



IMPACT OF FINANCIAL DERIVATIVES ON VOLATILITY AND INVESTORS BEHAVIOUR- REVIEW OF RELATED STUDIES

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ABSTRACT:

The evolution of derivatives in the Indian financial markets, particularly in the equity segment, has witnessed substantial growth and transformative changes since their inception in 2000. Originating in response to the challenges posed by heightened market volatility and risk following the economic reforms of 1991, the introduction of derivatives on both the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) aimed to align India's financial markets with global standards. This initiative pursued three primary objectives: mitigating market volatility, facilitating price discovery, and offering risk-aligned products for investors, especially hedgers. A multitude of studies has delved into the impact of derivatives on market volatility, yielding diverse perspectives. While some posit that derivatives may amplify volatility through substantial leverage, others emphasize their positive influence on market depth, liquidity, efficiency, and price discovery, ultimately mitigating volatility in the cash market. The research underscores the intricacies of understanding derivatives' effects on stock market dynamics, advocating for nuanced analysis and a comprehensive grasp of the intricate relationships between derivatives and underlying markets. Moreover, investigations into investor behaviour underscore the paramount importance of awareness and understanding of derivatives. Findings illuminate varying levels of investor awareness influenced by factors such as risk perception, regulatory frameworks, and market training, shaping investor participation in derivatives markets across different regions.

KEYWORDS:

DERIVATIVES MARKET, INVESTOR'S BEHAVIOUR, VOLATILITY, MARKET EFFICIENCY, SURVEY.

INTRODUCTION

The emergence and subsequent expansion of derivatives can be attributed to the demand generated by hedgers, who sought to protect themselves against future uncertainties, and speculators, who aimed to profit by forecasting and capitalizing on those uncertainties. Derivatives' trading was introduced in India in the year 2000 and has experienced significant expansion since then. Currently, the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) are not only the top exchanges in India, but they also hold the distinction of being the largest and fifteenth largest exchanges globally, according to the Futures Industry Association (FIA). This ranking is based on the volume of contracts traded. The derivative markets were introduced in India primarily due to the increased volatility in the equity market and the high level of risk and uncertainty faced by investors. This was observed after the economy was opened up in 1991 and financial market reforms were initiated.

Therefore, in order to address the aforementioned problems and align the performance of Indian financial markets with global markets, the decision to introduce derivatives on both NSE and BSE was made. As a result, both NSE and BSE commenced trading in equity futures in the year 2000. India's engagement with derivatives had three primary goals: a) mitigating market volatility, b) facilitating price discovery, and c) offering products that

align with investors' risk preferences, especially hedgers. The stock derivative market in India has experienced significant growth. Key indicators of the growth process involve the implementation of novel items, escalating quantities, and an enhanced risk management structure. This is apparent as the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) introduced Bank Nifty weekly options in 2016 and 2018, respectively. In 2018, NSE and BSE introduced currency derivatives for trading on the US Dollar and Indian Rupee currency pair, as well as weekly options contracts for NIFTY 50. Derivatives in India have resulted in enhanced integration with global markets, decreased transaction costs, improved liquidity, and reduced volatility in the equities segment.

There are generally two perspectives on the influence of derivatives on the stock market. The initial perspective is grounded in the idea of destabilizing forces, positing that derivatives trading results in heightened stock market volatility as a result of the substantial leverage employed (Newbery, 1987). The second perspective, grounded on the concept of market completeness, posits that derivatives contribute to enhancing market depth, liquidity, market efficiency, price discovery, and reducing asymmetric information. Consequently, they also mitigate the volatility of the cash market (Arrow, 1953; Ross, 1976; Mayhew, 2001).

STUDIES ON VOLATILITY

Bhaumik, Karanasos, and Kartsaklas (2008) investigated the NSE index in India, using FI-GARCH and bivariate dual long-memory models. The findings suggested a reduction in volatility after the introduction of futures trading, along with a decrease in the volume of futures and significant expiration day effects.

Butterworth, D. (1998) studied the FTSE Mid 250 futures contracts in the UK, using GARCH. The research found that futures trading significantly changed the volatility structure.

Debasish, S.S. (2008) studied the NSE Nifty Spot Market in India, utilizing six measures of volatility, the linear regression model, and the GARCH models. The research found no significant change in stock market volatility.

Drimbetas, E. et al (2007) investigated the Athens stock exchange in Greece, focusing on FTSE/ASE 20 index, DAX30, DJIA, and MSCI indices. The study used EGARCH and found a reduction in volatility after the introduction of futures trading.

Gahlot, R., Datta, K. and Kapil, S. (2010) examined the impact of S&P CNX Nifty index in India using ADF and GARCH (1,1). The study observed changes in the structure of volatility but no significant change in volatility.

Gahlot, Ruchika and Datta, Saroj Kumar (2012) conducted a study on Brazil, Russia, India, and China, focusing on IBRX-50, RTSI, Nifty, and CSI300 indices. They used the GARCH M model, ACF, and run tests, revealing a reduction in volatility after the introduction of futures trading in the Indian stock market.

Ghosh, G. and Bandivadekar, S. (2003) explored the impact on the S&P CNX Nifty and BSE Sensex, Nifty junior, and BSE-200 indices in India, using GARCH/ARCH models. The study observed a fall in volatility after the introduction of futures trading.

Gu, S. and Gong, X. (2012) examined the impact of CSI 300 index futures in China, utilizing GJR-GARCH and stock-Watson "counterfactual VAR" models. The study did not find any significant changes in the underlying stock market volatility.

Gulen, H and Stewart, M. (2000) investigated indices of twenty-five countries, employing GARCH models. The study found an increase in volatility in the US and Japan.

Gupta, K. and Singh, B. (2008) focused on the Nifty junior index and Nifty index in India, employing ARCH/GARCH (1,1). The study found a reduction in volatility after the introduction of futures trading.

Hiremath, Gaurishankar S. (2009) studied the NSE Option Index in India, employing GARCH (1,1). The research found an increase in volatility after introducing options in the Indian financial market.

Hussain and Atif (2020) conducted a study in India on the Nifty 50 index, utilizing the EGARCH (1,1) model. They found that an increase in derivatives volume led to an increase in the underlying spot market volatility. However,

open interest was observed to stabilize the stock market volatility.

Kalantzis, G.F. and Milonas, N.T. (2013) explored the impact of futures trading in France and Germany, focusing on powernext (French) and EEX (German) spot and futures markets. They used the Bivariate VECM-GARCH model and found that volatility reduced after the introduction of futures trading in France.

Kasman, A. and Kasman, S. (2008) explored the Turkish stock market, focusing on the ISE-30 index and using EGARCH. The study found a reduction in volatility after the introduction of futures trading.

Katsikas (2007) analyzed European markets, focusing on index futures of major European stock markets. The study used EAR-GARCH and found a negative relationship between volatility and autocorrelation.

Mallikarjunappa, T. and Afsal, E.M. (2008) explored the S&P CNX Nifty Index in India, discovering changes in volatility patterns after the inception of derivatives, but no significant change in the underlying market in terms of stabilization or destabilization.

Manier, M. (2009) analyzed the impact on the Nifty 50 index in India using GARCH, EGARCH, and GJR. The study did not find any significant change in volatility.

Pal and Chattopadhyay (2019) examined the NIKKI and S&P 500 indices in India, employing the DCC-MV-TARCH model. Their study revealed significant asymmetric volatility spillover between the domestic stock market, the foreign exchange market, and the bullion market. Changes in the gross volume of FII trade were also noted.

Pati, P.C. and Rajib, P. (2010) focused on NSE S&P CRISIL NSE Index and Nifty index futures in India, using LM test and ARMA-EGARCH. Their findings indicated a reduction in volatility after the introduction of futures trading.

Pilar, C. and Rafeal, S. (2002) explored the impact on the Spanish stock market in Spain, using GARCH, EGARCH, and GJR. The study found a reduction in volatility after the introduction of futures trading in Spain.

Rajoub and Azzam (2012) investigated the Amman Stock Exchange's general weighted price index in Jordan, employing the GARCH-M model. The study found a negative correlation between returns and volatility before and after the financial crisis.

Raju, M.T. and Karande, Kiran (2003) investigated the impact on the S&P CNX Nifty Index in India, employing cointegration analysis and GARCH techniques. The study found that volatility reduced after the introduction of futures trading, and price discovery prevailed in the futures and spot markets.

Rastogi (2019) focused on India, specifically the Nifty 50 index, using the Generalized Method of Moments (GMM) on weekly data from 2010-2017. The findings suggested that volatility in the options market was not associated with volatility in the spot and futures market. However, volatility in the spot and futures markets showed an

association with each other.

Sah, A.N. and Omkarnath, G. (2005) examined the impact on the S&P Nifty index and other indices like Nifty junior, NSE 200, S&P Nifty 500, BSE 100, and BSE 200 in India, using GARCH (1,1) and EGARCH. The study found no significant change with the introduction of futures and options.

Sahu, D. (2012) analyzed individual stocks in the Indian market using Jarque-Bera (JB), ADF test, Lagrange Multiplier (LM) test, GJR-GARCH (1,1), and GARCH (1,1). The study revealed a reduction in volatility after the introduction of futures trading in India.

Sarang, S.P. and Patnaik, U.S. (2006) studied the impact on S&P CNX Nifty, Nifty junior, and S&P 500 indices in India, employing GARCH and IGARCH. The study found no significant change in volatility but observed a change in the structure of volatility.

Shenbagaraman, P. (2003) focused on the impact on the S&P CNX Nifty index in India, employing GARCH (1,1). The study found no significant change in volatility.

Singh S. and Tripathi L.K (2016) studied the impact of the introduction of futures on the Sensex in India. They employed Unit Root Test, ARCH LM, and GARCH (1,1)

techniques and observed that the introduction of futures led to a reduction in spot market volatility.

Siopis and Lyroudi (2007) explored the Athens stock exchange in Greece, focusing on the FTSE/ASE 20 index and employing GARCH (1,1), EGARCH (1,1), and TGARCH (1,1). The study found significant changes in volatility following the introduction of futures.

Smit, E. and Nienaber, H. (1997) explored the impact on the share, gold, and industrial indices of the Johannesburg Stock Exchange (JSE) in South Africa, using ARIMA. The study found a positive relationship between equity volatility and trading volume of the spot and futures market.

Thenmozhi, M. (2002) studied the NSE 50 futures and NSE 50 index, S&P CNX Nifty index futures in India, using Standard Deviation. The research found reduced volatility after the introduction of futures trading.

Yu, Shang-Wu. (2001) examined different indices of six countries, including the USA, France, Japan, Australia, UK, and Hong Kong, using GARCH (1,1) and MA (1). The study observed an increase in volatility in the US, France, Japan, and Australia, with no significant change in the UK and Hong Kong.

Authors and Year	Indices Studied	Frequency of Data	Econometric Techniques
Hussain and Atif (2020)	CNX Nifty 50	Daily	EGARCH (1,1)
Pal and Chattopadhyay (2019)	CNX Nifty Next 50	Daily	DCC-MV-TARCH
Singh and Tripathi (2016)	BSE Sensex & Nifty 50	Daily	Not specified
Kalenteis and Milonas (2013)	S&P 500	Daily	VECM-GARCH
Kabir and Ikram (2012)	CNX Nifty 50	Monthly average	GARCH (1,1)
Sahu, D. (2012)	CNX Nifty 50	Daily	GARCH (1,1)
Girish, G.P. (2012)	CNX Nifty 50	Daily	GARCH (1,1)
Otswal, Priyanka (2011)	CNX Nifty 50	Daily	GARCH (1,1)
Kaur, Gurpreet (2011)	CNX Nifty 50	Daily	GARCH, ARCH, EGARCH
Sakhtivel, P. and Kamaiah, B. (2011)	CNX Nifty 50, BSE Sensex	Daily	GARCH(1,1)
Ray, K. and Panda, A.K. (2011)	CNX Nifty 50	Daily	EGARCH
Singh, G. and Kansal, S. (2010)	CNX Nifty 50	Monthly	VECM-GARCH
Gahlot, R., Datta, K., and Kapil, S. (2010)	CNX Nifty 50	Daily	GARCH,ARCH
Pati, P.C. and Rajib, P. (2010)	CNX Nifty Next 50	Trading volume	ARIMA-EGARCH
Manier, M. (2009)	S&P 500	Daily	GARCH(1,1)
Gupta, K. and Singh, B. (2009)	Nifty junior index, Nifty index	Daily	GARCH (1,1)
Gaurishankar S. Hiremath, (2009)	Option index of NSE	Daily	GARCH (1,1)
Mallikarjunappa, T. and Afsal, E.M. (2008)	CNX Nifty Next 50	Monthly	Not specified

Debasish, S.S. (2008)	CNX Nifty 50, BSE Sensex	Daily	GARCH (1,1)
Bhaumik, Karanasos and Kartsaklas (2008)	CNX Nifty Next 50	Daily	EGARCH
Sarangi, S.P. and Patnaik, U.S. (2006)	S & P CNX Nifty, Nifty junior, S&P 500	Daily	GARCH, IGARCH
Sah, A.N. and Omkarnath, G. (2005)	S&P Nifty index indices like Nifty junior, NSE 20, S&P Nifty 500, BSE 100, and BSE 200	Daily	GARCH
Raju, M.T. and Karande, Kiran (2003)	S&P CNX Nifty, BSE Sensex	Daily	EGARCH
Ghosh, G. and Bandivadekar, S. (2003)	S&P CNX Nifty, BSE Sensex	Daily	ARCH & GARCH
Shenbagaraman, P. (2003)	Not specified	Daily	GARCH
Thenmozhi, M. (2002)	S&P CNX Nifty	Daily	ARCH

STUDIES ON INVESTOR BEHAVIOUR

Balaji.K and Prabu.K (2011) to investigate the perceptions of traders regarding options trading in the national stock market. The researchers employed percentage analysis, Chi-Square, and Correlation testing for data analysis. The findings revealed that a substantial proportion of traders in the options market engaged in trading activities that were influenced by market fluctuations, and the level of trader expertise had an impact on options trading.

Bodnar and Gebhardt (1998) conducted a comparative survey on the prevalence of derivatives usage in Germany and the US. The researchers discovered a greater utilization of higher derivatives in Germany, with comparable hedging patterns reported across industry and size categories, similar to those found in American companies.

Brahmabhatt, Raghu Kumari, P.S., and Malekar Shamira (2012) examined the impact of volatility on investor conduct in Mumbai, India, with a focus on gold, currency, and bonds. The survey emphasized the significant level of awareness regarding investment information and prospects in Mumbai.

D. Miloš Sprčić (2007) employed survey methodologies, multivariate analysis, and t-tests to investigate the utilization of financial derivatives as hedging instruments in non-financial enterprises based in Croatia and Slovenia. The investigation uncovered little decision-making authority concerning derivatives and the utilization of standardized and structured derivatives for risk mitigation, although exchange-traded and over-the-counter options were not widely employed in either country.

Daniel Ekerumeh Aduodeh (2010) conducted a study on the Ghana market using interviews, content analysis, and SPSS 16.0 software. The study aimed to quantitatively analyze the extent of awareness regarding derivative instruments and the necessary conditions for establishing

a derivatives market in Ghana. The study determined that Ghana has the necessary conditions to establish a derivatives market, but it need the establishment of a legislative and regulatory framework.

El-Masry (2006) utilized a survey method in the United Kingdom to examine the utilization of financial derivatives by non-financial corporations. The study revealed that larger corporations exhibited a higher utilization of derivatives compared to medium and smaller enterprises. Public companies and foreign firms were identified as the leading adopters of derivatives.

Grant and Marshall (1997) performed a survey that examined the utilization of derivatives in non-financial companies. The authors' findings indicate that the utilization of derivatives in the UK is highly advanced, exhibiting risk management goals that align with those of other nations.

Guaya, Wayne, and Kothari, S.P. (2003) employed the measures of standard deviation and median to examine the utilization of derivatives as a hedging mechanism by non-financial companies. Their findings revealed that corporate derivatives were commonly employed.

Martin, A., et al. (2009) performed a survey in Peru to examine the utilization of financial derivatives by non-financial enterprises. The authors discovered that the growth of the financial derivatives industry in Peru was impeded by insufficient market restrictions and poor training.

Ngugi N., et al. (2013) performed a survey in Kenya to examine the factors that impact the growth of financial derivatives markets. The study highlighted the necessity for the development of novel financial derivatives instruments that build upon the foundations of existing ones.

Papa, Vincent T. and Peters, Sandra J.(2003) from the CFA Institute performed a study to assess the level of quality in the risk disclosures of current financial instruments according to IFRS Statement No. 7. The study

highlighted the need for hedge accounting-related disclosures to incorporate financial statements that reflect the impacts of hedge accounting.

Prevost, Andrew K., et al. (2000) performed a cross-national survey in the United States, United Kingdom, and Germany, examining the utilization of derivatives and the management of financial risk in both major and minor economies. The findings demonstrated that the primary factors influencing the utilization of derivatives in both industrial and mining firms were firm size and leverage.

Stulec, I., Bakovic, T., and Duzovic, I. (2013) performed a study in multiple nations, encompassing the USA, Canada, United Kingdom, Belgium, Sweden, Taiwan, Pakistan, and Croatia. The primary objective was to evaluate the level of understanding of derivatives concepts among major corporations in Croatia, examine the reasons

for utilizing derivatives, and explore the prospects for the growth of financial derivatives in Croatia. The study revealed that derivatives were widely seen as high-risk financial tools, and there was a notable lack of understanding regarding derivatives, with only affluent persons being deemed appropriate for investment.

The ANZ Banking Group (2003) performed a comprehensive study using telephone surveys and interviews to assess the level of financial literacy among adults in Australia. The findings revealed a significant deficiency in financial literacy among Australian respondents.

Thomas, T.C. and Rajendran, G. (2012) utilized the Delphi technique and BB&K model to ascertain five distinct BB&K personalities: Adventurer, Celebrity, Individualist, Guardian, and Straight Arrow.

Author(s)	Year	Findings
Gakhar, D (2016)	2016	Analyses derivatives awareness level of Indian investors and perception of the investor about the derivatives market's future in India. Results suggest the need for an investor grievance redressal mechanism, steps by regulators to increase investments, and investor training and awareness programs.
Ngugi N. et al. (2013)	2013	Financial derivatives instruments help companies manage risk, improve the legal and regulatory framework, create the right market environment, and increase operational efficiency.
Stulec, I. et al. (2013)	2013	Firms believe derivatives are risky instruments, and only high-class individuals can invest in them.
Papa and Peters (2013)	2013	Concluded that hedge accounting-related disclosures need to be included in financial statements (income statement and balance sheet) with the effects of hedge accounting.
Brahmabhatt, et al. (2012)	2012	Found that awareness of investment knowledge and opportunities is very high in Mumbai.
Thomas, T. C. and Rajendran, G. (2012)	2012	Categorized investment perceptions of individual investors based on BB&K personalities.
Daniel, Ekerumeh Aduodehe (2010)	2010	Checked the level of awareness of financial derivatives and found an adequate level of awareness among investors. Ghana is ready to develop a derivatives market, but legal and regulatory framework for derivatives trading is needed.
Martin, A. et al. (2009)	2009	Suggested that the development of the financial derivatives market in Peru is less likely due to fewer market regulations and less training provided to respondents (Chief financial managers).
Sprčić, Danijela Miloš (2007)	2007	Indicated that non-financial firms

In conclusion, the evolution of derivatives in the Indian financial markets, particularly in the equity segment, has been marked by substantial growth and a multitude of changes since their introduction in 2000. The derivatives market in India was established to address the challenges posed by increased market volatility and risk after the economic reforms of 1991. The introduction of derivatives on both the National Stock Exchange (NSE) and Bombay

Stock Exchange (BSE) aimed to align India's financial markets with global standards and fulfill three primary objectives: mitigating market volatility, facilitating price discovery, and providing risk-aligned products for investors, especially hedgers. Numerous studies have investigated the impact of derivatives on market volatility,

revealing diverse perspectives. While some studies suggested that derivatives may contribute to increased volatility due to substantial leverage, others emphasized their positive effects on market depth, liquidity, efficiency, and price discovery, ultimately mitigating cash market volatility. The research presented here highlights the complexities of understanding derivatives' impact on stock market dynamics, emphasizing the need for nuanced analysis and a comprehensive understanding of the intricate relationships between derivatives and the underlying markets.

Additionally, studies on investor behaviour underscore the significance of awareness and understanding of derivatives. Findings reveal varying levels of awareness

among investors in different regions, with factors such as risk perception, regulatory frameworks, and market training influencing investor participation in derivatives markets. Overall, the conclusion drawn from these studies is that a well-regulated and informed derivatives market has the potential to contribute positively to risk management and financial market stability, but careful attention must be given to investor education and regulatory frameworks to ensure responsible and sustainable market development.

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