

OPERATIONAL STRATEGIES AND PERFORMANCE OF OPTIONS TRADING IN INDIA

E.V.P.A.S.Pallavi¹, Dr. K. S. S. Rama Raju² and Dr. T. Kama Raju³

¹Assistant Professor, M. V. G. R. College of Engineering, Andhra Pradesh, India

Email: pallavielisetty@gmail.com

²Professor, M. V. G. R. College of Engineering, Andhra Pradesh, India

Email: kssramaraju@yahoo.co.in

³Associate Professor, Dr. B. R. Ambedkar University, Andhra Pradesh, India

Email: trtammenani@rediffmail.com

ABSTRACT

“A derivative is a synthetic construction designed to give the same profile of returns as some underlying investment or transaction, without requiring the principal cash outlay. They are called derivatives because they derive their value from the performance of the underlying instrument. Financial derivatives can be found in debt, equity, currency and commodity markets”. The examples of derivatives include futures, forwards, options and swaps. Options are used world over to hedge not only the portfolio risk but also to maximize the return on investments. First a view on the market is to be taken on the basis of fundamental information available then on that basis different strategies are to be employed. Option trading provides a platform where one can develop his own strategies and techniques to achieve his objective based on his risk and return parameter. Options have peculiar quality under which the holder of the option has been given right to buy or sell an underlying asset at a specified period for a fixed premium. Option trading strategies used by speculators, hedgers and arbitrageurs. Options can be used to create portfolio with unique features, capable of achieving investment objectives. Keeping this view the present paper proceeds to investigate the dynamic operational strategies and performance of options trading in India.

Keywords: Derivatives, Options, Pros and Cons of Options, Operational Strategies of options, Performance of options.

INTRODUCTION

The emergence and growth of the market for derivative instruments can be traced back to the willingness of risk averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. Derivatives are meant to facilitate the hedging of price risks of inventory holdings or a financial/commercial transaction over a certain period. By locking in asset prices, derivative products minimize the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors, and thereby, serve as instruments of risk management. Now that world markets for trade and finance have become more integrated, derivatives have strengthened these important linkages between global markets, increasing market liquidity and efficiency, and have facilitated the flow of trade and finance.

Following the growing instability in the financial markets, the financial derivatives gained prominence after 1970. In recent years, the market for financial derivatives has grown in terms of the variety of instruments available, as well as their complexity and turnover. Financial derivatives have changed the world of finance through the creation of innovative ways to comprehend, measure, and manage risks.

India's tryst with derivatives began in 2000 when both the NSE and the BSE commenced trading in equity derivatives. In June 2000, index futures became the first type of derivative instruments to be launched in the Indian markets, followed by index options in June 2001, options in individual stocks in July 2001, and futures in single stock derivatives in November 2001. Since then, equity derivatives have come a long way.

A Derivative is a financial instrument whose value depends on other, more basic, underlying variables. The variables underlying could be prices of traded securities and stock, prices of gold or copper. Derivatives have become increasingly important in the field of finance, Options and Futures are traded actively on many exchanges, Forward contracts, Swap and different types of options are regularly traded outside exchanges by financial intuitions, banks and their corporate clients in what are termed as over-the-counter markets – in other words, there is no single market place organized exchanges.

This paper proceeds to investigate the dynamic operational strategies and performance of options trading in India. It is organized as follows: Section II deals with the objective, scope of study. Review of literature has also been done in this section. Section III enumerates the importance of options and how an investor control the portfolio risk through Options. Section IV reveals the performance of options in derivatives trading.

OBJECTIVES OF THE STUDY

The broad objectives of the study are set as follows

1. To study about Derivatives Market and Options Trading.
2. To study about pros and cons of Options
3. To study about Operational Strategies of Options
4. To highlight the performance of options trading in India

RESEARCH METHODOLOGY

Our study on the topic Operational Strategies and Performance of Options Trading in India is based exclusively on secondary data taken from various various articles, newspapers and bulletins and reports issued by NSE, BIS.

LITERATURE REVIEW

The use of options and future in risk management especially the liquidity risk was well analyzed by Don M. Chance (2008). Their main contribution was to provide a rationale for the use of futures and options in imperfect capital markets for risk management purposes by a risk-averse firm that faces joint price and liquidity risk. The analytical results showed that there was a hedging role for options on futures and the additional exposure to price risk created by the options position is partly offset by an adjustment of the futures position. Numerical results showed that the existence of liquidity risk reduces the optimal futures hedge ratio and that options are not normally used before a liquidity need actually arises.

Bartram (2004) in his article “The Use of Options in Corporate Risk Management” 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 non-financial corporations across different underlying and countries. The results showed that overall, a significant number of 15%-25% of the firms outside the financial sector use financial options which reflects the fact that options are very versatile risk management instruments that can be used to hedge various types of exposures, linear as well as nonlinear. They concluded that options are useful component of corporate risk management if exposures are uncertain, e.g. due to price and quantity risk and depending on the correlation between price and quantity risk, the optimal hedge portfolio may consist of a varying combination of linear and nonlinear risk management instruments. They also proved that the accounting treatment as well as liquidity effects can impact the choice of derivative instrument and at the same time, there may be agency-related incentives to use options because of their role to present dual bets on both direction as well as future volatility of the underlying.

In another work of Fernandies & Santos (2002) in their paper, “Evaluation of Investment Strategies with Options” tried to evaluate the investment strategies with options on indexed FTSE 100 (covered calls at-, in – and out of the money and protective puts at -, in – and out of the money). The results indicate that the new risk measure was more statistical significant than the traditional beta of CAPM, for that the information supplied by the measure of the performance (modified alpha) seemed to be more reliable. On the other hand, the values of modified alphas reveal that these dynamic strategies result in excess returns close to zero (as theoretically expected), denouncing that the market price of these options appears to be in equilibrium (the options seemed to be correctly priced).

Options: A Tool for Control Portfolio Risk

In finance, an option is a contract which gives the owner the right, but not the obligation, to buy or sell an underlying asset or instrument at a specified strike price on or before a specified date. The seller incurs a corresponding obligation to fulfill the transaction that is to sell or buy, if the long holder elects to "exercise" the option prior to expiration. The buyer pays a premium to the seller for this right. An option which conveys the right to buy something at a specific price is called a call; an option which conveys the right to sell something at a specific price is called a put.

The power of options lies in their versatility. Options enable investor to adapt or adjust their position according to any situation that arises. Options can be as speculative or as conservative as investor want. This means investor can do everything from protecting a position from a decline to outright betting on the movement of a market or index.

Options trading are an extremely vast field unlike stock trading. In stock trading, investor either buy or sell short the stock itself, that's all there is to it. However, in options trading, there are two kinds of options; Call options and Put options on every option able stock and each kind of option can be bought or shorted or put together into combinations of advanced strategies in order to cater to specific outlooks.

Portfolio risk refers to the possibility that an investment portfolio will not earn the expected or desired rate of return. Investors attempt to reduce this risk through diversification or hedging (taking an offsetting position in a related security).

Portfolio risk includes both systematic and unsystematic risk. Systematic risk is risk that impacts the overall market; for example, inflation, interest rate changes, or economic conditions. Unsystematic risk, such as product defects or management turnover, is unique to individual securities.

Types of Options

Call Option

A call option gives the holder the right but not the obligation to buy the underlying asset at a specified exercise price. Since the initial cash flow to buy the option is comparatively small, investors bullish on the asset (can be a stock or any other asset for that matter) can use call options to maximise their returns by buying into the product. Further, even in the case of the asset moving the other way, the maximum loss for the investor is only the premium he has paid.

Put Option

A put option is the reverse of the call option. It gives the holder the right to sell an asset at a predetermined price. Investors bearish on the future trends of the asset price can use a put option. It confers the same benefits as in a call option.

Pros and Cons of Options Trading

Options have benefits and drawbacks as an investment. Godin (2001) referred to options as the right to buy or sell stock at a certain price. Godin noted that many investors aren't really interested in buying or selling the stock their option is based on. Instead, they use the buying and selling of the options as the investment.

Pros

- 1. Cost Efficiency:** Options have great leveraging power. As such, an investor can obtain an option position that will mimic a stock position almost identically, but at a huge cost savings.
- 2. Less Risk - Depending on How You Use Them:** There are situations in which buying options is riskier than owning equities, but there are also times when options can be used to reduce risk. It really depends on how we use them. Options can be less risky for investors because they require less financial commitment than equities
- 3. Higher Potential Returns:** Investor don't need a calculator to figure out that if we spend much less money and make almost the same profit, we will have a higher percentage return. When they pay off, that's what options typically offer to investors.
- 4. More Strategic Alternatives:** The final major advantage of options is that they offer more investment alternatives. Options are a very flexible tool. There are many ways to use options to recreate other positions. We call these positions as synthetics.

Cons

- 1. Higher spreads:** Options tend to have higher spreads because of the lack of liquidity. This means it will cost investor more in indirect costs when doing an option trade because investor will be giving up the spread when he trade.

2. Higher commissions: Options trades will cost more in commission per dollar invested. These commissions may be even higher for spreads where investor have to pay commissions for both sides of the spread.

3. Complicated: Options are very complicated to beginners. Most beginners, and even some advanced investors, think they understand them when they don't.

4. Time Decay: When buying options investor lose the time value of the options as he hold them. There are no exceptions to this rule.

5. Less information: Options can be a pain when it is harder to get quotes or other standard analytical information like the implied volatility.

6. Options not available for all stocks: Although options are available on a good number of stocks, this still limits the number of possibilities available to investor.

Operational Strategies of Options

Users of Option trading strategies are speculators, hedgers, and arbitrageurs. Options can be used to create portfolios with unique features, capable of achieving investment objectives not attainable with futures. Here are trading strategies for the various participants:

Arbitrage

The purchase and sale of the same security in different market to take advantage of a price disparity between two markets is termed as arbitrage. 'This strategy involves risk-less profit from market mispricing. Before March 2001, a major part of the volume on the stock exchange was accounted for by arbitrage of shares between the NSE and the BSE as they followed settlement periods and different carry-forward mechanisms. In this situation, there are hardly any arbitrage opportunities in the cash market. The option market can fill this vacuum. In the both NSE and BSE, various option contracts in different series have started and are growing in number.

Hedging

Hedging represents a strategy by which an attempt is to be made to limit the losses in one position by simultaneously taking a second offsetting position. The offsetting position may be in same or different security. In most cases hedgers are not perfect because they cannot eliminate all losses. The hedging strategies to be used against a price rise/decline are discussed below.

Hedging against a price increase-

In this hedging strategy, one has either a short futures position or a short position in the cash market. The purpose is to hedge against a price rise. This can be achieved by using following options contracts:

Long calls

This is simplest hedging strategy to guard against price increases in short cash or futures market position. The cash market or futures position is exposed to an increase in stock price. An investor can hedge against such a price risk by buying a call option in the same stock.

Short put

Hedgers can use sell put options as a protection against small price increases. The premium received from the put option sold can be used to offset the increased costs in the cash market due to the price increase. If, however, the price falls, the hedger will not benefit fully because the put option may be exercised against him. This strategy does not help during a period of high volatility since if cash price moves strongly in either direction; it will not provide a hedge or may even eat away potential profits.

Hedging against price decline**Long put**

This is a very simple hedging strategy to guard against a price decline in a long cash or futures market position. Here, the spot market or futures positions are exposed to a decline in spot market or futures prices. By buying a put option in the same stock, the investor can hedge against the risk of a fall in price. If the prices actually fall during the period when the position is held or on maturity.

Sell calls

An investor can sell call options to protect himself against a small price decline. The premium received from doing so he can be used to offset reduced sell proceeds in the cash market due to the price decline. This hedge strategy is also known as covered call sale since the call sale is covered against the long position in the cash market.

Speculation

A Speculator has a definite outlook about future prices and therefore buys put or call option depending upon this perception. If a he has a bullish outlook, he will buy calls or sell puts. As a bearish perception the speculator will buy put and write calls. He will earn a profit if his view is in right direction. If he is not, he will lose the money.

Long calls

A long call means buy a right to purchase the underlying shares or index at a future date and at a specified price. When the spot price of a share is lower than the strike price, he is not obliged to buy. A call buyer must be bullish on the underlying shares. 'If the stock price remains the same or falls, the buyer of an at-the-money or out-of-the-money or out-the-money call will lose 100 percent of his initial investment. The price of the stock must rise by more than the premium originally paid for an at-the money call if the call buyer is to be benefited.

Long put

The buyer of a put option has a right to sell the underlying asset at the strike price on or before the expiration date. Buying a put is a bearish strategy. If an at-the- money put is bought and the stock price rises or remained unchanged, the investor loses 100 percent of his initial investment.

Short Call

The writer of the call is under the obligation to deliver the underlying asset to the buyer at the strike price. If the call writer does not possess the underlying asset, he is writing naked calls. He makes no losses if it is below the strike price, but gains in the form of a premium. A naked call writer must be bearish, if the stock remains unchanged or declines, the writer of

the call will keep the premium, but he should be aware of the call keep the premium, he should be aware of the potential substantial margin requirement on the naked option positions.

Short put

The writer of a put option has an obligation to buy the underlying asset from a put buyer at the strike price when the option is exercised. The put option should be exercised only if the stock price is less than the strike price. If the stock price is at or above the put's stock price expiration, the put will expire worthless and the seller will keep the premium.

Option Spreads

This is a strategy to take advantage of relative price changes. This involves buying and selling different options simultaneously, creating a price spread that widens or narrows depending on what happens to the prices of the underlying assets. Options spreads in which two legs of the spreads have different strike prices but the same expiry date are called vertical spreads. This is also a speculative strategy but with limited risk and return compared to naked speculation. Some important option spreads are as follows:

Straddles

These are created by simultaneous sale or purchase of the options. These involve buying the put and a call (long straddle) or selling a put and a call (short straddle). This strategy is often used by speculators who believe that the prices of the asset will move significantly in one direction or the other (long straddle), or remain fairly constant (short straddle).

- **Long straddle-** A long straddle is created by buying an equal number of calls and puts with the same strike price and with the same expiration date. This is beneficial if the prices of the underlying assets move substantially in either direction. If prices fall, the put option is profitable, and if prices rise, the call option will yield gains.
- **Short straddle-** This is reverse of the long straddle. Here, the investor sells an equal number of calls and puts for the same strike price and with the same expiration date. This strategy is adopted only when prices are expected to be stable.

Performance of Options Trading In India

Derivatives market in India has registered an "explosive growth" and is expected to continue the same in the years to come. Introduced in 2000, financial derivatives market in India has shown a remarkable growth both in terms of volumes and numbers of traded contracts. NSE alone accounts for 99 percent of the derivatives trading in Indian markets. The introduction of derivatives has been well received by stock market players. Trading in derivatives gained popularity soon after its introduction. In due course, the turnover of the NSE derivatives market exceeded the turnover of the NSE cash market. For example, in 2011-12, the value of the NSE derivatives markets was Rs. 31349731Cr. (Table 1)

Table 1. Derivatives Turnover segment

(Rs.In Crores)

Year	Total Derivatives Turnover Segment (F & O)		Options		% to Total	% to Total
	No of contracts traded	Trading volume	No of contracts traded	Trading volume		
2001-02	4196873	101927	1213429	28929	28.91	28.38
2002-03	16768909	439863	3965303	109380	23.65	24.87
2003-04	56876015	2130446	7315485	270035	12.86	12.68
2004-05	77017185	2547053	8338670	290812	10.83	11.42
2005-06	156300630	4824251	18175892	518739	11.63	10.75
2006-07	216883573	7356270	30440748	985723	14.04	13.40
2007-08	425013200	13090477	64826669	1721247	15.25	13.15
2008-09	557390497	11010481	125384414	3960728	22.49	35.97
2009-10	679293922	17663666	355395793	8534030	52.32	48.31
2010-11	1034212062	29248222	683146950	19395710	66.05	66.31
2011-12	1205045464	31349731	900512107	23697062	74.73	75.59

Sources: SEBI Annual Reports

Out of total number of contracts traded in derivative turnover segment the options contracts occupied 28.91% in the year 2001-02 and it was increased to 74.73% by the end of 2011-12. Similarly out of total trading volume of derivatives the options taken 28.38% in the year 2001-02 and was gone up to 75.59% by the end of the 2011-12. This reveals the role of options in derivatives segment.

With regard to Index and Stock options contracts trading as reported by SEBI, has witnessed a tremendous growth in both index and stock options year by year over the study period of 2001-02 to 2011-12 (Table 2) but the quantum of turnover as compared within stock options and index options differs quite a lot. Trade of options trade in stocks is far behind the trade of options in index.

The overall contract traded was 1,213,429 crores in the year 2001-02 and it increased to 890,512,107 crores by the year ending 2011-12 of which only 3 percent contracts belongs to Stock Options i.e.36,494,371 crores and 97 percent contracts i.e.864,017,736 crores belongs to Index Options because of greater flexibility and leverage when compare with stock options.

Table 2. Index and Stock Options contracts Trading Segment

(Rs.In Crores)

Year	Index options			Stock Options			Over all contracts traded
	Call	Put	Total	Call	Put	Total	
2001-02	113,974	61,926	175,900	768,159	269,370	1,037,529	1,213,429
2002-03	269,674	172,567	442,241	2,456,501	1,066,561	3,523,062	3,965,303
2003-04	1,043,894	688,520	1,732,414	4,248,149	1,334,922	5,583,071	7,315,485
2004-05	1,870,647	1,422,911	3,293,558	3,946,979	1,098,133	5,045,112	8,338,670
2005-06	6,413,467	6,521,649	12,935,116	4,165,996	1,074,780	5,240,776	18,175,892
2006-07	12,632,349	12,525,089	25,157,438	4,394,292	889,018	5,283,310	30,440,748
2007-08	26,667,882	28,698,156	55,366,038	8,002,713	1,457,918	9,460,631	64,826,669
2008-09	110,431,974	101,656,470	212,088,444	9,762,968	3,533,002	13,295,970	225,384,414
2009-10	167,683,928	173,695,595	341,379,523	10,614,147	3,402,123	14,016,270	355,395,793
2010-11	314,533,244	336,105,313	650,638,557	24,273,560	8,234,833	32,508,393	683,146,950
2011-12	428,034,677	435,983,059	864,017,736	24,565,283	11,929,088	36,494,371	900,512,107

Sources: SEBI Annual Reports

It was further observed that the turnover of Index put option is greater than Index call option for the last three years of the study period because of volatility and new regulations in options market. Where as there is no adverse change between Stock call and put options. The growth percentage of Index and Stock Options Contracts Trading during the period 2001-02 to 2011-12 is presented in the Table No. 3.

It was observed that the percentage increase in index options is higher in the year 2005-06 with 292.74% and lowest in the year 2011-12 with 32.80%, where as in case of stock options the growth rate is higher in the year 2002-03 with 239.56% and lowest in the year 2004-05 with -9.64 because of new innovations in trade policy system like screen based authority system.

Table 3. Y-o-Y Growth of Index and Stock Options contracts Trading Segment

Year	Index options			Stock Options			Over all contracts traded
	Call	Put	Total	Call	Put	Total	
2001-02	-	-	-	-	-	-	-
2002-03	136.61	178.67	151.42	219.79	295.95	239.56	226.78
2003-04	287.09	298.99	291.74	72.93	25.16	58.47	84.49
2004-05	79.20	106.66	90.11	-7.09	-17.74	-9.64	13.99
2005-06	242.85	358.33	292.74	5.55	-2.13	3.88	117.97
2006-07	96.97	92.05	94.49	5.48	-17.28	0.81	67.48
2007-08	111.11	129.13	120.08	82.12	63.99	79.07	112.96
2008-09	314.10	254.23	283.07	22.00	142.33	40.54	247.67
2009-10	51.84	70.87	60.96	8.72	-3.70	5.42	57.68
2010-11	87.58	93.50	90.59	128.69	142.05	131.93	92.22
2011-12	36.09	29.72	32.80	1.20	44.86	12.26	30.35

During the last five years of the study period the growth percentage of both Index call and put options fluctuated between 29.72% to 314.10% where as Stock Call and put options fluctuated between -3.70% to 142.33%. From the overall contract trading segment it was fluctuated between 30.35% to 247.67% due to global financial anguish and volatility in derivatives market.

Among overall trading volume of options segment (Table 4) majority of trading volume belongs to stock options for the period of first four years of the study period, which was 87% in 2001-02, 92% in 2002-03, 80% in 2003-04 and 58% in 2004-05. There after the trading volume of Index options is greater than the trading volume of Stock options due to innovative strategies in index options trading segment. In the year 2005-06 the percentage of index options volume (Rs.338,469 Crores) to the overall trading volume (Rs.518,739 crores) was 65% where as the percentage of stock options trading volume to overall trading volume was 35%. By the end of 2011-12 the proportion of index options to total options trading volume increased to 95% and stock options was only 5%.

Table 4. Index and Stock Options Trading Volume Segment

(Rs.In Crores)

Year	Index options			Stock Options			Over all Trading Volume
	Call	Put	Total	Call	Put	Total	
2001-02	2,466	1,300	3,766	18,780	6,383	25,163	28,929
2002-03	5,670	3,577	9,247	69,644	30,489	100,133	109,380
2003-04	31,801	21,022	52,823	168,174	49,038	217,212	270,035
2004-05	69,373	52,581	121,954	132,066	36,792	168,858	290,812

Table 4. Index and Stock Options Trading Volume Segment (Contd. ...)
(Rs.In Crores)

Year	Index options			Stock Options			Over all Trading Volume
	Call	Put	Total	Call	Put	Total	
2005-06	168,632	169,837	338,469	143,752	36,518	180,270	518,739
2006-07	398,219	393,693	791,912	161,902	31,909	193,811	985,723
2007-08	668,816	693,295	1,362,111	308,443	50,693	359,136	1,721,247
2008-09	2,002,544	1,728,957	3,731,501	171,843	57,384	229,227	3,960,728
2009-10	4,049,266	3,978,699	8,027,965	389,158	116,907	506,065	8,534,030
2010-11	9,090,702	9,274,664	18,365,366	777,109	253,235	1,030,344	19,395,710
2011-12	11,090,656	11,315,090	22,436,967	932,530	327,565	1,260,095	23,697,062

Sources: SEBI Annual Reports

The growth percentage of Index and Stock Options Trading volume during the period 2001-02 to 2011-12 is depicted in the Table No. 5. During the study period the growth percentage of index options trading volume highest with 471.24% in 2003-04 and lowest with 22.17 percent in 2011-12. Where as year of year growth percentage of stock options trading volume is highest with 297.94 percent in 2002-03 and lowest with -36.17 percent in 2008-09 due to the effect of global recession on derivative market. By the end of 2011-12 the growth trend in all the segments is low because of diversification of investment into common stock and the new regulations of SEBI in connection with derivatives market. The overall trading volume registered with a positive trend during the entire study period and it encourages the pricing strategies of options trading.

Table 5. Y-o-Y Growth of Index and Stock Options Trading Volume Segment

Year	Index options			Stock Options			Over all Trading Volume
	Call	Put	Total	Call	Put	Total	
2001-02	-	-	-	-	-	-	-
2002-03	129.93	175.15	145.54	270.84	377.66	297.94	278.10
2003-04	460.86	487.70	471.24	141.48	60.84	116.92	146.88
2004-05	118.15	150.12	130.87	-21.47	-24.97	-22.26	7.69
2005-06	143.08	223.00	177.54	8.85	-0.74	6.76	78.38
2006-07	136.15	131.81	133.97	12.63	-12.62	7.51	90.02
2007-08	67.95	76.10	72.00	90.51	58.87	85.30	74.62
2008-09	199.42	149.38	173.95	-44.29	13.20	-36.17	130.11
2009-10	102.21	130.12	115.14	126.46	103.73	120.77	115.47
2010-11	124.50	133.11	128.77	99.69	116.61	103.60	127.27
2011-12	22.00	22.00	22.17	20.00	29.35	22.30	22.18

CONCLUSION

Option strategies provide means of risk reduction, anyone who is at risk from a price change can use options to offset that risk. Different strategies are useful for different market perceptions of the price movements. Option trading strategies are used for both hedging and speculation. In different market perception and price movements different strategies are useful. Option strategies are complex positions created including a combination of options and underlying shares which help the investor to benefit from his view. Hence the complexities of the investment risks and their management gives rise to commensurate solution through a series of innovative strategies in the form of a combination of options of different types. It is indeed attribute to the versatility of the mechanics of option trading that a customized solution can be worked out for each specific risk management problem.

REFERENCE

1. Bartram (2004). "Some Formulas for Evaluating Two Popular Option Strategies." *Financial Analysts Journal* 49 (September-October 2004): 71-76.
2. Don M. Chance. "Options Market Efficiency and the Box Spread Strategy." *The Financial Review* 20 (November 2008): 287-301.
3. D.C. Patwari & Bhargava "Options and Futures an Indian perceptive" Jaico Publishing House, 2005
4. Fernandies & Santos (2002), Optimal Risk Management Using Options, *Journal of Finance*, FIN-98-001.
5. N.D. Vohra & Bagri, "futures and options" Tata McGraw Publishing Company Limited, New Delhi, 2002
6. NCFM, Capital Market (Dealers) Module Work Book" National Stock Exchange Of India Limited 2003
7. R Mahajan, "futures & option introduction to equity derivatives" Vision Books New Delhi, 2002
8. SEBI Bulletin, Securities and Exchange Board of India, 2002 – 2011
9. S.P. Gupta, "Financial derivatives Theory, Concept and Problems" 2005, Prentice hall of India Private Limited, 2005