International Journal of Management Studies *ISSN(Print) 2249-0302 ISSN (Online)2231-2528*
http://researchersworld.com/index.php/ijms

Doi : 10.18843/ijms/v8i1/04
DOI URL :http://dx.doi.org/10.18843/ijms/v8i1/04

Role of Options Greeks in Risk Management

Ujjwal Anand

Student, MBA (Finance Management),
Christ (Deemed to be University),
Karnataka, India

Dr. Manu K. S.

Assistant Professor,
Christ (Deemed to be University),
Karnataka, India

(Received January 05, 2021; Accepted February 25, 2021)

ABSTRACT

Purpose of the research: *The study has been undertaken to analyse an optimum strike selection for naked options and assess an event strategy with options trading for Bank Nifty & Nifty 50 options indices.* ***Methodology:*** *The study collected the data of Nifty 50 and Bank nifty options data for the analysis. The study considered delta, Vega, implied volatility and Implied volatility percentile for the further analysis. Nifty underlying movement along with different strike options have been studied in order to find out the sensitivity of the movement in the underlying. In general, the study develops a scheme to simulate different trading strategies and thus identify some simple but profitable strategies.* ***Findings:*** *Overall the study found that ITM options are more responsive to the movement of the underlying as compare to ATM or OTM. Strike selection must consider that strike price which is having delta (+/- 0.7). Study also found that before every economic event, implied volatility percentile tends to increase & once the event is being occurring the implied volatility tends to move down & so happens with the premium of the option. During the event IVP tends to crash along with implied volatility & premium also starts decaying .Therefore, creating a short straddle before every economic event, is highly profitable.* ***Implications:*** *The study implies that a retail participants must be focusing on option Greeks & risk management in order to trade event strategy. Most of the retail trader are find the event trading difficult due to high volatility & swings before the event.* ***Originality:*** *The existing literature focused on derivatives management for risk management. The current study focused predominately on retail traders and finding the right options trading strategy to protecting their capital with earning profits with minimum risk.*

Keywords: Naked options, Event trading Implied Volatility Percentile, Vega and Delta.

INTRODUCTION:

Narender L. Ahuja (2006), expressed Futures and options trading helps in hedging the price risk and also provides investment opportunity to speculators who are willing to assume risk for a possible return. A derivative is a contract that derives its value from the performance of an underlying entity. This underlying entity can be an asset, index, or interest rate, and is often simply called the "underlying". An option is a agreement that permits (but doesn't require) a participant to buy or sell an underlying tool like a security, ETF or even index at a determined price over a convinced period of time. Buying and selling options is done on the options market, which trades expiry contracts based on securities. However, options are not the similar tool as stocks as they do not signify possession in a company. And, although futures use agreements just like options do, options are considered to be a tool consisting lower degree of risk due to the fact that walk away from an options agreement at any point. The worth of the option (its premium) is thus a proportion of the underlying scrip or security. The major concern of the present study is to evaluate the impediments in the acceptability of options trading as risk management instrument. Options trading have entered completely in Indian trading community since nearly last two decades, yet when as compare to the rest of the world it is still far behind them. After getting satisfied from the subordinate database study that for growth and mass undertaking of options trade for the purpose for which it is tailored made, the researcher manage a primary study to find the acceptance among the Indian community which is associated

directly/indirectly with options trading and to find impediments, if any, in its path and also to suggest treatment based on the findings of the study. We are considering two financial derivatives in our research. They are:

- **Futures:** A derivative instrument may be a standardized legal agreement to shop for or sell one thing at a pre-set value at an outlined time within the future, between parties not illustrious to every alternative. Typically, The plus changed is typically a goods or monetary tool.
- **Options:** An option is an agreement which gives the buyer the right, but not the obligation, to purchase or sell an underlying asset or instrument at a predetermined strike price previous to or on a defined date, depending on the form of the option.

As highlighted by Richards et.al (2017) The major problem faced by the trader's & especially retail traders is that they lose their capital while they enter into trading business specially into options because of not having proper risk management. Stop loss gets triggered often whenever there is an economic event.

REVIEW OF LITERATURE:

Dilip P.M. & Raju G. (2001) showed that the capital market is becoming more and more risky and complex in nature so that ordinary investors are unable to keep track of its movement and direction. Richards et.al (2017) stated investors use stop losses have less expertise & that, once not victimisation stop losses, these investors square measure additional reluctant to understand losses than different investors. Narender L. Ahuja (2006) expressed Futures and options trading helps in hedging the price risk and also provides investment opportunity to speculators who are willing to assume risk for a possible return. Bartram (2004) in investigated the motivations and practice of non-financial firms with regard to using financial options in their risk management activities. The paper provided a comprehensive account of the existing empirical evidence on the use of derivatives in general and options in particular by nonfinancial corporations across different underlying and countries. Agarwal and Naik (2004) characterize risk exposures and portfolio choices involving hedge funds, and that they realize that investors want to earn risk premia related to totally different risk factors have to be compelled to differentiate hedging methods. Shalini H S and R. Duraipandian (2014) analyse the utilization of various choice mercantilism methods as best instrument in monetary engineering that used as good tool for managing risk in each optimistic and pessimistic markets. Chan et.al (2008) inspected the economic advantages of exploitation complete volatility to forecast future silent volatility for valuation, trading, and hedging within the S&P 500 index options market. Jameson and Wilhelm (1992) evaluated the risks that options market creators face and provided empirical proof that their risk factors are exceptional to option markets due to the stochastic volatility of the stock return and the inability to rebalance the option position continuously. Ahn et.al (2003) assesses the optimum hedge consists of a situation in a single position whose strike price is independent of the mark of expenditure the institution is willing to incur for it's hedging program. Dmitriy and Neil (2020) states that Options trading size is operative and well-organized spreads of traders who time executions are less than 40% of the size of conventional measures, and the overall average effective spread is one-quarter smaller than conventional estimates. Ryu & Yan (2020) inspects the overall options request for volatility does not forecast spot marketplace volatility before the market reform, but it does so after the reform.
Colette et.al (2019) estimates the features of options and the factors affecting their valuation, and outlines several trading mechanisms that new options traders might use as they seek their more effective strategies. These instruments include long call, short put, bull call spread, short call, long put, bear put spread, short straddle, short strangle, long butterfly, long straddle, and long strangle. Bali et.al (2019) states about volatility and it's skewness & there effect on stock return. D. Bams et al. (2017), evaluates the abilities of the implied volatility and historical volatility models to provide exact Value-at Risk Forecast. Yang et. al (2016) inspects whether option price monotonicity properties hold in a liquid market with little market friction & considers the validity of the monotonicity properties in light of option market characteristics**.** Option buyer won't get profit of maximum but they losses the premium value of the option. This study will help in risk management & structuring an option trade which can be used in a practical market.

OBJECTIVES OF THE STUDY:

1) To Analyse an optimum strike selection for naked Options Buying for Nifty 50 2) To assess an Event strategy with options trading for Bank Nifty & Nifty 50.

RESEARCH METHODOLOGY:

Data: The study collected (NIFTY & BANKNIFTY) options prices, Open interest, Option Greeks, Change in OI, Implied volatility, Implied volatility percentile. Event strategy means creating a strategy for an upcoming economic event. The events may have crucial impact on the sentiments of the participants.
Events studied: The study used four different events - Union-Budget, RBI Monetary policy, and Supreme Court verdict on Loan moratorium and US Presidential Election 2020 to analyse the role of options Greeks in risk management

Table 1: Period & Variable of study

Contract	Time Frame	Expiry date	
NIFTY	01st-24th April 2020	24th April 2020	Normal Sample Period
Bank Nifty Implied Volatility Percentile	Jan 2018, Jan 2019, Jan 2020	26th Jan 2018, 25th Jan 2019, 31st Jan 2020	Union-Budget 2018-19, Union-Budget 2019-20, Union-Budget 2020-21,
Bank Nifty Futures & IVP	8th Oct-14th Oct 2020	30th Oct 2020	Supreme court verdict on Loan moratorium
NIFTY IV	6th Nov-12th Nov 2020	27th Nov 2020	US Presidential Election 2020
Nifty Futures & IVP & Straddle	24th Jan-07th Feb 2020	28th Feb 2020	RBI Monetary policy

RESEARCH FRAMEWORK:

Operational definition of Options:

Payoff chart: Option payoff diagrams area unit profit Associate in nursing loss charts that show the risk/reward profile of choice or combination of choices. As choice chance will be advanced to know, P&L graphs offer a moment read of the risk/reward sure enough commercialism concepts you may have.
Long Position: Long position means buying a contract or scrip when they are bullish.
Short Position: Short position means creating a position when participants are bearish on a contract or scrip.
Open Interest: Open interest refers to the overall range of outstanding spinoff contracts that haven't been settled. For every vendee of a derivative instrument there should be a merchandiser. From the time the client or merchandiser opens the contract till the counter-party closes it, that contract is taken into account 'open'.
Long Unwinding: Long unwinding means the long position created in futures & options are being booked out. Traders are not expecting any further up move in the contract.
Short Covering: Short covering means the short position which has been created earlier, are being booked out. Traders are not expecting any further downside in the contract.
Short Build up: Short build-up means the short position are being created by the participants in the market. Participants are expecting a fall or decline in a position.
Long Build up: Long build up means the long position are being created by the participants in the contract. Participants are expecting a rise in the price before the contract expires.

VARIABLE DEFINITION OF THE RESEARCH:

Option Greeks measure the different factors that affect the price of an option contract. We'll explore the key Greeks: Delta, Gamma, Theta, Vega and Rho. Armed with Greeks, an options trader can make more informed decisions about which options to trade, and when to trade them.
Delta: It is a degree of the alteration in an option's price (that is, the premium of an option) consequential from a change in the underlying security. The worth of delta choices from - 100 to 0 for put and 0 to 100 for call (-1.00 and 1.00 without the decimal shift, respectively). Puts create adverse delta as they have a inverse relationship with the underlying security—that is, put premiums drop when the underlying security upsurges, and vice versa.

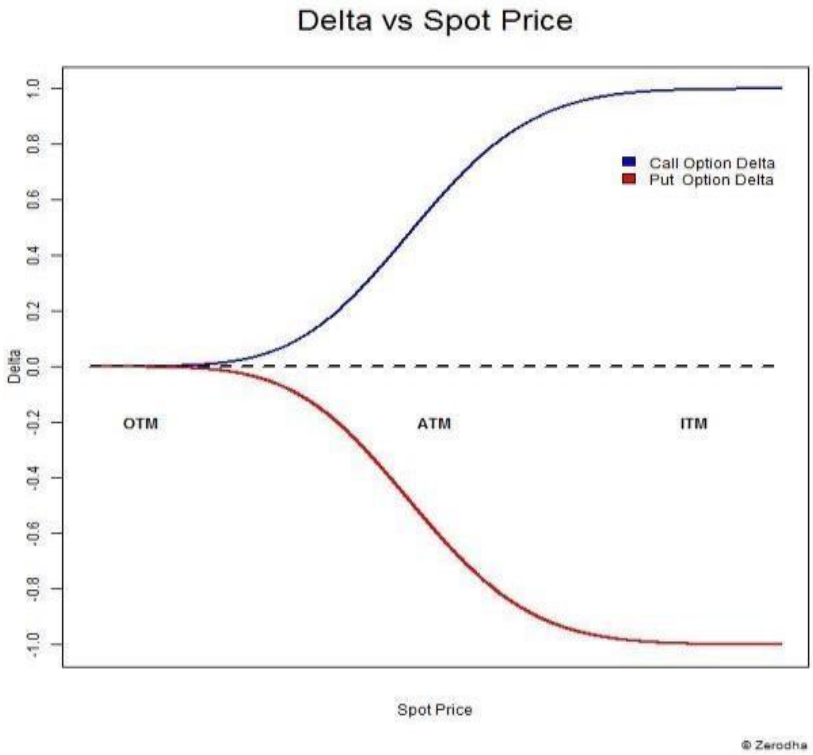


Fig. 1: Allocation of Delta on different strike prices

From the Fig:1 we can conclude that at the money option has 0.5 delta which is nothing but 50% probability of the option to be in ITM & 50% probability to be in OTM. Similarly, Deep ITM option has a delta of 1 for call & -1 for Put. & OTM options has delta of less than 0.5 for both.

Theta: Theta calculates the degree of time decay in the cost of an option or its premium.
Time decay signifies the destruction of an option's worth due to the waste/pass of time. As time passes, the probability of an option being profitable or in-the-money lessens. Time decay inclines to accelerate as the contract expiry date of an option draws nearer because there's low time value left to earn a profit from an option position.

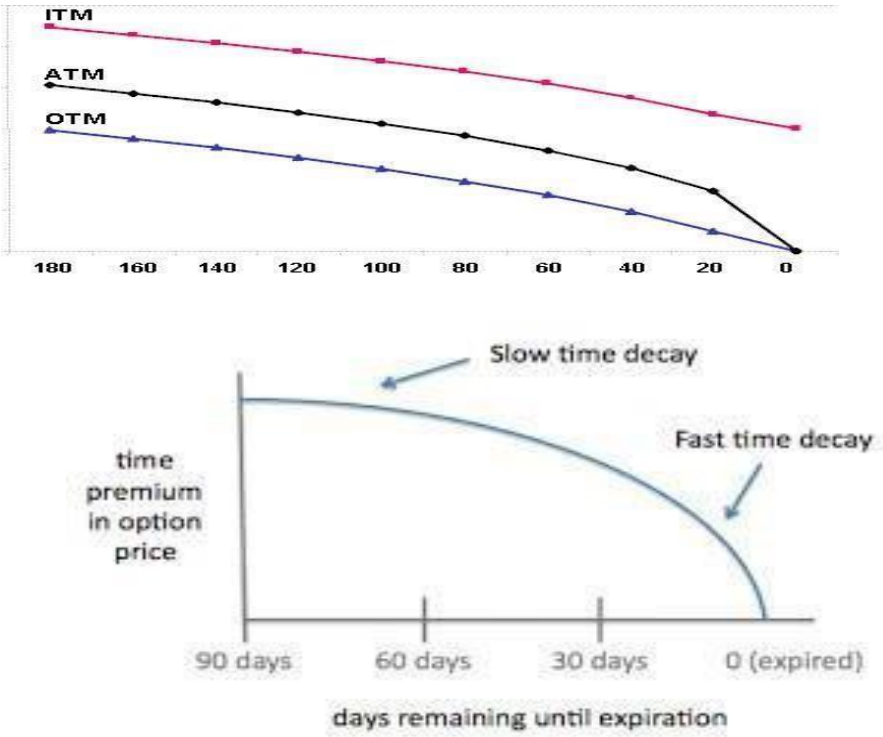


Fig. 2: Theta impact on different strike

Fig (2) depicts that lesser the time to expiry higher the theta & higher theta results in premium erosion. Higher the time to expiry lesser the theta & less theta won't result in premium erosion.

Vega: Vega computes the degree of change in implied volatility or the forward-looking probable volatility of the underlying asset price. While delta signifies actual price changes, Vega is focused on deviations in potentials for future volatility. Higher volatility makes options more expensive since there's a larger likelihood of beating the strike price at some point.

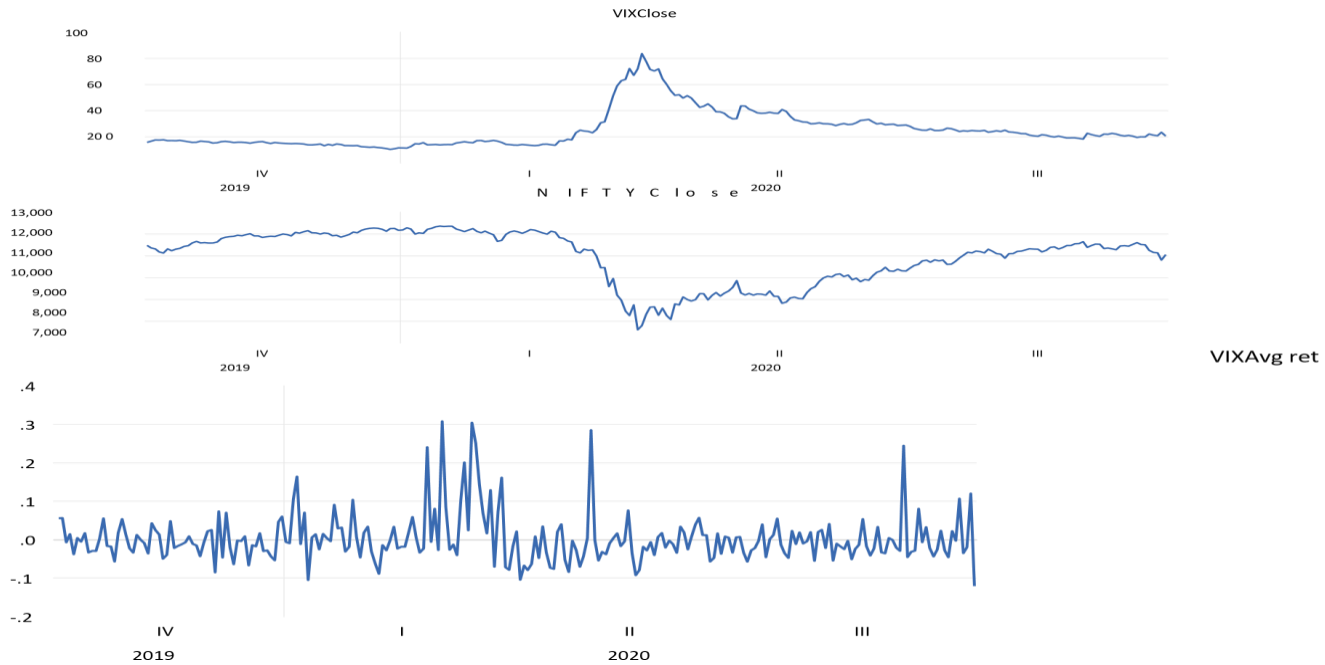


Fig. 3: Relationship between India Vix & Nifty

From Fig:3 we can conclude that there is an inverse movement between Nifty 50 & India Vix. We can also conclude that volatility is mean reverting in nature

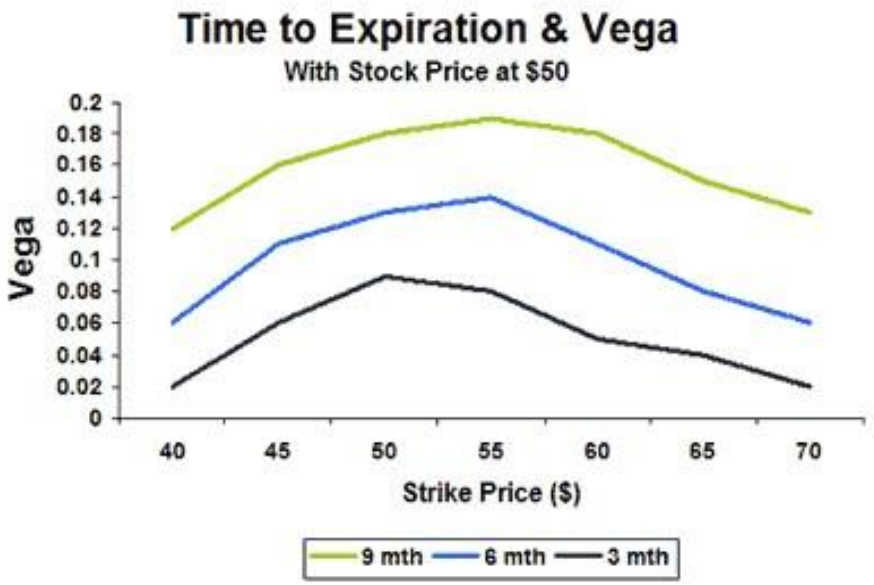


Fig. 4: Relationship between Volatility & Time to expiration

From fig:4 we can conclude that there is a higher Vega in the far expiry or next expiry contract as compare to current expiry. Higher the time to expiry higher the Vega, Lower the time to expiry lower the Vega.

Gamma: Gamma computes the degree of changes in delta over time. Since delta values are always changing with the underlying asset's price, gamma is used to quantify the degree of variation and provide traders with an idea of what to imagine in the future. Gamma figures are uppermost for at-the-money options and lowermost for those deep in- or out-of-the-money.

Rho: Rho (p), which signifies the degree of variation among an option's worth and a 1% variation in the interest rates. This quantifies the sensitivity to interest rates.

Option Chain: Option chain is a list or table of all available option contracts. It includes stocks & index with Put & call option for every F&O listed security. The table will contain information on open interest, Implied volatility, Change in Open interest, LTP (Last traded price), Change in Price, Bid-Ask etc. for a given expiration date.

In the Money (ITM) Options: - In the money options are those options where Spot>Strike for call options. For Put options, It's spot<Strike.

At the Money (ATM) options: - These are those options where Spot= Strike price. **Out of Money (OTM)** options: These are those options where Spot<strike for call & spot>strike for put options.

Option chain Analysis: Option chain is a list or table of all available option contracts. It includes stocks & index with Put & call option for every F&O listed security. The table will contain information on open interest, Implied volatility, Change in Open interest, LTP (Last traded price), Change in Price, Bid-Ask etc. for a given expiration date.

The main data which must be focused can be how much Market maker move is pricing the range? By focusing on at the money straddle i.e., ATM CALL+PUT combining together how much is costing. which strikes are having highest Open interest on both call & put side? The strikes which are having the highest OI for both call & put will be considered to as a range for the market. How much the strangle is costing? The costing of the strangle is the range which is actually provide a clear idea of bigger range. How is volatility skew? Volatility skewness will help in identifying whether the option is cheaper or expensive.

How is volatility smile? A volatility smile basically tells if the implied volatility is equally distributed at all levels of the strikes where ATM option will have the highest IV. Look at IV skew Implied volatility skewness tells which side volatility is concentrated & skewed. whether the option is backward skewed or forward skewed. It will tell whether the option is cheaper or expensive. Maximum pain level is a level of strike price at which Option buyer will lose the maximum & option seller will lose minimum. Change in Open Interest Change in open interest will help in identifying the trend. If the price of the underlying is moving up but there is not shift in PUT OI towards downside, one should not trust this upside & vice-versa.

Call Option: A call option, often simply labelled a "call", is a contract, between the buyer and the seller of the call option, to exchange a security at a set price.

Put option: A put option is a tool which provides the holder the right to sell an asset, at a definite price, by a stated date to the writer of the put. The purchasing of a put option is perceived as a negative notion about the future estimation of the hidden scrip.

Bullish: Bullish means participants are expecting that the price will move further upward.

Bearish: Bearish means participants are expecting that the price will move downward.

Non-Directional: Not clear about the direction of the movement of the underlying. Options should be traded by participants because It may provide cost efficiency, It may be less risky than cash & futures, It has the potential to deliver higher percentage returns, It offers a number of strategic alternatives

Vix is popularly known as Volatility index. It is also known as fear index. It's a regular measure of stock market's expectation of volatility indicated by Nifty 50. Because vix can show the turmoil in the market. We can interpret that Vega is having a characteristic of mean reverting.

One more thing, Vega can spend endless time on the downside.

Table 2: Option Risk: Reward

OPTION	RISK	REWARD
Buying	Limited	Unlimited
Selling	Unlimited	Limited

Source: Author's own calculation

From Table:2 We can conclude that option buyer is having a limited risk of the amount he/she has paid as premium but unlimited reward Where as an Option seller has a limited reward of the premium, he has sold but is having an unlimited risk as price may go up to any extent on the upward.

Table 3: Price & Open Interest relationship

Price & Open interest relationship

PRICE MOVEMENT	OI MOVEMENT	INTERPRETATION
UP	UP	LONG BUILDUP
UP	DOWN	SHORT-COVERING
DOWN	UP	SHORT BUILD UP
DOWN	DOWN	LONG UNWINDING

Source: Investopedia

From table 3 we can conclude that whenever the price goes up along with open interest is to be termed as Long Build-up. whenever there is an increase in price but decrease in open interest it signs short-covering. Whenever there is a decrease in price along with increase in open interest it signs short build-up. whenever there is a decrease in price along with open interest it sign's long unwinding.

To structure Naked Option Buying or Long Option Trading:
We need a direction for going long into options. Direction can be bullish or bearish. We have to buy a call option when we are bullish on an underlying. Similarly, we have to buy a put option when we are bearish on an underlying. Intrinsic Value: On an expiry day observe for intrinsic value, at times options writer manages to hold, And that's where options trades below fair value. Liquidity: Rounds strikes tend to have more liquidity, Less BID/ASK Spread, When VIX/IV is very high look to trade in round strikes.

DATA ANALYSIS & DESCRIPTIVE ANALYSIS:

This research paper is focusing on structuring naked option buying, The Major Greeks which will have an impact are Delta, Theta, Vega.
DELTA: It is the Probability of options expiry ITM, 0 to 1 for Call European, varies from 0 to -1 for Put European, if negative means bearish, if positive means bullish, It Keeps changing, Value delta tells you how much you will make/lose, change in options portfolio with respect to change in underlying. Value delta will tell us how much money we can make with the help of strike selection. For explaining the importance of delta & value delta for optimum strike selection, We have consider the Nifty 50 April Monthly expiry as illustration in Table:4.

Table 4: Value Delta table (Illustration explanation of Nifty 50)

The CMP of NIFTY 50 is 9500 & the strikes which has been considered into example is 9500 & 9300 (ATM & ITM) & strikes impact on Profitability of the position.

Market	Lot Size	Strike	Delta	Value Delta	Market	Profit
9500	75	9500	0.5	(0.5*75) 37.5	9800	(300*37.5) ₹11250
9500	75	9300	0.7	(0.7*75) 52.5	9800	(300*52.5) ₹15750

Source: Author's own calculation

Table (4) depicts the illustration of Nifty 50 index we can conclude that ideally an option buyer should have a delta greater than 0.5 but less than 1. So, it's is always ideal to have a delta of 0.7. Slight ITM option is having delta greater than 0.5 & thus the response on the profitability is higher than the ATM options.

VEGA (Volatility): It Change in options portfolio with respect to 1-point change in implied volatility, If you buy option, you have +ve Vega, If you sell option, you have -ve Vega, Higher days to expiration, Higher the Vega, Always highest Vega at ATM, As you move away from ATM Vega reduces. For explaining the importance of vega & value vega, we have considered an example of NIFTY 50 that is at 9500 with IV 35 on call side in Table:5

Table 5: Value Vega impact on the profit/loss

Strike	Option	IV	Vega	Option price
9500	CE	35	10	100
9500	CE	37 (Shift in IV from 35 to 37)		120 (37- 35)*10) +100

Source: Authors own calculation

From table: 5 We can conclude that Vega is change in option price with respect to change in IV. Moneyness changes as Vega changes. Always buy an option which has longer time period to expire. ATM is having a higher Vega. As there is a rise in IV of an option, The premium tends to increase of the option & thus, The buying of an option must be supported with increase in IV.

THETA: It change in options portfolio with respect to time. If you Buy option you will have negative Theta. If you sell option you will have positive theta. More days to expiration, Lesser the theta. Highest Theta at ATM strike. As you move away from ATM, theta reduces. Theta is high, near to expiry. Theta is high for ATM strike options. Theta is a friend of option seller. Theta is a strong enemy of option buyer. It must be less.

For Finding out the Optimum strike selection for long option trade, We are considering Nifty 50 which is trading at 9000 & we have chosen ITM option of 8000, ATM option of 9000 & OTM option of 10000 in table:6 & Fig:5.

Table 6: Impact of different strikes on the movement of Nifty 50

Instruments	Movement	% Return
NIFTY 50	8600-9600	11.62%
OTM Option 10000CE	150-0.05	-100%
ATM Option 9000 CE	550-810	47%
ITM Option 8000 Ce	1100-1950	77%

Source: Author's own calculation

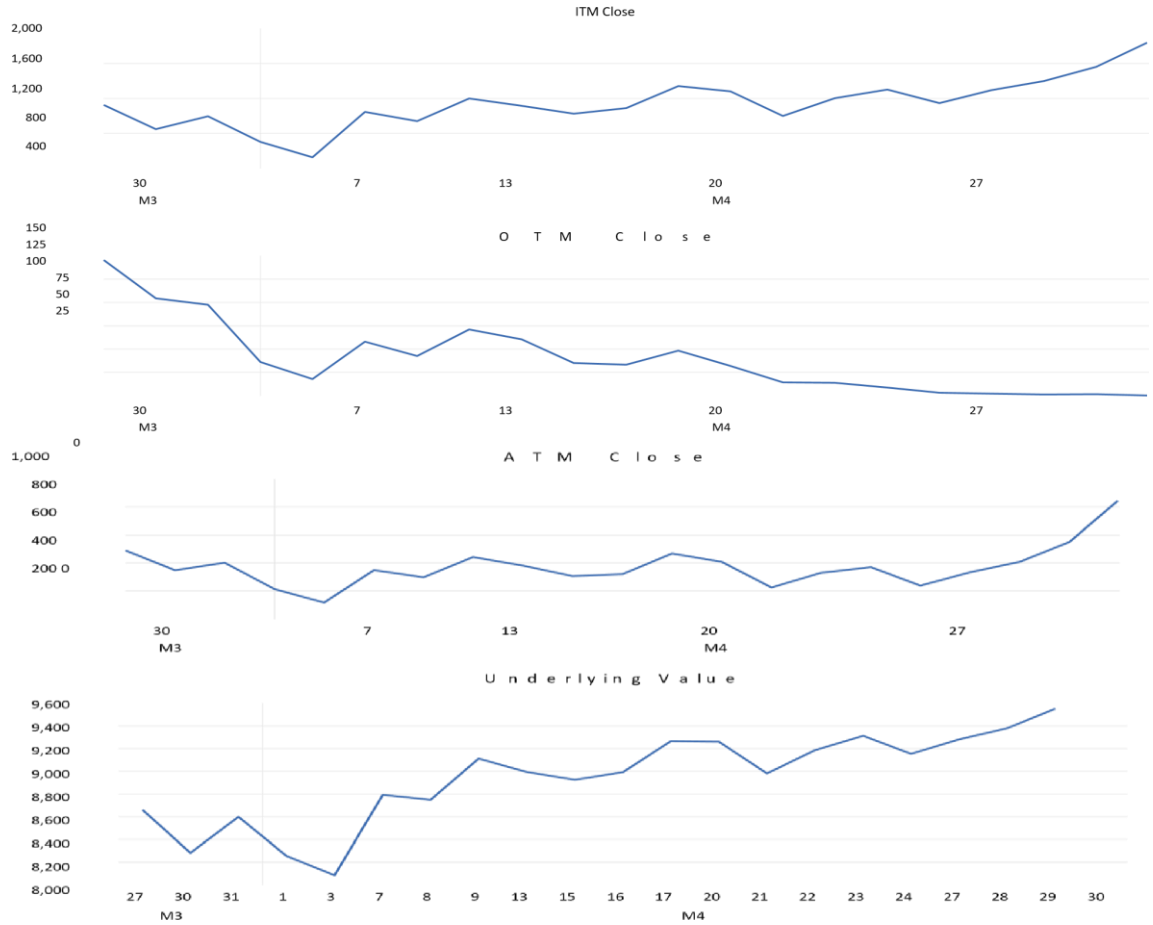


Fig. 5: Impact of different strikes on the movement of the NIFTY 50

From Fig:5 & table:6 that In the money option is having more growth than At the money option & Out of money due to value delta. OTM Option expires worthless that too after having such movement. Therefore, we can say that Buying ITM option is more worthy than ATM or OTM.

Table 7: Option Greek table for different strikes

ITM	HIGHER DELTA	LESSER THETA	HIGH GAMMA	LOW VEGA
ATM	DELTA NEUTRAL	THETA NEUTRAL	NEUTRAL GAMMA	HIGH VEGA
OTM	LESSER DELTA	HIGHER THETA	LOW GAMMA	LOW VEGA

Source: Investopedia

From table:7, we can conclude that ITM option has more delta & less theta so, it's a wise decision to buy an ITM option as compare to OTM option & ATM option. Value Delta tells you how much money you are going to make or lose. value delta is the value of the total delta of the portfolio.

Weeklies vs Monthly options: - Buying Monthly options is more logical as we get more vega & less theta. Less theta will help in slow decay of option premium. Weekly options should be preferred only when IV is relatively low/cheap. When a trader is expecting a fast move in the underlying as well as volatility is expected to increase in a day, then he/she should go for buying weekly option.

Therefore, we can conclude that Buying an option is only worth when a participant is having a clear view on direction. Implied volatility should also increase. Strike must be having a delta of 0.7 as they have less theta & High delta.

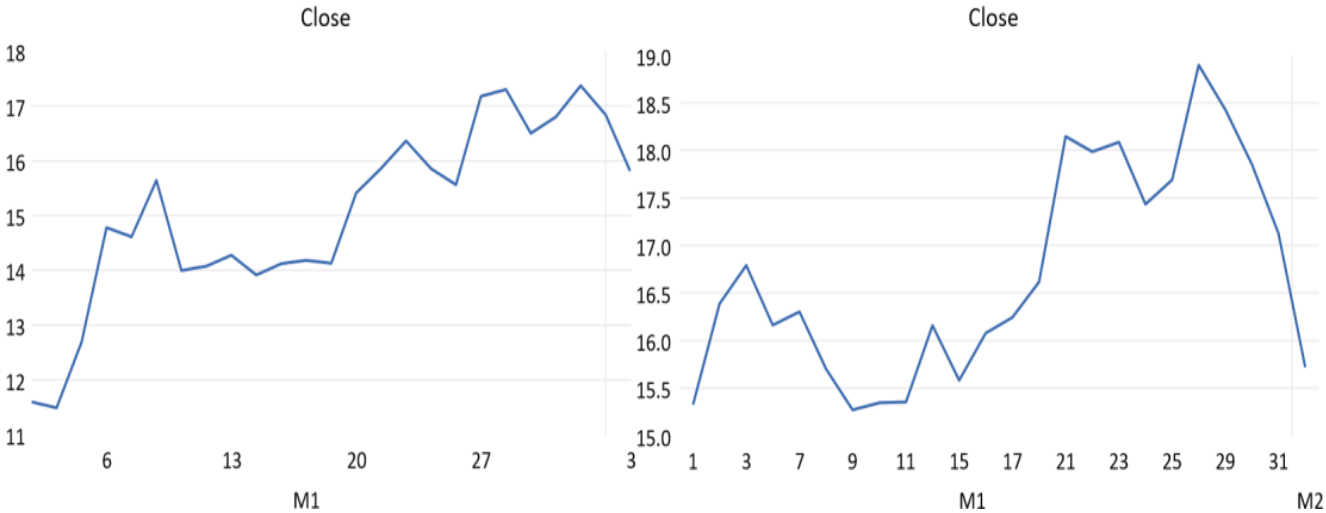
To Structure an event strategy:

Event strategy means any economic event which have an impact on the economic stability of the country. For structuring an event strategy, we first needs to know how implied volatility respond before any economic event. Further, we need to use derivative of the Implied volatility for formulating strategy. The main derivatives of implied volatility are:

Implied volatility Percentage- IVP tells you the actual percentage of days in the past that a stock IV was lower or lesser than its current implied volatility.

$$\text{IVP} = \frac{\text{Current IV} - 1 - \text{Year IV Low}}{1 - \text{Year Iv High} - 1 - \text{Year IV LOW}}$$

Implied volatility effect before Union Budget:



January 2020 Implied Volatility **January 2019 Implied Volatility**

Fig. 6: Implied volatility is rising before budget 2020,2019 and 2018

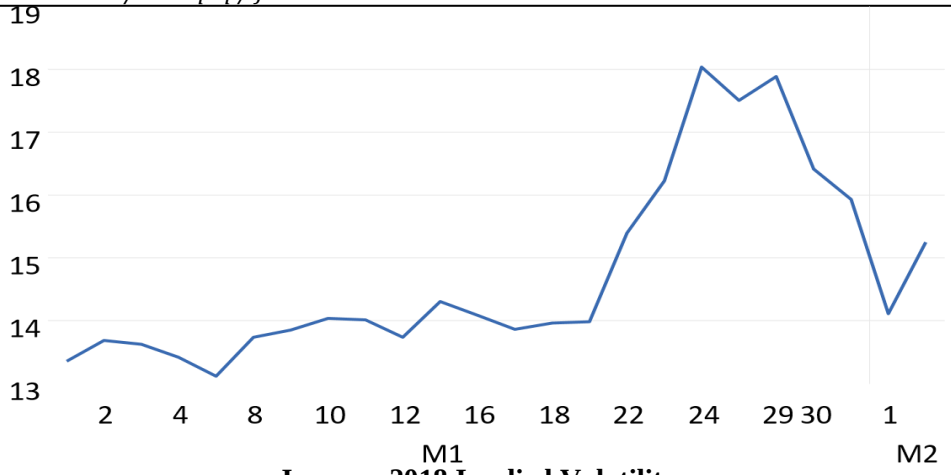


Fig.7: Implied Volatility is rising before budget 2018

From Fig 6 & 7, We can infer from the above-mentioned graph is that Implied volatility increases before every event (Budget) & got cool-off once the event is over. The best strategy is to short the volatility with risk management, but as we aren't sure about the direction of the underlying. We will go for neutral delta strategy.
Now we know that IV rises near to expiry, now the main thing which comes in play are the derivatives of Implied volatility:

- Implied volatility Percentage
- Implied volatility Ranking

As we want to find out how many times the implied volatility was trading below CMP. We will use Implied volatility Percentage.

$$\text{IVR} = \frac{\text{Number of Trading days below current IV}}{252}$$

If the implied volatility percentile is above 80 & there is a result/event is going to out. It's a perfect strategy to go short Volatility as it's too high. This is the main reason why is Option price fall when result or any event is out.
Now some strategies with short Vega but with neutral delta are:

- Short straddle
- Short strangle

Short Straddle: - This strategy deals with shorting out the both ATM CE & PE. By doing this, we will get neutral delta, Theta & negative Vega. As the event will be over majorly, the position will be in profit/positive.
Short strangle: - This strategy deals with shorting out the both OTM CE & PE. By doing this, we will get neutral delta, Positive theta & negative Vega. This strategy will help us in playing a broader range of the market by selling OTM Ce & Pe.
This current study is formulating an event strategy for 3 events.

EVENT I: Supreme court Loan moratorium hearing:
For finding out the optimum event strategy for supreme court loan moratorium hearing, we have taken ATM options 23100 Call & Put both for Bank Nifty weekly expiry. The Supreme court loan moratorium hearing event was scheduled on 14th Oct 2020.

Table 8: Change in IVP & it's impact on Straddle

Date	Implied volatility Percentile	Bank nifty Futures	Straddle (ATM CE& PE)
08th Oct 2020	50	23185	₹809
09th Oct 2020	52.78	23903	₹1001
12th Oct 2020	54.75	23766	₹861
13th Oct 2020	56.75	23562	₹663
14th Oct 2020	59.75	23874	₹780

Source: NSE India

From table: 8, we can infer that before this event Implied volatility percentile has increased & selling the Banknifty weekly expiry straddle before the expiry is actually profitable due to high IVP.
Whenever there is an event, Implied volatility percentile tends to increase & actually it's the best time to sell out the straddle. Receive the premium & enjoy theta with decreasing Vega having neutral delta. Ideally before any quarterly result of the company IVP tends to move higher there also it's important to create a short straddle 3-4 days before the event & enjoy the theta once event is occurring. Option premium tends to decay due to high theta, decreasing Vega.

EVENT II: U.S. Election

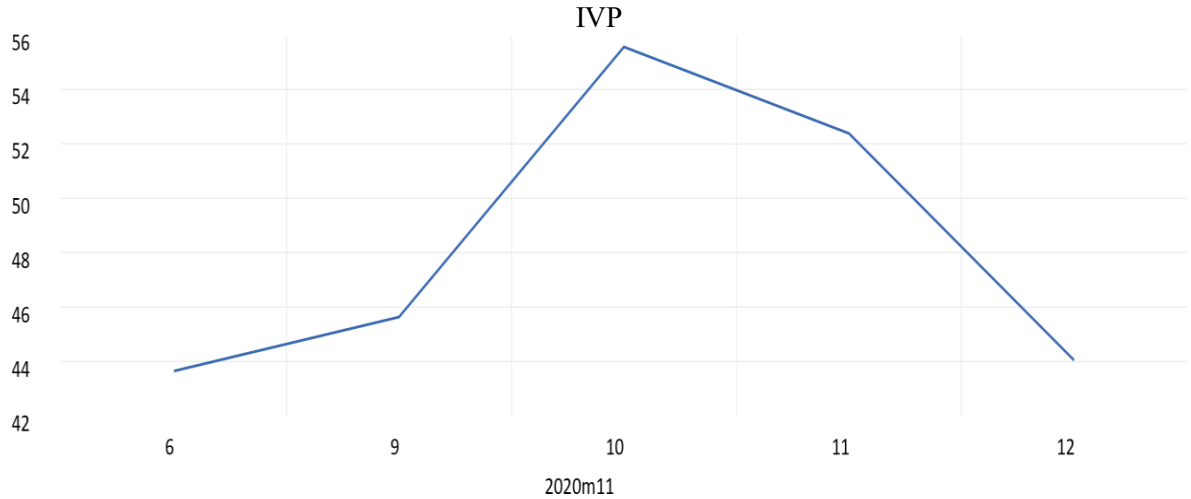


Fig. 8: IVP Before US Election

From Fig: 8, we can infer that IVP was continuously increasing before US Election.
Once the event is over, IVP started falling back.

Table 9: Change in IVP & it's impact on Straddle

Date	Implied volatility Percentile	Nifty Futures	Straddle (ATM CE& PE)
06th Nov 2020	43.65	12261.45	₹208.75
09th Nov 2020	45.63	12467.25	₹171.3
10th Nov 2020	55.56	12659.1	₹173.45
11th Nov 2020	52.38	12755.05	₹89.5
12th Nov 2020	44.05	120706	₹89.0

Source: NSE India

From table: 9, it depicts that before the event, Implied volatility percentile has increased & selling the Nifty 50 weekly expiry straddle before the expiry is actually profitable due to high IVP.
Whenever there is an event, Implied volatility percentile tends to increase & actually it's the best time to sell out the straddle. Receive the premium & enjoy theta with decreasing Vega having neutral delta. Ideally before any quarterly result of the company IVP tends to move higher there also it's important to create a short straddle 3-4 days before the event & enjoy the theta once event is occurring. Option premium tends to decay due to high theta, decreasing Vega.

EVENT III: RBI Monetary Policy
Implied volatility Percentile

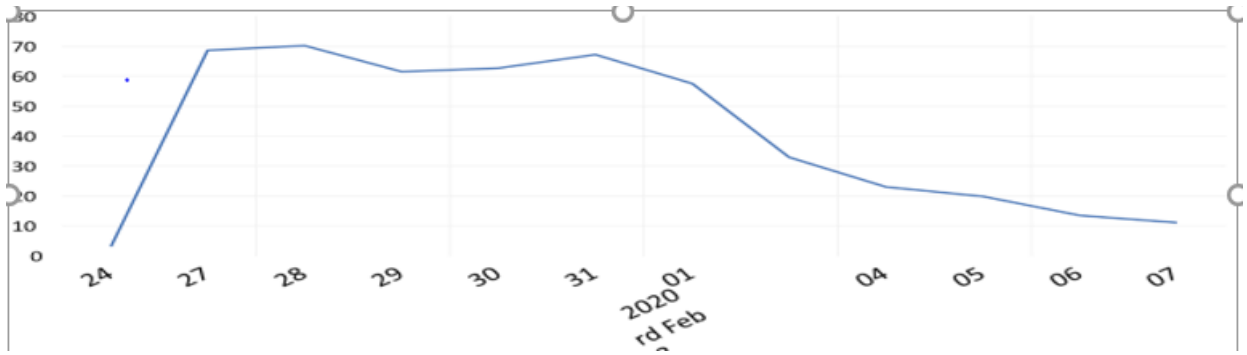


Fig. 9: IVP Before RBI Monetary Policy (February 2020)

From fig:9, we can see that IVP was continuously increasing before RBI Monetary Policy. Once the event is over, IVP started falling back.

Table 10: Change in IVP & it's impact on Straddle

Date	Implied volatility Percentile	Nifty Futures	Straddle (ATM CE& PE)
24th Jan 2020	3.17	12271.6	₹ 366.95
27th Jan 2020	68.65	12125.7	₹ 419.95
28th Jan 2020	70.24	12068	₹ 430.15
29th Jan 2020	61.51	12121.55	₹ 405.85
30th Jan 2020	62.7	12043.5	₹ 362.95
31th Jan 2020	67.26	11994.3	₹ 351.55
01st Feb 2020	57.54	11654.9	₹ 440.9
03rd Feb 2020	32.94	11703.15	₹ 340.05
04th Feb 2020	23.02	11964.25	₹ 200.5
05th Feb 2020	19.84	12086.3	₹ 181.3
06th Feb 2020	13.49	12136.35	₹ 190.25
07th Feb 2020	11.11	12095.9	₹ 159.7

Source: NSE INDIA

From table:10, we can infer that before RBI Monetary policy event Implied volatility percentile has increased & selling the Nifty weekly expiry straddle before the expiry is actually profitable due to high IVP.
Whenever there is an event, Implied volatility percentile tends to increase & actually it's the best time to sell out the straddle. Receive the premium & enjoy theta with decreasing Vega having neutral delta. Ideally before any quarterly result of the company IVP tends to move higher there also it's important to create a short straddle 3-4 days before the event & enjoy the theta once event is occurring. Option premium tends to decay due to high theta, decreasing Vega.

DISCUSSION:

The study has mainly focused on the better risk management associated with a trade. In our study reference fig:6,7,8 & 9, we have found out that before every economic event, Implied volatility percentile used to increase & shoot up. The overall study found that Implied volatility percentile use to shoot up before any economic event & that can be used to make worth of the option position with better risk management. Once the event is occurring or is over Implied volatility percentile tends to move down which ultimately helps in falling premium of the options as value Vega tends to decline. In our study reference table:8,9 & 10, we conclude that short straddle before 3-4 days from an economic event date is profitable due to high IVP & fall in IVP during the event & even after that.

also we found out in our study reference fig:5, that Delta of option changes with respect to the moneyness of option. The strike selection is also very important for creating a naked option buying. In our study we conclude that selecting a strike price which is slight ITM or having Delta as 0.7 is ideal to buy due to low theta, Ideal delta & value delta is also favourable. In our study reference table:6, we conclude that slight ITM option will help us in making more worth out of the position due to value delta & value Vega. If the direction is clear, one should go for slight ITM or strike having delta = 0.7 call or put as per direction to make more worth out of a position. Monthly or next weekly expiry option should be used for naked option buying.

CONCLUSION:

This study provides a comprehensive discussion on the risk management though options. In doing so, some key features of options like Greeks, Implied Volatility & its derivatives are used. Based on the discussion, it is observed that options can be used as a tool for risk management & broader range play. However, since risk is associated to it but we are trying to mitigate the risk. Hence, this study discussed some of the key characteristics of the options for risk management.

REFERENCES:

Agarwal V. and Naik Narayan Y. (2004), Risks and Portfolio Decisions Involving Hedge Funds, *The Review of Financial Studies*, 17 (1), 2004, 63- 98.

Ahn, D.H., Boudoukh, J., Richardson, M. and Whitelaw, R.F. (2003). Optimal Risk Management Using Options. *The Journal of Finance*, 54: 359-375. https://doi.org/10.1111/0022-1082.00108

Bali, Turan; Hu, Jianfeng; and Scott, Murray (2019). Option Implied Volatility, Skewness, and Kurtosis and the Cross-Section of Expected Stock Returns, *Research Collection Lee Kong Chian School of Business*, 1-67

Bartram Dave (2004). Assessment in Organisation, *Applied Psychology*, *53(2),* 237 – 259.

Chan, Wing H. and Jha, Ranjini and Kalimipalli, Madhu, (2008). The Economic Value of Using Realized Volatility in Forecasting Future Implied Volatility, *SSRN.* Retrieved from *https://papers.ssrn.com/sol3/ papers.cfm?abstract_id=943317*

Colette Southam, Pill Gerg, Fernandez Kyle (2019). Option Trading Strategies, *The Journal of Finance.*

D. Bams et al. (2017). Volatility measures and Value-at-Risk, *International Journal of Forecasting,* 33, 848–863

Dilip P.M. & Raju G. (2001). Indian Capital Market: A retrospect Hedge Rebalancing, *The Journal of Finance Vol. 47*, No. 2 (Jun., 1992), pp. 765-779.

Dmitriy Muravyev, Neil Pearson D. (2020). Options trading costs are lower than you think, *The Review of Financial Studies*, *33(11),* 4973–5014

Jameson Mel and Wilhelm William (1992). Market Making in the Options Markets and the Costs of Discrete Hedge Rebalancing, *Journal of Finance*, 47(2), 765-79

Narender L. Ahuja (2006). Commodity Derivatives market in India: Development, Regulation and Future Prospective, *International Research Journal of Finance and Economics*, 2, *1450- 2887*.

Narender L. Ahuja, (2006). Commodity Derivatives market in India; Development, Regulation and Future Prospective, *International Research Journal of Finance and Economics*,1(2),153- 162

Richards, Daniel & Rutterford, Janette & Kodwani, Devendra & Fenton-O'Creevy, Mark. (2017). Stock market investors' use of stop losses and the disposition effect. The European Journal of Finance. 23. 130 - 152. 10.1080/1351847X.2015.1048375.

Ryu D. & Yan H. (2020). Intraday option price changes and net buying pressure, *Applied Economics letter, Retrieved from https://www.tandfonline.com/doi/abs/10.1080/13504851.2020.1864272? journalCode=rael20*

Shalini H. S. & Duraipandian R. (2014). Commodity derivative markets in India, *International Journal of Management IT and Engineering, 4(2), 87-95.*

Yang Heejin & Hyung-Suk Choi & Doojin Ryu, (2016). Option Market Characteristics and Price Monotonicity Violations, *Journal of Futures Markets, John Wiley & Sons, Ltd*. 37(5), 473- 498.
