CHAPTER-3

LITERATURE REVIEW

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"We want something more than mere theory and preaching now, though."

*Sherlock Holmes*

### 3.1 INTRODUCTION

Researchers, Scholars, Teachers, Academicians, Students and Practitioners get ideas though reading and life-long process of learning. In the present study also, reference of related literature has been used. Various studies have been carried out to understand derivative trading strategies, option trading strategies, option spread strategies and the application of such studies.

The focus here in this study is not to understand option spread strategies in its traditional sense. The focus here is to understand what are the popular trading strategies used by analysts, parameters or factors used for the design and construction of these spreads and also the effectiveness of these strategies compared to naked options. For that various research papers, working papers, and articles were referred. The purpose of referring them was to understand the gap in various studies carried out in the past as well as derive supportive evidence for some of the findings of such studies.

**Figure 3.1 Snap-Shot of LITERATURE REVIEW**

![Diagram of Literature Review](image)

Source:-Developed by Researcher

As you can see from the figure, Literature review is done in three phases.
3.2 DERIVATIVE TRADING STRATEGIES

There has been a substantial change in investment strategies used by active investors in Indian stock market over the past five years. Investors have shifted from purely technical analysis to both fundamental and technical - whether its cash market or derivative market. One of the most challenging areas in derivative is increased volatility. In few minutes one can earn fantastically or erode his capital. The complex nature of derivatives with surge in volatility has created a diverse range of trading strategies to be explored and used by traders in order to earn returns and minimize risk. Each derivative product in itself is a different world since they take on completely different characteristics. Trading in futures are poles apart from trading in options. Options are more complex than futures. They are a distinct class of derivative instruments.

- Sandeep Srivastava, Surendra S Yadav and P k Jain (2008) surveyed broker’s assessment of market activity and their perceptions of derivative trading in Indian markets. He found that derivatives have penetrated into Indian Stock market and investors are using these securities for different purposes like risk management, profit enhancement, speculation and arbitrage. High net worth individual and proprietary traders account for a large proportion of broker’s turnover.

- Sushismita Bose and Sumon Kumar (2007) analyzed the impact of derivatives contracts on the cash market and found that trading volumes were significantly higher on expiration days and during the five days leading up to expiration days compared with non-expiration days(weeks).

- Rohini Singh (2009) discussed the advantages/disadvantages of using derivatives. Further Evaluated the pay offs from options and their combinations. As far as investment analysis is concerned, she appreciate the role of Futures in Portfolio management.
• Corporate hedgers can hedge the speculative bubbles by having insurance in form of options against potential bubbles at all times, Analysis done by Damir Tokic ESC Rennes – International School of Business, Rennes, France “When hedging fails: what every CEO should know about speculation”.

• Large insurance companies need to fit the use of equity and bond derivatives within an overall coherent financial management policy, Straightforward futures and forwards contracts have proved to be the most versatile and useful form of derivative. While option-based strategies can be essential for producing structured retail products. (Dr Joseph Mariathasan, 2000)

• Derivative use by banks operating in India is hypothesized to improve their intermediary function. The research outcome identifies the influence of derivative use on the growth of advances by banks. Bank participation in advances increases with increase in hedging activities through futures. (Madhumathi Rajendran, 2007)

• A survey conducted by Eurex (Major European exchange for derivatives) and financial news on the use of derivatives in the European fund industry reveals that the general trend points to an increase in the use of options in the professional portfolio management among institutional investors.

• There have been few research papers based on retail investor awareness and how they perceive derivative products, like N.Ramanjaneyalu and Dr. A.P. Hosmani (2010) highlighted the need for awareness among retail investors. Asani Sarkar (2006) has done the analysis of various derivatives products available for retail investors. Rohini Singh (2009) discussed the advantages/disadvantages of using derivatives. Anjali Chokshi (2010) studied the investor’s perception regarding Derivative market in India. Ashutosh Vashistha and Satish Kumar (2010) proposed that innovation of derivatives have redefined and revolutionized the landscape.
### 3.3 OPTION TRADING STRATEGIES

Options have come a long way. Once considered as ‘niche products’ are now well-established and proven investment tools. Asset management firms can use options as professional tools to manage their investments. During volatile markets, investors tend to favor value safeguarding investment products. Index based option strategies such as protective put strategies are especially suitable for this purpose.

- Alok Dixit, Surendra S Yadav and P K Jain (2010) examined opinion of trading member organizations/brokerage firms on the state of options pricing in Indian Securities market and found options market is a less attractive destination and majority are not aware of Put-call parity relationship. Also majority felt that existing measures on derivatives education are inadequate.

- E.V.P.A.S.Pallavi1, Dr. K. S. S. Rama Raju2 and Dr. T. Kama Raju3 (2013) studied Operational strategies and performance of options trading in India and found that Options can be used to create portfolio with unique features, capable of achieving investment objectives. Options are used world over to hedge not only the portfolio risk but also to maximize the return on investments.

- Sandeep Srivastava (2003) studied role of open interest and trading volume from the stock option market in determining underlying asset prices in cash market. He found that these parameters have significant explanatory power and one can formulate profitable trading strategies based on it.

- Bhuyan and Chaudhury (2001) have examined the role of options market’s open interest in conveying information about the future movement of the u.a and have shown that the trading strategies based on this predictor yields better results as compared to the buy-and-hold and passive covered call strategies.

- P.Varadharajan and Dr. P.Vikkraman (2012) studied the same thing on NSE Stock options using the Open Interest Price Predictor given by Bhuyan and
Chaudhary (2001) and found that open interest of the underlying have the same
trend pattern as then closing price of the underlying stock. This study proves
that the activity in the equity options market contain useful information about
future stock price that can be used for trading purposes.

- According to the Black and Scholes (1973) option pricing model, the option
  price is determined only by five input factors. Bollen and Whaley (2004) find
evidence suggesting that net buying pressure affects options’ implied volatility,
which suggests that option prices are affected by demand. According to their
research, there are more index puts traded than index calls. However, the
opposite is observed for individual stock options. Their findings suggest that
the index put buying pressure drives the change in volatility of index options,
while the stock call buying pressure drives the change in volatility of stock
options. Intuitively, the demand for calls and puts would be different in rising
and falling markets. When the market becomes more volatile, the increasing
volatility results in higher prices for both calls and puts.

- Off Late the Volatility indices have gained lot of attention and momentum.
  Today it is another leading market indicator which every trader watches
closely. (Roy Antony and Dr Y.V Reddy,2002)

- An investor who is holding a portfolio and who is worried about the value of
  portfolio falling down over a period has two options. The first option is that the
  investor can sell part of his holdings and buy them back later at a lower price.
  But if the investor wants to protect himself during the downturn and participate
during the uptrend, he can use the protective put strategy. An investor who
purchases a put option while holding shares of the underlying stock from a
previous purchase is said to be employing a ‘protective put’ strategy. As P.A.K
Preethametc (2008) studied this strategy in the Indian stock market on S& P
CNX NIFTY using different maturities and option series. The analysis was
constructed by assuming a long position in European style options on NIFTY
from the time they were introduced in India on June 4, 2001. The returns using
put options are then compared to the returns on S& P CNX Nifty Index. The
analysis revealed significant profitability in investing in the one-month expiry Volume-based Protective Put Strategy.

- Other Empirical Studies also have demonstrated that such strategies achieve a risk-return ratio that is significantly more attractive than that of the underlying security- Call option writing also. Adam M and Maurer R (1999)

- Trennepohl and Dukes (1981) is among the earliest empirical research to test option writing and buying return. Merton,Scholes and Gladstein (1978) concluded that certain option strategies like fully covered writing strategy have been successful in changing the patterns of returns and are not reproducible by any simple strategy of combining stocks with fixed income securities. Covered strategy is a combination of the stock with its respective option. The strategy can give good returns in the long run compared to the traditional approach of long term investing in stocks.

- Michael L. Hemler and Thomas W. Miller, Jr (2015) studied the performance of Option Based Investment Strategies. Using data from January, 2003, through August, 2013, they examine the relative performance of options-based investment strategies versus a buy-and-hold strategy in the underlying stock. Specifically, using ten stocks widely held in 401(k) plans, they examine monthly returns from five strategies that include a long stock position as one component: long stock, covered call, protective put, collar, and covered combination. To compare performance we use four standard performance measures: Sharpe ratio, Jensen’s alpha, Treynor ratio, and Sortino ratio. Ignoring early exercise for simplicity, they find that the covered combination and covered call strategies generally outperform the long stock strategy, which in turn generally outperforms the collar and protective put strategies regardless of the performance measure considered. The findings suggest that options-based strategies can be useful in improving the risk-return characteristics of a long equity portfolio.
• Kapadia and Szado (2007) examined the buy-write strategy on the Russell 2000 Index. Using returns over the period 1996–2006, they conclude that “the buy-write strategy can outperform the index.”

• Absolute stock market returns are predictable by options volume while returns per se are not, call and put volume offer useful information on the future behavior of stock and futures markets. (Teppomartikainen and Vesaputtonen, 1996)

• David Landis (2005) mentions about using options in her article on how to win in any kind of market. She suggests simple conservative strategies of using options like buy protective put, sell OTM puts, sell covered calls and long leaps.

• Dr. Ritu Kothiwal; Mr. Ankur Goel (2012) in review of trading/marketing strategies of futures and options in India, lists top 9 trading strategies in derivatives as Buy call, Buy put, Buy futures and sell call, Bull spread, calendar spread, strangle, straddle, stock insurance, sell call & put.

• Charles J. Higgins (2011) studied options in a different way. Options are bought to hedge (insure) or to speculate on securities. He examined the sale of options in a conservative approach (in lieu of limit orders) and in an aggressive approach (in lieu of margin interest expense). He examined aspects that are lesser known in terms of option level approvals, option use in lieu of limit orders, and no interest expense versions of speculative leverage.

3.4 **OPTION SPREAD TRADING STRATEGIES**

The strategies discussed above were plain vanilla strategies i.e using only one type of option- either call or put along with position in stocks. We can also create a plethora of strategies using call and put together with different maturities and option series- Spread Strategies, Pair Trading Strategies etc. Option spread trading has become increasingly popular with active traders and
investors. Option spread strategies is a best way to counter the effect of implied volatility. There are various types of spreads major ones are -vertical bull and bear, straddle and strangle strips and straps, Butterfly and condor, horizontal spreads etc. Option spreads and combinations are used to create trading portfolios with heightened sensitivity to one or more of the determinants of option prices and reduced sensitivity to others. The straddles, strangles, bull and bear spreads, and butterflies thus created enable traders to exploit expected changes in the price of the underlying asset, its volatility, or the time to expiration while minimizing their exposure to the other risks.

- Rick Thachuk (2000) in trading techniques suggest that Option spreads can be beginner friendly. They offer greater risk/reward trades and allow minimally capitalized traders to enter volatile markets safely. It helps traders especially those with small sized account balance to trade expensive markets at little cost and with little risk.

- Paul Brittain and Carley Gamer (2006) studies came out with 8 proven but simple option strategies in which they suggested the trading methods which are easily understood and easy to employ. They suggest these strategies to be proven effective option plays. The strategies were a combination of plain vanilla- and spread combinations.-Short call, Short put, bull call spread with a naked leg, bear put spread with a naked leg, call ratio spread, put ratio spread and synthetic long call and put option. They used Strike price, Volatility, Greek Letters and Support & Resistance points in Technical Analysis as major parameters.

- An-sing Chen and Mark T. Leungz (2003) studied at the money straddle options on foreign currency futures using direct forecast method versus the conventional option trading strategy of basing trading decisions on a two-step procedure of first generating a volatility forecast and then inputting the volatility forecast into an appropriate option pricing model to price the straddle. He found that the direct forecasting strategy is more profitable than the
A Study of Derivative Trading Strategies in Indian Stock Market

conventional two-step method. He relied on implied and historical volatility along with trading volume and open interest.

- In order to eliminate all risk in one direction, Edward laporte (2011) suggested turning iron condor into iron cockroach using Chicago board option exchange volatility index. Iron condors are also called short strangles. These strategies are non-directional. It involves selling an at-the-money straddle or strangles and waiting for volatility to collapse, hopefully realizing a profit in the meantime. Option traders wait for the volatility index to reach its peak so that they can sell option premium at elevated levels even in strikes out of the money. An iron condor is the simultaneous sale of a vertical call and vertical put spread in the same expiration month with the same size spreads while an iron cockroach is the simultaneous sale of a call spread and a put spread in the same expiration, with one spread being wider than the other. The wider spread can be created with call or put spread depending on the bullish or bearish bias. The focus more was on volatility and strike price.

- Chirag Babulal Shah (July 2013) studied Bull Call Debit spread strategy on Nifty Index Option. He back test the Bull Call debit spread strategy for a time period long enough to cover the various practical scenarios of the capital market. A period of 6years is taken into consideration and a algorithmic method of back testing is used. The study does not look at any other factors such as market sentiments, the global scenarios, macro or micro economics, etc. The Bull call debit spread strategy is a very basic and easy to understand and implement options strategy. This strategy has proved to yield profits in the long run. The reason for the profits is the extent of loss when one goes wrong compared to the profit when one goes right.

- Green and Figlewski (1999) examine the forecast of stock volatility and return of option writing. They find that at-the-money stock index calls have a high probability of producing large losses, with larger losses for longer time to maturity. Writing options with a delta hedge reduces the writer’s risk exposure compared to naked writing, but risk is still considerable. The practice of option
writing has increased steadily in recent years, and some practitioners apply relatively complicated hedging techniques to manage writing risks (Collins; 2007).

- Research done by Bondarenko (2003), Coval and Shumway (2001), examine the returns of strategies that involve puts and calls. They report that strategies involving put options offer good returns and that put options are more expensive than calls of comparable distance from the money.

- Maheshwari (2013) concludes that market participants majorly retail participants may not be experiencing efficient markets, due to lack of education, liquidity and transaction charges. This is true in the current scenario as retail traders and investors view options as a highly leveraged instrument apt for speculating. However speculation does not always work and these investors shy away from derivatives markets once they burn their hands with leveraged losses.

- Another strategy called option straddles also has received less attention as the primary aim of the studies. Nevertheless, because of their hedging properties, straddles have been investigated directly for their execution, performances and characteristics related to market, firms and investors. To maximize the expected profitability in stock options trading, Mehta (1982) presented an integer programming model for obtaining the optimal number of calls and puts. Peterson (1977) analyses the issue of why large commodity futures traders hold a large percentage of their portfolios in straddle positions. In the study by Moschini and Lapan (1992), the authors reveal that, under certain assumptions of the market and the firm, straddle positions not only raise expected utility by reducing income risk but also influence the firm’s input decisions. The use of short straddle positions may implicitly alter the firm’s belief about the output cash price and provide the firm some degree of flexibility. In another corporate-related study, Nhon (1998) describes the use of unbalanced straddles (i.e., straps and strips) and shows how these combination positions can reduce the inventory procurement costs to below-market prices.
3.5 **THEORETICAL AND MARKET ANALYSIS**

- Her-jiun sheu and Yu-chen wei (March-April 2011) studied option trading based on volatility forecasting using price data on Taiwanese stock market. He found straddle trading the best and used parameters like Volatility, Advance Decline Ratio, Market Turnover(Trading Volume/No of shares listed in exchange), Volatility Index, Put Call Trading Volume and Open Interest Ratios.

- Another extensive study was based on vertical bear and bull spread by J. Scott Chaput and Louis H Ederington (2003). Data on options on Eurodollar futures were examined for the design and trading of vertical spreads, also called bull and bear spreads. A bull call spread is created by buying a call option at one strike X1 and selling a call with the same expiration date at a higher strike, X2. As compared with simply buying call option X, the bull spread buyer gives up the additional profits if the underlying asset price rises beyond X, but also lowers the cost of the spread and therefore curtails losses if the underlying asset price does not rise as anticipated. You can also create bull put spread on the same lines. He found that vertical spreads are an important trading strategy. 60% of vertical spreads are debit spreads which implies to reduce net price and increase the profit like hood on long positions than to limit potential losses on short positions. Thirdly both strikes are out of the money in over two thirds of vertical spread significantly higher on debit spreads. They used a widespread of parameters for the analysis viz Trade type(Call or Put), Strike price Levels, Buy/Sell Indicator, Time to maturity in months(Expiration Month), Trade Size in No of Contracts, Spread Delta, Spread Vega, Spread Gamma & Theta, Implied Volatility and Strike Price Gap.

- Simple strategies suggested by Frank D. Cholly and Frank J. Cholly (2009), for profit making without incurring too much risk are Buy ATM puts, Buy far OTM puts and buy a vertical bear put spread. Options allow you to tailor a strategy to a specific event allowing to greater profits on limited risks, if you are right.
• Tom Preston (2008) emphasized the relation of vertical spreads with time decay. He says with passing of time option, option was drop in price. So it all has to do with option time decay and having it on your side by selling options.

• Volatility and time decay risks are significantly minimized in ATM Vertical Spreads. Also one can make big-ticket earnings play on a small budget. (Alex Mendoza, 2013).

• When you are unsure of the direction and the timing of the move of the market, initiate a long term long volatility strategy. The cost of long term option strategy can be offset by selling shorter-dated options. (Dan Keegan, 2009).

• Short Option strangle strategy is a better strangle strategy. It requires a trader to estimate relevant high and low strike prices between the trade date and expiration. The upper and lower price ranges are also useful for any put or call sales or purchases as they show what the market is currently expected related to future price spread. (Paul D. Cretein, 2009).

• When you are already huge up and you want more but at the same time don’t want to give it back, investor can convert a winning long position into a bull call spread. It achieves both the goals, limiting the downside and maintain the opportunity to profit further. (Frederic Ruff, 2007).

All manner of spreads involves considering various parameter choices in terms of whether to use call or puts or both, when to use these strategy, strike price levels and gaps, profit or loss potential, sensitivity of various factors affecting option premium and its effect on strategy.
3.6 CONCLUSION-THE GAP

Option spread trading has become increasingly popular with active traders and investors. Option spreads involve purchase one option in conjunction with the sale of another option. If managed properly, these spreads offer greater expected risk/return characteristics than futures and even outright purchases of call or put options.

Given the importance of this topic to understanding market for these spread strategies, numerous Empirical studies investigated the option strategies in European and United Countries.

However, the relatively new and emerging equity markets in the Asian-Pacific region have not been tested extensively to determine spread strategies used by traders in Indian stock market & to know their perceptions & preferences relating to various aspects of the Indian stock market.

The basic characteristics of these spreads are discussed in every derivative text and in the practitioner literature such as McMillan (1980), but to our knowledge spreads and their combinations have been largely ignored by researchers. No researcher has examined their design and trading in depth. No one has asked how these spreads should be designed theoretically and no one has examined how they are structured in practice in Indian markets. Using a unique database for one of the most active option markets, Options on Nifty Indexes, we seek to fill this gap by documenting use of these trading strategies. We seek to fill this void by examining the design and trading of all spread strategies in the Indian Option market. Indian Derivative market is still unexplored for these effective & important derivative trading strategies. Fundamental factors behind this can be awareness, abnormality of Indian markets, knowledge & usage of products etc. In fact in international markets like US, investors use more options than future and cash product. India has to go long a way to increase the usage of these products and changed the whole picture of Indian derivative market.

Hence there is a gap as far as research on option spread trading strategies with respect to derivatives is concerned. This study aims to bridge that gap. This study therefore undertakes the academic research of Option Spread Trading Strategies in Derivative Market with almost higher degree of worthiness and effectiveness. The
literature review helped to determine the variables or parameters to be investigated while creating these strategies. Furthermore as many as 25 variables have been identified in literature and guidelines on operationalizing these variables were provided. This provided an initial pool from which the final 12 variables were selected for data collection.

**Fig 3.2-Variables Identified from Literature Review**

[Diagram showing variables]

Source: Developed by Researcher

### 3.6.1 VARIABLES DEFINED

1. Trading Volume-Volume is the number of shares or contracts traded in a security or an entire market during a given period of time. For every buyer, there is a seller, and each transaction contributes to the count of total volume. That is, when buyers and sellers agree to make a transaction at a certain price, it is considered one transaction. If only five transactions occur in a day, the volume for the day is five.

2. Strike price Gap- The various price gaps at which different option contract are opened for different underlying assets.
3. Time to expiration- A specified time, after which the options contract is no longer valid. The expiration time gives a more specific deadline to an options contract on top of the expiration date by giving a time of day. The expiration time was not the same as the last time to trade the option.

4. Advance decline ratio- A market-breadth indicator to compare the number of stocks that closed higher with the number of stocks that closed lower than their previous day's closing prices. To calculate the advance/decline ratio, divide the number of advancing shares by the number of declining shares. The A/D ratio can be calculated for various time periods, such as one day, one week or one month.

5. Volatility Index- The Volatility Index is the ticker symbol for the Chicago Board Options Exchange (CBOE) Volatility Index, which shows the market's expectation of 30-day volatility. It is constructed using the implied volatilities of a wide range of S&P 500 index options. This volatility is meant to be forward looking and is calculated from both calls and puts.

6. Trade size- The number of shares being offered for trade at a specified bid price, that a trader is wasing to trade at that bid price.

7. Put call Ratio- The put-call ratio is a ratio of put options to call options. The put-call ratio has long been viewed as an indicator of investor sentiment in the markets. Times where the number of traded call options outpaces the number of traded put options would signal a bullish sentiment and vice versa.

8. Type of spread- Spread refers to the difference between bid and asks prices of an asset. In an option spread refers to the purchase and sale of an option of the same class but of a different series. Type of spread refers to the spread created by call or put option.
9. Open Interest Ratios- Open interest is the total number of options and/or futures contracts that are not closed or delivered on a particular day.

10. Put call Trading Volume- It is the trading volume of the put options to the trading volume of the call options on a given trading day or period.

11. Volatility- Volatility measures the amount and speed at which price moves up and down, and is often based on changes in recent, historical prices in a trading instrument. Commonly, the higher the volatility, the riskier the security.

12. Greek letters- Greek Letters are special characters to measure the sensitivity of option prices. There are many factors affecting option prices. Each factor has a Greek letter associated with it. Such as Delta, Gamma, Theta, etc.
References


49. www.nseindia.com/content/ncfm/sm_otsm.pdf on option strategies.