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The Impact of Maturity on Futures and Options with Reference to National Stock Exchange: An Exploratory Study

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Abstract

National Stock Exchange was ranked foremost for trading of individual futures stocks in the year 2007. Since then trading of stock futures has witnessed a tremendous growth in India. Futures and options instruments have not only emerged for trading but also to minimize the risk associated with stock price fluctuations. Index, stock futures and options are based on monthly, bimonthly and quarterly contracts which expire on last Thursday of the month. The scope for studying futures and options has gained prominence with the introduction of weekly option contracts of Bank Nifty and Nifty Index Option at National Stock Exchange. It is believed that longer-dated options are more sensitive to the risk of intertemporal shift in any economic environment while shorter dated options are comparatively less risk sensitive. The factors stated above stress upon the need to explore the impact of maturity date on futures and options. Thus, the present study makes an attempt to present a detailed review of literature in this context. The present paper is of threefold. Firstly, it attempts to draw inferences based on literature review in relation to impact of maturity effect on derivatives market in National Stock Exchange. Secondly, it also makes an attempt to bring out the effect of monthly and weekly futures and options contracts. Towards the end, based on the analysis efforts had been made to draw a meaningful conclusion which may be helpful to academicians as well as investors and also may provide scope for further research.

Keywords

Futures, Options, Maturity, Nifty Weekly Options, Bank Nifty Index, Bank Nifty Weekly Options

1. Introduction

Introduction of derivatives is a paradigm shift in the Indian Financial Market with the recommendations of L.C Gupta Committee. Nifty 50 Index futures contract was the first derivative contract launched on National Stock Exchange in India. Derivatives need to be understood as a tool to hedge against stock price fluctuations. In National Stock Exchange the trading volume in index futures in 2001 was Rs. 2365 crores and for the 2017-2018 the volume was Rs. 164984859 crores as on June 2018 (www.nseindia.com). Compared to cash segment, derivatives volumes and traded value of derivatives have grown immensely over the last two decades. Futures and Options have registered tremendous growth in the recent past not just for trading but also as a tool to minimize the risk which emerges out of stock price fluctuations. Index, stock futures and option are based on monthly, bimonthly and quarterly contracts which expire on last Thursday of every month whereas the futures contracts are associated with the benefits like hedging, low-cost execution and liquidity the demerit can be uncontrollable future events, complex issues of new investors, leverage issues and timing. Options contract, wherein the option possessor has the right to buy or sell an asset but do not have any obligation to enter into the contract. To capitalize on short term moves, minimizing the effects of time decay and hedge event related risk weekly options as a tool had been added as a feather to the existing crown. It was found that trading volumes were significantly high during expiration days for the futures and options instruments [1].

Bank Nifty index are known for their high volatility and huge volumes which can be a reason to consider introducing bank nifty weekly options which are now more than 2-year-old. With the success of Bank Nifty weekly options, Nifty weekly was introduced in National Stock Exchange recently. Weekly options are another tool in the existing toolbox which is dominant enough to generate quick profits or losses depending upon the usage. The index weekly options can be helpful to the investors to safeguard their portfolio risk in a volatile market.

2. Theoretical Background

Extant studies on expiration-day effects widely studied in USA and these studies have focused on research such as the trading volume, return, volatility, and the purported "triple-witching hour" expiration Fridays. The conventional research on derivatives was confined to advanced countries as the markets are liberalized and known for giant contribution in the derivatives segment. However, there has been an increasing trend in studying the derivative instruments in emerging markets [2]. The impact of expiration date on futures and options has received limited attention. The research conducted so far in the Indian context presents the case of mixed results. The present section makes an attempt to present a summary of all the relevant work done in the emerging markets in two parts 1) review of literature in derivatives markets, and 2) fu-

tures and options.

Gakhar and Meetu [3] suggested that as the regulatory framework in Indian Capital Markets are centralized, to boost the confidence of participants in derivatives segment many issues like tax, bottlenecks and economies of scale need to have an independent regulator. Kadioglu *et al.* [4] observed that when volatility occurs in market, there is a tendency is to blame new happenings at that particular time. Derivatives started early 80's and ample data were available for testing. To date, there is no evidence to sustain the argument that trading of stock futures has diluted the market. Mishra *et al.* [5] found that the dominance of spot market over futures and options market was due to the increase in Securities Transaction Tax. It was also opined that Securities Transaction Tax should act as a tax shelter on put and call positions. Wang [6] found that the speculators responded optimistically to market sentiment, in contrast hedgers traded against market sentiment after controlling for the market threat factors. Bose and Bhaumik [7] observed that trading volumes were considerably superior on expiration days than on non-expiration days, there was noteworthy expiration day effect on a daily basis returns to the market index and also on fluctuation of the returns. Ankit Jain *et al.* [8] examined the effect of entry of small investors in derivatives segment to find that entry of small investors exerted influence on both spot market and derivatives markets leading to increase in stock valuations, price efficiency and a significant increase in liquidity. Agarwal *et al.* [9] examined the effect of derivatives on diverse stock features such as valuation, price effectiveness and liquidity and found that derivatives put in value by improving price competence and liquidity of the stock. Shalini and Raveendra [10] suggested that globalization and liberalization across the world have increased the financial risk. It was found that equity derivatives play an important in price-discovery, hedging strategies; innovations in financial engineering are driving financial derivatives. Lai [11] suggested that superior returns can be enjoyed by hedged portfolios developed from copula-based GARCH model than traditional form of hedging models. Nandan *et al.* [12] examined the price effectiveness of the Nifty Index Futures contracts to conclude that there are chances of overpricing and also a major difference between mispricing series with varying days to expiry. Kamaiah and Sakthivel [13] investigated the impact of stock futures expiration on the spot market in the NSE and observed positive abnormal returns and volumes on days before the expiry day. Vipul [14] analyzed the expiry day impact in the Indian stock market. 14 equity shares of different sectors were considered for the study and it found that share prices have fallen the day before the expiration day and has risen significantly the day after the expiration day. Debasish and Puri [15] examined whether latent expiration effects subsist on the Index Futures and observed that volumes are significantly higher on the expiration day and do not have any price distortions on the expiration day. Bodla and Jindal [16] observed that Compound Annual Growth Rate of trading volume has diminished

slightly after the introduction of derivatives and also found a positive effect of expiration of derivatives on trading volume of sample stocks. Mahalwala [17] found that although the trading volumes were higher on expiration days than non-expiration days, there was no significant difference between the return on expiration between expiration and non-expiration days. Table 1 and Table 2 present a summary of all the relevant works in the areas of maturity/expiration day and maturity/expiration day impact on futures and options market in India respectively.

Table 1. Review of literature in derivatives markets.

Sl.no	Year	Author	Purpose/Objective	Findings
1	1983	Cornell and Frernch [17]	To study the influence on taxes and Pricing of Stock Futures.	The results revealed a significant implication for tax-exempted investors. If the additional investors were under tax-exemption, then the timing of option would be regardless and the "perfect markets" pricing model assumption should invoke.
2	1985	M Brenner *et al.* [18]	To bring out the relationship between option prices as the assets involved are not essentially of the fixed income nature.	Observed that, the relative values of options might have been affected by several institutional arrangements like delivery and exercise policies, margin requirements, and transactions costs.
3	2002	C Wang [6]	To study the behavioral performance of speculators and hedgers pertaining to derivatives markets in U.S.	The outcome was that, speculators were possessing positive responsiveness towards market sentiment whereas hedgers were negatively responding towards destabilizing impact on futures prices.
4	2003	MS Pan *et al.* [20]	To find out how volatility and futures risk premium influence the trading demands in relation to speculation and hedging in S & P 500.	There is a positive co-relation between volatility and open interest for Hedgers and speculators and also observed that speculators are more responsive to the changes than hedgers in terms of demand in futures risk premium.
5	2009	A Sadath and B Kamaiah [21]	To examine the bid-ask spread of equity stocks at the introduction of individual stock futures in NSE.	Single stock futures in NSE have increased liquidity in the underlying stocks.
6	2013	K Gakhar and Meetu [3]	To examine the trading mechanism of different types of derivative products and also future prospects and various issues in Indian market.	Several issues like absence of economies of scale, taxation, legal bottlenecks need to have independent regulator to be resolved to boost confidence of participants in the derivatives segment.
7	2014	Misra *et al.* [8]	To study the significance of Increase in Derivatives-Trading in India on the Price mechanism Process.	It was found that spot market dominance was high compared to futures and options. Due securities transaction tax on futures and options.
8	2014	HS Shalini and PV Raveendra [10]	To examine the origin of derivatives trading, types, regulations, policy developments, potential prospects and challenges of derivatives market in India.	Equity derivatives play an important role in Price-Discovery, technical risk management tools, advancement in financial engineering and hedging strategies are driving financial derivatives.
9	2014	T Nandan *et al.* [12]	To examine the price competence of the CNX Index Futures.	It was observed that there are chances of overpricing and also a considerable difference between mispricing series with altering days to expiration.
10	2015	D Agarwal *et al.* [9]	To find the effect of futures and options on valuation, price efficiency and liquidity of stocks.	It was found that derivatives in fact add value to spot market by increasing liquidity and enhancing price.
11	2016	E Kadioglu *et al.* [4]	To find the determinant of the volatility of the futures contracts in Turkey.	The results point out that time to maturity and open interest have a pessimistic effect on volatility, whereas volume has an optimistic effect on volatility.
12	2016	K K Kotha and S Bose [19]	To analyze the dynamic linkages between SGX and NSE Nifty Index Futures contracts taking into account the underlying spot market as well.	It has been found that, irrespective of the exchange in which futures contract are traded, the descriptive statistics of the three-price series and three return series are similar.

Continued

13	2016	Ankit Jain *et al.* [8]	To examine the impact of entry of small investors into derivatives segment.	Liquidity and Price efficiency improved because of small investors' participation and also volatility not increased in the derivatives segment.
14	2016	I Gautam *et al.*,	To study the perception of market participants in derivatives trading.	It was observed that all participants agreed that volumes and volatility have increased significantly after introduction of derivatives and also facilitate price discovery and possibility of good returns.
15	2018	Sadia Perveen	To explore the causes for lack of growth in derivatives market.	It was found that economic instability was the major cause for lack of growth in derivatives market.
16	2018	Y S Lai [11]	To examine how GARCH model based on Copula with higher frequency data is useful for hedge ratio estimation.	It was observed that superior returns can be enjoyed by the hedged portfolios build from copula based GARCH model than traditional form of hedging models.

Table 2. Maturity/expiration day impact on futures and options in India.

Title	Year	Author	Purpose/Objective	Findings
1	2005	Vipul [14]	To examine the expiration day influence on the stock index futures.	The study concludes that prices in cash segment has fallen before the expiry day and raised after the day after expiration.
2	2007	S Bose and S Bhaumik [7]	To find out the influence of expiration effects on the market index as against to prices of single stocks.	The study reveals that there is significant expiration effect of derivatives on both mean and variance of daily returns.
3	2008	B Kamaiah and Sakthivel [13]	To investigate the futures contracts expiry day impact on the cash market as well as individual stocks.	Single stocks volatility amplified at the time of expiry day of futures contracts and also was unable to find price setback for almost all the individual stocks.
4	2008	BS Bodla and K Jindal [16]	To investigate the impact of financial derivatives contract on the trading volume of spot market.	It is observed that there is positive effect of expiration of derivatives on trading volume of sample stocks.
5	2011	A Sadath and B Kamaiah [22]	To examine the impact of stock futures expiration in relation to price & volume of stocks in NSE.	It has been observed that futures expiration has a significant effect on price & volume leading to expiration.
6	2014	Sakthivel *et al* [23]	To bring out the relationship between time to expiry and price volatility in NSE.	It was found that a futures trading quantity is a major determinant of futures price volatility whereas time to maturity is not.
8	2016	SS Debasish and TN Puri [15]	To study the volume of trading, volatility on expiry day/week and daily price range and price turnaround on the expiry day/week is different than that of comparison set.	The study examined expiration impact on the Nifty in comparison with return and trading volume during the expiration weeks of the Nifty Index futures with the quantity and return on comparison weeks and comparison days.
9	2016	G Yilgor *et al.*,	To investigate the effect of futures contracts on the spot market volatility.	The study revealed that futures and options market reduce spot market volatility.
10	2016	R Mahalwala [17]	To find the expiration-day impact of index derivatives trading in India.	It was observed that there was a significant increase in trading volume on expiration days, return on expiration is same as on non-expiration days and volatility on expiration days observed to be decreased.
11	2017	Sangeeta Wats [24]	To find the effect of expiry day of derivatives on the underlying market volatility.	Because of introduction to derivatives monthly contracts cash market volatility has augmented in the expiration weeks or expiration days.
12	2019	H Gurgul and M Suliga [1]	To examine the impact of stock and index futures expiration on the spot market.	It was concluded that strong volumes and trading activity on expiration days was significantly higher than normal days.

3. Conclusion

Extant literature provides important insights pertaining to the expiration day impact on futures and options market in India. The literature review drives to the conclusion that there was a considerable expiration day effect on a daily basis returns to the market index and also on the volatility of returns. Futures and Options are decades old to the global market and gained significant progress in developed countries. In developing economy like India, it is hardly two decades old. Of late, Securities Exchange Board of India (SEBI), Indian regulatory authority, has introduced the weekly options contracts like Bank Nifty weekly options and Nifty weekly options contracts. Extant research focusing on Futures and Options contracts examined the monthly contracts and majority studies have examined the futures and options expiration day effect on volatility of underlying market, individual stocks and returns. With the introduction of new product "Weekly Options" in the line can be understood as a new tool, which is believed to be useful for the investors in hedging their portfolios, to utilize volatility for short term gains due to lesser chance of time decay. Thus, there is a wider scope for the future research in the areas of Bank Nifty weekly options and Nifty weekly options and exploring the impact of expiration day impact of weekly options on individual stocks, Bank Nifty Index, Nifty Index, and Volatility of spot market and also on volatility of returns. It would be interesting to examine the impact of expiration day for high-frequency data [15]. Further, agricultural future contracts remain yet other key areas of research to study the relationship between expiration day and volatility [4]. Further, it is important to study the performance and expiration day impact in the emerging economies by clubbing diverse economies in the world. Such studies would provide some assistance in policy making which determines the financial architecture of emerging economies [2].

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Gurgul, H. and Suliga, M. (2019) Impact of Futures Expiration on Underlying Stocks: Intraday Analysis for Warsaw Stock Exchange. *Central European Journal of Operations Research*, 1-36. https://doi.org/10.1007/s10100-018-00606-9

[2] Singh, J.B. and Singh, S.D. (2018) Derivative Trading in Emerging Markets: A Survey. *Journal of Business Thought*, **8**, 83-103.

[3] Gakhar and Meetu (2013) Derivatives Market in India: Evolution, Trading Mechanism and Future Prospects. *International Journal of Marketing, Financial Services & Management Research*, **2**, 38-50.

[4] Kadioğlu, E., Kılıç, S. and Öcal, N. (2016) Determinants of Price Volatility of Futures Contracts: Evidence from an Emerging Market. *Journal of Applied Finance & Banking*, **6**, 103-115.

[5] Mishra, B., Malik, S. and Pore, L. (2013) Impact of Increased Derivatives-Trading in

India on the Price-Discovery Process. Securities and Exchange Board of India, Mumbai, 31.

[6] Wang, C. (2003) The Behavior and Performance of Major Types of Futures Traders. *Journal of Futures Markets: Futures, Options, and Other Derivative Products*, **23**, 1-31. https://doi.org/10.1002/fut.10056

[7] Bose, S. and Bhaumik, S.K. (2007) Impact of Derivatives Trading on Emerging Capital Markets: A Note on Expiration Day Effects in India. https://doi.org/10.2139/ssrn.988175

[8] Jain, A., Misra, M. and Tantri, P. (2016) How Do Small Investors Impact Derivatives Markets? Evidence from a Policy Experiment. https://www.nseindia.com/research/content/1516_BS6.pdf

[9] Agrawal, D., Subramanyam, K.R., Tantri, P.L. and Thirumalai, R.S. (2015) Do Derivatives Matter? Evidence from a Policy Experiment. https://www.nseindia.com/research/content/1415_BS2.pdf https://doi.org/10.2139/ssrn.2726446

[10] Shalini, H.S. and Raveendra, P.V. (2014) A Study of Derivatives Market in India and Its Current Position in Global Financial Derivatives Markets. *IOSR Journal of Economics and Finance*, **3**, 25-42. https://doi.org/10.9790/5933-0332542

[11] Lai, Y.S. (2018) Dynamic Hedging with Futures: A Copula-Based GARCH Model with High-Frequency Data. *Review of Derivatives Research*, **21**, 307-329. https://doi.org/10.1007/s11147-018-9142-1

[12] Nandan, T., Agrawal, P. and Bhargava, S. (2014) Mispricing in CNX Nifty Futures: An Empirical Investigation. *Asia-Pacific Journal of Management Research and Innovation*, **10**, 413-422. https://doi.org/10.1177/2319510X14553726

[13] Kamaiah, B. and Sakthivel, P. (2008) Futures Expiration Day Effects on Spot Market Volatility: Evidence from the Nse. *The Asian Economic Review*, **50**.

[14] Vipul (2005) Futures and Options Expiration-Day Effects: The Indian Evidence. *Journal of Futures Markets*, **25**, 1045-1065. https://doi.org/10.1002/fut.20178

[15] Debasish, S.S. and Puri, T.N. (2010) An Empirical Study on Expiration Day Effects in Stock Index Futures in Indian Stock Market. *International Journal of Finance*, **22**.

[16] Bodla, B.S. and Jindal, K. (2008) Equity Derivatives in India: Growth Pattern and Trading Volume Effects. *ICFAI Journal of Derivatives Markets*, **5**, 62-82.

[17] Cornell, B. and French, K.R. (1983) Taxes and the Pricing of Stock Index Futures. *The Journal of Finance*, **38**, 675-694. https://doi.org/10.1111/j.1540-6261.1983.tb02496.x

[18] Brenner, M., Courtadon, G. and Subrahmanyam, M. (1985) Options on the Spot and Options on Futures. *The Journal of Finance*, **40**, 1303-1317. https://doi.org/10.1111/j.1540-6261.1985.tb02384.x

[19] Kotha, K.K. and Bose, S. (2016) Dynamic Linkages between Singapore and Nse Listed Nifty Futures and Nifty Spot Markets. *Journal of Prediction Markets*, **10**, 1-13.

[20] Pan, M.S., Liu, Y.A. and Roth, H.J. (2003) Volatility and Trading Demands in Stock Index Futures. *Journal of Futures Markets: Futures, Options, and Other Derivative Products*, **23**, 399-414. https://doi.org/10.1002/fut.10067

[21] Sadath, A. and Kamaiah, B. (2009) Liquidity Effect of Single Stock Futures on the Underlying Stocks: A Case of NSE. *IUP Journal of Applied Economics*, **8**, 142-160.

[22] Sadath, A. and Kamaiah, B. (2011) Expiration Effects of Stock Futures on the Price and Volume of Underlying Stocks: Evidence from India. *The IUP Journal of Ap-*

plied Economics, **10**, 25-38.

[23] Sakthivel, P., Raghuram, G., Veerakumar, K. and Sumathisri, B. (2014) Time to Maturity and Volume Effects on Volatility: Evidence from NSE Futures Market. *Asian Social Science*, **10**, 75. https://doi.org/10.5539/ass.v10n18p75

[24] Wats, S. (2017) Expiration Day Impact on the Indian Spot Market Volatility. *NMIMS Management Review*, **33**, 88-97.