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A Study on Factors Affecting Derivative Financial Option Price with Reference To Banknifty

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ABSTRACT: The paper targets to explore on the impact of BANKNIFTY derivatives transaction on spot market volatility in India. This paper aims at carrying out technical analysis of the banks present in bank nifty and to assist investment decisions in this nifty, since banking sector is one of the most upcoming sectors in Indian market. It has also proven to be one of the leading and fastest growing sector of the Indian economy. Bank Nifty index represents the twelve most liquid and large capitalized stocks from the banking sector, which trades on National Stock Exchange of India. Secondary data of the daily share prices of bank nifty during last five financial years (from 2014 to 2019) is collected and taken for this study. The methods used are descriptive statistics, ADF test and GARCH model. The volatility is declined for BANKNIFTY stocks. The major tools are used in this study to technically finding out the movements in bank nifty and predict the future movements.

KEYWORDS: BANKNIFTY, Volatility, Derivatives, GARCH Model.

I. INTRODUCTION

A derivative is financial instrument whose value is 'derived' from another underlying security or a basket of securities. Traders can assume highly leveraged positions at low transaction costs using these extremely flexible instruments. Derivative products like index futures, stock futures, index options and stock options have become important instruments of price discovery, portfolio diversification and risk hedging in stock markets all over the world in recent times. With the introduction of all the above-mentioned derivative products in the Indian markets a wider range of instruments are now available to investors. Introduction of derivative products, however, has not always been perceived in a positive light all over the world. It is, in fact, perceived as a market for speculators and concerns that it may have adverse impact on the volatility of the spot market are neither new nor understudied. Recent research, however, strengthens the argument that introduction of these products have not only deepened the markets but have also been instrumental in reduction of volatility in the spot markets.

The past decade has witnessed the multiple growths in the volume of international trade and business due to the wave of globalization and liberalization all over the world. As a result, the demand for the international money and financial instruments increased significantly at the global level. In this respect, changes in the interest rates, exchange rates and stock market prices at the different financial markets have increased the financial risks to the corporate world. Adverse changes have even threatened the very survival of the business world. It is, therefore, to manage such risks; the new financial instruments have been developed in the financial markets, which are also popularly known as financial derivatives.

Today, the financial derivatives have become increasingly popular and most commonly used in the world of finance. This has grown with so phenomenal speed all over the world that now it is called as the derivatives revolution. In an estimate, the present annual trading volume of derivative markets has crossed US \$ 30,000 billion, representing more than 100 times gross domestic product of India. Financial derivatives like futures, forwards options and swaps are important tools to manage assets, portfolios and financial risks. Thus, it is essential to know the terminology and conceptual framework of all these financial derivatives in order to analyze and manage the financial risks. The prices of these financial derivatives contracts depend upon the spot prices of the underlying assets, costs of carrying assets into the future and relationship with spot prices. For example, forward and futures contracts are similar in nature, but their prices in future may differ. Therefore, before using any financial derivative instruments for hedging, speculating, or arbitraging purpose, the trader or investor must carefully examine all the important aspects relating to them.

In the 1980s, the financial derivatives were also known as off-balance sheet instruments because no asset or liability underlying the contract was put on the balance sheet as such. Since the value of such derivatives depend upon the movement of market prices of the underlying assets, hence, they were treated as contingent asset or liabilities and such transactions and positions in derivatives were not recorded on the balance sheet. However, it is a matter of considerable debate whether off-balance sheet instruments should be included in the definition of derivatives. Which item or product given in the balance sheet should be considered for derivative is a debatable issue. In brief, the term financial market derivative can be defined as a treasury or capital market instrument which is derived from, or bears a close relation to a cash instrument or another derivative instrument. Hence, financial derivatives are financial instruments whose prices are derived from the prices of other financial instruments.

II. LITERATURE REVIEW

Divya Verma (2020) Derivatives were introduced in Indian financial market to reduce volatility in the spot market. The present study attempts to study the impact of derivatives on stock market volatility. In the present study, data have been taken for Nifty Index for a period from 01-01-1996 to 05-02-2016. For analyzing the impact of introduction of derivatives on Nifty Index Volatility, we have taken proxy variable of Nifty Junior Index and Standard & Poor's 500 (S & P 500) Index returns.

Rastogi and Athaley (2019) Studied the integration of volatility in the spot, futures, and options market. The results revealed that the volatility in the options market is not associated with volatility in the spot and futures market. But the volatility in spot and futures markets is associated with each other.

Manasa N (2018) The paper targets to explore on the impact of BANKNIFTY derivatives transaction on spot market volatility in India. The scope is confined will equity future contracts. The period of study from 1 st April, 2010 to 31st March, 2017, is chosen to observe the influence of trading the derivatives on volatility of spot market after global financial crisis. The data for stocks comprises of daily closing prices of near month contract and also equity market. The methods used are descriptive statistics, ADF test and GARCH model. The volatility is declined for BANKNIFTY stocks. But the diagnostic checking concludes that serial correlation and ARCH effects are desirable for the model.

Definition of Financial Derivatives

Before explaining the term financial derivative, let us see the dictionary meaning of 'derivative'. Webster's Ninth New Collegiate Dictionary (1987) states Derivatives as:

- A word formed by derivation. It means, this word has been arisen by derivation.
- Something derived; it means that some things have to be derived or arisen out of the underlying variables. For example, financial derivative is an instrument indeed derived from the financial market.
- The limit of the ratio of the change is a function to the corresponding change in its independent variable. This explains that the value of financial derivative will change as per the change in the value of the underlying financial instrument.
- A chemical substance related structurally to another substance, and theoretically derivable from it. In other words, derivatives are structurally related to other substances.
- A substance that can be made from another substance in one or more steps. In case of financial derivatives, they are derived from a combination of cash market instruments or other derivative instruments.

Bank Nifty Options Tips and Strategies

Bank NIFTY is an index of the 12 highest cap and most liquid stocks from the banking sector. Launched in 2009, this index is now heavily traded on the stock market, with a lot of traders making a living off exclusively specializing in Bank NIFTY. Over the years, many traders who have focused on the trading of Bank NIFTY options have devised a plethora of bank option trading strategies and the market is now littered with Bank NIFTY tips and tutorials on how to trade in Bank NIFTY.

This article will provide a concise summary of two Bank NIFTY option trading strategies as well as provide many Bank NIFTY tips and Bank NIFTY option tips that can potentially help you understand how to make better trades in the future.

There are several pros and cons to Bank NIFTY. On one hand, due to its high volatility, Bank NIFTY is exceptionally attractive to traders who are looking to generate a quick profit, as price jumps are more likely. This characteristic also makes it more appealing to intraday traders, as any profit margin over 2-3% per day constitutes a good day's trade.

However, it is this same volatility that causes Bank NIFTY to be extremely risky. Simply put, the price is likely to fluctuate, and if you are unable to keep up, the chances of loss are amplified, along with the amount of loss you could incur.

1. Strategy

This Bank NIFTY option strategy applies only to intraday trading. Firstly, chart a 5-minute Candle Chart in your charting software. Pick the point at which you will commence your strategy. You must pick a point where the first two candles are either both bullish or both bearish. If your first two candles are bullish, you must place the buy order at the high of the second candle. Once this is triggered, the stop loss order must be set at the low of that same candle. Alternatively, if the two candles are bearish, you do the exact opposite and place your buy order at the low of the candle, with the stop-loss order placed as a buy order at the high of the candle. You can also employ a bracket order to carry out this strategy. In this situation, your stop-loss order is set at 40% of the height of your candle. Here, we are chasing a 1:2 ratio and therefore, the target is placed at double the height of the candle. For instance, if the height of the candle is 40 points, you place the target order at 80 points. It is important to note that if both candles are bullish you must focus on placing sell orders only, and vice versa for bearish candles.

2. Strategy

This strategy is split into two parts: sell trades and buy trades:

a. Sell trade If the market opens at a gap down (a jump to a lower price from last day's close), you must wait for the chart to fill that gap. When a candle fills this gap, you place a sell order at that point. Analysis and trend studies predict that the price is likely to drop from this point. The sell order, therefore, protects you from this fall in price.

b. Buy Trade This Bank NIFTY options trading strategy is designed for when the market opens at a gap up. When you notice the market opening at a gap up, you once again wait for a candle to fill that gap and then proceed to place a buy order at that point. Contrary to the 'sell trade' section of this strategy, the price is predicted to rise, allowing you to possibly turn a profit. While the gap is usually filled within a day, another one of the Bank NIFTY tips states that if this is not the case, you simply wait for the gap to be filled in the coming days and place your orders then.

Setting your targets and stop-losses is an integral step of these Bank NIFTY option tips. To gauge where the stop loss and targets must be placed, chart a horizontal line from the high of the closing candle. This is also the point at which you place your buy order, and once the market corrects to cover this gap, your buy order will be completed. The stop loss should be placed at the low of the closing candle. Similar to the previous Bank NIFTY options trading strategy, another tip is to place the target at twice the height of the candle. For example, if the candle is 50 units, your target should be set at 100.

Derivative financial options are contracts that give their holders the right, but not the obligation, to buy or sell an underlying asset at a predetermined price within a specified time frame. The price of a derivative financial option is influenced by a number of factors, including market conditions, the price of the underlying asset, volatility, and the time remaining until the option expires.

In the case of the Bank Nifty, the following factors are likely to impact the price of derivative options: Market conditions:

- The overall market conditions, including the level of economic growth, interest rates, and monetary policy, can affect the Bank Nifty and, in turn, the price of Bank Nifty options.
- Price of underlying asset: The price of the Bank Nifty index is one of the most important determinants of the price of Bank Nifty options. An increase in the Bank Nifty price generally leads to an increase in the price of call options, while a decrease in the Bank Nifty price leads to a decrease in the price of put options.
- Volatility: Volatility, or the fluctuation in the price of the underlying asset, also affects the price of Bank Nifty options. Higher volatility leads to higher option prices as there is a greater chance of large price movements in the underlying asset.
- Time remaining until expiration: The time remaining until the option expires is another factor that affects the price of Bank Nifty options. As the expiration date approaches, the time value of the option decreases and the option's price is more closely tied to the price of the underlying asset. Interest rates:
- Interest rates can also impact the price of Bank Nifty options. Higher interest rates can increase the cost of holding a long position in an option, leading to a decrease in the price of options.

III. METHODOLOGY

Initially methodology starts with the initial analysis of the return series with the help of basic statistical tool called "Descriptive Statistics" before proceeding with econometric modelling. An initial assessment of mean and standard deviation of the series is done to comment on the volatility of prices of stocks under study. Skewness and kurtosis measure will help us understand the asymmetry from the normal distribution in a set of statistical data. To check the whether series is stationary or not for the existence of unit root, ADF test is applied. Stock market data displays volatility clustering, where time series shows period of high volatility and low volatility. GARCH/ARCH time series models generally utilised in econometrics and finance because of random volatility. Before applying the GARCH model for return series, heteroskedasticity test is applied



and residuals of all the stocks are plotted to check whether the volatility exists or not. If these things exist for residuals plot, this gives justification to run the GARCH model.

IV. RESULTS

In this section, results of the study are discussed where first summary of descriptive statistics for BANKNIFTY stocks are estimated of both futures return and cash return are shown in Table 1. Further, ADF test results are shown in Table 2, followed by GARCH model results are discussed shown in Table 3.

Statistics of Bank stocks

The Table 1 recapitulates the descriptive statistics of BANKNIFTY stocks returns. The factor of skewness for all the return series are dissimilar from zero which shows that return distribution is asymmetric and the coefficient of kurtosis shows that the return series are not symmetric in all the stocks. Further from Jarque-Bera test, displays that in all the stocks, series are not normally distributed as probability value are equal to zero.

Table 1: Statistics of Bank Stocks

| Table 1 DESCRIPTIVE STATISTICS OF BANK STOCKS | | | | | | | | | |
|--|----------------|---------|--------|---------|----------|----------|----------|------------|---|
| Symbol | Variable | Mean | Max | Min | Std. Dev | Skewness | Kurtosis | Jarquebera | P |
| AXIS | Futures Return | -0.0005 | 0.1297 | -1.6149 | 0.0442 | -27.9452 | 1019.8 | 74929 | 0 |
| | Cash Return | -0.0005 | 0.1460 | -1.6139 | 0.0443 | -27.7381 | 1010.2 | 73519 | 0 |
| BANKBAROD A | Futures Return | -0.0008 | 0.2093 | -1.6195 | 0.04552 | -25.7845 | 920.9522 | 61283 | 0 |
| | Cash Return | -0.0008 | 0.2034 | -1.6171 | 0.04543 | -25.8219 | 922.7417 | 61522 | 0 |
| CANBK | Futures Return | -0.0002 | 0.1215 | -0.1454 | 0.02589 | 0.075008 | 4.80304 | 237.1 | 0 |
| | Cash Return | -0.0002 | 0.1260 | -0.1434 | 0.02545 | 0.106533 | 5.030067 | 301.9 | 0 |
| FEDRALBAK | Futures Return | -0.0006 | 0.1190 | -1.5841 | 0.04699 | -23.9702 | 772.0699 | 43048 | 0 |
| | Cash Return | -0.0006 | 0.1173 | -1.5827 | 0.04686 | -24.1369 | 778.6607 | 43788 | 0 |
| HDFCBANK | Futures Return | -0.0002 | 0.0768 | -1.6072 | 0.041 | -34.5735 | 1355.4 | 1.3300 | 0 |
| | Cash Return | -0.0002 | 0.0775 | -1.6054 | 0.0409 | -34.6031 | 1356.9 | 1.3300 | 0 |
| KOTAKBANK | Futures Return | 0.0009 | 0.0859 | -0.6935 | 0.02871 | -14.7222 | 347.7 | 86746 | 0 |
| | Cash Return | 0.0009 | 0.0842 | -0.7011 | 0.0288 | -14.6113 | 344.6 | 85219 | 0 |
| SBIN | Futures Return | -0.0011 | 0.1059 | -2.2859 | 0.0586 | -34.194 | 1332.2 | 1.2700 | 0 |
| | Cash Return | -0.0011 | 0.1114 | -2.2820 | 0.0586 | -34.1462 | 1329.9 | 1.2700 | 0 |
| YESBANK | Futures Return | 0.0010 | 0.2 | -0.1318 | 0.0244 | 0.3003 | 9.609 | 3192.9 | 0 |
| | Cash Return | 0.0010 | 0.2023 | -0.1347 | 0.0248 | 0.3354 | 9.3128 | 2921.8 | 0 |

The test critical values -3.43392,-2.863013, -2.567607 are statistical significant at 1%, 5% and 10% level and *denotes statistical significant at 1% level.



ADF Test

The Table 2 describes the results of ADF test for BANKNIFTY stocks. Generally to check the stationary of the return series, unit root test is followed by employing ADF test. In all the stocks of BANKNIFTY returns, the t-statistic value of ADF test statistics is less than the expected critical values, hence, the return series are stationary at level with intercept in all the stocks of BANKNIFTY.

Table 2 ADF TEST

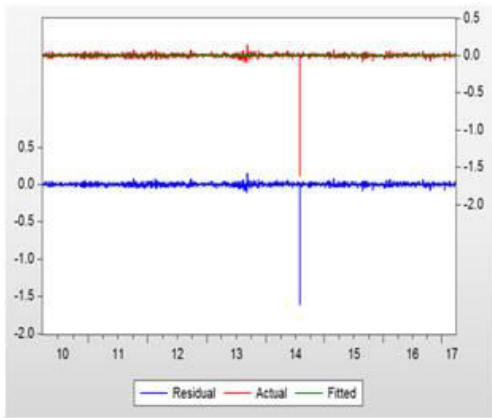
| Symbol | t-Statistic Futures Return | t-Statistic Cash Return | Probability* |
|------------|----------------------------|-------------------------|--------------|
| AXIS | -40.88645 | -40.83462 | 0 |
| BANKBARODA | -42.39085 | -42.29624 | 0 |
| CANBK | -40.39227 | -39.49335 | 0 |
| FEDRALBNK | -31.82826 | -31.71682 | 0 |
| HDFCBANK | -42.11621 | -42.0653 | 0 |
| KOTAKBANK | -43.06441 | -43.07084 | 0 |
| SBIN | -41.46426 | -41.28508 | 0 |
| YESBANK | -38.70207 | -38.75875 | 0 |

GARCH model

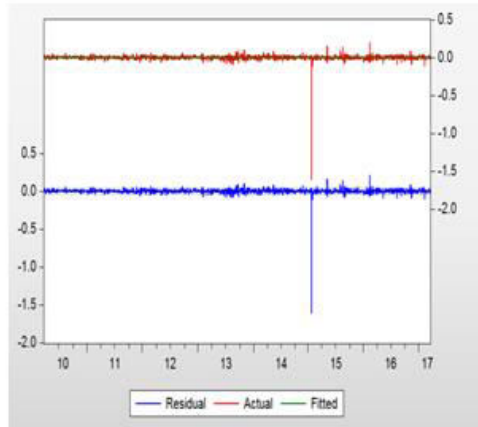
The Figure 1, indicates pattern of volatility clustering of daily return series of BANKNIFTY stocks the residuals of BANKNIFTY stocks which indicates that there are long periods with low fluctuations and also long periods with high fluctuations tends that variation in respective periods followed by respective high/low volatility . When we find the residuals in this pattern, this is the justification to run ARCH family models. Further ARCH-LM test statistic is applied for residuals which indicate the presence of ARCH effect. The best tool to measure the volatility is GARCH model, where in this study used to find the effect of stock futures on volatility of spot market.

Table 3: Results of Estimated GARCH Model

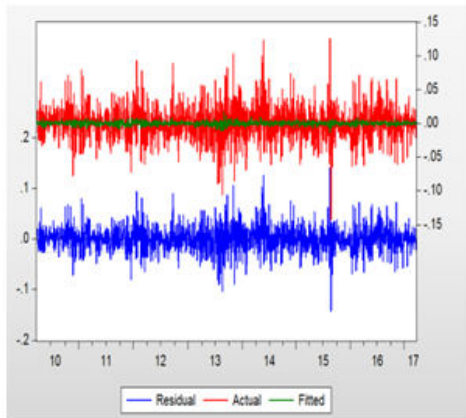
| GARCH (1,1) Model: | | | | | | |
|---|----------------------|---------------------|------------------------|----------------------|---------------------|-----------------------|
| Mean Equation: $R_t = a_0 + a_1R_{t-1} + s_t$ (1) | | | | | | |
| Variance Equation: $h_t = a_0 + \alpha_1e^2 + \beta_1h_{t-1} + \gamma_1D_f$ (3) | | | | | | |
| $t-1$ | | | | | | |
| Symbol | Mean Equation | | Variance Equation | | | |
| | a_0 | a_1 | a_0 | a_1 | Q_1 | γ_1 |
| AXIS | 0.0033* (0.0007) | 0.2487* (0.0351) | 0.0001* (0.0006) | -0.0019* (0.008) | 0.766* (0.008) | -0.0038* (0.0002) |
| BANKBARODA | -0.00007 (0.0021) | 0.1341 (0.1138) | 0.0009 (0.0009) | -0.0009* (0.0001) | 0.5525 (0.4626) | -0.0005* (0.00005) |
| CANBK | -0.0003 (0.0005) | 0.2945* (0.0354) | 0.00002* (0.000005) | 0.0969* (0.0121) | 0.8716* (0.0161) | -0.00006 (0.0001) |
| FEDRALBANK | 0.0037* (0.0006) | 0.1689* (0.0347) | 0.0005* (0.00001) | 0.2141* (0.0195) | 0.0079 (0.0197) | -0.005* (0.00003) |
| HDFCBANK | 0.0029* (0.0005) | 0.2287* (0.0261) | 0.0001* (0.0006) | -0.001* (0.0004) | 0.5147* (0.022) | -0.003* (0.00001) |
| KOTAKBANK | 0.00002 (0.0028) | 0.1299 (0.1) | 0.0008* (0.0002) | 0.15 (0.1147) | 0.6000* (0.1419) | 0.0000 (0.0001) |
| SBIN | 0.0035* (0.0008) | 0.3293* (0.0397) | 0.0011* (0.00002) | 0.0018* (0.00004) | -0.686* (0.0185) | -0.0053* (0.00002) |
| YESBANK | 0.0018* (0.0005) | 0.3069* (0.0308) | 0.00001* (0.0003) | 0.0715* (0.0102) | 0.8963* (0.0140) | -0.0008* (0.0002) |



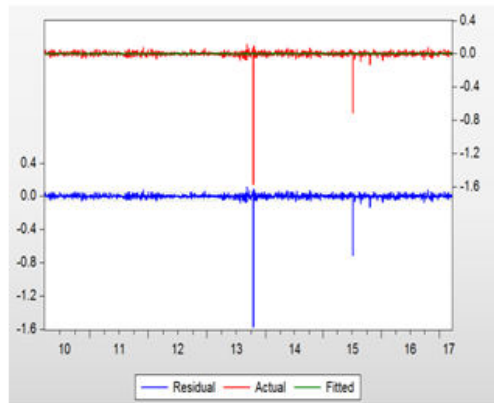
AXIS BANK LIMITED



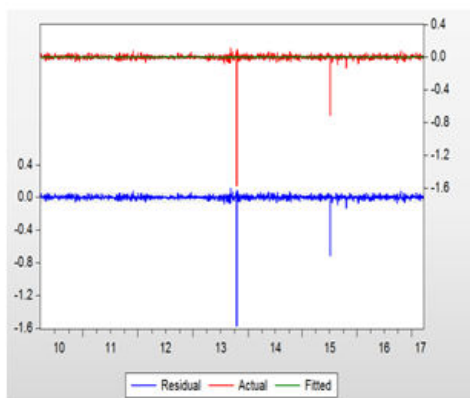
BANK OF BARODA



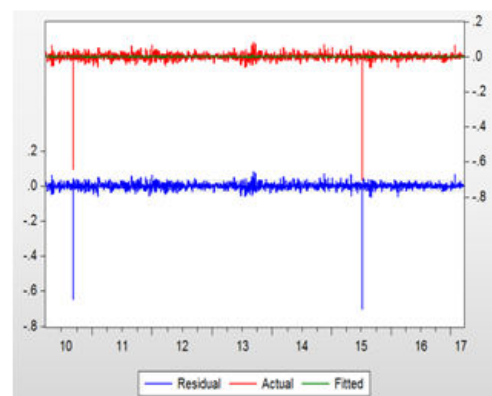
CANARA BANK



FEDERAL BANK



HDFC BANK



KOTAKBANK

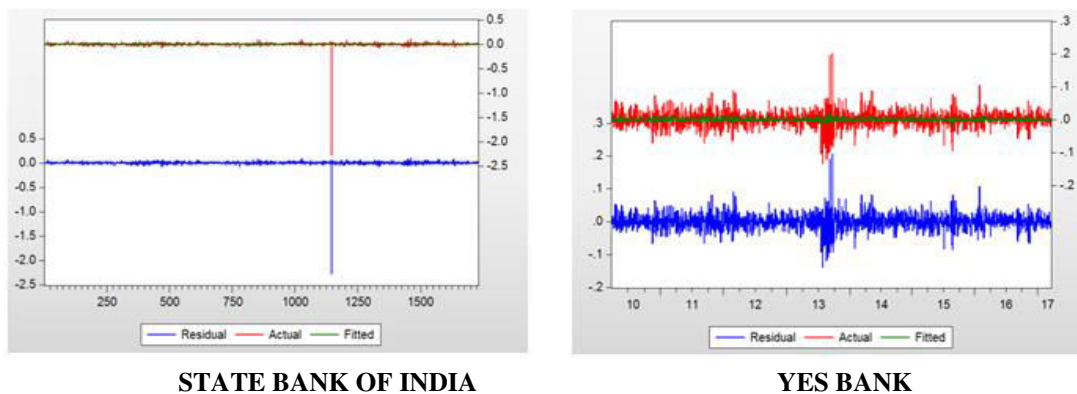


Figure 1: Pattern Of Volatility Clustering Of Daily Return Series of BANKNIFTY Stocks

The results of GARCH model of BANKNIFTY stocks is presented in the Table 3, α_1 is ARCH term, γ_{1i} is GARCH term and β_1 is dummy variable which is stock futures return. ARCH term is significant for all the stocks except KOTAKBANK. GARCH term is significant as value is less than 1% for HDFCBANK, SBIN, AXIS, YESBANK, CANBK, FEDERALBANK and BANKBARODA. To estimate the effect of derivative transaction on volatility of spot market, introduced a dummy variable in the conditional variance equation (2) of the GARCH model. Stock futures return is significant in case of HDFCBANK, SBIN, AXIS, YESBANK, FEDERALBANK and BANKBARODA and even the coefficient are negative hence, the volatility of stocks spot market is declined.

V. CONCLUSION

In conclusion, the price of derivative financial options, including Bank Nifty options, is influenced by a number of factors, including market conditions, the price of the underlying asset, volatility, time remaining until expiration, and interest rates. It is important for investors to understand these factors and how they interact to determine the price of options in order to make informed investment decisions. In this paper, examined the impact of stock futures on spot market volatility and from descriptive statistics, found that data returns of all the stocks are not normally distributed. From ADF test, all the stock returns are stationary at intercept level only. Next, ARCH effect is found in all the stocks and volatility is declined for HDFC BANK, SBIN, AXIS, YESBANK, BANKBARODA, CANARABANK and FEDERAL BANK in GARCH model. As stock futures contract provide a mechanism to hedge, speculate and arbitrage, so this reduces the volatility in spot market by risk transference.

Bank NIFTY is an attractive script for investors looking to make a quick profit. However, its volatility makes investments riskier. There are many options for how to trade Bank NIFTY options. By using the right Bank NIFTY tips and Bank NIFTY trading strategies, you can gradually start making more successful trades.

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