

## A STUDY ON FINANCIAL DERIVATIVES (FUTURES & OPTIONS)

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### ABSTRACT

The emergence of the market for derivatives products, most notably forwards, futures and options, can be tracked back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. Derivatives are risk management instruments, which derive their value from an underlying asset. The following are three broad categories of participants in the derivatives market Hedgers, Speculators and Arbitragers. Prices in an organized derivatives market reflect the perception of market participants about the future and lead the price of underlying to the perceived future level. In recent times the Derivative markets have gained importance in terms of their vital role in the economy. The increasing investments in stocks (domestic as well as overseas) have attracted my interest in this area. Numerous studies on the effects of futures and options listing on the underlying cash market volatility have been done in the developed markets. The derivative market is newly started in India and it is not known by every investor, so SEBI has to take steps to create awareness among the investors about the derivative segment. In cash market the profit/loss of the investor depends on the market price of the underlying asset. The investor may incur huge profit or he may incur huge loss. But in derivatives segment the investor enjoys huge profits with limited downside. Derivatives are mostly used for hedging purpose. In order to increase the derivatives market in India, SEBI should revise some of their regulations like contract size, participation of FII in the derivatives market. In a nutshell the study throws a light on the derivatives market.

**KEYWORDS:** Financial Derivatives,

### INTRODUCTION

The emergence of the market for derivatives products, most notably forwards, futures and options, can be tracked back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. By their very nature, the financial markets are marked by a very high degree of volatility. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking-in asset prices. As instruments of risk management, these generally do not influence the fluctuations in the underlying asset prices. However, by locking-in asset prices, derivative product minimizes the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors.

Derivatives are risk management instruments, which derive their value from an underlying asset. The underlying asset can be bullion, index, share, bonds, currency, interest, etc.. Banks, Securities firms, companies and investors to hedge risks, to gain access to cheaper money and to make profit, use derivatives. Derivatives are likely to grow even at a faster rate in future.

### NEED FOR STUDY

In recent times the Derivative markets have gained importance in terms of their vital role in the economy.

The increasing investments in derivatives (domestic as well as overseas) have attracted my interest in this area. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking-in asset prices. As the volume of trading is tremendously increasing in derivatives market, this analysis will be of immense help to the investors.

### **OBJECTIVES OF THE STUDY**

- To study the derivatives Market and Options.
- To analyze the operations of futures and options.
- To find the profit/loss position of futures buyer and seller and also the option writer and option holder.
- To study about risk management with the help of derivatives.

### **SCOPE OF THE STUDY**

The study is limited to “Derivatives” with special reference to futures and option in the Indian context and the Inter-Connected Stock Exchange has been taken as a representative sample for the study. The study can't be said as totally perfect. Any alteration may come. The study has only made a humble attempt at evaluation derivatives market only in India context. The study is not based on the international perspective of derivatives markets, which exists in NASDAQ, CBOT etc.

### **LIMITATIONS OF THE STUDY**

The following are the limitation of this study.

- The scrip chosen for analysis is ICICI BANK, SBI & YES BANK and the contract taken is January 2008 ending one –month contract.
- The data collected is completely restricted to ICICI BANK, SBI & YES BANK of January 2008; hence this analysis cannot be taken universal.

### **RESEARCH METHODOLOGY**

Data has been collected in two ways. These are:

#### **Secondary Method**

Various portals,

- [www.nseindia.com](http://www.nseindia.com)

Financial news papers, Economics times.

### **BOOKS**

- Derivatives Dealers Module Work Book - NCFM (October 2005)
- Gordon and Natarajan, (2006) '*Financial Markets and Services*' (third edition) Himalaya publishers

## LITERATURE REVIEW

### Behaviour of Stock Market Volatility after Derivatives

Golaka C Nath□, Research Paper (NSE)

Financial market liberalization since early 1990s has brought about major changes in the financial markets in India. The creation and empowerment of Securities and Exchange Board of India (SEBI) has helped in providing higher level accountability in the market. New institutions like National Stock Exchange of India (NSEIL), National Securities Clearing Corporation (NSCCL), National Securities Depository (NSDL) have been the change agents and helped cleaning the system and provided safety to investing public at large. With modern technology in hand, these institutions did set benchmarks and standards for others to follow. Microstructure changes brought about reduction in transaction cost that helped investors to lock in a deal faster and cheaper.

The reforms process have helped to improve efficiency in information dissemination, enhancing transparency, prohibiting unfair trade practices like insider trading and price rigging. Introduction of derivatives in Indian capital market was initiated by the Government through L C Gupta Committee report. The L. C. Gupta Committee on Derivatives had recommended in December 1997 the introduction of stock index futures in the first place to be followed by other products once the market matures. The preparation of regulatory framework for the operations of the index futures contracts took some more time and finally futures on benchmark indices were introduced in June 2000 followed by options on indices in June 2001 followed by options on individual stocks in July 2001 and finally followed by futures on individual stocks in November 2001.

## DERIVATIVES

### Derivatives

The emergence of the market for derivatives products, most notably forwards, futures and options, can be tracked back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. By their very nature, the financial markets are marked by a very high degree of volatility. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking-in asset prices. As instruments of risk management, these generally do not influence the fluctuations in the underlying asset prices. However, by locking-in asset prices, derivative product minimizes the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors.

Derivatives are risk management instruments, which derive their value from an underlying asset. The underlying asset can be bullion, index, share, bonds, currency, interest, etc.. Banks, Securities firms, companies and investors to hedge risks, to gain access to cheaper money and to make profit, use derivatives. Derivatives are likely to grow even at a faster rate in future.

## DEFINITION

Derivative is a product whose value is derived from the value of an underlying asset in a contractual manner. The underlying asset can be equity, forex, commodity or any other asset.

- Securities Contracts (Regulation) Act, 1956 (SCR Act) defines “derivative” to secured or unsecured,

risk instrument or contract for differences or any other form of security.

- A contract which derives its value from the prices, or index of prices, of underlying securities.

### **Emergence of Financial Derivative Products**

Derivative products initially emerged as hedging devices against fluctuations in commodity prices, and commodity-linked derivatives remained the sole form of such products for almost three hundred years. Financial derivatives came into spotlight in the post-1970 period due to growing instability in the financial markets. However, since their emergence, these products have become very popular and by 1990s, they accounted for about two-thirds of total transactions in derivative products. In recent years, the market for financial derivatives has grown tremendously in terms of variety of instruments available, their complexity and also turnover. In the class of equity derivatives the world over, futures and options on stock indices have gained more popularity than on individual stocks, especially among institutional investors, who are major users of index-linked derivatives. Even small investors find these useful due to high correlation of the popular indexes with various portfolios and ease of use. The lower costs associated with index derivatives vis-à-vis derivative products based on individual securities is another reason for their growing use.

### **PARTICIPANTS**

The following three broad categories of participants in the derivatives market

#### **HEDGERS**

Hedgers face risk associated with the price of an asset. They use futures or options markets to reduce or eliminate this risk.

#### **SPECULATORS**

Speculators wish to bet on future movements in the price of an asset. Futures and options contracts can give them an extra leverage; that is, they can increase both the potential gains and potential losses in a speculative venture.

#### **ARBITRAGERS**

Arbitrageurs are in business to take of a discrepancy between prices in two different markets, if, for, example, they see the futures price of an asset getting out of line with the cash price, they will take offsetting position in the two markets to lock in a profit.

### **FUNCTION OF DERIVATIVES MARKETS**

The following are the various functions that are performed by the derivatives markets. They are:

- Prices in an organized derivatives market reflect the perception of market participants about the future and lead the price of underlying to the perceived future level.
- Derivatives market helps to transfer risks from those who have them but may not like them to those who have an appetite for them.
- Derivatives trading acts as a catalyst for new entrepreneurial activity.

- Derivatives markets help increase saving and investment in long run.

## **TYPES OF DERIVATIVES**

The following are the various types of derivatives. They are:

### **FORWARDS**

A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.

### **FUTURES**

A futures contract is an agreement between two parties to buy or sell an asset in a certain time at a certain price, they are standardized and traded on exchange.

### **OPTIONS**

Options are of two types-calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

### **WARRANTS**

Options generally have lives of up to one year; the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the counter.

### **LEAPS**

The acronym LEAPS means long-term Equity Anticipation securities. These are options having a maturity of up to three years.

### **BASKETS**

Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options.

### **SWAPS**

Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used Swaps are:

- **Interest Rate Swaps**

These entail swapping only the related cash flows between the parties in the same currency.

- **Currency Swaps**

These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

## SWAPTION

Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaption is an option on a forward swap.

## REGULATORY FRAMEWORK

The trading of derivatives is governed by the provisions contained in the SC R A, the SEBI Act, and the regulations framed there under the rules and byelaws of stock exchanges.

### Regulation for Derivative Trading

SEBI set up a 24 member committee under Chairmanship of Dr. L. C. Gupta develop the appropriate regulatory framework for derivative trading in India. The committee submitted its report in March 1998. On May 11, 1998 SEBI accepted the recommendations of the committee and approved the phased introduction of derivatives trading in India beginning with stock index Futures. SEBI also approved the “suggestive bye-laws” recommended by the committee for regulation and control of trading and settlement of Derivative contract.

The provision in the SCR Act governs the trading in the securities. The amendment of the SCR Act to include “DERIVATIVES” within the ambit of securities in the SCR Act made trading in Derivatives possible within the framework of the Act.

- Eligibility criteria as prescribed in the L. C. Gupta committee report may apply to SEBI for grant of recognition under section 4 of the SCR Act, 1956 to start Derivatives Trading. The derivative exchange/segment should have a separate governing council and representation of trading/clearing member shall be limited to maximum 40% of the total members of the governing council. The exchange shall regulate the sales practices of its members and will obtain approval of SEBI before start of Trading in any derivative contract.
- The exchange shall have minimum 50 members.
- The members of an existing segment of the exchange will not automatically become the members of the derivatives segment. The members of the derivatives segment need to fulfill the eligibility conditions as lay down by the L. C. Gupta committee.
- The clearing and settlement of derivatives trades shall be through a SEBI approved clearing corporation/ clearing house. Clearing Corporation/Clearing House complying with the eligibility conditions as lay down By the committee have to apply to SEBI for grant of approval.
- Derivatives broker/dealers and Clearing members are required to seek registration from SEBI.
- The Minimum contract value shall not be less than Rs.2 Lakh. Exchange should also submit details of the futures contract they purpose to introduce.
- The trading members are required to have qualified approved user and sales persons who have passed a certification programme approved by SEBI

## Introduction to Futures and Options

In recent years, derivatives have become increasingly important in the field of finance. While futures and options are now actively traded on many exchanges, forward contracts are popular on the OTC market. In this chapter we shall study in detail these three derivative contracts.

### Forward Contracts

A forward contract is an agreement to buy or sell an asset on a specified future date for a specified price. One of the parties to the contract assumes a long position and agrees to buy the underlying asset on a certain specified future date for a certain specified price. The other party assumes a short position and agrees to sell the asset on the same date for the same price. Other contract details like delivery date, price and quantity are negotiated bilaterally by the parties to the contract. The forward contracts are normally traded outside the exchanges. The salient features of forward contracts are:

They are bilateral contracts and hence exposed to counter-party risk.

Each contract is custom designed, and hence is unique in terms of contract size, expiration date and the asset type and quality.

The contract price is generally not available in public domain.

On the expiration date, the contract has to be settled by delivery of the asset.

If the party wishes to reverse the contract, it has to compulsorily go to the same counterparty, which often results in high prices being charged.

However forward contracts in certain markets have become very standardized, as in the case of foreign exchange, thereby reducing transaction costs and increasing transactions volume. This process of standardization reaches its limit in the organized futures market.

Forward contracts are very useful in hedging and speculation. The classic hedging application would be that of an exporter who expects to receive payment in dollars three months later. He is exposed to the risk of exchange rate fluctuations. By using the currency forward market to sell dollars forward, he can lock on to a rate today and reduce his uncertainty. Similarly an importer who is required to make a payment in dollars two months hence can reduce his exposure to exchange rate fluctuations by buying dollars forward.

If a speculator has information or analysis, which forecasts an upturn in a price, then he can go long on the forward market instead of the cash market. The speculator would go long on the forward, wait for the price to rise, and then take a reversing transaction to book profits. Speculators may well be required to deposit a margin upfront. However, this is generally a relatively small proportion of the value of the assets underlying the forward contract. The use of forward markets here supplies leverage to the speculator.

### Limitations of Forward Markets

Forward markets world-wide are afflicted by several problems:

- Lack of centralization of trading,
- Illiquidity, and

- Counterparty risk

In the first two of these, the basic problem is that of too much flexibility and generality. The forward market is like a real estate market in that any two consenting adults can form contracts against each other. This often makes them design terms of the deal which are very convenient in that specific situation, but makes the contracts non-tradable.

Counterparty risk arises from the possibility of default by any one party to the transaction. When one of the two sides to the transaction declares bankruptcy, the other suffers. Even when forward markets trade standardized contracts, and hence avoid the problem of illiquidity, still the counterparty risk remains a very serious

The pay off for the buyer and the seller of the futures of the contracts are as follows:

### PAY-OFF FOR A BUYER OF FUTURES

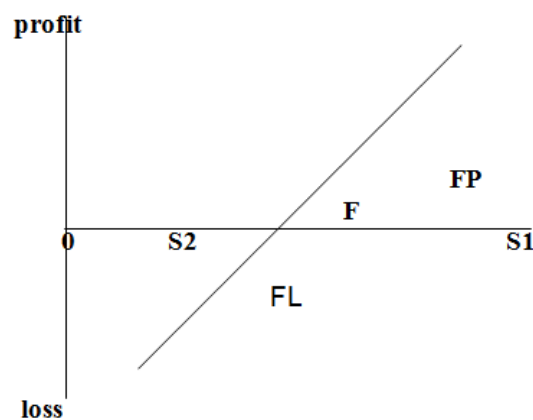


Figure 1

**CASE 1:** The buyer bought the futures contract at (F); if the future price goes to S1 then the buyer gets the profit of (FP).

**CASE 2:** The buyer gets loss when the future price goes less than (F), if the future price goes to S2 then the buyer gets the loss of (FL).

### PAY-OFF FOR A SELLER OF FUTURES

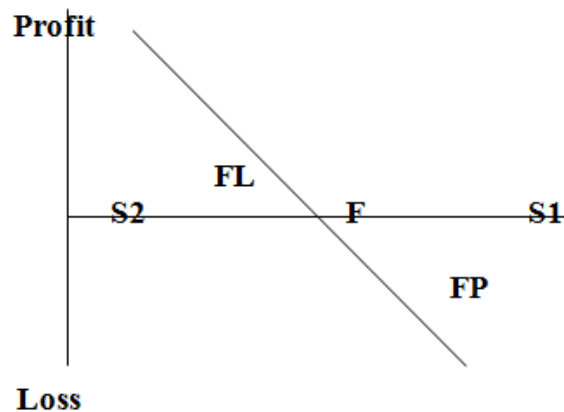


Figure 2



## F – FUTURES PRICE S1, S2 – SETTLEMENT PRICE

**CASE 1:** The seller sold the future contract at (F); if the future goes to S1 then the seller gets the profit of (FP).

**CASE 2:** The seller gets loss when the future price goes greater than (F), if the future price goes to S2 then the seller gets the loss of (FL).

## INTRODUCTION TO OPTIONS

### Definition

Option is a type of contract between two persons where one grants the other the right to buy a specific asset at a specific price within a specific time period. Alternatively the contract may grant the other person the right to sell a specific asset at a specific price within a specific time period. In order to have this right. The option buyer has to pay the seller of the option premium

The assets on which option can be derived are stocks, commodities, indexes etc. If the underlying asset is the financial asset, then the option are financial option like stock options, currency options, index options etc, and if options like commodity option.

## PROPERTIES OF OPTION

Options have several unique properties that set them apart from other securities. The following are the properties of option:

- Limited Loss
- High leverages potential
- Limited Life

## PARTIES IN AN OPTION CONTRACT

### Buyer of the Option

The buyer of an option is one who by paying option premium buys the right but not the obligation to exercise his option on seller/writer.

### Writer/Seller of the Option

The writer of the call /put options is the one who receives the option premium and is their by obligated to sell/buy the asset if the buyer exercises the option on him

## On the Basis of the Market Movements

On the basis of the market movements the option are divided into two types. They are:

### CALL OPTION

A call option is bought by an investor when he seems that the stock price moves upwards. A call option gives the holder of the option the right but not the obligation to buy an asset by a certain date for a certain price.

### PUT OPTION

A put option is bought by an investor when he seems that the stock price moves downwards. A put options gives the holder of the option right but not the obligation to sell an asset by a certain date for a certain price.

### On the Basis of Exercise of Option

On the basis of the exercising of the option, the options are classified into two categories.

- **American Option**

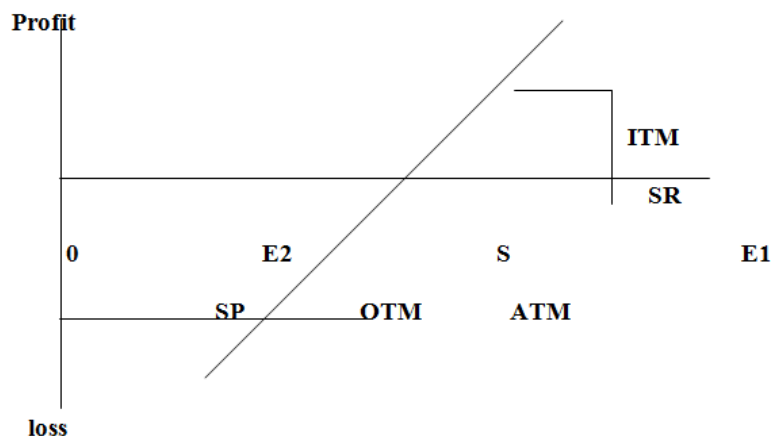
American options are options that can be exercised at any time up to the expiration date, all stock options at NSE are American.

- **European Option**

European options are options that can be exercised only on the expiration date itself. European options are easier to analyze than American options. All index options at NSE are European.

### PAY-OFF PROFILE FOR BUYER OF A CALL OPTION

The pay-off of a buyer options depends on a spot price of a underlying asset. The following graph shows the pay-off of buyer of a call option.



**Figure 3**

S - Strike Price OTM - Out of the money

SP - Premium/ Loss ATM - At the money

E1 - Spot price 1 ITM - In the money

E2- Spot price 2

SR- profit at spot price E1

**CASE 1:** (Spot price > Strike price)

As the spot price (E1) of the underlying asset is more than strike price (S). the buyer gets profit of (SR), if price increases more than E1 then profit also increase more than SR.

**CASE 2:** (Spot price < Strike price)

As a spot price (E2) of the underlying asset is less than strike price (s)

The buyer gets loss of (SP), if price goes down less than E2 then also his loss is limited to his premium (SP)

### PAY-OFF PROFILE FOR SELLER OF A CALL OPTION

The pay-off of seller of the call option depends on the spot price of the underlying asset. The following graph shows the pay-off of seller of a call option:

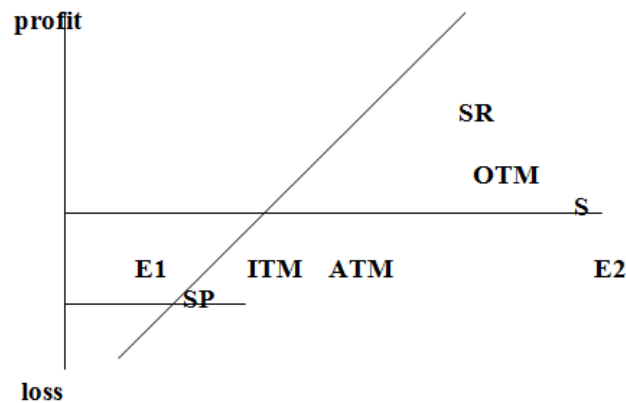


Figure 4

S - Strike price ITM - In the money

SP - Premium /profit ATM - At the money

E1 - Spot price 1 OTM - Out of the money

**E2 - Spot price 2**

SR - Loss at spot price E2

**CASE 1:** (Spot price < Strike price)

As the spot price (E1) of the underlying is less than strike price (S). the seller gets the profit of (SP), if the price decreases less than E1 then also profit of the seller does not exceed (SP).

**CASE 2:** (Spot price > Strike price)

As the spot price (E2) of the underlying asset is more than strike price (S) the seller gets loss of (SR), if price goes more than E2 then the loss of the seller also increase more than (SR).

S - Strike price ITM - In the money

SP - Premium /profit OTM - Out of the money

E1 - Spot price 1 ATM - At the money

E2 - Spot price 2

SR - Profit at spot price E1

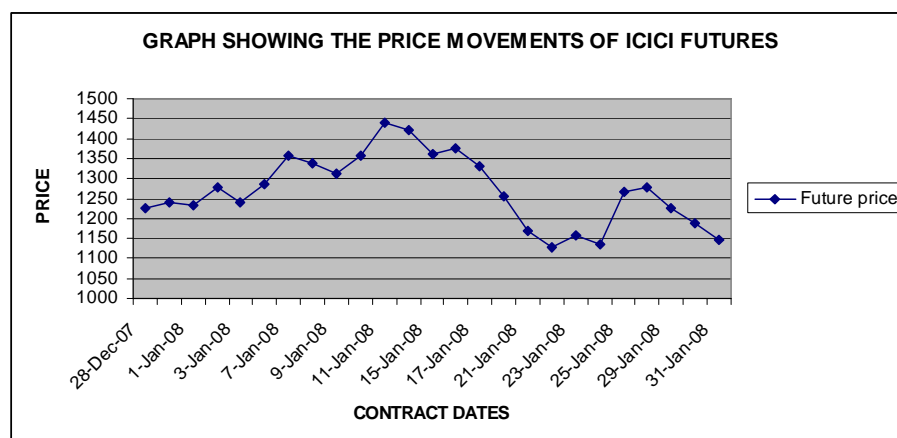
## DATA ANALYSIS AND INTERPRETATION

Table 1

Date	Market Price	Future Price
28-Dec-07	1226.7	1227.05
31-Dec-07	1238.7	1239.7
1-Jan-08	1228.75	1233.75
2-Jan-08	1267.25	1277
3-Jan-08	1228.95	1238.75
4-Jan-08	1286.3	1287.55
7-Jan-08	1362.55	1358.9
8-Jan-08	1339.95	1338.5
9-Jan-08	1307.95	1310.8
10-Jan-08	1356.15	1358.05
11-Jan-08	1435	1438.15
14-Jan-08	1410	1420.75
15-Jan-08	1352.2	1360.1
16-Jan-08	1368.3	1375.75
17-Jan-08	1322.1	1332.1
18-Jan-08	1248.85	1256.45
21-Jan-08	1173.2	1167.85
22-Jan-08	1124.95	1127.85
23-Jan-08	1151.45	1156.35
24-Jan-08	1131.85	1134.5
25-Jan-08	1261.3	1265.6
28-Jan-08	1273.95	1277.3
29-Jan-08	1220.45	1223.85
30-Jan-08	1187.4	1187.4
31-Jan-08	1147	1145.9

### ANALYSIS OF ICICI

The objective of this analysis is to evaluate the profit/loss position of futures and options. This analysis is based on sample data taken of ICICI BANK scrip. This analysis considered the Jan 2008 contract of ICICI BANK. The lot size of ICICI BANK is 175, the time period in which this analysis done is from 27-12-2007 to 31.01.08.



Graph 1

## OBSERVATIONS AND FINDINGS

If a person buys 1 lot i.e. 175 futures of ICICI BANK on 28th Dec, 2007 and sells on 31<sup>st</sup> Jan, 2008 then he will get a loss of  $1145.9 - 1227.05 = -81.15$  per share. So he will get a loss of  $14201.25$  i.e.  $-81.15 * 175$

If he sells on 14<sup>th</sup> Jan, 2007 then he will get a profit of  $1420.75 - 1227.05 = 193.7$  i.e. a profit of 193.7 per share. So his total profit is  $33897.5$  i.e.  $193.7 * 175$

The closing price of ICICI BANK at the end of the contract period is 1147 and this is considered as settlement price.

The following table explains the market price and premiums of calls.

- The first column explains trading date
- Second column explains the SPOT market price in cash segment on that date.
- The third column explains call premiums amounting at these strike prices; 1200, 1230, 1260, 1290, 1320 and 1350.

## OBSERVATIONS AND FINDINGS

- The future price of SBI is moving along with the market price.
- If the buy price of the future is less than the settlement price, than the buyer of a future gets profit.
- If the selling price of the future is less than the settlement price, than the seller incur losses

## SUMMARY

- Derivatives market is an innovation to cash market. Approximately its daily turnover reaches to the equal stage of cash market. The average daily turnover of the NSE derivative segments
- In cash market the profit/loss of the investor depends on the market price of the underlying asset. The investor may incur huge profits or he may incur Huge losses. But in derivatives segment the investor enjoys huge profits with limited downside.
- In cash market the investor has to pay the total money, but in derivatives the investor has to pay premiums or margins, which are some percentage of total contract.
- Derivatives are mostly used for hedging purpose.
- In derivative segment the profit/loss of the option writer purely depends on the fluctuations of the underlying asset.

## SUGESSTIONS

- The derivatives market is newly started in India and it is not known by every investor, so SEBI has to take steps to create awareness among the investors about the derivative segment.
- In order to increase the derivatives market in India, SEBI should revise some of their regulations like contract

size, participation of FII in the derivatives market.

- Contract size should be minimized because small investors cannot afford this much of huge premiums.
- SEBI has to take further steps in the risk management mechanism.
- SEBI has to take measures to use effectively the derivatives segment as a tool of hedging.

## CONCLUSIONS

- In bullish market the call option writer incurs more losses so the investor is suggested to go for a call option to hold, where as the put option holder suffers in a bullish market, so he is suggested to write a put option.
- In bearish market the call option holder will incur more losses so the investor is suggested to go for a call option to write, where as the put option writer will get more losses, so he is suggested to hold a put option.
- In the above analysis the market price of YES bank is having low volatility, so the call option writer enjoys more profits to holders.

## REFERENCES

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6. <http://www.bseindia/about/derivati.asp#typesofprod.htm>