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RESEARCH ARTICLE

A COMPARATIVE STUDY OF INTER-DAY AND INTRA-DAY VOLATILITY USING NIFTY

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ABSTRACT

The first chapter is mainly deals with the Introduction, about the study, about the industry and company profile. The objectives are to find out the performance of opening week and closing week of the select securities; to compare the price behavior of the gainers and losers of the selected securities. The research methodology, data sources, limitation, data collection methods & sampling design and review of literature are discussed in the second chapter. The third chapter says about the analysis of data and interpretation. Analysis consist of top 5 and bottom 5 bank returns. The last chapter is includes the findings, suggestions and Conclusion. The study results that the axis banks shows a better performance among gainers and SBI shows a better performance among losers. Thus the investors should have more attention in the closing week. Volatility is a symptom of a highly liquid stock market. Pricing of securities depends on volatility of each asset. An increase in stock market volatility brings a large stock price change of advances or declines. Hence in this paper an attempt *has been made to analyses the return and volatility.*

INTRODUCTION

Stock prices are changed every day by the market. Buyers and sellers cause prices to change as they decide how valuable each stock is. Basically, share prices change because of supply and demand. Investors interpret a raise in stock market volatility as an increase in the risk of equity investment and consequently they shift their funds to less risky assets. It has an impact on business investment spending and economic growth through a number of channels. Changes in local or global economic and political environment influence the share price movements and show the state of stock market to the general public. The issues of return and volatility have become increasingly important in recent times to the Indian investors, regulators, brokers, policy makers, dealers and researchers with the increase in the FIIs investment.

Data and methodology

Data were collected from BSE Sensex and NSE Nifty for calculating return and volatility. Sensex is a basket of 30 stocks representing a sample of large, liquid and representative companies. Due to its wide acceptance amongst the Indian investors, Sensex is regarded the pulse of the Indian stock market. Nifty is a well diversified 50 stock index accounting for 24 sectors of the economy. Hence these two indices were taken for the study. Data were taken from 2007 to 2012.

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Inter–Day volatility

The deviation in share price return between the two trading days is called inter–day volatility. Inter–day volatility is computed by close to close and open to open value of any index level on a daily basis. Standard deviation is used to calculate inter–day volatility. The inter–day volatility is calculated by close to close and open to open volatility method it is measured by standard deviation of returns.

Intra–Day volatility

The variation in share price return within the trading day is called intra–day volatility. It indicates how the indices and shares behave in a particular day. Intra–day volatility is calculated with the help of Parkinson Model and Garman and Klass model.

Parkinson Model3

Return

Return is the motivating factor that induces the investors to invest money in shares. Return means the profit earned as a result of rise in share prices. Return helps the investor to compare the benefits available in the alternative investment avenue. Descriptive statistics are used to analyse the return of the Nifty, and Sensex. The results of year-wise returns are given in the table one.

Table 1. Year-wise Descriptive Statistics for Nifty and Sensex (1998-2008)

Year	Name of the Indices	Minimum Index level	Maximum Index level	Daily Average Return (%)
2003	Nifty	808.70	1212.75	0.00294
	Sensex	2764.16	4280.96	-0.02482
2004	Nifty	931.00	1756	0.15606
	Sensex	3245.27	5933.56	0.14112
2005	Nifty	1124.70	1624.65	-0.09435
	Sensex	3540.65	5541.54	-013788
2006	Nifty	854.20	1198.45	0.00317
	Sensex	2600.12	3742.07	-0.01129
2007	Nifty	922.70	1146.5	-0.05239
	Sensex	2834.41	3512.55	-0.05568
2008	Nifty	924.30	1982.15	0.24440
	Sensex	2924.03	6194.11	0.23833
2009	Nifty	1388.75	2168.95	0.06813
	Sensex	4505.16	6915.09	0.04923
2010	Nifty	1902.5	3418.95	0.20754
	Sensex	6134.86	11307.04	0.21580
2011	Nifty	2632.80	4224.25	0.04663
	Sensex	8929.44	14652.09	0.05002
2012	Nifty	3633.6	6287.85	0.08534
	Sensex	12455.37	20873.33	0.09192

The Nifty had positive return whereas the Sensex had negative return. The pressure of economic sanctions following detonation of nuclear service, woes of East Asian financial markets, volatility of Indian currency and the redemption pressures faced by the Unit Trust of India (UTI) in respect of its US–64 Scheme made the Nifty decline from 1212.75 to 808.7 and the Senses from 4280.96 to 2764.16. From the analysis Nifty and Sensex return increased from 0.00294 percent to 0.15606 per cent and -0.02482 per cent to 0.14112 percent respectively. The strength of the Government and also its commitment towards second generation reforms improved macroeconomic parameters and better corporate results raised the return. In this year the growth rate of GDP and industrial sector was 6.4 per cent and 6.6 per cent respectively and within industrial sector, the growth rate of manufacturing sector was 7.3 per cent.

The trend got reversed during mid of the study period. The Indian economy decelerated and the Nifty and the Sensex yielded negative return of –0.09435 per cent and -0.13788 per cent respectively. There was a large sell off in new economy stocks in global markets. This brought down the Nifty from the height of 1636.95 to the lower level of 1108.20 and the Sensex from 5426.82 to 3689.43, The growth rate of GDP and the industrial sector declined from 6.4 per cent to 6 per cent and from 6.6 per cent to 4.9 per cent respectively. Within the industrial sector, the growth rate of manufacturing sector declined to 5.2 per cent and the infrastructure sector also registered a lower growth as compared to that of the previous year.

The earth quake in Gujarat, rising oil prices, devaluation of rupee vis-a- vis dollar, rising interest rates and inflation, the proposal to increase the tax on distribution of dividend by companies and by MFs from 10 per cent to 20 per cent did not speak well of the corporate sector. The study period also explains the recorded positive return of 0.00317 per cent but Sensex had negative return of - 0.01129 per cent. The year shows the negative return of –0.05239 per cent and -0.05568 per cent in the Nifty and Sensex respectively. Morgan and Stanley Capital International Index value for India declined to 3.9 per cent.

The daily average return in the Nifty and the Sensex was the highest in the year 2003–04. Strong economic fundamentals exhibited in the fall in interest rates, strong GDP growth rate, increase in foreign exchange reserves and exports of Indian companies doubled the Nifty and the Sensex in the first three quarters. Further, the large expenditure by the Government on infrastructure sector and the reform process enhanced the morale and motivation levels of Corporate India which in turn boosted the stock market returns. The SEBI's ban on the Participatory Notes issued by unregulated entities made the markets more disciplined and investor friendly. In addition, the introduction of T+2 settlement cycle and the derivatives in CNX.IT index, the margin system and the improved surveillance in the exchanges were also the reasons for the increased return.

There was a decline in the return in the year 2004–2005. As the index value of the Nifty sharply came down from 1892.45 and 5925.58 respectively on 23rd April 2004, to 1388.75 and 4505.16 respectively in May, 2004, a lower circuit breaker was applied on the NSE for the first time. This brought a total halt to all trading and the fund flow to stock market from the retail investors and the Foreign Institutional Investors dwindled. They were net sellers in May, 2004. But, slow down in Chinese economy, tax exemption on long term capital gain, and tax reduction on short term gain, the appreciation of rupee against the US dollar, low returns of bank FD rate and insurance policies and negative returns of debt market mutual funds prevented the negative return.

The overall performance of the stock markets in the world was well. By 2005, India's growth story was well established. Money started pouring in from everywhere. A new industrial resurgence; a pickup in investment; modest inflation in spite of spiraling global crude prices; rapid growth in exports and imports with a widening of the current account deficit; laying of some institutional foundations for faster development of physical infrastructure; progress in fiscal consolidation; and the launching of the National Rural Employment Guarantee (NREG) Scheme for inclusive growth and social security increased the return in the year 2005-2006. And the biotech sector is growing at 37.42 percent and inched closer to US$ 1.5 billion in revenues during fiscal year (April 1 to March 31) 2005-06. The GDP growth rate was 9.4%.In respect of the household sector, the saving in the form of financial and physical assets has gone up from Rs. 4,208.41 billion and Rs. 4,459.15 billion in 2005-06. All these factors boost the Indian stock market scaled high. Two things have happened in this period to push the market to uncharted territory. One is a robust inflow of foreign money, as more and more FIIs have rushed to pump money into the Indian market. What is new about these inflows is the decisive move made by Japanese funds to look at India as an alternative to China, the bulk of the $ 1.9 billion that has flowed into Indian markets in July alone has come from Japanese FIIs, taking the total FII investments in 2005 to around $7 billion. The number of new FIIs registered during the year has also gone up significantly.

Again there was a decline in the market return in the year 2006-2007. Global crude oil prices were surging yet again and had touched $78 a barrel due to the tensions in West Asia and the hurricanes from the Atlantic into the US east coast of the year further surged in crude prices and oil production and refinery output were disrupted in the affected area. Global liquidity had almost been drained off following the rate increases in the US, Europe and in Japan. The RBI had also done its bit in doing the same in India and a further movement in that direction cannot but had an adverse impact on the stock market. FII flows in 2006, at about $8.5 billion (around Rs 38,000 crore), were lower by 20 per cent than in 2005. But this was due to the markets tanking in May and June. Pharma, ferrous metals, FMCG, oil and gas, and auto components did perform well in that year.

The year 2007 saw Indian stock markets scaling new peaks. During 2007-08 the secondary market rose on a point-to-point basis with the Sensex and Nifty rising by 47.1 and 54.8 per cent respectively. Amongst NSE indices, both Nifty and Nifty Junior delivered record annual equity returns of 54.8 per cent and 75.7 per cent respectively during the calendar year. The Indian financial sector is on a roll. It has emerged as the third best performing market in the world with a dollar return of 71.23 per cent. The popular Bombay Stock Exchange (BSE) benchmark index, sensex, also posted its highest ever absolute gain of 6500 points in over two decades. Simultaneously, the National Stock Exchange (NSE) has climbed to the top spot in stock futures contracts and number-two slot in the index futures segment in the world. Spices export from India has reached record levels and exceeded the target set for 2007-08.

Ups and downs in the share prices are quite natural in stock market. The bull and the bear markets have certain characteristics and the investors adopt different strategies in the bull and the bear markets. The rise and the fall of shares are linked to a number of conditions such as political climate, economic cycle, economic growth, international trends, budget, general business conditions, company profits, product demand etc. In the bull market, buy–hold approach is adopted and in the bear market sell–move out approach is adopted by the investors. Results of return during the bull and the bear phases are presented in the following Table 2. The busy bull market turned into bear market for a very short duration. All the indices saw continuous and substantial fall from January, 2004 to May, 2004. Many reasons can be cited for this fall. The ban on Participatory Notes made FIIs to sell and the banks that did margin funding against shares also started selling. Retail investors and HNIs transferred some portion of their holdings in equities to bullion market because the price of gold increased to Rs.6360 per 10 gm on 7th January, 2004 and the silver increased to Rs10, 610 a kg on 2nd March, 2004.

The net investment of FIIs in January was around (Rs.38693 mn) which was very low compared to the investment (Rs.63819 mn) in December, 2003. On 14th May 2004 the value of the Nifty plunged deeply from 1582.4 to 1388.75 on 17th May 2004, and the circuit breaker was applied on the Nifty for the first time. The prospect of a non-BJP government in the center created a doubt about the reform process in the minds of investors and the brokers, and this affected the sentiment of the domestic investors.

After the election results, the market sentiment turned different for the better. On 6th July 2004, the railway budget was presented. The market responded to the railway budget positively. The rise in rupee value, the fastest growth in economy (8.2 per cent) and the manufacturing boom attracted huge FIIs inflows. FIIs holding in the Nifty stock in June, 2004 was Rs.1, 10, 000 crore and that FIIs registered with SEBI, increased from 492 in 1999 to 694 by April, 2005. Continuous GDP growth, sustained industrial growth and heavy FII's inflows strengthen the stock market in its peak with its ups and downs.

VOLATILITY

Stock market volatility indicates the degree of price variation between the share prices during a particular period. A certain degree of market volatility is unavoidable, even desirable, as the stock price fluctuation indicates changing values across economic activities and it facilitates better resource allocation. But frequent and wide stock market variations cause uncertainty about the value of an asset and affect the confidence of the investor. The risk averse and the risk neutral investors may withdraw from a market at sharp price movements. Extreme volatility disrupts the smooth functioning of the stock market. The literature on stock market volatility is voluminous, but, some general conclusions on common stock risk have emerged from this research. The overall stock market volatility has fluctuated over the time with no discernible trend and some authors have argued that volatility is higher during the bear markets. In this study, inter–day and intra–day volatility are calculated for each year and for different phases.

Table 2. Year-wise Inter-day Volatility for Nifty and Sensex (1998-2008)

Year	Close - Close		Open - Open	
	Nifty	Sensex	Nifty	Sensex
2003	1.843	1.979	1.923	2.069
2004	1.922	1.874	2.041	2.232
2005	1.980	2.151	1.982	2.846
2006	1.403	1.516	1.446	1.741
2007	0.991	1.010	0.992	1.060
2008	1.434	1.361	1.451	1.459
2009	1.642	1.496	1.644	1.571
2010	1.038	1.029	1.038	1.047
2011	1.776	1.758	1.801	1.764
2012	2.025	1.914	2.002	2.043

Table 2 indicates the close to close volatility and the open to open volatility in the Nifty and the Sensex moved in tandem. In the Nifty and in the Sensex, the close to close volatility ranged from 0.991 per cent to 2.025 per cent and 1.010 per cent to 2.151 per cent respectively. The open to open volatility in the Nifty and the Sensex ranged from 0.992 per cent to 2.041 per cent and 1.047 per cent to 2.846 per cent respectively. The close to close and the open to open volatility in the Sensex was very high in the study period. The loss was very high in Sensex compared to Nifty the entire financial year of the stock market was in the grip of bears. From the analysis Sensex values were consistently higher than the values of the Nifty, in both the

volatility. The study indicates that the close to close volatility was very high in Nifty. In the Nifty the open to open volatility was high in the starting study period. In the Sensex the open to open volatility was high in the mid of the study period. The Nifty also recorded negative return and a low volatility in the selected period.

Table 3. Year-wise Intra-day Volatility for Nifty and Sensex (1998-2008)

Year	High-Low 1.5411.464		Open-Close 1.4021.412	
1998-1999	Nifty	sensex	Nifty	Sensex
2003	1.541	1.464	1.402	1.412
2004	1.833	1.596	1.803	1.682
2005	1.901	1.823	1.871	1.730
2006	1.370	1.325	1.362	1.293
2007	0.941	0.862	0.920	0.822
2008	1.380	1.205	1.362	1.147
2009	1.512	1.298	1.416	1.252
2010	1.021	0.931	1.007	0.913
2011	1.704	1.528	1.672	1.494
2012	1.917	2.587	1.878	1.527

The close to close volatility in the Nifty was ranged from 3633.60 to 6287.33. US job data and interest rate cut by US Fed, higher inflation and political uncertainty over US-Indo nuclear agreement brought a tinge of wariness in the markets. Crude oil price affected the market adversely. On 3rd September 2007 the value of Sensex was 15422.05 but on 28th September it was 17291.10. In the first half of October 2007 Sensex climbed from 18K to 19K in just four days. As a result circuit breakers were applied on October 16.

In the Nifty, both open–close and high–low volatility were very high in the year 2007–2008. In 2002–2003 open –close and high –low volatility was very low in Nifty and Sensex. But in the Sensex open–close volatility was high in the year 2000–2001 and high–low volatility was very high in the year 2007-2008.

Except 2007-2008 the close to close volatility was low in Sensex compared to Nifty. Open– close volatility was low compared to other volatility and it ensures minimum fluctuation in the share prices within a trading day. High–low and open –close volatility moved alongside in the Nifty and in the Sensex. Open to open volatility was the highest of the four types of volatility; that indicates high flow of information.

Conclusion

The study conducted to identify the price fluctuations of the stock market in various levels. Indian economy shows both the bull and bear market during the selected study period. It confirms that the index selected for the study period is suitable for the nature of the study. The paper explains about the price variations using returns of the selected fund. It clearly shows that the economic factor is also a one of the reason for having fluctuations.

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