Financial Analysis on Indian Stock Market Volatility during Recession

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Abstract

In this article, a snapshot of the market performance during the two-year is presented and compared with the major overseas markets. A study considered a market performance of different sectors i.e. Information Technology and Banking with respect to the market. Further we analyzed that which sector is impacted most during the recession period. A number of parameters are used to capture the market performance such as daily return, Volatility of daily return, market capitalization and mutual fund activity. The period from January 2007 to November 2010 showed Indian market's march towards the highest-ever levels of market capitalization and stock indices in 2007, and, thereafter, a precipitous fall in 2008. These include strong economic fundamentals, relatively stable political climate and, hence, large foreign funds inflow. Finally, we interpreted that which sector performing good and bad at this Global recession period and which sector has performed good after the recession or we can say there is no impact of

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recession for that particular sector.

1   Introduction

The Indian Stock Market started falling from January 2007 to January 2010, the descent accelerating towards the end of 2008, due the global fallout of the U.S. mortgage crisis. After that there is a slowly improvement in the performance of the Indian Stock market relative to the other World markets.

The study seeks to analyze the following aspects of the Indian stock market for the years 2007 and 2010:

➢   The extent and pattern of daily returns on Sensex and Nifty and their volatility.

➢   Comparison of Indian market performance with global markets in terms of price trend, daily returns, and their volatility.

The following are the some of the important studies on the subject,

The study by French and Roll- French and Roll (1986) analyze the volatility of equity returns during exchange trading and non-trading hours.

The study by Jones and Wilson- The study by Jones and Wilson (1989) assesses whether the stock price volatility has increased, and whether it is currently above or below historical level. They measured volatility using two methods first is the percentage spread between high and low daily prices in each month and secondly, the standard deviation of the daily prices within each month.

Kaur's Study- The study by Kaur (2004) describes the extent and pattern of stock return volatility of the Indian stock market during the last decade of the previous millennium i.e. 1990 to 2000.

2   Preliminary Notes

The Indian stock market is taken to be represented by the two most popular, accepted and quoted indices, i.e. Sensex and Nifty. The market indices are fairly representative of the various industry sectors and trading activity mostly revolves around the stocks comprising the indices.

2.1 The Data

The closing price data for NSE Nifty has been taken from the NSE website (www.nseindia.com) and BSE Sensex (www.bseindia.com) Measures of Daily Return and Volatility The volatility of daily stock returns over a month has been calculated as the standard deviation of daily returns on market indices. The returns are calculated as log price differences in order to treat positive and negative returns. Thus, standard deviation (volatility) σ is defined as:

$$\sigma = \sum_{i=1}^{n} (n-r)^2$$

And the daily return,

$$rt = \log_e\left(\frac{Pt}{Pt-1}\right)$$

where

n = number of observation

r_t = return on day t.

$\bar{r}$ = average return during the period of observation

P_t = price on day t

P_{t-1} = price on the day before day t; i.e., day (t-1).

3 Main Results

This section presents the results of the measurement of daily returns on the domestic (Sensex and Nifty) and their volatility during the period of study. The daily returns have been calculated as the difference between the natural logarithms on daily closing prices on the consecutive days. From, these average daily return (e.g. simply a mathematical average) and volatility (e.g. standard deviation) in a month, year and over the full period of study (2007-2010) have been calculated.

Table 1 Indicate the average daily returns and their volatility over a month, for Sensex and Nifty. This will help in taking a closer look at the market performance during the period of study.

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4   Conclusions

The period of four years (2007 to 2010) has been very eventful for the Indian stock Market. It is evident that October 2008, when the US mortgage crises were unveiled, was by far the worst month for investors. While the returns were most negative, volatility was the highest in 2008 for both Senses and Nifty. And, the return and volatility was also highest in month of 2009 but it is less than 2008. But the year 2010 the return and volatility is less as compared to all the four years. So

it is observed that volatility was higher the market was falling. Conversely, market was less volatile while rising. These is because investors asymmetrical response to negative and positive news. So, from the above study, we are able to interpret that after the recession period now present Indian stock market is again going up and the market condition is improving.

Table 1:   Average daily return and Volatility in a month
(January 2007 – November 2010)

Month	Daily Return (%)		Volatility (%)	
	Sensex	Nifty	Sensex	Nifty
Feb. 2007	-0.45	-0.45	1.54	1.56
Mar. 2007	0.05	0.10	1.95	2.00
April 2007	0.30	0.34	1.68	1.75
May 2007	0.23	0.24	0.80	0.85
June 2007	0.03	0.27	0.82	0.72
July 2007	0.27	0.22	1.38	1.42
Aug. 2007	-0.07	-0.07	2.00	2.06
Sep. 2007	0.61	0.22	1.04	1.28
Oct. 2007	0.62	0.73	2.34	2.46
Nov. 2007	-0.11	-0.11	1.73	1.72
Dec. 2007	0.25	0.33	1.49	1.67
Max. Value	0.62 (Oct.2007)	0.73 (Oct. 2007)	2.34 (Oct. 2007)	2.46 (Oct. 2007)
Min. Value	-0.45 (Feb. 2007)	-0.45 (Feb. 2007)	0.80 (May 2007)	0.72 (June 2007)

Month	Daily Return (%)		Volatility (%)	
	Sensex	Nifty	Sensex	Nifty
Jan. 2008	-0.63	-0.77	2.95	3.29
Feb. 2008	-0.02	0.08	2.38	2.46
Mar. 2008	-0.65	-0.55	3.21	3.06
April 2008	0.50	0.44	1.40	1.28
May 2008	-0.26	-0.29	1.31	1.21
June 2008	-0.94	-0.89	1.93	1.91
July 2008	0.28	0.30	3.30	2.97
Aug. 2008	0.07	0.03	1.73	1.61
Sep. 2008	-0.59	-0.51	2.50	2.32
Oct. 2008	-1.36	-1.53	5.19	5.03
Nov. 2008	-0.41	-0.26	3.85	3.83
Dec. 2008	0.28	0.34	2.53	1.38
Max. Value	0.5 (April 2008)	0.44 (April 2008)	5.19 (Oct. 2008)	5.03 (Oct. 2008)
Min. Value	-1.36 (Oct. 2008)	-1.53 (Oct. 2008)	1.31 (May 2008)	1.21 (May 2008)

Month	Daily Return (%)		Volatility (%)	
	Sensex	Nifty	Sensex	Nifty
Jan. 2009	-0.26185	-0.145037354	2.904857	2.743312
Feb. 2009	-0.10867	-0.20816591	1.679481	1.810869
Mar. 2009	0.635712	0.446457714	2.464981	2.348186
April 2009	0.884967	0.824403342	2.112435	2.187009
May 2009	0.975514	1.240664913	4.046535	4.158168
June 2009	-0.11294	-0.16470714	1.71897	1.926197
July 2009	0.308381	0.337577363	2.208982	2.222631
Aug. 2009	-0.08179	0.026351853	1.751263	1.790387
Sep. 2009	0.5095	0.43443827	0.856604	0.924038
Oct. 2009	-0.39601	-0.381362383	1.074085	1.087792
Nov. 2009	0.497178	0.330547834	1.343761	1.584035
Dec. 2009	0.077131	0.157164848	0.959455	1.048561
Max. Value	0.975514 (May)	1.240665 (May 2009)	4.046535 (May)	4.158168 (May 2009)
Min. Value	-0.39601 (Oct)	-0.38136 (Oct. 2009)	0.856604 (Sep)	0.924038 (Sep. 2009)

Month	Daily Return (%)		Volatility (%)	
	Sensex	Nifty	Sensex	Nifty
Jan. 2010	-0.39478	-0.33415	0.958571	1.034413
Feb. 2010	0.023677	0.041179	1.154865	1.17897
Mar. 2010	0.220885	0.307036	0.552008	0.700841
April 2010	-0.04011	0.307036	0.823496	0.700841
May 2010	-0.12899	0.027537	1.509382	0.834224
June 2010	0.314766	0.198387	1.029701	1.183742
July 2010	0.096933	0.047045	0.563995	0.638324
Aug. 2010	-0.02917	0.029465	0.607597	0.684053
Sep. 2010	0.488682	0.524913	0.744737	0.776883
Oct. 2010	-0.10227	-0.00971	0.994748	1.090264
Nov. 2010	-0.20991	-0.12464	1.234561	1.294116
Dec. 2010				
Max. Value	0.488682 (Sep)	0.524913 (Sep. 2010)	1.509382 (May)	1.294116 (Nov. 2010)
Min. Value	-0.39474 (Jan)	-0.33415 (Jan. 2010)	0.552008 (March)	0.638324 (July 2010)

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