

# An Empirical Evidence of Volatility in Stock Market Returns: A Case of Individual Stocks

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**Abstract :** The paper is an attempt to measure the volatility of the individual stocks listed at NSE using daily closing prices of select companies. The companies have been select from the list of Nifty Midcap Liquid 15 covering the period from the launch of the index i.e. 2009 to 2016. The data have been analysed by working out standard deviation of daily log returns. The study reveals that Biocon Ltd., Canara Bank, Exide Industries Ltd., Reliance Infrastructure Ltd., Tata Communications Ltd., Union Bank of India, Voltas Ltd., have been comparatively less volatile than other securities. On the other hand, the securities such as Ajanta Pharmaceuticals, Bharat Forge Ltd., Strides Shasun Ltd. were highly volatile during the period of study.

**Key Words -** Volatility, Standard deviation, Daily log return, Nifty Midcap Liquidity 15

## I. INTRODUCTION

NIFTY Midcap Liquid 15 Index is designed to provide investors exposure to the liquid midcap stocks while making the index easily replicable and tradable. NIFTY Midcap Liquid 15 Index is computed using free float market capitalisation weighted method, wherein the level of the index reflects the total market value of all the stocks in the index relative to a particular base period. The method also takes into account constituent changes in the index and importantly corporate actions such as stock splits, rights, new issue of shares etc. without affecting the index value. The maximum weight of a single stock in the index is capped at 15%. Nifty Midcap Liquid 15 index is concerned about 15 most liquid stocks in the midcap sector. The index is up about 12% in one-year time period.

Broad-market indices serve as a benchmark for measuring the performance of the stocks or portfolios such as mutual fund. Apart from the key benchmark index – Nifty50, other midcap and small cap indices have also been popular among the traders. NSE has three indices for tracking midcap stocks. But among them, Nifty Midcap Liquid 15 index is leading all the indices.

Nifty Midcap Liquid 15 index has led the broader market indices. Meanwhile, three other broader indices have also posted double digit growth. The three indices were – Nifty Midcap 50, Nifty 100 Liquid 15 and Nifty Next 50. The dashboard image shows that the Nifty Midcap Liquid 15 index has outperformed not only the major indices but also the benchmark Nifty50 in this time period.

Nifty Midcap Liquid 15 index is concerned about 15 most liquid stocks in the midcap sector. Nifty Midcap Liquid 15 Index aims to provide investors exposure to the liquid midcap stocks while making the index easily replicable and tradable. In order to understand the importance of the index, it is important to monitor its performance in different time periods.

### 1.1 Sector Representation

Sector Weight (%): Financial Services 26.42, Pharma 20.51, Automobile 15.69, Industrial Manufacturing 13.30, Construction 9.45, Healthcare Services 7.40, Energy 4.17, and Telecom 3.06

## II. LITERATURE REVIEW

Raj, K. et al (2009), in their paper they examined the volatility in the individual stock listed at NSE using daily closing prices of 29 selected companies from the list of S&P CNX Nifty. The period after 2000-2001 has been registered comparatively less volatility than preceding years.

Ramya B. (2014), in his paper identified volatility in sectoral indices and BSE Sensex index. The correlation was found significant for most of the indices and most indices were having impact on the Sensex.

Srinivas Kumar N., (2016), did a study on selected companies of retail finance in his paper titled “Study on Volatility of Stock Market Data of Selected Companies Engaging in Retail Finance in India” GARCH methods were used to study the volatility of data related to four firms. All companies tend to have non-linear trends and the data was highly stochastic. Autocorrelations were not significant for three but reliance capital had rather showed interesting trend as there was close relationship between residuals and predicted values.

## III. OBJECTIVES

To compare the volatility in select individual stock for the study period

To estimate and compare the daily average return on individual stock for the study period

#### IV. RESEARCH METHODOLOGY

The present paper examines volatility in the securities of Nifty Midcap Liquidity 15 using daily closing prices of the 14 securities which have been selected on the basis of availability of data from 2009 to 2016. The rationale behind choosing the period starting from 2009 as this is the year of launch of Nifty Midcap Liquidity 15. All the data have been taken from the website of NSE (www.nseindia.com). Daily volatility has been computed by calculating standard deviation of daily returns.

Daily returns have been calculated by using the following formula:

$$\text{Return} = \text{LN} (\text{End Price} / \text{Beginning Price})$$

Where LN denotes returns the natural logarithm of a number. This measure of return takes into account only appreciation/depreciation in the share price and neglects the dividend yield.

Daily volatility in the security prices has been calculated by computing standard deviation of daily return.

$$\text{Daily Volatility} = \text{STDEV} (\text{sample of all daily returns})$$

Where STDEV estimates standard deviation on the basis of sample of daily returns, I have calculated the rolling standard deviation for one year.

#### IV. RESULTS AND DISCUSSION

##### 4.1 Results of Descriptive Statics of Study Variables

The exhibit shows daily returns, daily standard deviation and annual standard deviations of the 14 securities of Nifty Midcap Liquidity 15.

Ajanta Pharmaceuticals Ltd. was less volatile for the period of 2010, 2011, 2014 and 2016 with the percentage of 2.87%, 2.64%, 2.36% and 1.80% respectively. Whereas it was highly volatile in the year 2015 with 6.85%. the average return of Ajanta Pharmaceuticals Ltd. was highest among any other company taken in study. It depicts that except 2015; the return has been positive and around the average return i.e. 0.17 percent for each year. The dividends paid by the company are at 300 percent in FY 2015 against 50 percent dividend in FY 2011. The EPS for FY 2015 was at ₹35 against ₹27 in FY 2014.

Apollo Hospitals Enterprises Ltd. has slight stable patter in the volatility of returns which is ranging from 1.62% to 2.48% except in the year 2010 where it was 4.88%. Incase of Apollo Hospital Enterprises Ltd. out of 8 years 2year witnessed negative average daily return and its average daily return for the study period has been positive, almost around 0.05 percent per year.

Bharat Forge Ltd. also provided low returns which were utmost below 0.08 percent, the average daily return during the two years 2011 and 2015 was negative. The returns were slightly high in 2009. Bharat Forge Ltd. is the only stock in this index which has very high level of volatility in the returns during the year 2010, 2011, 2012, and 2013 which was 53.18%, 48.42%, 66.59% and 41.55% respectively. On the other hand during the year 2014, 2015 and 2016 shows less volatility in return.

The volatility in Biocon Ltd. has utmost been below 2.05% except the year 2009 when it was as high as 3.29%. It may say that volatility in this security has often stable. The average daily return for the study period was 0.81 percent and 4 years are such which experienced much higher returns compared to the average return.

Canara Bank also has less volatility pattern like above securities which was utmost below 2.83% except the two years 2009 and 2013 i.e. 3.21% and 3.10 respectively. Out of 8 years, Canara bank witnessed negative returns during 3 years. On the other hand it also experienced positive return during 5 years. The lowest negative return during the period was -0.27%.

Divi's Laboratories Ltd average daily return has been negative i.e. -0.23%. It was negative during 4 years which was ranging from -0.01 to -0.28%. The highest positive average daily return was 0.14% during 2 years i.e. 2012 & 2014 .The return Divi's Laboratories Ltd. has been highly volatile during the year 2009, 2015 and 2016 i.e. 5.38%, 4.67% and 2.37% respectively. Whereas it shows a very stable pattern of volatility in returns for rest of the period.

The average daily returns of Exide industries Ltd has been positive during 5 years out of 8 years. The returns were very high during 2009 i.e. 0.35% as compared to rest of the period which were having less 0.15%. Exide Industries Ltd. also experienced low fluctuation in daily return. The volatility has often been high in the year 2009 i.e. 3.11% but after that it has been comparatively stable.

Mahindra & Mahindra Financial Services Ltd. security was highly volatile during 2013 with 10.65%. in the remaining years, it has been relatively stable. Out of 8 years it witnessed highly positive returns during 3 years compared to the average return which is almost zero. On the other hand it also experienced negative return during 3 years. The lowest average return was -0.08% and the highest average return was 0.30% during 2011 and 2010 respectively.

The return in Reliance Infrastructure Ltd. also shows a stable pattern in volatility except 2009 & 2011 where it was highly volatile with 4.28% and 3.16% respectively. The average daily returns was -0.17% and it experienced higher returns in 2009 i.e. 0.26%. Strides Shasun Ltd. was highly fluctuating during the study period. It was highly volatile during 2009, 2013 and 2014 with 3.80%, 6.10% and 3.26% respectively. Whereas it was less fluctuating with volatility in return been below 2.63% for rest of the period.

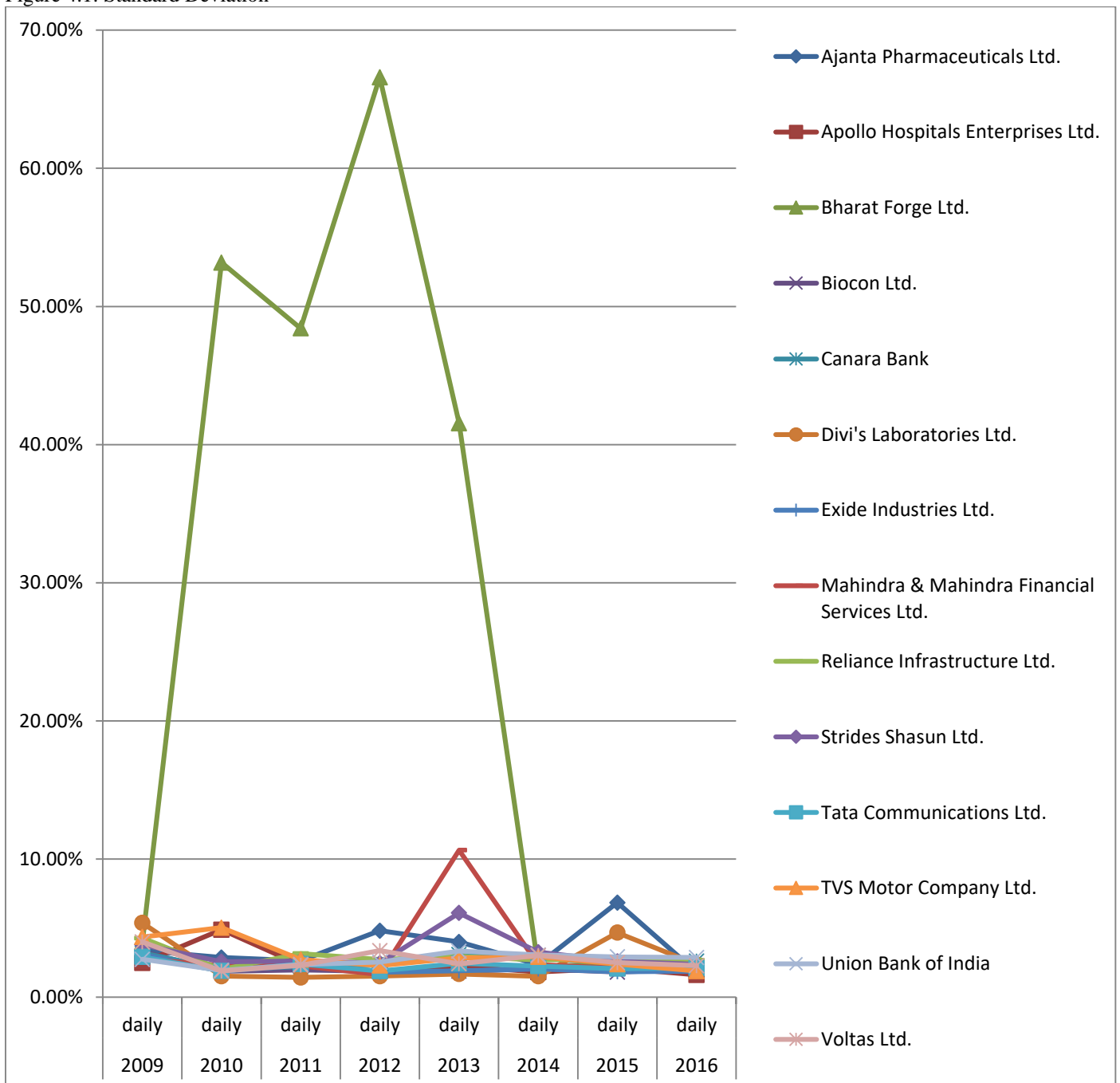
The average daily returns of Strides Shasun Ltd. ranged from 0.40% to -0.42%. In 2015 it was equal to average return i.e. 0.12%. The volatility in Tata Communications Ltd. has utmost been below 2.92%. As though, it was fluctuating for the entire study period. It provided low returns and out of 8 years, five years witnessed negative returns. The highest positive average return was 0.15%.

The average daily return for TVS Motor Company Ltd. is positive i.e. 1.10% and it experienced high returns during 2009, 2013 and 2014. TVS Motor Company Ltd. experienced high volatility in returns during 2009 and 2010 with 4.36% and 5.04% respectively and during rest of the period the volatility ranged from 1.90 to 2.93%.

Union Bank of India has also been one of the stock providing highly fluctuating returns over the years. The highest volatility has been experienced during the four consecutive years after 2012. It witnessed negative averaged daily returns. In 2014 it exhibits 0.25% of average daily return. Out of 8 years, 4 years witnessed positive returns and 4 years witnessed negative returns.

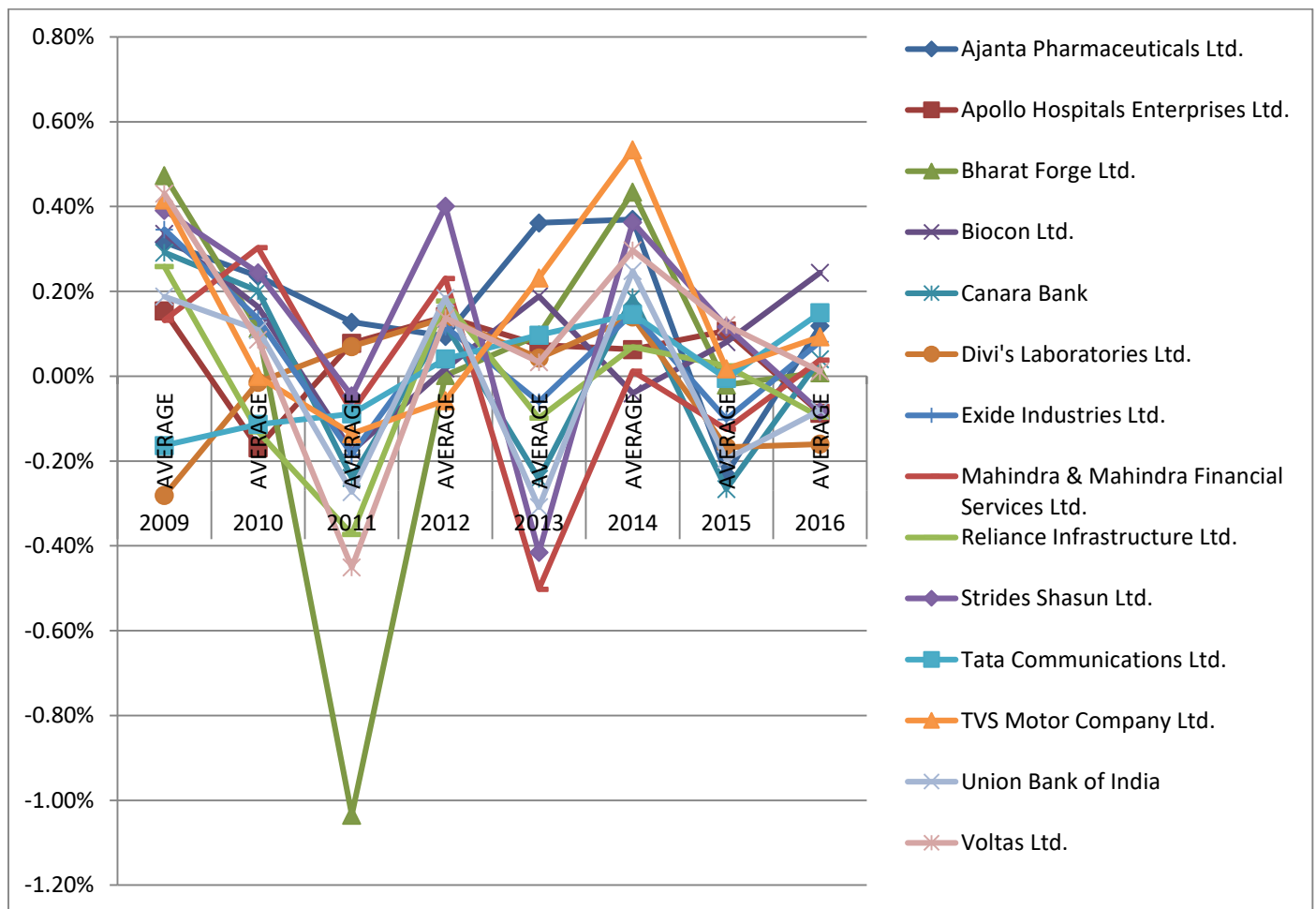
In case Voltas Ltd. the average daily returns was positive i.e. 0.08% for each year. Voltas Ltd. highest volatility has been 4% during 2009. Out of 8 years only one year experienced volatility below 1.89% i.e. during 2010.

Figure 4.1: Standard Deviation



Source: Authors Compilation

Figure 4.2: Average Daily Returns



Source: Authors Compilation

## V. FINDINGS AND CONCLUSION

This study reveals that Biocon Ltd., Canara Bank, Exide Industries Ltd., Reliance Infrastructure Ltd., Tata Communications Ltd., Union Bank of India, Voltas Ltd., have been comparatively less volatile than other securities. On the other hand, the securities such as Ajanta Pharmaceuticals, Bharat Forge Ltd., Strides Shasun Ltd. were highly volatile during the period of study. In terms of returns TVS Motor Company Ltd. witnessed highest return of 0.53% whereas Bharat Forge Ltd. experienced very less returns as compared to other stocks i.e. -1.03%.

## REFERENCES

1. Ramya B. (2014), "A study on stock market return and volatility analysis between sensex with sectoral indices of Bombay Stock Exchange".
2. Raj Kumar, Hariom Gupta, (2009) "Volatility in the Indian Stock Market: A case of individual securities". [https://www.researchgate.net/publication/46542984\\_VOLATILITY\\_IN\\_THE\\_INDIAN\\_STOCK\\_MARKET\\_A\\_CASE\\_OF\\_INDIVIDUAL\\_SECURITIES](https://www.researchgate.net/publication/46542984_VOLATILITY_IN_THE_INDIAN_STOCK_MARKET_A_CASE_OF_INDIVIDUAL_SECURITIES)
3. Srinivas Kumar N. (2016) "Study on Volatility of Stock Market Data of Selected Companies Engaging In Retail Finance in India". [www.pjitm.com/Doc/issu%20Jan%20-%20June%202016/PAPER%20-%201.pdf](http://www.pjitm.com/Doc/issu%20Jan%20-%20June%202016/PAPER%20-%201.pdf)
4. A. John William & T. Vimala (2015) "A Study On Equity Share Price Volatility Of Selected Private Banks In (NSE) Stock Exchange" <http://oaji.net/articles/2015/491-1438429526.pdf>
5. [www.nseindia.com](http://www.nseindia.com)
6. [www.moneycontrol.com](http://www.moneycontrol.com)