Speculation Strategies Using Investment in Options

* *Mihir Dash*
** *Narendra Babu*
*** *Mahesh Kodagi*

INTRODUCTION

A derivative is a financial instrument that derives or gets its value from some underlying real good or stock. It is in its most basic form simply a contract between two parties to exchange value based on the action of a real good or service. Typically, the seller receives money in exchange for an agreement to purchase or sell some good or service at some specified future date at a specific price. Futures and options are the two most important types of derivatives. Options, once developed as tools for hedging the risk of investments, have now emerged as a preferred mode of investment. Options trading have become popular in recent years. Even in India, SEBI has permitted options trading on certain stocks, and is thinking of allowing options trading on all stocks.

The key participants in derivatives markets are hedgers, speculators and arbitrageurs. Hedgers enter the derivatives market to lock-in their prices in order to avoid exposure to adverse movements in the price of an asset. While such locking may not be extremely profitable, the extent of loss is determinable and can be minimized. Arbitrageurs enter simultaneously into contracts in two or more markets to lock in risk-less profit by exploiting price differentials or imbalances, i.e. arbitrage opportunities. Speculators take short-term positions in the market. They virtually bet on the direction of price movements. While profits could be extremely high, potential for losses could also be high. The speculator, who has a different philosophy from that of the hedger, considers derivatives as instruments of profit making, instead of only as risk hedging tools.

1. OPTIONS TRADING

Options are an important element of investing in markets, serving a dual function of managing risk and generating income. Unlike most other types of investments today, options provide a unique set of benefits. Not only does options trading provide a cheap and effective means of hedging one's portfolio against adverse and unexpected price fluctuations, it also offers a tremendous speculative dimension to trading.

One of the primary advantages of options trading is that options contracts enable a trade to be leveraged, allowing the trader to control the full value of an asset for a fraction of the actual cost. Since an option's price mirrors that of the underlying asset at the very least, any favorable return in the asset will be met with a greater percentage return in the option, thus providing unlimited reward with only limited risk.

With options, the buyer can only lose what was paid for the option contract, a fraction of what the actual cost of the asset would be. However, the profit potential is unlimited. Options also provide their owners with numerous trading alternatives. Options can be customized and combined with other options and even other instruments to take advantage of any possible price dislocation within the market. They enable the trader or investor to acquire a position that is appropriate for any type of market outlook that he or she may have, be it bullish, bearish, choppy or silent.

While there is no disputing that options offer many investment benefits, an option trading involves risk and is not for everyone. For the same reason that one's returns can be large, so too can be the losses. Also, while the potential for financial success does exist in options trading, the means of realizing such opportunities are often difficult to create and to identify. With dozens of variables, several pricing models, and hundreds of different strategies to choose from, it is no wonder that options and options pricing have been a mystery to the majority of the trading public.

Typically options trading are more cumbersome and complicated than stock trading because traders must consider many variables aside from the direction they believe the market will move. The effects of the passage of time, variables such as delta, and the underlying market volatility on the price of the option are just some of the many items that traders need to gauge in order to make informed decisions. If one is not prudent in one's investment

* Alliance Business Academy, 19th Cross, 7th Main, BTM Layout II Stage, Bangalore-76. E-mail : mihir@alliancebschool.ac.in
** Futures First Info Services (P) Ltd., Airport Road, Bangalore-06.
*** Industrial Development Bank of India, Borivalli, Mumbai.

decisions, one could potentially lose a lot of money trading options. Those who disregard careful consideration and sound money management techniques often find out the hard way that these factors can quickly and easily erode the value of their options portfolios.

Because of these risks and benefits, options offer tremendous profit potential above and beyond trading in any other instrument, including the underlying security itself. Once the benefits have been defined, it is a matter of determining how to best attain them. The vast majority of options techniques involve elaborate mathematical models designed to help identify when option-writing or selling opportunities exist.

2. STRATEGIES FOR SPECULATORS

Speculation involves buying, holding and selling of stocks, commodities, futures, currencies, collectibles, real estate or any valuable instrument to profit from changes in its price, as opposed to buying it for use or for income (via dividends, rent, etc.). A speculator is a market participant who tries to profit from buying and selling futures and options contracts by anticipating future price movements. Speculators assume market price risk and liquidity and add capital to the markets.

Two popular speculation strategies using options are spread trading and combination trading. Spread trading involves taking positions in two or more options of the same type (call or put) at the same time, whereas a combination trading is an option trading strategy that involves taking positions in both calls and puts on the same stock.

The most important spreads are bull spreads; bear spreads, butterfly spreads, and calendar spreads. A bull spread consists of buying a call with lower strike price and selling a call at higher strike price. A bear spread consists of buying a call with higher strike price and selling a call at lower strike price. A butterfly spread consists of buying one call with relatively lower strike price, buying one call with relatively higher strike price and selling two calls at price which is between the two prices at which calls were bought. A calendar spread consists of selling a near month call option with a certain strike price and buying a far month call option with the same strike price.

The most important combinations are straddles, strips, straps and strangles. A straddle consists of a put and call with the same strike price and same expiration dates. A strip consists of long position in one call and two puts with same strike price and expiration dates. A strap consists of long position in two calls and one put with same strike price and expiration dates. A strangle consists of buying a put and a call with same expiration dates and different strike prices.

In all the above strategies, the speculator has to study the market thoroughly and decide which stock option to buy or sell and whether to buy or sell a call or a put option. The present study will lead to a speculation strategy, wherein all the above decisions will be simultaneously taken with the help of a mathematical programming model, similar to Sharpe's optimization model.

3. REVIEW OF LITERATURE

Many researchers have extensively studied options' trading, and their studies have resulted in many new strategies to help speculators to maximize the profits. In an extensive study done by Nandi et al (2001), it is argued that the speculator can book profits by having a portfolio of calls and puts in a volatility sensitive market. In the authors' opinion, though the buying and selling certain kinds of volatility-sensitive options portfolios is associated with substantial risk, it has been a popular practice. When such portfolios are formed, two factors significantly influence the value of the options: the price of the underlying asset and the future volatility expected to prevail until the options expire. It is possible to form a portfolio of call and put options so that the portfolio's payoff is very sensitive to the volatility of the underlying asset but only minimally sensitive to changes in the level of the underlying asset. Traders and investors who frequently buy or sell such portfolios do so with a view of the volatility embedded in the option price, or the implied volatility. So a speculator can bet on volatility in the market by constructing a portfolio of calls and options of those stocks, where there is a lot of volatility. There is often substantial risk, however, in options portfolios set up to exploit a perceived mispricing in the expected volatility of the underlying asset without initial sensitivity to the level of the asset. This risk stems from possible subsequent abrupt changes in the level of the asset price. They quote the example of the former Barings PLC, which sustained huge losses from short positions in volatility on Nikkei futures as they plunged in early 1995. The authors emphasize the need of formulating a proper investment strategy for speculator, so that his position can be more secured (Nandi et al, 2001).

4. RESEARCH DESIGN

This study analyses option derivatives. It throws light on how option derivatives are useful especially for speculators, who virtually bet on the direction of price movements. While profits could be extremely high, potential for losses is also high.

The primary objective of the study is to construct an optimal portfolio of options from the point of view of a speculator who tries to make profit by investing in options. The options portfolio is constructed to maximize profits using available derivatives, assuming that the premium is the investment made by the speculator. The secondary objective would be comparison of the optimal options portfolio with optimal portfolio of stocks, to investigate which one gives better returns.

For the study, daily closing prices of forty of the most actively traded stocks on NSE are taken, covering the duration of six months from 28-Oct-2005 to 27-Apr-2006. Subsequently, for the corresponding options, the strike prices are chosen on the basis of its proximity to underlying stock price at the beginning of the contract. The percentage changes in everyday stock prices and options prices are considered as the daily returns. These returns (positive or negative) are further used as inputs in constructing the optimal portfolio of stocks and optimal portfolio of options by using mathematical programming methods in order to maximize the expected return to sigma [ERTS]. Finally both the portfolios are compared to conclude which one yields better returns. The study required the following assumptions to be made. The companies selected for the study have not issued any dividends to its shareholders in the study period (28-Oct-2005 to 27-Apr-2006). It is assumed that short selling is allowed for all the forty stocks and their corresponding options, which are included in the study. It is also assumed that these companies have not issued any bonus shares, and also that there was no splitting of shares within the study period. Finally, it is assumed that no other activity affecting the number of outstanding shares has taken place within the study period.

5.A. OPTIMAL PORTFOLIO OF STOCKS:

An optimal portfolio of the forty stocks was constructed as a part of the study to know the maximal returns from the stocks. The portfolio was constructed as follows.

The daily returns of each stock were computed as $r_t = \frac{x_t - x_{t-1}}{x_{t-1}}$, where the x_t's are the closing prices of the stocks. A portfolio would consist of a combination of the stocks, with fixed proportions of each of the stocks in the overall investment. The corresponding proportion of the stock in the portfolio would then multiply the daily returns of each stock, and the products added together to yield the daily returns of the portfolio. The expected return to sigma (ERTS) of the portfolio would be $ERTS = \frac{\bar{r}}{s_r}$, where $\bar{r}$ represents the sample mean of the daily returns of the portfolio, and s_r represents the sample standard deviation of the daily returns of the portfolio. The ERTS would clearly be a function of the proportions of the stocks in the portfolio. The optimal portfolio would then be obtained by finding the proportions of stocks in the portfolio, which maximizes the ERTS. This was done using the Solver Add-In in Microsoft Excel.

The optimal portfolio of the forty most actively traded stocks on NSE in the research period is presented in TABLE 1. The table presents the stocks and their investment proportions in the total portfolio. As stated before, the decisions of which stocks to buy and which stocks to sell, and what proportion of each stock to include in the portfolio are all taken simultaneously with the help of mathematical programming methods. The "+" sign indicates buying of stocks and the "-" sign indicates selling of stocks. For example, ABB stock's weightage in the total portfolio is 5.45%. This means that 5.45% of the total investment should be invested in buying ABB stocks. On the other hand, ARVIND Garments' weightage in the portfolio is -24.00%, indicating short selling of Arvind Garments stocks worth 24.00% of the total investment. In the extreme cases, ONGC stocks comprise 34.85% of the total portfolio (should be bought), while SBI stocks comprise -33.56% of the total portfolio (should be sold short). As it has been assumed that short selling is allowed, the net investment is the total value of shares bought less than total value of shares short sold. In effect, short selling has reduced the total investment amount.

TABLE 1: Table showing Optimal Portfolio of Stocks

OPTIMAL PORTFOLIO OF STOCKS			
STOCKS	**Proportion of Investment**	**STOCKS**	**Proportion of Investment**
ABB	0.0545	IFLEX	0.1465
ACC	0.0493	INFOSYS	0.0484
ANDHRA	0.0123	IOC	0.0619
ARVIND	-0.2402	IPCL	-0.1209
BAJAJ	0.2118	M&M	0.0290
BEL	0.1202	MARUTI	0.0602
BHEL	0.1631	MTNL	0.0971
BOB	-0.1700	NALCO	0.0797
CAN	0.0628	ONGC	0.3485
CIPLA	-0.0271	PNB	0.1406
DR REDDY	0.2003	POLARIS	-0.1128
GAIL	0.1540	RAN	-0.0265
GRASIM	0.2132	REL	-0.1578
GUJ AMBUJA	0.0591	SATYAM	-0.1363
HCL	0.0622	SBI	-0.3357
HDFC	-0.2064	SCI	-0.0852
HDFC BANK	0.1934	SYNDICATE	0.1719
HINDALCO	0.0885	TATA MOTORS	-0.0983
HPCL	-0.0090	TATA POWER	-0.0910
ICICI	-0.0028	TCS	-0.0085

5.B. OPTIMAL PORTFOLIO OF OPTIONS:

All the stocks, which are included in the stocks portfolio, can be traded in options market. When the premium of the options itself is taken as the investment, a portfolio of call and put options can be constructed. The portfolio includes buying and selling of certain puts and calls. The net investment in options is the difference between the value of options bought and the value of options sold. Thus, in an options portfolio, the net investment amount will decrease to the extent of options that are short sold, resulting in more ROI.

Using the same method as before, an optimal option portfolio was also constructed. TABLE 2 presents the composition of the optimal options portfolio. Again the decisions of whether to buy or sell put or call options, and what proportion of each of the options to include in the portfolio are all taken simultaneously with the help of mathematical programming methods. The "+" sign indicates buying of options (either call or put) and the "-" sign indicates selling of options (either call or put). For example, ABB put option's weightage in the total portfolio is 69.18%. This means that 69.18% of the total investment must be invested in buying ABB put options. On the other hand, ABB call option's weightage in the total portfolio is -99.83%, indicating short selling of ABB call options worth 99.83% of total investment. In the extreme cases, Grasim Cements call options would comprise 100.00% of the total portfolio (should be bought), while Andhra Bank call options would comprise -100.00% of the total portfolio

TABLE 2: Table showing Optimal Portfolio of Options

OPTIMAL PORTFOLIO OF OPTIONS					
COMPANY	CALL	PUT	COMPANY	CALL	PUT
ABB	-0.99835	0.69185	IFLEX	0.50403	-0.86101
ACC	0.80200	-1.00000	INFOSYS	0.00782	0.30524
ANDHRA	-1.00000	0.18648	IOC	0.24449	-0.09564
ARVIND	-0.52467	0.59016	IPCL	0.71876	0.20773
BAJAJ	-0.005610	0.36040	M&M	-0.09461	-0.57900
BEL	-0.26247	-0.07090	MARUTI	0.37041	-0.01502
BHEL	0.29179	-0.38081	MTNL	0.48960	0.07104
BOB	-0.38295	0.09818	NALCO	0.67883	-0.78791
CAN	0.33364	0.05810	ONGC	0.44229	-0.06465
CIPLA	0.42522	-0.37408	PNB	-0.41713	0.26340
DR REDDY	0.64316	-0.13698	POLARIS	-0.19349	0.21290
GAIL	0.25473	-0.52441	RAN	0.06277	-0.32557
GRASIM	1.00000	-0.35195	REL	-0.86810	0.09236
GUJ AMBUJA	-0.47454	-0.57762	SATYAM	0.68274	0.31180
HCL	0.34815	-0.03675	SBI	0.01496	0.19949
HDFC	-0.57722	-0.09712	SCI	-0.57729	-0.41528
HDFC BANK	0.65964	-0.23289	SYNDICATE	0.39713	0.38947
HINDALCO	0.36277	0.63327	TATA MOTORS	0.23179	0.08280
HPCL	-0.21309	-0.35459	TATA POWER	-0.23577	0.39437
ICICI	-0.61474	-0.07358	TCS	0.99978	-0.31972

(should be sold short). Again, as it has been assumed that short selling is allowed, the net investment is the total value of options bought less than the total value of options short sold.

6. EXPECTED RETURN TO SIGMA (ERTS):

The optimal portfolios constructed resulted in different ERTS's, i.e. each portfolio yields different average rate of return per unit risk. TABLE 3 compares between the ERTS's of the optimal stocks portfolio and the optimal options portfolio. The ERTS of the optimal stocks portfolio is just 0.8275, while the ERTS of the optimal options portfolio is 1.3259, which is higher than that of stocks portfolio. Thus the optimal options portfolio has performed better on average than the optimal stocks portfolio, per unit risk. To test the significance of this difference, a paired-samples t-test was performed. The results are shown in TABLE 4. It was found that there was a significant difference between the average daily returns of the two portfolios: the average daily returns of the optimal stocks portfolio was significantly less than the average daily returns of the optimal options portfolio.

7. FINDINGS & DISCUSSION

The study was aimed at constructing an optimal portfolio of options for speculators and to compare that with the optimal portfolio of stocks. The study revealed the following broad findings, which were arrived after the analysis.

TABLE 3: Table showing ERTS's of different Portfolios

Portfolio	Mean Daily Returns	Standard Deviation Daily Returns	ERTS
Optimal Portfolio of Stocks	0.0086	0.0104	0.8275
Optimal Portfolio of Options	0.8763	0.6609	1.3259

TABLE 4: Table showing paired-sample t-test for daily returns of the optimal portfolio of stocks against daily returns of the optimal portfolio of options.

Paired Differences					t	df	Sig. (2-tailed)
Mean	SD Mean	Std. Error	95% Confidence Interval of the Difference				
			Lower	Upper			
-0.8677	0.658	0.06032	-0.9871	-0.7482	-14.385	118	4.59813E-19

Volatility need not be always bad for investors. One can use volatility to make profits also. A speculator should formulate a suitable investment strategy to get benefit out of implied volatility of stocks. When a speculator is predicting a lot of volatility in the market, but doesn't have idea as in which direction the market will move, he can construct options portfolio at exercise price, which is nearest to spot price, to make profit by volatility. In this study, the portfolio of options has given ERTS of 1.3259 and the ERTS of stocks portfolio is just 0.8275. So the options portfolio proves to be better. The speculator also need not worry about the risk, as the ERTS of both the portfolios is calculated per unit risk. Thus, for the same risk level, the optimal options portfolio yielded better returns; in fact, the average daily returns of the optimal options portfolio was significantly better than the average daily returns of the optimal stocks portfolio. Thus the optimal options portfolio is recommended over the optimal stocks portfolio. Though many investors feel short selling is very risky, if used properly it can improve profits. It reduces the investment and increases the ROI. Overall, one can reduce the risk, without having to reduce the returns.

8. CONCLUSION

Derivatives are not very popular yet in India. But they are very popular in Western markets. It is necessary to popularize derivatives trading to protect the wealth of investors. Moreover, options' trading is allowed only for few stocks. SEBI can provide the facility of options trading on all the stocks.

Derivatives help to reduce the exposure and protect the portfolio. It is advisable to hedge in order to cope with stock market volatility. Options help investors to reduce the loss and serves as hedging tool. But options can also be used as investment instruments. In this study the options premium was taken as the investment, and a portfolio of options was constructed to make profit by volatility. As a speculator one need not take too much of risk, one can reduce the risk, without having to reduce the returns using an options portfolio. Further, one can use Delta, Theta, Gamma and Vega techniques to hedge options portfolios. Further research also can be carried out to know how neutralizing these Greek letters will improve the performance of options portfolio.

Though options help to maximize the returns, the downward risk is also too high. Options are like a two-sided sword – they should be used very carefully, otherwise they may lead to huge losses. The famous investment guru Warren Buffet has warned against excess use of derivatives in portfolios. He states:

"Derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal."

BIBLIOGRAPHY

Elton, E.J. and M.J.Gruber, (1995), "Modern Portfolio Theory and Investment Analysis", 8th Edition, Wiley, New York.

Friedel, Wolfgang, (1991), "A Changing World Inspires New Definitions of Risk", *Risk Management*, New York.

Hull, C John, (2004), *Futures and Options Markets*, Pearson Education.

Nandi, Saikat, Waggoner, Daniel, "The Risks and Rewards of Selling Volatility", *Economic Review* (07321813), 07321813, 2001 1st Quarter, Vol. 86, Issue 1.

Reily and Brown, (2004), *Investment and Portfolio Management*, Thomson International.

Tan, Kopin, (2004), "Options Strategies Still Are Defensive, As Stocks' Fall Slows", *Wall Street Journal* - Eastern Edition, Vol. 244.