

VOLATILITY: AN ANALYSIS OF INDIAN STOCK MARKET

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ABSTRACT

This article examined the relationship between stock price volatility, trading volume, and the serial correlation of daily stock returns from January 1, 2015 to December 31, 2020. The results show that the effect of trading volume on stock market volatility has a significant impact on the volatility of stock market performance. Trading derivatives has improved the efficiency of the stock market by reducing the volatility of the spot market. Indicate that stock returns have caused an excessive change in fundamentals, expected total returns, and changes in the effective risk aversion of market participants. The relationship between yield, volatility and trading volume of 10 Indian stocks ... The contemporary correlation between yield and trading volume and the asymmetrical relationship between trading volume and yield is examined.

Keywords: *Volatility, Volume, Stock Price, Returns, Risk, Index, Trading.*

Introduction

Stock exchanges somehow assume significant work as indicators that reflect the performance of the country's monetary welfare. Hedges are bought and sold on the stock exchange. It occurs in high volatility; Prices vary in a short period of time and are dictated by the demand and supply of stocks at any given time. Stockbrokers are those who buy and sell securities for the benefit of individuals and institutions for a certain commission. Securities and Exchange Board of India (SEBI) is the authorized body that oversees the operations of stock exchanges, banks and other financial institutions. The past exhibitions in the capital markets particularly the protections trick by Harshad Mehta has prompted fixing of the activities by SEBI.

With the view to improve, train and get more noteworthy straightforwardness this segment, steady endeavors are being made and somewhat enhancements have been made.

Indian Capital Market Overview

Evolution

Indian Stock Markets are one of the most established in Asia. Its history goes back to about 200 years prior. The most punctual records of security dealings in India are pitiful and darken. The East India Company was the predominant organization back then and business in its credit protections used to be executed towards the end of the eighteenth century.

In this manner, at present, there are absolutely twenty-one perceived stock trades in India barring the Over the Counter Exchange of India Limited (OTCEI) and the National Stock Exchange of India Limited (NSEIL).

Literature Review

There have been number of experimental investigations in developed markets that give proof on the connection between trading volume and stock returns. Expiration impacts of stock future on the price and volume of underlying stock proof from India.

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- **Anver Sodath and B Kamaiah** examined the relation between daily trading volume and daily absolute changes of market Index and individual stocks and discovered positive relationship between's them.
- Exchanging volume and serial correlation in stock return Pakistan **Kahilid Mustafa** colleague educator utilized daily stock information and Epps December 1991 to December 2001 utilized exchanges information and found a positive contemporary relationship between's exchanging volume and outright returns.
- **Malabika dea, Professor of commerce(SQM) Pondicherry university & K shivsam, (2008)** dissected the dynamic relation between exchanging volume and returns utilizing singular stock exchanges information and found a positive slacked connection among volume and outright value changes.

Most studies show that after the introduction of index futures trading, the volatility of the spot market has decreased.

Objectives of the Study

The objective of this study is to;

- Study the behavior of volatility in stock markets after the changes in trading volume.
- Examine with help of econometric model whether the trading volume has reduced the risk and inefficiency in the Indian stock market or not.

Research Plan

In this study, our data set consists of all stocks in the S&P CNX Nifty Index. S&P CNX Nifty is a well diversified 10-stock index that represents different sectors of the Indian economy. The data were collected for the period from January 1, 2015 to December 31, 2020. The dataset consists of 12,580 daily adjusted closing price data points and three different measures of daily volume (number of transactions, number of shares traded and total value of the shares). The daily adjusted closing prices were used to estimate the daily returns. List of companies is as below:

Table 1.1: List of selected Companies and their Sectors

Company name	Sector	Symbol
Bharat Heavy Electricals Ltd.	Electrical Equipment	BHEL
HDFC	Finance	HDFC
I T C Ltd.	Cigarettes	ITC
Infosys Technologies Ltd.	Computers - software	INFOSYSTCH
Mahindra & Mahindra Ltd.	Automobiles - 4 wheelers	M&M
Oil & Natural Gas Corporation Ltd.	Oil exploration/production	ONGC
Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Sun Pharmaceutical Industries Ltd.	Pharmaceuticals	SUNPHARMA
Tata Power Co. Ltd.	Power	TATAPOWER

Limitation

- Small size sample of 10 companies
- Time period can be lengthened for studying the volatility
- Macro-economic factors like FIC ,FII, oil prices, Global factors have ignored they have impact on volatility on the stock markets
- F&O segments volatility
- Corporate House's Announcements

Methodology Followed for Stock Market Analysis

For the stock market analysis, secondary data available from NSE and BSE is considered and Regression analysis, Beta as standardized coefficient, Standard Error, ' t ' value is used as a tool of analysis. Following are the equations and terminologies which is used for this research.

- The actual return on each sample stock during both event window and estimation window is found as follows:

$$\{ r_{i,t} = (P_{i,t} - P_{i,t-1}) / P_{i,t-1} \}$$

Where

$r_{i,t}$ = Return on stock i in the period t

$P_{i,t}$ = Price of security i in the period

$P_{i,t-1}$ = Price of security i in the period t-1

- The actual market return on CNX-Nifty is found in the similar manner as follows:

$$\{ r_{m,t} = (I_t - I_{t-1}) / I_{t-1} \}$$

Where

$r_{m,t}$ = Market return in the period

I_t = Index value in the period

I_{t-1} = Index value in the period

- The following linear market model for stock i is estimated from the estimation window:

$$\{ r_{i,t} = \alpha + \beta r_{m,t} + u_{i,t} \}$$

Where

$r_{i,t}$ = Return on stock i on day t

α = Intercept

β = Beta of the stock i

$r_{m,t}$ = Market return of CNX-Nifty on day t

$u_{i,t}$ = Residual error term which is assumed to satisfy the usual assumptions of linear regression

model.

- The regression specification takes the followings general from:

$$\{ Y = a + bx + e \}$$

Where, y and x are dependent and independent variable respectively and e is the error terms

Accordingly, $r_{i,t}$ is estimated from the following regression specification

$$r_{i,t} = \alpha + \beta r_{m,t} + e$$

Results

ITC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.001	.002		-.406	.685
	Volume daily index return	-.014	.004	-.105	-3.736	.000

a. Dependent Variable: ITC daily stock price return

ITC stock Price Return = a+bx

$$= -.001 + -.014 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume.

So it is -.014 which is significant at p value of .000

BHEL

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		2.462	.014
	Daily return on index return	.004	.001	.073	2.597	.010

a. Dependent Variable: Daily return on stock prices BHEL

BHEL stock Price Return = a+bx

$$= .002 + .004 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .004 which is significant at p value of .010

M&M**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		1.902	.057
	daily return on m&m trading volume	.003	.001	.052	1.831	.067

a. Dependent Variable: daily return on m&m stock prices

M&M stock Price Return = a+bx

$$= .002 + .003 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .003 which is significant at p value of .067

Tata Power**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		2.840	.005
	daily return on tata power trading volume	.006	.001	.140	5.008	.000

a. Dependent Variable: daily return on tatapower stock prices

Tata Power stock Price Return = a+bx

$$= .002 + .006 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .006 which is significant at p value of .000.

HDFC**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		2.655	.008
	daily return on hdfc trading volume	.004	.001	.129	4.598	.000

a. Dependent Variable: daily return on hdfc stock prices

HDFC stock Price Return = a+bx

$$= .002 + .004 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .004 which is significant at p value of .000

Infosytech**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.001	.001		-.575	.565
	daily return on infosytech trading volume	-.003	.003	-.027	-.948	.343

a. Dependent Variable: daily return on stock infosytech prices

Infosytech stock Price Return = a+bx
= -.001 + -.003 x

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is -.003 which is significant at p value of .343

ONGC

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.001	.001		1.428	.154
	daily return on ONGC trading volume	.003	.001	.077	2.730	.006

a. Dependent Variable: daily return on ONGC stock prices

ONGC stock Price Return = a+bx
= .001 + .003 x

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .003 which is significant at p value of .006

Reliance

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		3.010	.003
	daily return on reliance trading volume	.001	.001	.021	.726	.468

a. Dependent Variable: daily return on stock reliance prices

Reliance stock Price Return = a+bx
= .002 + .001 x

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .001 which is significant at p value of .468

Sunpharma

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.001	.001		.569	.569
	daily return on sun pharma trading volume	.004	.001	.094	3.335	.001

a. Dependent Variable: daily return stock sun pharma prices

Sunpharma stock Price Return = a+bx
= .001 + .004 x

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .004 which is significant at p value of .001

SBIN**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.002	.001		2.702	.007
	daily return on SBIN trading volume	.005	.001	.102	3.618	.000

a. Dependent Variable: daily return on SBIN stock prices

SBIN stock Price Return = a+bx

$$= .002 + .005 x$$

B is the slope of regression line and it tells % change in return caused by % change in volume. So it is .005 which is significant at p value of .000

Analysis of Results**Table 1.2: Summary of Results**

Column1	Column2	Column3	Column4	Column5	Column6	Column7
S.NO	Company name	α	B	More than .05	less than .05	
1	ITC		-0.001	-0.014		
	Seg	0.685	0			1
2	BHEL		0.002	0.004		
	Seg	0.014	0.01			2
3	M&M		0.002	0.003		
	Seg	0.057	0.067	1		
4	TATA POWER		0.002	0.006		
	Seg	0.005	0			3
5	HDFC		0.002	0.004		
	Seg	0.008	0			4
6	INFOSYTECH		-0.001	0.003		
	Seg	0.565	0.343	2		
7	ONGC		0.001	0.003		
	Seg	0.154	0.006			5
8	RELIENCE		0.002	0.001		
	Seg	0.003	0.468	3		
9	SUN PHARMA		0.001	0.004		
	Seg	0.569	0.001			6
10	SBIN		0.002	0.005		
	Seg	0.007	11			7

As per Table (1.2) the Beta of 7 companies are Significant because level of Significance is less than 0.05($\sin < 0.05$) on the other hand the Beta of 3 companies are not Significant because for every company Significance level is more than 0.05($\sin > 0.05$).

Findings

This study has observed the informational impact of the cash markets trading on the volatility of stock market with the help of a well known test for the volatility of the financial markets and using the SPSS software calculated regression model. NSE Nifty listed 10 stocks are used understudy for stock market return. The general finding is that impact of trading volume on the stock market's volatility and it has significant impact on the volatility of the stock market return.

To control the effects of trading volume, we used other performance series and determined that derivatives are not a single factor affecting equity risk (volatility). There are a few other market factors. Great efforts have been made to control the volatility of the NSE market. A high volatility is considered a high risk on the stock trading in Stock Market. In order to reduce this risk factor in the Indian stock market, the market regulators are taking a number of measures; the introduction of derivatives trading is one of them.

Conclusion

The analysis concluded that derivatives trading had done its job. It has improved the efficiency of the stock market by reducing the volatility of the spot market. The result is different for the different time periods, as the analysis for the period January 2015 to December 2020 concludes that the volatility increases due to the trading volume.

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