



"Analysing an impact of last trading Thursday on return of selected shares and NSE- an Empirical Study"

KEYWORDS

Expiry day, last Thursday impact, derivatives

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ABSTRACT Derivative products are alleged to have a sharp affect on the stock market in various ways ever since their inception in June 2000. Currently, derivative trading constitutes approximately 90% of the total turnover of the NSE (National Stock Exchange). Launching of derivatives and their expiration (last Thursday of every month) in the Indian stock market has been perceived to have direct corollary on the return, volatility, efficiency and marketability of the stock market. This paper tries to analyze empirically the expiration day effect of stock derivatives on underlying securities. This study tests the presence of the last Thursday of the month effect on stock market volatility by using the S&P 500 market index during the period of January 2012 and December 2012 and sample companies which are trading on derivative market. The findings show that the last Thursday of the month effect on stock market volatility is not present in volatility and return equations.

INTRODUCTION

In India, trading in derivatives started in June 2000 with the launch of futures contracts in the BSE Sensex and the S&P CNX Nifty Index on the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE), respectively. Options trading commenced in June 2001 in the Indian market. Since then, the futures and options (F&O) segment has been growing continuously in terms of new products, contracts, traded volume and value. At present, the NSE has established itself as the market leader in this segment in India, with more than 99.5 percent market share (NSE Fact Book, 2006, p. 85). The F&O segment of the NSE outperformed the cash market segment with an average daily turnover of Rs291.91 billion, as compared to Rs114.79 billion in the cash segment from 2006 to 2007 (Derivatives Updates on NSE website, www.nseindia.com, 2007). This shows the importance of derivatives in the capital market sector of the economy. Previous studies on the volatility effects of derivatives listing provide mixed results, suggesting case-based biases. In this paper, we attempt to study the volatility implications of the introduction of derivatives on the cash market.

Literature Reviews

Literature that shows the impact of expiration day of derivatives (financial) on stock market to international market is as follows:

Chou HC, Chen NW, Chen HD (2006) examined the expiration effects of TAIFEX index derivative on the underlying stock market between 1998 and 2002. The empirical findings showed no significant expiration day effect, but concluded that expiration effect has strengthened as more relative index derivatives are listed on the TAIFEX. In general, the research concluded that the expiration effects in Taiwan are not as significant as those in U.S. market but are stronger than those in the Hong Kong market. The special settlement procedures adopted by the TAIFEX may account for the difference.

Vipul (2005) examined the future and option expiration effect on selected 14 stocks of Indian capital market. The study compared the price, volatility, and volume of the underlying shares in the cash market

one day prior to expiration, on the day of expiration and one day after expiration with the corresponding values of these variables one week and two weeks prior to the expiration days by using the Wilcoxon matched-pairs signed-ranks test.

Jindal and Bodla (2007) analyzed the effect of expiration of stock derivatives on the volatility and marketability of Indian stock market as well as the underlying individual stocks. The results presented that the expiration days of financial derivative witnessed an abnormally high volume trading which was attributed to arbitrage activities in the market. This clearly shows that expiration day results into high volatility in the stock market.

Research Methodology:

Expiration day effect of derivatives on the returns of the underlying stocks:

To analyze the expiration day effect on the returns of the underlying securities event study methodology has been adopted. The event in this case is defined as expiration of stock derivatives. Data for the share prices has been collected from the official website of National Stock Exchange (www.nseindia.com). For calculation purposes the following steps has been followed:

The actual returns for individual securities and S&P CNX NIFTY have been calculated for estimation window. The following formulas have been used for this purpose:

$$R_t = (P_t - P_{t-1}) / P_{t-1} \quad (i)$$

$$R_{nifty} = (I_t - I_{t-1}) / I_{t-1} \quad (ii)$$

Where R_t and R_{nifty} are the returns of individual security and S&P CNX NIFTY respectively. P_t and P_{t-1} is the price of individual security at time t and $t-1$ respectively. I_t and I_{t-1} is the value of S&P CNX NIFTY at time t and $t-1$ respectively.

Expiration day effect of derivatives on the volatility of the underlying stocks:

This part of the study evaluates the expiration day

effect on the volatility of the underlying securities during the period ranging from 1st January 2012 to 31st December, 2012 for 10 selected scripts in the form of stock options. Stock option trading was allowed on 31 securities at the time of inception of derivatives trading. Out of these stocks, that created history by introducing derivatives for the first time in Indian capital market. The data has been collected from the official website of National Stock Exchange (www.nseindia.com) and includes daily observations for the closing prices of the underlying stocks.

TOOL USED:

t-test:-

In testing the null hypothesis that the population mean is equal to a specified value μ_0 , one uses the statistic

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

where \bar{x} is the sample mean, s is the sample standard deviation of the sample and n is the sample size. The degrees of freedom used in this test is n - 1.

For analyzing the volatility structure, Regression is used

due varying nature of volatility, which also provides an avenue for verifying the presence of endogenous drivers of volatility shifts.

Regression Equation = a + bx

Slope(b) = $(N\sum XY - (\sum X)(\sum Y)) / (N\sum X^2 - (\sum X)^2)$

Intercept(a) = $(\sum Y - b(\sum X)) / N$

EMPIRICAL RESULT:

This paper has tried to examine the expiration day effect of derivatives on return and volatility of the underlying securities. To test this Regression test has been used.

Table 1(a) & table 1(b) shows percentage change in return of selected stocks return on last Thursday of every month and return of nifty of last Thursday of every month.

Table 1(a)	2013											Table 1(b)
Months	COMPANY											NIFTY
	AXIS	ICICI	SBI	RIL	IOC	ONGC	BHARTI AIRTEL	IDEA	SUN PHARMA	DR. REDDY		
JANUARY	0.685665	-1.31317	0.0821	-1.11526	3.281792	0.354505	-1.03453	-0.22085	2.097405	-1.08931		-0.1803
FEBRUARY	-4.72089	-4.72527	-6.85318	-2.78906	-4.65798	-1.43082	-1.0723	-0.38119	-0.01246	-0.70984		-2.4219
MARCH	0.208012	1.965758	1.16651	-1.5414	3.018109	2.636783	-1.61861	6.448598	-1.30754	0.623736		0.61617
APRIL	2.202583	0.619605	1.10654	1.492075	-0.39344	0.107313	0.612583	-0.63993	3.104936	3.895088		1.02799
MAY	-1.14538	-1.02092	-0.54524	-0.97041	0.340716	2.110092	2.970944	-1.03781	1.320506	-0.71134		0.85472
JUNE	0.874209	-1.00384	-0.46838	1.653399	0.948724	2.463606	-1.80133	-1.37518	2.760444	2.577197		0.60907
JULY	1.184866	-0.65356	0.23133	-1.6778	-0.0227	-1.14887	0.029674	3.636364	-2.31002	-2.1136		-1.0535
AUGUST	-1.07558	-0.88409	-1.66557	3.584559	-1.50305	-0.12048	2.027948	4.948862	0.324165	2.796996		1.74081
SEPTEMBER	-0.35266	0.981962	-0.54295	-0.99215	-2.79474	-1.08929	-0.81481	1.852941	1.982456	1.111088		0.16091
OCTOBER	0.13923	2.5478	4.58686	1.633333	-0.41893	1.275862	2.584882	1.289944	-1.75892	-2.8707		0.99404
NOVEMBER	-1.35171	-1.81595	-0.75408	0.575258	0.933165	0.70714	-0.94888	-0.14257	-0.67861	0.492903		-0.0025
DECEMBER	0.718279	0.424658	0.02567	-0.77697	0.117371	1.68725	0.8878	-1.28052	0.158172	-1.05307		0.14035

Table 1 shows figures for average returns for selected F&O scripts calculated by $R_t = (Pt-Pt-1)/Pt-1$ and figures in table 1(b) shows average returns for Nifty returns for last Thursday calculated by $R_{nifty} = (It- It-1)/ It-1$. Table 2 Analyzing the Expiration Day Effect of Stock Derivatives on the Volatility of the Underlying Securities

Company	Regression
AXIS	0.263671
ICICI	0.421848
SBI	0.40512
RIL	0.607697
IOC	0.136614
ONGC	0.288822
BHARTI AIRTEL	0.230689
IDEA	0.036806
SUNPHARMA	0.059814
DR. REDDY	0.194849

Table 2 shows regression analysis of selected companies for the research. The test shows that whether companies are having impact on changes in the NIFTY returns or not. From the analysis it can be interpreted that company like RIL having impact on last Thursday up to 60.76% i.e. changes in the NIFTY prices up to 60.76% can be directly identifiable because of RIL, ICICI is having 42.18% impact while SBI is having 40.51% impact on NIFTY return, while others are having quite less impact on NIFTY returns which can be called as negligible impact.

Results of T-test:

Table 3 shows analysis of t-test calculation for the Expiration Day Effect of Stock Derivatives on the Volatility of the Underlying Securities

H0: there is no significance impact of F&O stocks on Nifty returns

COMPANY	t calculated	t critical	accept/ reject
AXIS	-0.71272	2.100922	ACCEPT
ICICI	-0.96283	2.109816	ACCEPT
SBI	-0.62853	2.13145	ACCEPT
RIL	-0.45913	2.100922	ACCEPT
IOC	-0.42584	2.119905	ACCEPT
ONGC	0.814304	2.079614	ACCEPT
BHARTI AIRTEL	-0.09646	2.093024	ACCEPT
IDEA	1.080552	2.13145	ACCEPT
SUNPHARMA	0.439325	2.100922	ACCEPT
DR. REDDY	0.057311	2.109816	ACCEPT

The above table shows analysis of t-test for the selected companies for impact of last Thursday on NSE India. By applying t-statistics it can be interpreted that there is no impact of trading activity of F&O companies on NSE returns. From the test its clear that returns on Nifty is statistically independent and having less impact of returns of F&O stocks.

CONCLUSION

The empirical study revealed the impact of expiration day on the return and volatility of underlying stocks. The study indicates a significant effect of expiration day on the returns of the underlying securities. This price effect of expiration can be due to the cash settlement mechanism of futures contracts which facilitate the unwinding of arbitrage positions causing price distortions and also position adjustments by the market makers. As a whole, it can be said that the returns and volatility in returns is higher on expiration days as compared to other days. But the changes in the prices are not because of only expiration impact, due to some other factors also. The results obtained also signify that on expiration day, not all the companies which are trading in futures and options are having impact on cash market, but changes in the cash market price it can also because of the arbitrageurs and speculators join the market to take advantage of price differentials and price discovery.

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