is non normal nature.

Moreover, the fact of volatility clustering in financial data becomes apparent from the chart depicted below where the daily log returns on y axis have been plotted against time (taken on x axis).

FIGURE 1.1: DAILY LOG RETURNS OF SENSEX
(For the period 01-04-2004 to 31-03-2010)



As stated earlier, the phenomenon of volatility clustering is pinpointed laying down the fact that small returns are followed by still smaller returns and large returns are traversed by still larger returns. These results suffice that World Recession has crept into the bourses of BSE and there is every reason to investigate about its impact on persistence level of stock market i.e. the facet of informational efficiency.

The GARCH model, as stated, is run for both the time frames viz pre recession and post recession and the results are collaborated as follows:

TABLE 1.2: Estimates of GARCH (1, 1) Model For PRE RECESSION PERIOD

Variable	Description	Coefficient	Std. Error	z- Statistic	Probability
γ_0	Intercept	0.000755	0.000171	4.416475	0
γ_1	Return Nifty JUNIOR	0.037867	0.023659	1.600531	0.1095
ω	Return S&P 500	0.122925	0.042982	2.859896	0.0042
γ_2	Constant	1.74E-06	3.39E-07	5.13395	0
γ_3	ARCH(1)	0.173341	0.018906	9.168691	0
γ_4	GARCH(1)	0.796319	0.020314	39.20026	0

TABLE 1.3: Estimates of GARCH (1, 1) Model For POST RECESSION PERIOD

Variable	Description	Coefficient	Std. Error	z- Statistic	Probability
γ_0	Intercept	0.000527	0.000377	1.399666	0.1616
γ_1	Return Nifty JUNIOR	-0.02548	0.051394	-0.495778	0.6201
ω	Return S&P 500	0.022808	0.053566	0.425798	0.6703
γ_2	Constant	1.79E-07	2.65E-07	0.675272	0.4995
γ_3	ARCH(1)	0.094009	0.018717	5.022799	0
γ_4	GARCH(1)	0.908771	0.017242	52.70776	0

The coefficient of GARCH term has risen from 0.796319(pre recession) to 0.908771(post recession) while the coefficient of ARCH term has declined from 0.173341 to 0.094009 in the same frame. These patterns imply that the "old news" have gained importance after the turbulent recession has crept in and the "recent news" no longer plays a significant role in determining returns.

Moreover, the GARCH coefficient signifies that there is faster incorporation of news and as a result there is less persistence. Again the sum of coefficients of ARCH and GARCH term total to 1 indicating the fact that the model is a good fit.

As the inclusion of Nifty Junior and S&P 500 rule out every possibility of "other factors", the study can be used to conclude that recession has gone a long way in moulding the content of informational efficiency. No doubt, the visible effect of recession is increased volatility but the disguised impact is changing pattern of informational efficiency.

Thus the null hypothesis is rejected and alternate hypothesis is accepted that there is an impact of World recession on the aspect of informational efficiency.

CONCLUSION

The present study aimed at investigating the issue of informational efficiency gives out serious notifications. The empirical results worked out stress that after the recession has crawled in the bourses of Indian stock Market, the importance of old news has increased. A valid conclusion that can be drawn is that the volatility hike can be attributed to the persistence of old news. The world recession has marred the efficiency of BSE after the "GLOBAL CHAOS" as the increasing importance of old news shows that information is

not rapidly assimilated. The volatility, undoubtedly, grew significantly and has made spot markets inefficient. This has been well sufficed with empirical findings.

The lesson on Government's part is that before such dilemma taking giant magnification (in future), policy makers should predict and safeguard against them so as to save one's trading bourses from serious crash. The aim must be faster assimilation of information. Economy must be shock absorbent in nature lest it may cripple down drastically- a lesson for lifetime.

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