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A CONCEPTUAL FRAMEWORK OF STOCK MARKET VOLATILITY AND A STUDY OF SELECTED NIFTY COMPANIES

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ABSTRACT

The stock market is one of the largest venues for financial speculation, analysis, and investigation. It's the place where stocks and options and other financial instruments are bought and sold. Due to macroeconomic services like taxation, stock market prices may not signify the real substantial value. The stock market is the nerve center for major investments around the world and accounts for more money than most people realize. Many people consider the stock market to be the ideal place to make investing selections. Because of this, the industry as a whole was able to provide returns that exceeded investors' expectations. Whenever there is a significant change to the index, it becomes the front-page story of virtually every national daily and is met with several responses from experts and pieces on the economy. Although India's stock market has been around for more than a century, its importance in the allocation of limited investment information has just been recognized in the last decade. The Indian stock exchange has undergone significant changes in recent years. These changes have had an impact on the capital market, which is widely regarded as the most transparent, clean, and efficient markets due to institutional investment, derivatives, and market intermediation.

Keywords: *Conceptual Framework; Stock Market intermediation; Volatility; financial speculations.*

INTRODUCTION

The Indian capital market has witnessed radical changes in recent years. These shifts have had an effect on every facet of the Indian capital market, including the main and secondary markets, derivatives, institutional investment, and market intermediation. One of the most open, efficient, and pristine marketplaces is the capital market, according to research by Raju and Ghosh (2004). There is a widespread belief, spurred by recent changes in global financial markets, that asset return volatility has increased. There has been an increase in volatility, but how much and whether or not it is supported by information arrivals versus other factors is debatable.

Volatility is a measure of risk and, as such, should give investors and others a reason to be wary of the stock market and other financial instruments. As a result, concerns about volatility have risen in prominence in recent years among financial professionals, market players, individual investors, regulators, and academics (Kaur, 2004 a).

Stock price volatility is caused by factors such as rising interest rates, high inflation, economic slowdown, currency fluctuations, slow economic reforms, political instability, asset price crashes, political tension, and potential terrorist attacks. Political, economic, social, and most crucially psychological variables affect market movements. Binder and Merges (2000) identified four stock market volatility factors: uncertainty about the price level, the riskless rate of interest, the risk premium on equities, and the predicted profit-to-revenue ratio. Shiller (1987) found that dividends, real interest rates, and a direct measure of intertemporal marginal rates of substitution affect the aggregate stock market's true investment value. Kaur (2004 b) suggests that long-term volatility is influenced by firm market capitalization, corporate leverage (financial and operations), personal leverage, and economic conditions. Short-term factors include traded volume, news, and noise trading, and lower-capitalization firm stocks are more volatile. They trade at lower prices and less often than high-capitalization corporations. Rao (1997) observed that budgets enhanced market portfolio stock price volatility. Industrial production, the disparity between long and short interest rates, and expected and unexpected inflation affect the stock market, according to Chen et al. (1986).

REVIEW OF LITERTAURE

Binder and Merges (2000) Data collected monthly from January 1929 through April 1989 were analysed to determine if there was a correlation between economic factors and stock market volatility. They created a basic model of the economy in uncertain times that correlates four economic variables with market volatility: the unknown level of prices, the risk-free interest rate, the risk premium on equity, and the ratio of predicted profits to revenues. Early analyses show that these variables have high explanatory power, explaining more than half of the variance in market volatility between 1929 and 1989. Over 90% of market volatility is explained by these four factors when cluster regression coefficients are permitted to change over time. These findings have implications for both understanding and predicting volatility in the stock market in the future.

Singh et al. (2010) The historical volatility of the CNX S&P Nifty and the Nikkie 225 stock markets of India and Japan. They furthermore made an effort to learn how changes in Treasury bond rates will affect insurance firms in Japan and financial institutions in India. The secondary data investigation was purely descriptive. Financial institutions and insurers were selected using a purposeful sampling strategy. Nikkie225's 8 insurance firms and NSE CNX S&P Nifty's 15 banking institutions made up the sample size. Stock market volatility was analysed for both the Indian Nifty and the Japanese Nikkie225 markets. The Nikkie225 stock market was determined to have a high frequency of volatility. Similarly, it was discovered that Japanese insurance firms are more sensitive to shifts in the interest rate on U.S. Treasury bonds than their Indian banking sector counterparts.

Kumar and Raju (2011) Conducted an analysis on the relationship between Foreign Institutional Investor (FII) flows and the returns of different indexes on the National Stock Exchange. The researchers utilized daily data for the variables spanning from 2000 to 2009.

The findings suggest that there is observable evidence of positive feedback trading within the Indian market, specifically in four specific indices: Bank Nifty, CNX Midcap, CNX Nifty Junior, and S&P CNX 500. These indices were selected among a total of fifteen indices that were examined. It has been observed that Foreign Institutional Investors (FIIs) play a dual role in the stock market, acting as both causal agents and being influenced by stock returns. Furthermore, there exists a selective bidirectional relationship between net FII flows and the returns of specific indices, namely CNX Midcap, CNX Nifty Junior, S&P CNX 500, and S&P CNX Nifty, among the fifteen indices that were sampled.

Verma and Agarwal (2005) Conducted a four-year analysis utilizing budget as the event window. The effect of the budget was evaluated by comparing the CNX nifty index's returns before and after the incident. According to the results of the study, the occurrence has a considerable effect on the financial markets.

Joshi and Pandya (2008) looked at what causes price swings on India's BSE and NSE stock exchanges. Certain stylized characteristics concerning volatility, like volatility clustering and mean reverting, are suggested by several volatility estimators and diagnostic tests. This analysis is based on 16 years' worth of daily Sensex and Nifty data (July1990 - October2006). The results showed that the GARCH (1, 1) model best fits the data series under study and provides a satisfactory explanation of volatility. Volatility in both markets is highly persistent and predictable, as demonstrated by the model with a large value of the lag coefficient. Since the error coefficient of GARCH (1,1) is minimal, even huge market surprises lead to only modest changes in expected volatility going forward.

AN OVERVIEW OF THE NIFTY 50

NIFTY 50

The NIFTY 50 is a broad and balanced index of 50 stocks representing 14 different industries. It is used for benchmarking fund portfolios, index fund portfolios, and derivatives based on indices. NIFTY 50 is managed and updated by India Index Services and Products Limited. The Industrial Index Services Limited (IISL) is the first company in India to specialize in the core product index (CPI).

The NIFTY 50 is a market capitalization-weighted index comprising 50 Indian stocks. It has its roots in economics and was developed for use by Indian stock investors and traders.

FLOATING STOCK

Ten percent of floating stock is required for NIFTY 50 businesses. In this context, "floating stock" refers to shares that aren't held by the company's founders or other official bodies.

INITIAL DATE AND VALUE

Since this date marks the end of the first year of trading on the NSE's Capital Market Segment, it was chosen as the base period for the NIFTY 50 index. The initial value of the index was set at 1000, and the initial capital was 2.06 trillion.

TRADING NIFTY 50 DERIVATIVES

On June 12, 2000, NSE began trading index futures. The NSE focuses its futures contracts on the NFTY 50 index. In June 2001, the bourse began offering index options based on the NIFTY 50.

VOLATILITY PREDICTION IN THE STOCK MARKET USING THE GARCH MODEL

As high levels of volatility can disrupt the normal operation of any stock market, their study is always a major issue for analysts and scholars. There's a chance it might also dampen corporate activity and inflation (Srivastava, 2008). A rise in stock market volatility may be indicative of a rise in other asset types, such as debt. This change may increase the cost of capital for firms, particularly startups, as investors move their focus to the shares of more established, successful companies. Though there is consensus on what constitutes stock market volatility and to a lesser extent, how to quantify it, there is far less agreement on the causes of variations in volatility. Researchers looked into what triggers the sudden shifts in the flow of news that might alter stock prices and returns. Because of this, shifts in market volatility would simply reflect shifts in the domestic or global economic climate. Alternatively, some argue that variables including changes in macroeconomic policies, variations in investor risk appetite, and increased uncertainty are the primary drivers of market volatility (Srinivasan et al., 2010).

Investment strategy development and portfolio management would benefit greatly from the detection of volatility tendencies. Risk-averse investors, for instance, may choose to modify their portfolios by decreasing their exposure to assets with projected increases in volatility or by employing more complex dynamic diversification strategies to hedge against such increases. Option pricing models may function better if accurate predictions of stock market volatility are used. Accurately predicting the future standard deviation of returns during the remaining life of the option is crucial for arriving at an accurate value for the option. Option buyers and sellers might benefit from this information. For dynamic portfolio insurance strategies, the anticipated volatility of the stock market is also a crucial input (Srinivasan and Ibrahim, 2010).

Therefore, the effects of financial market volatility extend across the economy. Almost the entire Indian economy was jolted on Black Monday, May 17, 2004, leaving regulators, self-regulators, market players, and government bureaucrats on edge. Even the average citizen is worried about high-profile incidents like the Harshad Mehta Scam and the Ketan Parekh debacle. Events such as the 1987 stock market disaster, the 1989 "mini-crash," the currency turbulence in Southeast Asia, etc., all show how volatility may affect markets around the world.

Since events in one region of the world might have instantaneous effects in another (Srivastava and Jain, 2006), predicting volatility is a topic with great practical importance in the current environment.

Thus, it can be said without a doubt that volatility assessment is a crucial component of most financial choices, including those involving asset allocation, derivative pricing, and risk management. However, there is no definitive solution to the question of what model should be used to compute volatility, as various volatility models have been published in literature and are being employed by practitioners, each of which produces its own volatility estimate.

Volatility in the financial markets is predictable, and a forecast of high volatility is essentially just a forecast of a high variance. Thus, even if the variance can be predicted perfectly, the size and direction of market swings cannot. You can correctly anticipate the likelihood of rain, yet there still might not be rain if you're trying to predict volatility (Engle, 1993).

The statistical term for this behaviour is autoregressive conditional heteroskedasticity (ARCH), which means that volatility tends to cluster together. Using Conditional Heteroscedasticity (ARCH) to model stock market volatility has become increasingly common. When comparing ARCH models to more standard time series models, it is clear that the conditional variances can evolve over time as functions of earlier errors. The initial strategy involved enhancing the univariate ARCH model by adding a new variance function requirement. Bollerslev (1986) established the Generalised Autoregressive Conditional Heteroscedasticity (GARCH) technique, which represents one advancement in the field. After that, whenever a re-specification of the variance equation was being considered, the integrated GARCH (IGARCH) (Engle et al., 1994) and the exponential GARCH (EGARCH) (Nelson, 1991) were major ones. The volatility of stock returns in emerging countries such as India, however, has received little empirical attention. While Roy and Karmakar (1995) looked at average sample standard deviation to determine if volatility has increased, Goyal (1995) employed conditional volatility estimates, as suggested by Schwert (1989), to identify the underlying trend. In addition, he examined how the carry forward method affected the level of volatility. Pattanaik and Chatterjee (2000) have modelled the volatility of the Indian financial market using ARCH/GARCH models.

NIFTY BANK STOCK VOLUMES ON EXPIRATION DAY

Derivatives in the financial markets, such as stock futures, are generally considered to be the most significant innovations of modern times. Changing the structure of the financial market with the intent of reducing the risk of financial investment is the primary objective. With an eye towards keeping up with the rest of the world, NSE developed several financial products in India to keep the financial market functioning smoothly and at a high standard. A restricted offering of common shares began trading on the NSE on November 9, 2001.

However, the number of stock futures traded on the NSE increased by a factor of ten, and by 2007 the NSE had established itself as the premier stock futures exchange in the world. There

are currently 160 stocks that can be traded in the futures market on the NSE. Many investors are concerned about the impact of derivatives on the equities market and other securities as stock futures gain popularity as an investment option. Consequently, the purpose of this Chapter is to investigate how the expiration of stock futures contracts affects trading activity for the underlying Nifty Bank Stocks.

- **Proof of Stationarity**

Unit root testing in time series was pioneered by Dickey and Fuller (1979 and 1981). It is a diagnostic tool for finding time series that have become stationary. Only if the data is stationary can its behaviour over a period of interest be analysed.

- **Arithmetic Mean with Autocorrelation**

The Ordinary Least Squares Method is used to pick the ARMA process for the mean equation based on the SBC (Schwarz Bayesian Criterion). The model with the smallest SBC wins the competition.

- **EGARCH**

The exponential version of the skedastic function in the EGARCH model ensures positive conditional variance without the need to restrict parameters.

- **Dummy 1**

The dummy1 takes a value of one for days that are about to expire and a value of zero for the remaining days.

- **Dummy 2**

The volume reversal was analysed using this variable, with the value assumed to be one on trading days immediately after the expiration date and zero on all other trading days.

THE EFFECT OF EXPIRATION DAY ON NIFTY BANK STOCK RETURNS

The study of derivatives' volatility has recently risen to prominence in the field of finance. The empirical distribution of asset returns is evaluated with time dependences in mind. The serial dependence of time series has typically been modelled using autoregressive integrated moving average (ARIMA) structures. But the model can't figure out the asset return volatility clustering because of the homoscedasticity. It is important to consider the heteroscedastic repercussions of the time series process while analysing the observed fat tails, also known as clustering of volatility.

Since the returns, volatility, and price reversal are all dependent on the closure price, a stationarity check and the diagnostic models like the Normality test, Auto-Correlation, and Arch Test are shared by the remaining three parts of the analysis.

- **The Unit Root Test**

The time series data have seasonality removed using a stationarity test.

- **Examining the Norm**

To determine if the time series follows a normal distribution, the Jarqua-Bera test was used.

- **Correlation In a Series**

In statistics, autocorrelation is used to describe the relationship between observations of the same variable collected over specified intervals of time. Partial autocorrelation is performed only on residuals.

- **Examining Lagrange Multipliers**

It was used to look for signs of heteroscedasticity in the study's data.

- **ARMA**

The ordinary least squares method was used to determine ARMA for each stock. The model with the best fit was chosen based on the Schwarz Information Criterion (SIC).

Mean and variance equations were separated out to make up the model's two distinct sections.

- **EGARCH**

Dummy1 and Dummy2 make up the mean equation, which is the subject of the. The procedure of returning an item on its expiration date is described by the dummy1 variable. On the day after the expiration date, returns are inverted, as described by the Dummy2 variable.

Discuss the variance equation that dummy1 used to explain the price volatility of banking shares on the maturity day.

The dummy2 of the variance equation described the price reversal in nifty bank stocks on the Monday after expiration day (i.e., Friday).

CONCLUSION

The daily returns on the Sensex and Nifty time series graph shows that returns were continuously fluctuating around the mean value, which was close to zero. Both good and negative areas might be seen in the return measures. Periods of relative calmness were interspersed between the more frequent swings, which tended to group together. This was in

line with the "volatility clustering" finding made by Fama in 1965, which states that time series changes tend to follow each other in a clustering pattern, with significant changes coming after smaller ones. High volatilities are followed by high volatilities and low volatilities are followed by low volatilities, according to the time series graph of the returns for both markets. Therefore, there are significant time changing differences in time series. To further clarify how risk affects returns, conditional variance should be included in the function. Consequently, the GARCH model is a great tool for the research. The skewness statistic for daily returns for the Sensex and Nifty is found to be different from zero, indicating that the return distribution is not symmetric.

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